The Criminal Justice System and More Lenient Drug Policy

Three Case Studies on California’s Changes to How Its Criminal Justice System Addresses Drug Use

Gabriel Weinberger

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Abstract

The nation’s reliance on incarceration appears to have reached a peak a few years ago and there is a movement towards a major de-carceration initiative that will be driven by local jurisdictions. Current research must be focused on learning from the early wave of de-carceration experiments, which are mostly associated to drug-related crimes, to provide implications for future policymaking.

This dissertation deals with the implementation, at the local level, of various major changes to California's criminal justice system. These changes include liberalization of marijuana policies, Public Safety Realignment, and Proposition 47. The theme behind these changes has been a change in how the criminal justice system sanctions drug use. This dissertation explores an important question from each policy that can guide future policy. The first chapter explores whether localities that allowed for regulated dispensaries that sell medical marijuana to operate experienced an increase in crime rates. The second chapter describes how Public Safety Realignment changed the landscape for how social services are provided through the criminal justice system, detailing the effect on counties by using Los Angeles as a case study. Finally, the third chapter uses Los Angeles as a case study to answer whether community supervision is an adequate mechanism for engaging individuals with substance use disorder treatment.

Overall, the dissertation suggests that there may be collateral consequences from more liberal policies but that these can be addressed outside of the scope of the criminal justice system. In the context of regulating the supply of marijuana, a formerly illicit drug in California, I find that it did not result in a wave of higher crime rates. Finally, a major implication from this dissertation is that further work is required to serve the population that is affected by policies that reduce the use of incarceration for drug-related crimes. Local governments need to continue to address low-level crime caused by problematic drug use by improving their systems for providing social services without settling for using the lever of the criminal justice system.
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Introduction

National Policy Landscape

As the term “mass incarceration” becomes mainstream, it has become clear that there is a widely-adopted belief that the nation’s criminal justice system needs fixing. In year-end 2016 there were almost 2.2 million inmates in state and federal prisons and in local jails in the United States, and this number rises to 6.6 million when including all those in community supervision (i.e. probation and parole) (Kaeble & Cowhig, 2018). This has not always been the case, as the population of inmates over the period of 1975-2005 increased from 110 prisoners per 100,000 residents to 476 per 100,000 residents (Useem & Piehl, 2008). But as the correctional system population has risen to staggering numbers, the mass incarceration experiment has finally started to be questioned, to the extent that decreasing incarceration rates has actually become one of the few bipartisan issues in American politics. While the Sentencing Reform and Corrections Act hit a snag in the Senate before the 2016 elections, there is momentum after the 2018 midterm elections for The First Step Act (Bolton, 2018). The proposal would decrease the size of the federal prison population.

But the criminal justice system is mostly a local problem, and there has also been a nationwide recognition across jurisdictions that they must de-carcerate. State and local jurisdictions supervised (a broad term that includes both incarceration and community supervision) almost 20 times as many people as the federal government in 2016 (Kaeble & Cowhig, 2018). Local governments have started to acknowledge the huge social and monetary costs to communities of such high incarceration rates. Reducing costs was the main driver of the Justice Reinvestment Initiative, which has partnered 35 states with research institutions that identify local drivers and propose policy that will reduce the rates of incarceration (Pew Charitable Trusts 2018). Of course, this is just part of the reforms that have taken hold nationwide. The total incarcerated population decreased by almost 17 percent between 2007 and 2015 (Subramanian, Henrichson, & Kang-Brown, 2015). Levels of incarcerations still have a long way to drop to get back to that 1975 rate, and it is essential as we move in that direction for policymakers to learn from the ongoing de-carceration experiments.

Much of the blame for the nation’s incarceration problem has been attributed to the “War on Drugs,” making drug policy reform low hanging fruit in the movement to de-carcerate. In “The New Jim Crow,” Michelle Alexander makes a compelling argument for how the War on Drugs has been used to massively expand the reach of the criminal justice system (Alexander, 2011).

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1 Based on the author’s calculations using figures of the total supervised population, by state and federal entities, on December 31, 2016.
3 Calculations were done by the author using data from various sources put together by Vera Institute for Justice.
While there is debate as to the weight one should place on low-level drug sentences’ role in creating mass incarceration, it is politically expedient to tackle this problem first. The “Willy Horton effect,” where sensationalist crimes are used to drive fear towards lenient policies, has made it difficult to pass laws targeting individuals convicted of violent crime. In the reforms initiated through the Justice Reinvestment Initiative, many have included revising sentencing with regards to offenses related to drug use as well as improving pre-trial and post-release care for behavioral health problems (Pew Charitable Trusts 2018). It is therefore likely that the national policy landscape, at least for the immediate future, will be driven by drug policy reforms.

California’s Criminal Justice Changes

California was no exception to the rule of exploding incarceration rates. By the turn of the 21st century, the number of inmates under state control in California was exerting a huge cost at the human, fiscal, and operational level. The prison population in 2007 was at 171,000, after growing since 1987 at three times the rate of the state population (California Department of Corrections and Rehabilitation, 2008; Davis et al., 2011). Due to this increase, state spending on adult corrections between FY1984-85 and 2006-07 went from four percent of the General Fund to eight percent (Alpert, 2007). The growing prison population had also become a pressing issue legally, as two district courts found that deficiencies in prison medical and mental care were primarily a consequence of overcrowding (U.S. Eastern and Northern District Courts of California, 2009).

In an effort to de-carcerate, California has restructured its criminal justice system in fundamental ways since the turn of the century. These changes were largely driven by policies related to how the system addresses drug use. The first major change occurred in 1996 when the state became the first to legalize medical marijuana through the passage of the Compassionate Use Act (CUA). Later, the passage of Proposition 36 led to the enactment of the Substance Abuse and Crime Prevention Act (SACPA) in 2001, which was based on the idea that individuals with substance use disorders should be in treatment instead of incarcerated. Moreover, the decriminalization of marijuana later in the decade was a reinforcement of this idea that valuable prison and jail space should be reserved for violent criminals. Towards the second half of the decade the State legislature passed SB 1453, AB 900, SB x3-1, and SB 678 trying to increase rehabilitation and diminish the use of the prison system for those in contact with the criminal justice system.

4 See “Locked in: The true causes of mass incarceration – And how to achieve real reform” for another take (Pfaff, 2017).
Only able to really “nibble around the edges”\(^5\) in terms of making a dent in its prison population (see Chapter 2 for a more extensive historical perspective), the state would take a much more revolutionary approach. Still, this approach was mostly focused on people deemed to be suffering from problems related to drug use. On October 2011, California’s legislature enacted AB 109 and AB 117, which came to be collectively known as Public Safety Realignment (referred to interchangeably as “Realignment” or “AB 109” in this dissertation). Considered to be the “biggest penal experiment in modern history,” it amended hundreds of criminal codes and in the first two years affected over 100,000 justice-involved individuals (Petersilia & Snyder, 2013, p. 269). These individuals (referred to as the “realigned” population thereafter) were most likely to have been convicted of drug- and property-related crimes, both highly correlated to substance use (Bronson, Stroop, Zimmer, & Berzofsky, 2017; Seddon, 2007). Then, Proposition 47 was passed by referendum in November 2014, reclassifying most drug possession and petty theft\(^6\) offenses from felonies to misdemeanors. As I will show in Chapter 2, the goal behind Proposition 47 was to divert resources spent on incarcerating people with drug use-related problems to community services meant to address these same problems.

**Cross-cutting Themes**

As the national conversation builds towards criminal justice reform, like in many other areas of policy experimentation, states are looking to California for lessons. The goal of this dissertation was to add to the literature examining these lessons by analyzing three state-level policies enacted in California. Moreover, the analyses in this dissertation focus on the most important jurisdictional level in criminal justice: the county. Policy evaluations are oftentimes studied at the state-level, but this misses important idiosyncrasies in implementation and other variation that occurs at the local level. And California’s reforms have given local governments a lot of responsibility over implementation and defining the role of the justice system. Brandeis once said that “states are the laboratories of democracy,” but sometimes we have to look even deeper, to the county level (Diller, 2007).

Additionally, for the policies studied in this dissertation to succeed locally, they require thoughtful implementation and analysis, as well as buy-in from local officials. Policies that take a more liberal approach to criminal justice are in greater need of research because they take on more risk by promoting alternatives to incarceration- we could reduce the crime rate to zero if we incarcerated everyone. These policies must be continuously evaluated so as to target the populations in need of help and assure law enforcement agencies that crime rates are not inching upwards (Cullen, Jonson, & Mears, 2017; Petersilia & Cullen, 2015). The evaluations are also

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\(^5\) This was a term used by Susan Turner in a presentation given to an audience of criminal justice practitioners and academics (Turner, 2016).

\(^6\) Petty theft is another crime highly correlated to substance abuse.
important to ensure that the communities implementing these policies are not being harmed. The chapters that make up this dissertation are meant to provide lawmakers with this type of applied research.

The three case studies making up this dissertation each examine county-level implementation of a significant change in California’s criminal justice system associated with how drug use is addressed. These changes were a result of three major policies: medical marijuana liberalization (Chapter 1), Realignment (Chapter 2) and Proposition 47 (Chapter 3). Legalization of medical marijuana, while a state policy, has left much of the question of distribution to local jurisdictions. Realignment, not so much an experiment with a sample of 58 counties, was more like 58 different experiments happening at once (Bird & Grattet, 2014; Lin & Petersilia, 2014). And in the case of Proposition 47, given that most of the target population were already the responsibility of their county of residence due to Realignment (see Chapter 2), the effects were mostly felt by the county systems. With regards to these state policies, I use local-level implementation to answer research questions that are generalizable to other jurisdictions aiming to reduce their incarcerated population. I assess the following research questions in each chapter:

- **Chapter 1:** What is the effect on crime of allowing for the distribution of medical marijuana through dispensaries?
- **Chapter 2:** What did AB 109 do and who were the target population? What are the biggest challenges facing California counties in achieving the goals of Realignment? How did the subsequent enactment of Proposition 47 affect counties in the context of Realignment? How did Los Angeles County implement its system of services for the AB 109 population so that an individual released from prison attains substance use disorder services (SUD)?
- **Chapter 3:** What are the demographic and drug-use characteristics of the group that received Proposition 47 relief through the process of resentencing? Does being on community supervision make one more likely to stay engaged in SUD treatment after an initial treatment episode?

The first chapter examines whether a change in policy regarding how marijuana, formerly an illegal substance, was supplied to consumers had an effect on crime rates. In the early part of the turn of the century, the state began giving local jurisdictions strong autonomy to decide whether to permit and how to regulate medical marijuana dispensaries. These dispensaries acted essentially as retail store-fronts for medical marijuana eligible patients. Some local actors, such as law enforcement, had been critical of these store-fronts, arguing they were a conduit for all types of crime (California Police Chiefs Association, 2009). My co-authors and I use a difference-in-difference methodology to exploit variation in dispensary laws across counties, over time, to test the effect of allowing dispensaries on different types of crime.
Decriminalizing marijuana has been viewed as long-hanging fruit in the fight to end the collateral consequences of the war on drugs. As of this date, 33 states have some form of legalization of marijuana and ten states have legalized it outright ("State Marijuana Laws in 2018 Map," 2018). Many have argued for decriminalization on the basis that criminalizing marijuana has had a detrimental impact to communities (Drug Policy Alliance 2018). As marijuana sales move out of the domain of the criminal justice system (previously through medical sales, more recently through recreational sale), questions arise as to whether marijuana use or the existence of dispensaries that are mostly cash-only businesses could generate more crime rather than less. Research on the impact of these changes can both assuage public safety concerns over more liberal marijuana laws and help law enforcement work within existing laws to minimize crime.

This paper makes two important contributions to the literature on marijuana laws and their effect on public health. First, it examines marijuana laws at the county- and city-jurisdiction level, where much of the actual implementation occurs. Previous research examining the effects from marijuana laws has almost exclusively examined state-level laws. These studies have thus created samples with significant heterogeneity within each observation. It is likely that this heterogeneity is the reason that studies testing the impact of these laws on marijuana use and crime have found inconsistent results (Pacula, Bousted, & Hunt, 2014). Second, the study investigates an important policy problem currently affecting California policymakers. Dispensaries have become more and more common as the state has officially legalized marijuana in 2016, but local jurisdictions still have the power to regulate the presence and operations of these dispensaries.

We find no evidence of an increase in crime as a result of counties allowing dispensaries. On the contrary, we find a possible decrease in property crime. We also find preliminary evidence that counties allowing dispensaries may experience an increase in driving under the influence. Overall, the paper demonstrates that policymakers should continue to closely monitor misuse of marijuana that may become more prevalent as a consequence of it being easier to attain. However, an increase in crime is not inherent in liberalizing the supply of marijuana.

In the second chapter of this dissertation, “Realignment and Proposition 47: A Description Through a Historical Context,” I introduce two fundamental criminal justice policies through California’s historical context. I show that increasing the provision of social services to justice-involved individuals is essential for the success of Realignment. Moreover, I describe specific provisions of AB 109 to explain the mechanisms by which the law is supposed to lead to a reduction in recidivism through an increase in service provision. I connect these mechanisms to the most important issues counties will face to successfully implement Realignment. The paper also introduces the complexities for service provision brought on by Proposition 47, which changed the landscape by making it more difficult to incarcerate and supervise low-level offenders.
As an application, the second paper describes Los Angeles (LA) County’s system of service provision for its AB 109 population, particularly SUD treatment, within the new structure brought about by Realignment. By focusing on implementation in one county, I stick to one of the 58 experiments that has been conducted in the state. This experiment is conducted in one of the largest and most complex bureaucracies in the country, making it important to understand on its own. Moreover, while studies have exploited variation across counties or at the state-level from Realignment, the complexities and intricacies of each county system have made it difficult to categorize counties’ efforts to make specific recommendations about what works (Bird & Grattet, 2015; Hopper, Dooley-Sammuli, & Evans, 2012; Petersilia, 2014a; Turner, Fain, & Hunt, 2015). By drawing from one experience, I can better describe the processes in place during implementation, in order to create a framework for future analyses that explore effects to service provision and recidivism.

The intended audience of the paper are two-fold. Most directly, practitioners working at the local level can benefit from this analysis. The paper lays the framework for the goals of Realignment, and the mechanisms and challenges present to county governments to achieving these goals, which is beneficial for local actors working in the criminal justice landscape. The paper can also benefit the research community investigating Realignment. The policy created countless opportunities to learn from a decarceration experiment, an immensely important task as more jurisdictions begin their own experiments.

The paper drives the third chapter in this dissertation. The second chapter concludes that one of the most pressing concerns for officials in LA County (and other counties) are individuals that require social services, and for which the criminal justice system was a way to reach them with these services, but have become harder to reach as a result of Proposition 47 (Hunter, Davis, Smart, & Turner, 2017). Officials in LA have argued that this has affected those most in need of treatment and other services, who are no longer receiving them because they have fallen outside of the purview of the criminal justice system (Castellano et al., 2016).

The third chapter also focuses on local-level implementation to learn about an important policy issue. I exploit a process created by Proposition 47, relief from community supervision through resentencing of an existing conviction, to test the effect of community supervision on engaging people in SUD treatment services. Resentencing of previous convictions during the first year after Proposition 47 was enacted led to people that were under community supervision to receive a sudden termination of the supervision case. In LA, the timing of these terminations was a result of many factors outside of the control of the individuals that would be terminated from supervision. I use this variation to study whether community supervision in LA was a positive force in maintaining people engaged to SUD treatment.

The study contributes to the literature that examines the effectiveness of using the criminal justice system to engage people with services. I analyze a novel dataset of publicly-administered
SUD treatment episodes for a cohort under supervision, matched to the dates of supervision. Because the sample period covers both the cohort’s time under supervision once Proposition 47 was enacted as well as after their supervision had ended, I was able to compare pre- and post-supervision periods. While most studies in this field measure the retention in SUD treatment of a cohort that enters treatment or the effect of specific interventions, I explore a problem that will become more common as jurisdictions reduce the reach of the criminal justice system: will this remove a mechanism that works to engage people in services?

I find that in fact community supervision did have a positive effect in keeping clients engaged to SUD treatment services. My finding is important for policymakers in Los Angeles, other counties in California, and other jurisdictions that reduce their use of community supervision. It highlights the need for local governments to find alternative ways to connect people in need with social services. Importantly, this paper also paves the way for future research on longer-term outcomes using Proposition 47 as a policy lever that reduced the reach of the justice system.
Abstract: Regulated marijuana markets are more common today than outright prohibitions across the U.S. states. Advocates for policies that would legalize marijuana recreational markets frequently argue that such laws will eliminate crime associated with the black markets, which many argue is the only link between marijuana use and crime. Law enforcement, however, has consistently argued that marijuana medical dispensaries (regulated retail sale and a common method of medical marijuana distribution), create crime in neighborhoods with these storefronts. This study offers new insight into the question by exploiting newly collected longitudinal data on local marijuana ordinances within California and thoroughly examining the extent to which counties that permit dispensaries experience changes in violent, property and marijuana use crimes using difference-in-difference methods. The results suggest no relationship between county laws that legally permit dispensaries and reported violent crime. We find a negative and significant relationship between dispensary allowances and property crime rates, although event studies indicate these effects may be a result of pre-existing trends. These results are consistent with some recent studies suggesting that dispensaries help reduce crime by reducing vacant buildings and putting more security in these areas. We also find a positive association between dispensary allowances and DUI arrests, suggesting marijuana use increases in conjunction with impaired driving in counties that adopt these ordinances, but these results are also not corroborated by an event study analysis.
Introduction

The impact of liberalizing marijuana laws on crime is a subject of great political and scholarly debate. Advocates for policy reform in states considering liberalization laws, both medical marijuana laws (MMLs) allowing for dispensaries as well as policies promoting retail sale for recreational purposes, suggest that bringing marijuana markets out of the shadows of the black market is a clear net public safety gain.\(^7\) Indeed such a position is supported by scholarly work seeking to identify a causal link between marijuana use and violence, but not finding any (Arseneault, Moffitt, Caspi, Taylor, & Silva, 2000; Mulvey et al., 2006). Nonetheless, law enforcement agencies in jurisdictions that have already adopted dispensary systems for medical marijuana claim that these dispensaries are inextricably connected to crime (California Police Chiefs Association, 2009; Ingold & Lofholm, 2016; Powers, 2014).

The difficulty in reconciling these two positions can to some extent be comprehended by understanding the different mechanisms through which marijuana liberalization laws might potentially influence crime. First, there is the obvious impact of legitimizing what was previously an illegal market. By transitioning marijuana transactions from illegitimate exchanges that had to be actively enforced to legitimate transactions, there is an immediate reduction in the burden of enforcement assuming the legal market replaces the black market (Miron & Zwiebel, 1995; Edward M Shepard & Blackley, 2005). Law enforcement and the Courts may then transition resources to other, arguably more violent, types of crimes (Huber, Newman, & LaFave, 2016; Miron & Zwiebel, 1995). Second, there is the potential for liberalization laws to influence crime rates through an increase in marijuana (mis)use (e.g. psychopharmacological crime), to the extent that marijuana use induces criminogenic behavior. While there is no clear causal link between marijuana use and criminogenic behavior, there is suggestive evidence for a positive correlation between use and property crime (Green, Doherty, Stuart, & Ensminger, 2010; Pacula & Kilmer, 2003).\(^8\) A third potential mechanism through which liberalization laws could plausibly influence crime, which might also explain the positive correlation between use and property crime, is that these liberalization ordinances enable the creation of new brick and mortar and delivery businesses that, because of the federal prohibition and banking laws that prevent (until recently) credit and debit cards from being accepted in stores, operate entirely on a cash basis, creating strong targets for burglaries or thefts (California Police Chiefs Association, 2009).

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\(^7\) For example, see the “Issues” webpage for the Marijuana Policy Project: [https://www.mpp.org/issues/](https://www.mpp.org/issues/).

\(^8\) Another important factor to consider is marijuana use and victimization, although any evidence of a causal link pointing to an increase in victimization has been inconclusive (Markowitz, 2005; Office of National Drug Control Policy, 2013).
A whole new body of scholarly work has emerged exploiting the natural experiment created by new state laws that liberalize the sale of medical marijuana to examine this relationship. As of November 2016, medical marijuana laws have been passed by 28 states plus the District of Columbia. The enactment of state laws since 1996 provide an opportunity to empirically test the effect of regulated markets on outcomes of interest. Studies have evaluated outcomes such as marijuana use (Chu, 2014; Harper, Strumpf, & Kaufman, 2012; Deborah S. Hasin et al., 2015; Lynne-Landsman, Livingston, & Wagenaar, 2013; Pacula, Powell, Heaton, & Sevigny, 2015; Wall et al., 2011; Wen, Hockenberry, & Cummings, 2015), crime rates (Chu & Townsend, 2017; Gavrilova, Kamada, & Zoutman, 2017; Huber et al., 2016; Morris, TenEyck, Barnes, & Kovandzic, 2014; Edward M. Shepard & Blackley, 2016), and other health outcomes (D. M. Anderson, Rees, & Sabia, 2014; Chu, 2015; Smart, 2015). These studies all use a difference-in-difference methodology where the treatment is a change in a state law that loosens restrictions on the sale of marijuana.

The concern with these state-level studies is that many states, particularly the early adopting states, actually defer to local entities when it comes to regulating marijuana supply and production, which leads to variation in treatment within states (Dilley, Hitchcock, McGroder, Greto, & Richardson, 2017; Freisthler, Kepple, Sims, & Martin, 2013). For example, in Colorado and Washington State, which legalized the sale of recreational marijuana in 2014, various types of policies exist at the community level and a significant portion of the population live in communities where the sale of recreational marijuana is not allowed (Colorado Department of Revenue, 2016; Dilley et al., 2017). Moreover, medicinal marijuana laws within a state may differ on important elements, such as bans on dispensaries and cultivation (Pacula et al., 2014). Therefore, studies that generalize a MML across the state are ignoring heterogeneity within their treatment sample, possibly leading to the inconsistent findings in the MML literature (Pacula et al., 2015). Given the localized nature of crime and the importance of levels of aggregation, this (mis)measurement of the treatment dosage is especially problematic for estimating effects on crime rates (Freeman, Grogger, & Sonstelie, 1996; Hipp, 2007).

The objective of this study is to investigate whether a particular element of MMLs, namely allowance for dispensaries, affects local crime and other indicators of marijuana misuse (i.e. driving under the influence). We are also able to identify other dimensions of MMLs, such as allowance for home cultivation, but due to little variation in these other dimensions, we focus on allowances for dispensaries. Moreover, we estimate effects on different types of crime, as well as arrests indicating marijuana use, to better understand the mechanisms driving the results. By utilizing a novel dataset that codifies elements of MMLs across local jurisdictions within California, we capture heterogeneity on the treatment variable that is present in other studies. Moreover, by focusing on local variation within a single state with a long experience with the policy, we are able to implicitly control for changing state norms and marijuana use that could be

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9 We still control for whether a jurisdiction has limitations on home cultivation in all of our models.
independently associated with marijuana-involved crime. Other state-level factors that could bias estimates of crime rates across states, such as depenalization of marijuana, are also implicitly controlled in our analysis (Huber et al., 2016). This analysis can help inform policies at the local level, where regulation is usually enacted, that better balance safety and access to medical marijuana.

We find no evidence that ordinances allowing for marijuana dispensaries lead to an increase in crime. In fact, we see some evidence of a drop in property crime along with an increase in DUI and misdemeanor marijuana arrests, pointing to possible increases in misuse of marijuana that don’t result in more crime. Supplementary analyses indicate that the significant effects may be driven by pre-existing trends, so we limit our conclusions to the fact that counties allowing dispensaries did not experience an increase in crime. The rest of this paper proceeds as follows: Section 2 provides some background into the literature on regulation of marijuana markets and crime, Section 3 describes the methods used for the analysis, Section 4 provides results, and Section 5 concludes with a discussion of policy implications and limitations.

Background

**Why Might Dispensary Laws Affect Reported Crime Rates and Arrests?**

It is clear that explicitly writing into law that entities are permitted to engage in retail distribution of medical marijuana reduces the criminal justice risks of supplying marijuana. Theoretically, we might expect this to increase availability and access to marijuana, which could increase demand at both the extensive, and potentially the intensive margins. Indeed there is consistent evidence that laws on-the-books explicitly permitting entities to produce and distribute medical marijuana increase non-medical use of marijuana among adults (D. S. Hasin, Sarvet, Cerdá, & et al., 2017; Pacula et al., 2015; Wen et al., 2015). The laws appear to have no general impact on youth marijuana use (M. D. Anderson, Hansen, & Rees, 2015; Choo et al., 2014; Deborah S. Hasin et al., 2015; Lynne-Landsman et al., 2013; Shu-Acquaye, 2016), although there is some evidence from studies accounting for the relative size of these evolving marijuana market that larger and/or more competitive markets do in fact influence youth marijuana use (D'Amico et al., 2015; Smart, 2015); It is *a priori* unclear, however, what effect this increased use among adults may have on community-level violent and property crime or driving under the influence. Moreover, the replacement of a black market by a new cash-based business may or may not lead to a change in reported robberies, burglaries, and thefts (California Police Chiefs Association, 2009). Although we cannot hypothesize on the overall directional change, by applying the Goldstein (1985) typology of drug crime, we consider the potential mechanisms driving changes in crime.

The first set of crimes in the typology is those committed due to intoxication, or psychopharmacological crimes. As was summarized in a recent report by ONDCP, there is little
evidence for a causal link between marijuana intoxication and pharmacological crime (Office of National Drug Control Policy, 2013, p. 14). Marijuana has been linked to correlates of violence such as development of psychosis disorders, aggression later in life, and delinquent behavior (Arseneault et al., 2000; Hall & Degenhardt, 2008; White & Hansell, 1998); but laboratory studies have not found a link between cannabis and violence (Moore & Stuart, 2005) and there is reason to believe that marijuana use alone may lower the propensity to commit an aggressive act (Ostrowsky, 2011). If marijuana is a substitute for alcohol, then increased availability of marijuana through retail outlets may lead to substitution away from alcohol, thereby reducing crime that would otherwise be associated with alcohol intoxication (Christopher Carpenter, 2007; Christopher Carpenter & Dobkin, 2010) and DUIs (D. M. Anderson, Hansen, & Rees, 2013). However, if alcohol and marijuana are complements (Pacula, 1998; J. Williams, Liccardo Pacula, Chaloupka, & Wechsler, 2004), it is possible that their joint consumption could lead to more aggressive behavior than alcohol or marijuana alone. Therefore, on net, we are a priori ambivalent towards the expected directional change (if any) in reported crime and DUI arrests due to pharmacological criminality, resulting from legal dispensaries or looser rules on cultivation.

A second type of crime in the typology is “economic-compulsive” crimes caused by those in need of income to pay for a drug habit (Goldstein, 1985). We can expect that legalization of marijuana, even for medical purposes, will reduce the price of obtaining marijuana, and indeed there is limited evidence showing that potency has risen while prices for potency-adjusted fixed amounts have fallen (D. M. Anderson et al., 2013; Sevigny, Pacula, & Heaton, 2014). Substantially larger price declines have been observed with full legalization (Smart, Caulkins, Kilmer, Davenport, & Midgette, 2017). Overall, we would expect a minimal increase in income-producing property crime driven by economic-compulsive behavior as a result of legalizing dispensaries.

The third category of crime is “systemic crimes,” or those associated with the provision and distribution of drugs in black markets. There is very limited evidence of violence attributed to illicit retail marijuana markets, although a recent study has found that counties bordering Mexico in states that passed MMLs have experienced a decrease in violent crime by decreasing the financial incentives of drug trafficking organizations (Gavrilova et al., 2017; Reuter, 2009). Nevertheless, any possible violence would have likely been mitigated in California given that home cultivation was allowed in most counties for many years before dispensary laws.\(^{10}\)

However, the presence of dispensary store-fronts may, themselves, lead to a change in both violent and property crimes in a given area, although again the direction is theoretically ambiguous. On the one hand the sale of marijuana, even for medicinal purposes, is illegal to the federal government. Therefore, no banks with a national charter are willing to provide credit or

\(^{10}\) Our models will control for whether the county had any restrictions on self-cultivation.
regular services to dispensaries that sell these goods. This has meant that most dispensaries must operate on a cash-basis, and they have a lot of cash (California Police Chiefs Association, 2009; McDonald & Pelisek, 2009). On the other hand, dispensaries have lots of security in and around them because of their cash business and highly desirable product. They often are zoned in areas that previously had empty buildings, and so by moving into these areas and bringing their own security systems they provide more “eyes on the ground” which can deter crime.

Spatial models that measure the density of dispensaries in a given area are an effective way to test the effect of store fronts on crime, but the results from these have been quite mixed. A few correlational studies have found a positive relationship with crime either in the immediate area (Contreras, 2016) or in adjacent neighborhoods (Freisthler, Ponicki, Gaidus, & Gruenewald, 2016). A recent study exploiting an exogenous shock that led to closings of dispensaries in Los Angeles County, though, found that these closures actually led to an increase in crime in the immediate vicinity (T. Y. Chang & Jacobson, 2017). The authors argue that the increase in crime was a result of a loss of “eyes on the street” being provided by the dispensaries that were forced to close. Overall, we cannot say whether we expect a change in the distribution of marijuana caused by the legalizing dispensaries to have a positive or negative effect on reported crime in California.

Because theory does not provide any clear guidance on anticipated effects of these laws, it has been viewed an empirical question. A recent set of studies examine the relationship between MMLs and crime by exploiting variation in uptake across states and using Part I reported crimes at the aggregate level. Morris et al. (2014) and Shepard and Blackley (2016) both use a difference-in-difference methodology, with the former employing a sample of all states in the period between 1990-2006 and the latter a sample of only the eleven states that make up the Western Census Region between 1997 and 2009. Chu and Townsend (2017) adopt a similar approach while measuring crime at the city policy agency level to improve measurement, but still rely on a state-level classification of MMLs. Huber (2016) add information about whether states have depenalized marijuana to their difference-in-difference model, arguing that depenalization has an effect on non-drug crime by shifting enforcement resources. Finally, Gavrilova, Kamada, and Zoutman (2017) employ a difference-in-difference-in-difference approach to study the added effect of MMLs on crime in counties bordering Mexico compared to inland adopting counties (where MMLs are measured at the state-level). These studies have mostly found very little evidence of a relationship between uptake of medical marijuana laws and reported crime, with the exception of the Huber study that estimated a 5% significant decrease in robberies, larcenies, and burglaries.

11 They argue that because up until 2009 only four states outside of the Western Region had passed a MML, a sample of only western states provides a more similar control group.

12 The Gavrilova study finds a significant decrease in violent crime in Mexico-bordering counties with MMLs, but a negligible insignificant effect on violent crime in inland counties with MMLs.
The current paper addresses important limitations of the prior studies. First, prior studies that exploit state-level policy variation assume the treatment (exposure to medical marijuana dispensaries) is homogenous across the state. It is clear from recent work that this is not the case, as many local jurisdictions choose to adopt bans on medical marijuana dispensaries (Dilley et al., 2017; Pacula et al., 2015). Crime rates are also not constant across a state, and in fact are very localized, which raises uncertainty as to whether variation in aggregated crime rates observed at the state level are being driven by the same or different jurisdictions in which medical marijuana dispensaries are allowed (Dilley et al., 2017; Freeman et al., 1996). Our study is able to explicitly address this concern by examining more localized measures of crime and dispensaries at the county level. Second, prior state analyses frequently omit other relevant policy variables that are also changing during this time period, such as cannabis depenalization, that might also be important for determining crime and arrest rates (Huber et al., 2016). Our study overcomes this limitation by exploiting variation within one very large state, thereby holding constant across our treated and control counties changes in other state-specific laws (Edward M Shepard & Blackley, 2005).

**California Experiment: Medical Marijuana Laws across California Counties**

In 1996, California was the first state to pass a law allowing for the legal possession and cultivation of marijuana for medicinal purposes. The initiative changed a section of the Health and Safety code to protect patients who used marijuana with the recommendation from a physician from state prosecution. Passed through a ballot initiative, Proposition 215 (later to be known as the Compassionate Use Act (CUA)), did not address any channels through which marijuana might be supplied or obtained due in large part because of its explicit contradiction with federal law, which still maintained a strict prohibition on marijuana for medicinal purposes by classifying it as a Schedule 1 drug.

A few factors encouraged county and city jurisdictions in California to start crafting their own medical marijuana regulations, creating the variation over time we exploit in this study. First, the lack of specificity in the CUA regarding the production and distribution of marijuana left local governments with the authority to adopt whatever regulations they felt was appropriate, as there was no state pre-emption of any local regulations (Freisthler et al., 2016). Second, the ambiguity of the state law meant that the distribution of marijuana within the state remained illegal unless localities specifically addressed the issue.

These two factors paved the way for subsequent policy decisions since the passage of the CUA in 1996 that have affected medicinal marijuana regulation in California and solidified the role of counties and cities to create their own laws related to medical marijuana dispensaries. Statute SB 420, which provided legal protection to marijuana dispensaries operating within the state as of January 1, 2004, gave local jurisdictions the autonomy to decide whether and how to permit dispensaries. While it exempted the “collective or cooperative cultivation” from prosecution, it left it to local jurisdictions the authority to implement and regulate them (State of
California. October 12, 2003, §1(b), (c)). The “Ogden memo,” published in October, 2009, strengthened the incentive localities had to develop clear regulations over dispensaries, as it specified that the Federal government would not prioritize prosecuting patients or caregivers that were acting in clear compliance with state laws (Ogden, 2009). As California law delegated these authorities to local jurisdictions, this memo signaled to city and county governments that local ordinances regarding dispensaries would be binding.13 As demonstrated by the increase in counties after 2004 and 2009 with dispensary laws shown in Figure 1, the evolution of these rulings and decisions has spurred the variation in local policy that is currently observed within the state of California today.

Data and Methods

Data

City and County Ordinance Data

This study uses a database of medical marijuana legal provisions adopted across all 58 counties of California as well its most populous 14 cities (those with a population exceeding 200,000 residents). The database is based on legal analysis of the language in the public law versions of county ordinances that were adopted between the period January 1, 1997 through December 31, 2014. The year 1997 is used as a starting point because California’s statewide policy passed in November of 1996.

The legal database includes jurisdictions’ (dis)approval on provisions related to the distribution of cannabis supply-related products. By December 31, 2014, 28% (16 out 58) of jurisdictions had made legally effective a county ordinance permitting co-operatives or dispensaries.14 In order to limit the subjectivity of the database associated with subsequent implementation of the provisions and to ensure every jurisdiction’s county ordinances were assessed along the same criteria, e.g. as written in public version, this study does not include successive interpretations of courts or policies established by regulatory bodies.

An indicator variable was created that is defined as “1” for counties that explicitly allow dispensaries in a given year and “0” otherwise. This is a reasonable definition because none of the state-level statutes or court rulings explicitly allow for dispensaries. Inevitably, some counties changed their policy throughout the year and we have created an annual dataset, so we

13 The authority of local governments to regulate dispensaries in their jurisdiction was reinforced in 2013 after the Supreme Court of California ruled in the case of Riverside vs. Inland Empire Patients Health and Wellness Center (56 Cal. 4th 729 [2013]) that the city of Riverside had the right to abolish marijuana dispensaries through zoning laws.

14 The peak number of dispensaries open in one year is actually 18 during 2013, but two counties stopped allowing for dispensaries the following year.
use the law in place for the majority of the year. Additionally, because home cultivation is allowed by the Compassionate Use Act, we assume that home cultivation is allowed with no limits unless explicitly stated. We create a variable that identifies whether the county has placed any limits on cultivation for the given year. To make it easier to interpret along with the dispensary variable, the indicator variable is defined as “1” when there are no limits placed by the county on home cultivation and “0” when the county either explicitly prohibits or places any sort of limit on home cultivation.

A significant complication to the analysis is that a county ordinance applies to the unincorporated part of a county, which is the area of a county that does not pertain to an incorporated city. Incorporated cities may create different laws than the county they are nested in, which apply to residents within the city limits. Estimation of impacts of just county ordinances ignoring the specific ordinances of the cities incorporated within them could therefore lead to biased results. This is why in addition to the county ordinances, the research team also completed the same categorization procedure of ordinances for the 14 incorporated cities in California with a population larger than 200,000. Doing so meant that in most counties we would capture the laws that applied to the greatest share of the county population in each county.

While crime offense data are available at the level of police agencies within counties, our main analysis will be conducted at the county level because it mitigates the problem of agency jurisdiction borders and because more control variables are available at the county level. The distinction between counties and cities, however, means we have to be careful to account for the treatment of cities that had laws different than that of the county (and for the possibility of differences for those cities in which we do not have information). Therefore, we construct a county-level policy indicator using the following rules: (1) the county unincorporated area policy is used if we don’t have information on any city within a county, or if the city information is consistent with the county; (2) when information on a city within a county is available and contradicts that of the county policy, we use the county or city policy that applies to the larger share of the full county population. As a sensitivity analysis, we collect data on police agency-level reported crime for the 14 cities and the unincorporated areas of each of the 58 counties; and run a similar analysis using ordinances for these 72 independent jurisdictions to ensure that our results are not driven by different laws within jurisdictions in a county. We also conduct robustness checks using other methods of classifying the treatment variable.

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15 The data on ordinances is at the monthly level, but because crime offense data should be interpreted at the annual level we collapse the ordinance data annually (very little variation is lost by collapsing the ordinance data to the annual level). We also show as a robustness check the results from estimating the treatment variable as the fraction of the year in which the policy was in place (for example, 0.5 if dispensaries were allowed for 6 months.

16 We categorize this variable as “any limits” because it is rare for counties to place limits on cultivation. Counties that place any limits, then, should be different than those that do not regulate cultivation.

17 There are 3 counties (Alameda, San Diego, and Los Angeles) that have 2 cities within its boundaries that fit the criteria of a population of 200,000 or more. In these cases, we use the city with the larger population.
Figure 1 displays the distribution of counties in each year that have a policy that allows for dispensaries, using the policy definition described above. It shows that the change in this element of the MMLs was a gradual process that, with the exception of 2 counties (San Francisco and Santa Clara), starts in 2004 after SB420 passed. By 2010, 12 of the 58 counties allow dispensaries and in 2013 18 counties do so. Finally, by the end of our sample period in 2014, 16 of the 58 counties allow for dispensaries. One may note that the number of counties allowing for dispensaries can decrease, and this is a function of the fact that counties that allow dispensaries may either (a) include sunset provisions, or (b) subsequently pass ordinances that disallow them. Our indicator variable reflects these subsequent changes as well.\textsuperscript{18}

\textbf{Figure 1. Number of Counties that Allow Medical Marijuana Dispensaries, by Year}

![Number of Counties that Allow Medical Marijuana Dispensaries, by Year](image)

Note: This figure represents the method of using a county’s ordinance unless there is a city in the county that has the largest share of the population in the county.

\textbf{Crime Incident Data}

The second source of data we have compiled for use in this study are the number of total offenses reported to police by type of crime, for each county and each year in our sample period. The data on reported offenses for the seven types of index crimes are pulled from the State of California Department of Justice (Criminal Justice Statistics Center 1997-2014) website. The

\textsuperscript{18} This is complicated in our event study analyses, but we account for it by adding a dummy variable to the model indicating years post-treatment when the county no longer allows for dispensaries.
California DOJ publishes raw county-level data\textsuperscript{19} from the information it receives from each police agency. We also create a variable for violent offenses that corresponds to the Uniform Crime Report (UCR) Part I violent crimes: homicide, rape\textsuperscript{20}, robbery, and aggravated assault; and property offenses refers to UCR Part I property crimes: burglary, larceny/theft\textsuperscript{21}, and motor vehicle theft.

Since the UCR is based on the Hierarchy Rule, only the most severe crime is counted per incident. The importance of this for our purposes is that if marijuana has an effect on the severity of crimes, we may observe this as a change in crime; although no change in the actual number of incidents. For example, where two offenses (e.g. aggravated assault and theft) occurred during an incident; this incident will be recorded as an aggravated assault. If marijuana results in a fall in pharmacological crime (such as aggravated assault), but still affects economic-crimes (theft), we would observe a decrease in aggravated assault and an increase in thefts. While in this scenario the former is true (there is indeed a fall in assault), the latter is not true; the offense of theft occurred in both incidents.

Final Dataset

We have created a dataset of aggregate crime by year and county and merged it with the ordinance data to create a panel dataset from 1997 to 2014. Figure 2, Panels A, B, and C, track how reported violent offense, property offense, and DUI arrest rates, respectively, have changed over our sample time period for counties that started allowing dispensaries at any period between 1997 and 2014 and those that never allowed dispensaries during that same period. The vertical axes signify the two years (2004 and 2009) that begin an “episode” when more counties start entering the treatment group, as well as a year (2011) when various important state criminal justice policies are passed\textsuperscript{22}. The first important pattern to note is that crime has decreased in the state as a whole since 1997, regardless of whether dispensaries were allowed. This downward trend in crime per capita is consistent with the decline in crime that has been observed throughout the United States. Secondly, it appears that there are parallel trends throughout most of the pre-treatment time period between the two groups of counties, with the exception that counties that never allowed dispensaries had a larger decline in violent and property offense rates between 1999 and 2001 than counties that allowed dispensaries at any point in time, and DUI

\textsuperscript{19} Raw data means that no imputation procedures are used to account for possible missing values. California does not conduct a state-wide version of the National Crime Victimization Survey, meaning that reported crime-offense reports is the only source for measuring the level of crime.

\textsuperscript{20} We don’t show results for effects on rape because there is no reason to believe dispensaries would have an effect and agencies in California were allowed to start using the new expanded definition in January 2014.

\textsuperscript{21} Larceny/theft includes both felony and misdemeanor crimes. The classification for felony theft in California changed in 2011 and it was not possible to go back and re-classify all previous felony offenses into misdemeanors, so the state decided to include all larceny and theft crimes, regardless of monetary value, under felony property crime.

\textsuperscript{22} These include decriminalization of marijuana as well as AB 109, a major policy that led to a shift in resources among all law enforcement agencies.
arrests between the two groups start to converge around 2009. Nevertheless, because jurisdictions start allowing dispensaries at different times, it is difficult to draw conclusions about the relationship between dispensaries and crimes from these broad state trends.

**Figure 2. Crime Rates per 100,000 residents, by Whether County Ever Allows Dispensaries**

Panel A: Total Violent

Panel B: Total Property

Panel C: DUI Arrests

Notes: The dashed line represents the counties that ever allow dispensaries in the sample period. The solid line represents counties that up until the end of the sample period, had never allowed dispensaries. The vertical lines represent the years 2004 and 2009 because these were important transition years.

We also collect data on variables at the county level that have been shown in the literature to influence the crime rate. These variables include the one-year lagged unemployment rate (Raphael & Winter-Ebmer, 2001), the average per capita income, the density of alcohol outlets per capita (Gruenewald & Remer, 2006), and the county population density (Edward M Shepard & Blackley, 2005). Lastly, we include an indicator for 2011 and later, the year that
California both decriminalized recreational marijuana use and substantially changed its criminal justice system through a process that has been termed “Public Safety Realignment.” The unemployment rate comes from the Bureau of Labor Statistics, the per capita income from the Bureau of Economic Analysis, the alcohol outlets from the California Department of Alcohol and Beverage Control, and the land area and population from the United States Census Bureau.

Table 1 shows the summary statistics for the different types of crime we are analyzing and the independent variables used in our model. One will note that most of the total property crime is made up of larceny/thefts and most of the total violent crime is made up of aggravated assaults.

<table>
<thead>
<tr>
<th>Table 1. Summary Statistics</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Violent Crime Rate</td>
<td>433.3</td>
<td>156.3</td>
</tr>
<tr>
<td>Homicide Crime Rate</td>
<td>4.3</td>
<td>2.2</td>
</tr>
<tr>
<td>Robbery Crime Rate</td>
<td>85.7</td>
<td>82.7</td>
</tr>
<tr>
<td>Assault Crime Rate</td>
<td>312.7</td>
<td>109.3</td>
</tr>
<tr>
<td>All Property Crime Rate</td>
<td>2,866.1</td>
<td>980.0</td>
</tr>
<tr>
<td>Burglary Crime Rate</td>
<td>735.8</td>
<td>225.8</td>
</tr>
<tr>
<td>Theft Crime Rate</td>
<td>1,768.1</td>
<td>695.8</td>
</tr>
<tr>
<td>Motor Vehicle Theft Crime Rate</td>
<td>362.3</td>
<td>219.1</td>
</tr>
<tr>
<td>DUI Arrests</td>
<td>749.4</td>
<td>346.1</td>
</tr>
<tr>
<td>Felony Marijuana Arrests</td>
<td>59.5</td>
<td>61.0</td>
</tr>
<tr>
<td>Misdemeanor Marijuana Arrests</td>
<td>140.6</td>
<td>110.7</td>
</tr>
<tr>
<td>Alcohol Outlet Density</td>
<td>32.4</td>
<td>27.6</td>
</tr>
<tr>
<td>Per Capita Income</td>
<td>34,852.5</td>
<td>11,069.5</td>
</tr>
<tr>
<td>Unemployment Rate</td>
<td>9.0</td>
<td>3.1</td>
</tr>
<tr>
<td>Population Density</td>
<td>659.1</td>
<td>2,298.9</td>
</tr>
</tbody>
</table>

All rates are calculated per 100,000 residents. Alcohol outlet density is calculated as the number of outlets per 10,000 people in the county. Population density is calculated as the number of people per square mile of land area in
the county. All violent crime rate includes rape crimes even though we do not study the effect on rape crimes alone.

**Empirical Strategy**

To test whether allowing dispensaries affects aggregated criminal activity, we analyze the impact of local dispensary laws on UCR reported violent and property crime rates as well as DUI and marijuana-related arrest rates. Using the county-year as our unit of analysis, we will capture the effect from a change in dispensary allowance through a staggered difference-in-difference approach. Counties become part of the treated group at different times as they adopt laws throughout our sample period, and the changes resulting from adoption are compared to a control group that never adopts. All our model specifications include county fixed effects, as we are confident that there are unique unobservable county characteristics, which may cause a spurious correlation between crime rates and policy adoption. To account for the fact that there are trends in crime and arrest rates that are common across counties, we also include in the model a continuous (annual) time variable and a second order term. We choose this specification, over the more common method of including year dummy variables, to preserve more power after observing a clear quadratic trend in all crime. Finally, we control for various time-variant county characteristics, described in the previous section, that may be correlated with both changes in crime and a county’s propensity to adopt an ordinance allowing for dispensaries.

Our preferred specification is one that also adds county-specific time trends to the model. If counties across the state had differing pre-treatment trends, this specification helps create a better fit of the data. Studies that examine crime as an outcome across states, including in the MML literature, have argued for the inclusion of these jurisdiction-specific trends (Chu & Townsend, 2017; Gavrilova et al., 2017; Raphael & Winter-Ebmer, 2001). California is very diverse with counties that differ in economic, political, and demographic characteristics; creating differences in crime trends one would usually associate with states. Moreover, there were differential impacts of the Great Recession and Public Safety Realignment across counties because of these different characteristics, resulting in differential crime trends that we can see when we look at counties individually.

The model specification is represented by the equation

\[
\log(y_{ict}) = \alpha + \delta D_{ct} + \rho C_{ult} + \beta X_{ict} + \alpha_c + \omega Time_t + \tau Time^2_t + f_{ct} + \epsilon_{ict}
\]

where \(y_{ict}\) represents the logarithm of the reported crimes per 100,000 residents of crime type \(i\) for county \(c\) in year \(t\). Our main treatment variable is represented by \(D_{ct}\), an indicator for whether county \(c\) in year \(t\) allows for dispensaries. \(\alpha_c\) controls for the county-specific variation, \(Time\) and

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23 DUIs include driving under the influence of any substance that may impair driving, so driving under the influence of marijuana is included in these figures.

24 We run all the models including year dummies as well to ensure that the coefficients are not affected by this choice.

25 We ran a variety of tests for model fit and found that this model best described the data generating process. Additional models were also tested and available upon request.
Time$^2$ control for state trends over the study’s time-period, and $f_{ct}$ accounts for the county-specific trend (we will show results based on different functional forms used to model the trend). Cult controls for whether the county had a restriction in place on amount or location with regards to cultivation and $X_{ict}$ represents a vector of county time-varying covariates that have been shown to be associated with crime rates in the literature.$^{26}$ The coefficient of interest, $\delta$, estimates the average effect in reported offenses for counties that allowed dispensaries compared to those that did not.$^{27}$ Finally, our models are robust to clustered standard errors.

A primary assumption in the difference-in-difference methodology is that of pre-policy parallel trends in outcomes, or that there are no variables in the error term correlated to the outcome as well as the decision for a jurisdiction to adopt a dispensary policy. If this type of policy endogeneity were occurring or if pre-policy trends in crime between the treated and untreated groups differed for other reasons, we’d expect the trend for policy-adopting jurisdictions to change before the passage of an ordinance, leading to a biased coefficient of the treatment variable. One advantage from our technique is that the treatment is staggered over time, mitigating the probability that something happened at the state level that affected both crime and county-specific entry into treatment. Moreover, as ordinances are legislative processes, it is likely that many factors are attributable to the passage that have nothing to do with changes in crime (Jenny Williams & Bretteville-Jensen, 2014). Finally, dispensaries were adopted by large and small, urban and rural counties, which mitigates the concern that counties adopting dispensaries are inherently different.

As a check that the parallel trends assumption holds and to explore possible dynamic effects of treatment, we complement our average effect model with an event study. The event study disaggregates $D_{it}$ into a set of dummy variables indicating whether a county-year observation represents a certain number of years before or after treatment. The model specification will be the same as that shown above, to account for other state and county characteristics and trends that affect county-specific crime rates.

The event study allows for identifying potential endogeneity if there are significant effects in the years leading up to policy adoption. For example, it picks up effects from the years preceding the passage of the law if suppliers sense that the county legislature or law enforcement are amenable to dispensaries and start to operate before an ordinance is officially put in place. The event study model also addresses a limitation from our model in which the average effect may mask differences in the development stage of dispensary operations after implementation.

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$^{26}$ The covariates used are: An indicator for when California decriminalized marijuana starting in 2011, the density of alcohol outlets in the county, log of per capita income for the county, the lagged unemployment rate in the county, and the log of the population density in the county.

$^{27}$ While there is a wide range in populations and urban density in counties across California, which could lead to variance in the error term that is not constant across observations, we decided not to incorporate a weighted least squares regression. Models incorporating a WLS regression, testing various weights, did not improve estimates for homoskedasticity, so we did not feel that we fully understood the structure of the variance component to properly adjust for it. Results from these tests are available upon request.
(Meer & West, 2015). It may be the case that there is a lag in observed effects as development of dispensaries takes place in the first few years.

**Local Jurisdictions and Sensitivity Checks**

As mentioned in the section describing the data, the analysis incorporates a measure of crime and arrests at the county level even though it is not always the case that a dispensary ordinance applies throughout the entire county. We address this issue by also running our difference-in-difference model at the ecological level of police-agency jurisdictions, where the reported crime rates should reflect 100% of the geographical area defined by our treatment variable. We collected agency-level data on the reported offenses by crime type from the UCR database for each of the 14 cities for which we have ordinance information and for the unincorporated areas of each of the 58 counties. For the cities, we use offense data that are reported by the police department of the city (e.g. reported offenses according to the Los Angeles Police Department to measure crime in Los Angeles City). For the unincorporated parts of each county, we use offense data reported by the Sheriff’s department of the county. This leaves us with crime rates from a total of 72 independent jurisdictions, which match the 72 jurisdictions for which we have information on ordinances regarding allowance for dispensaries.

We follow the same empirical model from the main analysis, where the explanatory variable of interest is now an indicator for whether dispensaries are allowed in each jurisdiction, for the 72 independent jurisdictions over the 18-year sample period. One complication of running the analysis at the level of individual police-agency jurisdictions is that the covariates used in the regressions from the previous section are not available at this geographic level. Nevertheless, this should not affect the results because the variations across years within jurisdictions for variables that affect crime rates are minimal and are mostly absorbed by the controls that exploit the panel data structure. In the current model, we incorporate dummies indicating the independent jurisdictions to control for unobserved heterogeneity across individual jurisdictions and the same continuous time variables as above to control for state-level changes. Lastly, we estimate standard errors robust to clustering at the county-level, as even across two independent agencies, there may be correlation within the same county.

We also apply other sensitivity checks that address less serious, but important, concerns. First, we present results removing certain counties that may be different than the rest because they adopted a dispensary policy very early, even before the passage of SB 420. Second, we conduct robustness checks related to the issue of differential city ordinances contained within a county by estimating the model using other methods to choose the applicable ordinance for the jurisdiction. Third, we address the difficulty in properly identifying the amount of time during a year in which the policy was active by presenting results of a model measuring the main treatment variable using fractional years based on the month that the policy went into effect. Finally, we estimate a model with a sample consisting of only control counties and treated
counties with a policy in place five or more years. Similar results to the main analysis would point to consistent effects on crime over the treatment period.

Results

County Level Crime and Arrests

We present in Table 2 the results of the average effect on overall violent and property crime based on specifications with no county-specific time trend (columns (1) and (4)), as well as with county-specific trends using linear (columns (2) and (5)) and quadratic functional forms (columns (3) and (6)).

The first important result to observe is that our estimates are sensitive to an inclusion of the county-specific time trend, as it leads to an increase in the magnitude of the coefficients for both overall violent and property crimes. For property crimes, it changes a roughly zero effect size to at least a partially significant coefficient. The choice of functional form for the county-specific trends is less important, with coefficients that are roughly similar across the different specifications. As we found differential property crime trends in some counties in supplemental analyses (not reported here), we have greater confidence in models that adjust these series for the county-specific time trend.

We find no significant impact of dispensaries on violent crime in any of our models. Table 3 shows that even when we disaggregate by crime type, none of the violent crimes (columns 1-3) are affected by dispensary laws. The consistency of findings regardless of inclusion or exclusion of the county-specific time trend is reassuring, but not surprising in light of the more consistent trends observed across counties in these measures.

For property crimes, we see no effect from adopting dispensaries in the model excluding county-specific time trends. However, the model incorporating a linear trend shows a 5.1% statistically significant drop in reported property offenses during the years in which counties allowed for dispensaries, while the quadratic specifications shows a 6.3% decrease that is statistically significant. Further decomposing these results, Table 3 shows that the effect on property crime appears to be driven by a decrease in thefts.

Only a brief discussion of the other covariates is warranted. As previously mentioned, due to very lax regulations on cultivation, the variable for cultivation regulations only measures whether there were any explicit limits set by a county. While Table 2 does show a sharp drop in violent crime of almost 10% in counties that didn’t restrict cultivation, when county-specific trends are not included, this relationship becomes insignificant with the inclusion of time trends.

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28 We also ran the model using a cubic functional form for the county-specific time trend, but don’t show the results for simplicity, as they are very similar to the quadratic functional form model.
The effects from the other covariates included in the model are difficult to interpret due to limited variation once the fixed effects and time trends are controlled for.29 Table 4 shows results for the effects on variables that may be informative with regards to marijuana (mis)use. We see a very strong and robust effect on DUI arrests, as adopting dispensary laws was associated with at least a statistically significant 7.7% increase in DUI arrests.30 This effect increases when county-specific time trends are included in the model, with the preferred specification indicating a significant increase in DUIs of 9.1%. As DUIs in California (at least during the study period) apply to any substance use, this increase may have been a result of more marijuana-impaired driving arrests. This is equivalent to 65 more DUI arrests per 100,000 residents on average per year,31 as a result of dispensaries. Arrests for felony and misdemeanor marijuana arrests are noisy due to important changes across the state that led to an overall large drop in both types of arrests statewide. Our results demonstrate a significant increase in misdemeanor arrests with our preferred specification, though, which does reinforce the evidence of possible increases in marijuana misuse.

29 Supplemental analyses not shown here reveal that nearly all of the variation in our other descriptors (more than 90%), with the notable exception of unemployment, can be captured by fixed effects and county-specific time trends.

30 While the increase in DUIs may be a result of changes in enforcement in counties that allowed for dispensaries, it is unlikely that there is a high correlation between the timing of dispensary laws and changes in DUI enforcement. Many factors impact enforcement, and cultivation of marijuana was allowed in almost all counties well before dispensaries opened (Jenny Williams & Bretteville-Jensen, 2014).

31 We took the average across non-adopting years for counties that would eventually adopt dispensaries for this calculation because counties that adopted dispensary laws had lower DUIs on average (see Figure 2).
Table 2. Effect of Allowing Dispensaries on Violent and Property Crime Rates

<table>
<thead>
<tr>
<th></th>
<th>Violent Offenses</th>
<th>Property Offenses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
</tr>
<tr>
<td>Allows Dispensaries</td>
<td>0.006</td>
<td>-0.020</td>
</tr>
<tr>
<td></td>
<td>(0.065)</td>
<td>(0.071)</td>
</tr>
<tr>
<td>Cultivation-No Limits</td>
<td>-0.013</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>(0.064)</td>
<td>(0.029)</td>
</tr>
<tr>
<td>Alcohol Outlet Density</td>
<td>0.008</td>
<td>-0.051</td>
</tr>
<tr>
<td></td>
<td>(0.029)</td>
<td>(0.025)</td>
</tr>
<tr>
<td>Post CJ Reforms</td>
<td>0.151**</td>
<td>0.081*</td>
</tr>
<tr>
<td></td>
<td>(0.026)</td>
<td>(0.025)</td>
</tr>
<tr>
<td>Population Density</td>
<td>0.871</td>
<td>1.591**</td>
</tr>
<tr>
<td></td>
<td>(0.432)</td>
<td>(0.630)</td>
</tr>
<tr>
<td>Per Capita Income</td>
<td>0.300</td>
<td>0.22</td>
</tr>
<tr>
<td></td>
<td>(0.364)</td>
<td>(0.364)</td>
</tr>
<tr>
<td>Unemployment Rate</td>
<td>0.003</td>
<td>0.004</td>
</tr>
<tr>
<td></td>
<td>(0.005)</td>
<td>(0.004)</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.22</td>
<td>0.43</td>
</tr>
<tr>
<td>County-specific trends</td>
<td>None Linear</td>
<td>None Linear</td>
</tr>
</tbody>
</table>

Outcome variable is in log scale of the per/100,000 population. All models include county fixed effects and a continuous time trend (including 2nd order term). Standard errors (in parentheses) are adjusted for clustering within counties. The county ordinance is based on the ordinance of the major city when that city has a population greater than 200,000 and a population greater than the unincorporated area. Each regression has 1,044 observations and covers the period from 1997-2014.

+ $p<0.0167$; * $p<0.0083$; ** $p<0.00167$ (p-values are adjusted for multiple testing using the Bonferroni adjustment for 6 tests)
| Table 3. Effect from Allowing Dispensaries, by Crime Type |
|---------------------------------|-------|-------|-------|-------|-------|-------|
| Homicide                        | Robbery | Assault | Burglary | Theft | MV Theft |
| Allows Dispensaries             | 0.249 | 0.299 | -0.047 | -0.016 | -0.060* | -0.098 |
| (1)                             | (0.185) | (0.247) | (0.077) | (0.026) | (0.029) | (0.075) |
| Cultivation-No Limits           | -0.449 | -0.064 | -0.027 | -0.033 | -0.078+ | -0.081 |
| (2)                             | (0.330) | (0.167) | (0.063) | (0.045) | (0.041) | (0.121) |
| Alcohol Outlet Density          | -0.016 | -0.001 | -0.000 | 0.000 | -0.000 | -0.004 |
| (3)                             | (0.013) | (0.002) | (0.002) | (0.001) | (0.001) | (0.004) |
| Post CJ Reforms                 | 0.129 | -0.090 | -0.134* | 0.002 | 0.104** | 0.263 |
| (4)                             | (0.292) | (0.180) | (0.054) | (0.035) | (0.031) | (0.176) |
| Population Density              | 6.447 | 8.287+ | 1.681 | -0.650 | 1.176* | -2.146 |
| (5)                             | (4.161) | (4.306) | (1.501) | (0.829) | (0.508) | (3.986) |
| Per Capita Income               | -0.263 | -1.616 | -0.045 | 0.016 | -0.282 | 0.120 |
| (6)                             | (3.72) | (1.061) | (0.298) | (0.221) | (0.258) | (1.274) |
| Unemployment Rate               | -0.001 | -0.006 | 0.003 | 0.012** | -0.002 | 0.001 |
| (7)                             | (0.050) | (0.020) | (0.005) | (0.004) | (0.003) | (0.020) |
| $R^2$                           | 0.08   | 0.11   | 0.46   | 0.51   | 0.64   | 0.09   |

Outcome variable is in log scale of the per/100,000 population. All models include county-specific linear time trends, as well as fixed effects and a continuous time trend (including 2nd order term). Standard errors (in parentheses) are adjusted for clustering within counties. The county ordinance is based on the ordinance of the major city when that city has a population greater than 200,000 and a population greater than the unincorporated area. Years since adoption is calculated from January of the first year dispensaries were explicitly allowed. Each regression has 1,044 observations and covers the period from 1997-2014.
### Table 4. Effect of Allowing Dispensaries on Marijuana-Related Arrests

<table>
<thead>
<tr>
<th>Outcome Variable</th>
<th>Allows Dispensaries</th>
<th>Cultivation-No Limits</th>
<th>Alcohol Outlet Density</th>
<th>Post CJ Reforms</th>
<th>Population Density</th>
<th>Per Capita Income</th>
<th>Unemployment Rate</th>
<th>$R^2$</th>
<th>County-specific trends</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
<td>(5)</td>
<td>(6)</td>
<td>(7)</td>
<td>(8)</td>
<td>(9)</td>
</tr>
<tr>
<td>DUI Arrests</td>
<td>0.077*</td>
<td>0.091*</td>
<td>0.088**</td>
<td>-0.022</td>
<td>-0.015</td>
<td>-0.049</td>
<td>0.087</td>
<td>0.215</td>
<td>0.125</td>
</tr>
<tr>
<td></td>
<td>(0.024)</td>
<td>(0.026)</td>
<td>(0.025)</td>
<td>(0.092)</td>
<td>(0.083)</td>
<td>(0.084)</td>
<td>(0.120)</td>
<td>(0.106)</td>
<td>(0.080)</td>
</tr>
<tr>
<td>Felony Marijuana</td>
<td>0.034</td>
<td>0.070</td>
<td>0.085</td>
<td>-0.113</td>
<td>-0.135</td>
<td>-0.090</td>
<td>-0.383</td>
<td>-0.241</td>
<td>-0.095</td>
</tr>
<tr>
<td></td>
<td>(0.032)</td>
<td>(0.039)</td>
<td>(0.038)</td>
<td>(0.106)</td>
<td>(0.100)</td>
<td>(0.092)</td>
<td>(0.174)</td>
<td>(0.133)</td>
<td>(0.098)</td>
</tr>
<tr>
<td>Misdemeanor</td>
<td>0.001</td>
<td>0.001</td>
<td>0.000</td>
<td>0.002</td>
<td>-0.000</td>
<td>0.001</td>
<td>0.003</td>
<td>-0.002</td>
<td>-0.003</td>
</tr>
<tr>
<td>Marijuana</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.004)</td>
<td>(0.003)</td>
<td>(0.002)</td>
<td>(0.003)</td>
<td>(0.002)</td>
<td>(0.003)</td>
</tr>
<tr>
<td></td>
<td>-0.204***</td>
<td>-0.434***</td>
<td>-0.429***</td>
<td>-0.204**</td>
<td>-0.434**</td>
<td>-0.429**</td>
<td>-1.666**</td>
<td>-1.714**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.198**</td>
<td>0.195**</td>
<td>0.337**</td>
<td>0.198**</td>
<td>0.195**</td>
<td>0.198**</td>
<td>0.198**</td>
<td>0.195**</td>
<td>0.198**</td>
</tr>
<tr>
<td></td>
<td>(0.030)</td>
<td>(0.032)</td>
<td>(0.033)</td>
<td>(0.061)</td>
<td>(0.089)</td>
<td>(0.102)</td>
<td>(0.163)</td>
<td>(0.187)</td>
<td>(0.161)</td>
</tr>
<tr>
<td></td>
<td>-0.657*</td>
<td>-1.715</td>
<td>-1.701**</td>
<td>-0.657*</td>
<td>-1.715</td>
<td>-1.701**</td>
<td>2.343</td>
<td>-3.052</td>
<td>-2.521</td>
</tr>
<tr>
<td></td>
<td>(0.226)</td>
<td>(0.817)</td>
<td>(0.463)</td>
<td>(0.622)</td>
<td>(2.955)</td>
<td>(1.560)</td>
<td>(1.217)</td>
<td>(1.704)</td>
<td>(1.522)</td>
</tr>
<tr>
<td></td>
<td>-0.177</td>
<td>-0.151</td>
<td>0.042</td>
<td>1.075</td>
<td>2.611</td>
<td>2.608</td>
<td>-3.052</td>
<td>-2.206</td>
<td>-0.679</td>
</tr>
<tr>
<td></td>
<td>(0.146)</td>
<td>(0.206)</td>
<td>(0.231)</td>
<td>(0.785)</td>
<td>(1.570)</td>
<td>(1.773)</td>
<td>(2.784)</td>
<td>(2.377)</td>
<td>(1.599)</td>
</tr>
<tr>
<td></td>
<td>-0.003</td>
<td>-0.003</td>
<td>-0.002</td>
<td>0.033</td>
<td>0.053*</td>
<td>0.048</td>
<td>-0.010</td>
<td>-0.001</td>
<td>0.003</td>
</tr>
<tr>
<td></td>
<td>(0.004)</td>
<td>(0.005)</td>
<td>(0.005)</td>
<td>(0.014)</td>
<td>(0.018)</td>
<td>(0.019)</td>
<td>(0.018)</td>
<td>(0.019)</td>
<td>(0.015)</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.47</td>
<td>0.58</td>
<td>0.57</td>
<td>0.03</td>
<td>0.16</td>
<td>0.15</td>
<td>0.55</td>
<td>0.66</td>
<td>0.68</td>
</tr>
</tbody>
</table>

Outcome variable is in log scale of the per/100,000 population. All models include county fixed effects and a continuous time trend (including 2nd order term). Standard errors (in parentheses) are adjusted for clustering within counties. The county ordinance is based on the ordinance of the major city when that city has a population greater than 200,000 and a population greater than the unincorporated area. Each regression has 1,044 observations and covers the period from 1997-2014.

$p<0.0111$; $* p<0.0055$; $** p<0.0011$ (p-values are adjusted for multiple testing using the Bonferroni adjustment for 9 tests)
The event study analysis results, demonstrated in the panels in Figure 3 where the graphs show the effect of each individual year relative to the passage of a law, can help in interpreting the results described above. Note that the sample is not perfectly balanced; many counties adopted dispensary laws later in the sample period so they did not have as many years of post-treatment observations. The tails in the figures below, the values -3 and 4 on the x-axis, represent dummy variables that incorporate all the years before or after, respectively, relative to the year of adoption (0 value on the x-axis).

Panels A of Figure 3 show that for overall violent crime, the failure to observe an effect is not due to a violation of the parallel trends assumption. The effect sizes of for violent crime consistently include 0 in both the pre- and post-policy periods and do not demonstrate any clear trends. Panels B, C, and D, on the other hand, demonstrate pre-existing trends for property crime and DUI and misdemeanor marijuana arrests. Moreover, it appears from the left tail of the figures that, historically, counties that adopt dispensary laws have higher property crime rates and lower DUI and misdemeanor arrests than non-adopting counties, and that regression towards the mean was occurring before dispensaries were allowed. Possible policy endogeneity makes it difficult to measure the magnitude of any possible overall and dynamic effects, though the trends continuing past zero, even if not significant, point to the significant effects shown in Table 2.

**Figure 3. Event Study Analysis Results, by Type of Crime**

![Figure 3](image_url)
Notes: “Year 0,” indicating year when policy adopted, is omitted from the regression to provide an excluded category. Counties never adopting a law have a 0 for all indicator variables. Dummy variables for 3+ years pre- and 4+ years post-intervention are represented by -3 and 4, respectively. Regressions also include the covariates from the model described in Section 3.2. An indicator variable in the model controls for county-year observations for periods after an adopting county no longer allows for dispensaries.

**Sensitivity Checks**

In this section, we show the results from a variety of sensitivity checks that account for limitations to our main analysis. Each row in Table 5 shows the coefficient for the “allows dispensary” variable of a different analysis, with regressions run for property and violent crime, as well as DUls, presented in the columns. We show these three outcomes because our main analysis has not demonstrated any significant effects on specific types of these crimes, with the exception of theft, which seems to track the property crime variable.\(^{32,33}\)

The results for our first sensitivity check, shown in the first row of Table 5, represent the average effect of allowing dispensaries when variables are measured at the police-agency jurisdiction level. We see that the coefficient magnitudes are similar to those of the main analysis, even though the DUI arrests and property crime variables are no longer significant. This may occur because our new unit of analysis is smaller, leading to more variation from year to year and noisier data. Overall, these results do not contradict those of the main analysis.

In the next two rows, we check for whether how we define the treatment variable changes our findings. “Unincorporated County” means that we identify the treatment based only on the county (i.e., unincorporated part of the county) law even if a city exists within the county with a different law, and “City Always” defines a variable that uses the city law (if available) to identify

\(^{32}\) We also ran these models on theft crimes and find similar results to those shown for property crime.

\(^{33}\) We use county-specific time trends instead of agency-specific because county rates should have smoother trends. This decision has no impact on the results shown.
treatment regardless of whether the unincorporated population is larger. The following row shows the results of a model allowing for the treatment variable to be a fraction if an ordinance was passed after January of that year. The two rows labelled “No San Francisco” and “No Santa Clara” show the results of analyses that exclude each of these counties. These two counties adopted dispensaries very early on, even before the enactment of SB 420, which might indicate something unique about them. Moreover, given the changing trend in crime over our sample period, the timing of their “post-intervention” may impact the results (even after adjusting for county-specific linear trends) in addition to the higher leverage demonstrated by San Francisco due to it experiencing more years of treatment. Finally, the last row presents the effects of dispensary laws when we restrict the treatment sample to counties with laws for five or more years. All of these sensitivity checks point to the same findings as our main analysis, indicating a significant increase in DUI arrests and decrease in reported property crime offenses. While the analysis excluding San Francisco leads to an insignificant coefficient for property crime, it is still negative and similar in magnitude to the other models.

34 In fact, Santa Clara County is unique in that it stops allowing dispensaries to operate after 3 years and then adopts a new ordinance allowing for dispensaries in 2011.
### Table 5. Sensitivity Checks

<table>
<thead>
<tr>
<th></th>
<th>Violent Offenses (1)</th>
<th>Property Offenses (2)</th>
<th>DUI Arrests (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>City Agencies</td>
<td>-0.036</td>
<td>-0.042</td>
<td>0.160</td>
</tr>
<tr>
<td>Unincorporated County</td>
<td>-0.027</td>
<td>-0.068+</td>
<td>0.056</td>
</tr>
<tr>
<td>City Always</td>
<td>-0.034</td>
<td>-0.054</td>
<td>0.090**</td>
</tr>
<tr>
<td>Partial Year</td>
<td>-0.022</td>
<td>-0.052</td>
<td>0.099**</td>
</tr>
<tr>
<td>Removing San Francisco</td>
<td>-0.008</td>
<td>-0.036</td>
<td>0.097**</td>
</tr>
<tr>
<td>Removing Santa Clara</td>
<td>-0.033</td>
<td>-0.059</td>
<td>0.087*</td>
</tr>
<tr>
<td>Only Counties 5+ years</td>
<td>-0.170+</td>
<td>-0.088</td>
<td>0.089</td>
</tr>
</tbody>
</table>

+ $p<0.0333$; * $p<0.0067$; ** $p<0.0033$ (p-values are adjusted for multiple testing using the Bonferroni adjustment for 3 tests)

City Agencies refers to using city agency crime rates and laws. Unincorporated County refers to analysis using laws according to county, even when larger cities exist. City Always refers to analysis always choosing law applicable to city within county if available. Partial Year refers to using fractions for treatment variable, in case a law was passed after January. Removing San Francisco, Removing Alameda, and Removing Santa Clara refers to excluding each of these counties, individually, from the analysis. Only Counties 5+ Years refers to analysis with sample of non-adopters and counties that had law in place 5+ years.

Outcome variable is in log scale of the per/100,000 population. All models include county fixed effects, a continuous time trend (including 2nd order term), and county-specific linear time trends. Standard errors (in parentheses) are adjusted for clustering within counties. Each regression (except City Agencies) has 1,044 observations and covers the period from 1997-2014.

### Discussion

California is experimenting with opening recreational marijuana retail stores, which will make it the largest state (in population and size) to do so. Again, localities will get to decide where and how many stores are allowed to open in each of their jurisdictions. Insights from the opening of medical marijuana dispensaries may be useful for better understanding the likely impacts of opening these recreational stores, and could serve to help police agencies and the courts and correctional systems prepare.

This study improves upon the work conducted thus far evaluating the impact of retail medical marijuana stores on crime. We use a novel longitudinal local ordinance database that allows us to assess the extent to which types of violent, property, and substance abuse crime rates are impacted over time with the decision by local jurisdictions to allow dispensaries to open.
Consideration of local variation within a state where substantial differences exist in allowances is crucial but had been previously ignored in the literature. Moreover, by examining variation within a single state, we can account for important statewide changes that are also important for driving marijuana use and potentially crime, including rules related to cultivation and decriminalization.

Evidence from our statistical analysis of a quasi-experimental setting, this study finds no impacts on any type of violent crime, but that counties adopting local ordinances did potentially experience a small decrease in property crime and increase in DUI arrests. Due to evidence of pre-existing trends, it is not possible to make a conclusive statement about the magnitude of these effects.

Our study is not without its own limitations, however. A clear problem is that our policy indicator is not capturing the actual exposure to the law for the residents in a county, since cities within counties can adopt conflicting ordinances. Our analysis at the police-agency level suggests that, at the very least, we are not missing increases to reported crime due to incongruence in treatment exposure. It also does not provide enough evidence to refute our findings of increases in DUI arrests. Moreover, when we measure our treatment variable using two alternative methods, we find similar results.

Second and relatedly, our study does not empirically assess the impact of having many versus few dispensaries within a jurisdiction (i.e. the “intensive margin”). Studies focusing on dispensary density and crime in the immediate vicinity, though, have not been much more definitive, finding no effect on any crime (Kepple & Freisthler, 2012), a negative relationship with property crimes (T. Y. Chang & Jacobson, 2017), and small increases on property and violent crimes in adjacent areas (Freisthler et al., 2016). We do know that within California, counties differed substantially in their approach to dispensary allowances, with some jurisdictions significantly limiting the total number of dispensaries allowed from the beginning and others not imposing any thresholds until much, much later. The lack of annual store-front data (pertaining to density) makes it more difficult to interpret dynamic effects, as there is scant research on the length of time we should expect for dispensary laws to be fully implemented within a jurisdiction and whether there are threshold effects in terms of total number of open dispensaries. There is also little to no information about delivery services, and laws associated with delivery services. The impact of delivery services may cause property crimes to rise in areas outside of the immediate vicinity of the dispensaries, thereby influencing property theft crimes in jurisdictions outside of those choosing to adopt the policy.

Third, a significant limitation in all difference-in-difference analyses is that there is no direct mechanism to test whether the treatment variable is correlated to an unobserved variable that affects the outcome, leading to a violation of the parallel trends assumption. We performed an event study analysis that did not refute our conclusions in the case of violent crimes, although there was evidence of policy endogeneity for property crime and DUI arrests. Until the policy
endogeneity is explicitly addressed, the magnitude of the true effect on these outcomes cannot be easily determined.

Our study appears to reinforce the conclusions from other studies that fail to find an increase in the type of crime predicted by law enforcement. We find no effects on burglary, robberies, or assaults, which are the types of crimes one would expect if dispensaries were prime targets as a result of their holding large amounts of cash. It is important to note, though, that it may merely be the case that crime is such a localized effect that there is too much variation even within our treatment exposure aggregated to the city or county level (Hipp, 2007). Pertaining to our findings of potentially decreasing property crime rates, there is a theoretical reason for why dispensary store-fronts may decrease crime. Dispensaries may open in otherwise desolate areas, creating foot traffic, or “eyes on the street,” that makes these areas safer (T. Y. Chang & Jacobson, 2017).

We do find some interesting preliminary results with respect to the relationship between dispensaries and DUls. Anderson, Hanson, and Rees (2013) find that MMLs lead to a substitution away from alcohol use, but the potential positive relationship between dispensaries and DUI arrests we find in our analysis suggests that either increases in marijuana-impaired driving exceeded reductions in alcohol impaired driving (a hypothesis we find highly unlikely) or that the opening of dispensaries induced use of both substances among those who were willing to drive impaired (more likely). The latter interpretation would have important ramifications for crime rates, given the known association between using alcohol together with other illicit substances and violent behavior (Office of National Drug Control Policy 2013). It is possible that our null results mask an increase in violent crime due to concurrent use of marijuana and alcohol, which is being offset by other mechanisms such as a decrease in pharmacological crimes due to an increase in marijuana use alone.

As we can only measure an aggregate effect, future research should attempt to tease out the effects on crime due to different mechanisms and actions of local actors. While some attributes of dispensaries may have led to a reduction in crime compared to the status quo, other aspects may have promoted crime. Moreover, the effect on crime rates will depend on other actions taken on by the local policymakers, dispensary owners, and law enforcement. For example, dispensaries may have adopted home delivery methods, which would reduce the potential number of victims near dispensaries. There may have also been specific actions taken by police that prevented an increase in crime rates, and these should be identified. Further research that identifies elements of MMLs along with more specific aspects of implementation can help policymakers respond with actions that address crime-promoting aspects of allowing for retail dispensaries.

Our findings indicate that policymakers should be careful in how they regulate the presence of dispensaries, while not jumping to the conclusion that dispensaries are clearly crime generating hot-spots. Similarly, while police are right to be wary about potential crime effects from the introduction of cash-dependent businesses, our results demonstrate that current policy
has not led to a wave in crime (even if this may be due to actual police practices). Our findings suggest that it is possible to regulate these markets and find a common ground between safety and access to medical marijuana. Natural experiments like the one being undertaken in California will only further help researchers better understand exactly how to find this ideal common ground. While much of the new wave of marijuana laws are applied to recreational marijuana, research studies on crime that exploit laws associated to medical dispensaries, such as this one, are still very pertinent as long as the federal government continues to classify marijuana as a Schedule 1 drug. This classification, making marijuana an illicit drug, means that recreational dispensaries are still facing the same issues that drove stakeholders to argue that dispensaries would lead to increases in crime.
Chapter 2: Laying a Foundation for Studying County Social Services Provision in the Context of California’s Criminal Justice System Reforms

Gabriel Weinberger, M.A.
Pardee Rand Graduate School

Abstract: On October, 2011, California enacted what is considered to be the “biggest penal experiment in modern history,” affecting over 100,000 justice-involved individuals in the first two years. Public Safety Realignment, which shifted vast responsibilities from state agencies to individual counties and created 58 different laboratories, made community corrections as a tool for providing social services immensely important. A historical perspective of California’s criminal justice system since the turn of the century will show that counties would have to find ways to provide rehabilitation services to their justice-involved population to avoid either overburdening their criminal justice systems or risk worsening public safety. A few years later, Proposition 47, by reducing the punishment for a subset of crimes that were highly prevalent among the group affected by Realignment, would change the landscape by which these individuals could be induced into taking up services. This paper creates a framework, in the context of Realignment and Proposition 47 in California, for understanding the connection between criminal justice systems and service provision. It applies this foundation to Los Angeles County, describing how the largest county in California implemented its system of services for the reentry portion of the population realigned from state to county supervision. It focuses on the role played by the probation department as both a system navigator and a mechanism for coercion. This role makes its relationship with service agencies important, which this paper demonstrates by examining the connection between probation and the agency tasked with administering substance use disorder services. The paper concludes with a summary of the key research questions that arise from this review.

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Introduction

On October 2011, California’s legislature enacted AB 109, which along with a few minor trailer bills, came to be collectively known as Public Safety Realignment (referred to as “Realignment” in this paper). Considered to be the “biggest penal experiment in modern history,” in the first two years it affected over 100,000 justice-involved individuals (Petersilia & Snyder, 2013, p. 269). As I will show in this paper, these individuals were most likely to be property and drug offenders that cycle in and out of the criminal justice system. In the most general sense, Realignment shifted the responsibility for this affected population to individual counties by requiring county agencies, mainly sheriff and probation departments, to supervise a defined set of individuals that would have previously been the responsibility of state agencies. It did so with very few restrictions as to how each county would supervise an individual charged with a crime that is AB 109-eligible, only assuring that the benefits and costs were borne by the county. Given the vast differences in implementation across counties with respect to both law enforcement and social service investments (Bird & Grattet, 2014; Lin & Petersilia, 2014), Realignment became 58 different experiments.

Increasing the provision of social services to justice-involved individuals, with the goal of reducing criminal behavior, was one of the main objectives of Realignment. In a policy paper published in the California Journal of Policy and Politics that developed a framework for future evaluations of Realignment, Petersilia and Snyder (2013) argue that “at its core, Realignment [was] designed to increase treatment for offenders” (p.282) and that one of the ten most important questions that would determine the success of Realignment is whether “offenders participate in more evidence-based treatment programs” (p.269). This objective was based on research that shows that provision of social services, such as substance use disorder (SUD) treatment, leads to a decrease in recidivism and a decrease in crime (Frisman et al., 2006; Jofre-Bonet & Sindelar, 2001; H. A. Pollack, 2017; Vieira, Skilling, & Peterson-Badali, 2009; Vogler, 2017; Wen, Hockenberry, & Cummings, 2017). Moreover, using community corrections to mandate SUD treatment has been shown, in studies unrelated to Realignment, to lead to at least as much dosage of SUD treatment for the mandated population as is experienced by the population that enters voluntarily (Coviello et al., 2013; Hough, 2002; J. F. Kelly, Finney, & Moos, 2005; Stevens et al., 2005). Thus, providing social services through the justice system can help achieve two fundamental goals for counties implementing AB 109: increasing reintegration to society among former prisoners and reducing crime in their communities.

This paper contributes to the literature by creating a framework, in the context of Realignment in California, for understanding the connection between criminal justice systems

35 Individuals that are charged with a crime eligible for AB 109 will be referred to as “realigned individuals” in this paper because they are the population whose supervision has been transferred from the State to the counties.
36 While convincing arguments have been made that recidivism is not a good measure for reintegration to society (Klingele, Forthcoming), this has been the primary indicator used in the literature.
and service provision. It expands on Petersilia and Snyder’s (2013) foundational “10 Questions Everyone Should Ask About California’s Prison Realignment” by focusing on the question of how counties would provide services. Research and evaluation to inform effective provision of human services through community correction programs is vital for the success of Realignment and for California’s decarceration movement in general (Petersilia & Cullen, 2015). For this type of research, a solid foundation of the policy changes and their goals is needed. I will describe the policy environment under which Realignment came about, and apply the discussion to concrete problems policymakers and stakeholders will need to address with regards to social services provision.

The paper will also place Proposition 47, passed in November of 2014, in the context of the changes being faced by counties. The policy, which reduced nine felonies to misdemeanors, has been a contentious issue because of the way it effectively decriminalized drug use and low-level property crime without providing other ways to deal with these crimes (Castellano et al., 2016; C. Chang, Gerber, & Poston, 2015). In describing the details of Proposition 47, I will show that, due to AB 109, the individuals benefitting from the policy were already the responsibility of county-level justice agencies and other stakeholders. This means that the effects of Proposition 47 on service provision, and subsequent recidivism, would be felt by county agencies that work with the justice-involved population.

As an application to the implementation of Realignment, I describe Los Angeles County’s general system of service provision for its AB 109 reentry population and then look more closely into SUD treatment. By focusing on implementation in one county, I stick to one of the 58 experiments that has been conducted as a result of Realignment. This experiment is conducted in one of the largest and most complex bureaucracies in the country, making it important to understand on its own. Moreover, while studies have exploited variation across counties, the complexities and intricacies of each county system have made it difficult to categorize counties’ efforts to make specific recommendations about what works (Bird & Grattet, 2015; Hopper et al., 2012; Petersilia, 2014b; Turner et al., 2015). By drawing from one experience, I can more precisely describe the processes implemented, to create a foundation for future analyses and developing lessons from this locality.

This paper begins by setting the context, at the state level, for the major changes that were about to take place. By describing the issues that the State had been trying to address for over a decade, I aim to provide a better understanding of the policy problems that counties, such as Los Angeles, would need to address. Section 3 will explain the policy and institutional changes created by AB 109 and will show that to meet the service needs required by the realigned population, it is important to focus on navigation systems within a county. It will then describe the changes created by Proposition 47, in the post-Realignment landscape. Section 4 describes the system created in Los Angeles County to supervise and provide services to the realigned population, with an emphasis on SUD treatment. In the final section, I summarize the key questions that arise from this review.
Background

Context of California’s Criminal Justice System

By the turn of the 21st century, the number of inmates under state control in California was exerting a huge cost at the human, fiscal, and operational level. The prison population in 2007 was at 171,000, after growing since 1987 at three times the rate of the state population (California Department of Corrections and Rehabilitation, 2008; Davis et al., 2011). Due to this increase, state spending on adult corrections between FY1984-85 and 2006-07 went from four percent of the General Fund to eight percent (Alpert, 2007). The growing prison population had become a pressing issue legally as well when Coleman v. Brown and then Plata v. Brown, filed in 1990 and 2001, respectively, complained of deficiencies in prison mental and medical care that violated the 8th amendment’s restriction on cruel and unusual punishment (U.S. Eastern and Northern District Courts of California, 2009). But the prison population continued to be a problem and, with prison capacity at 216 percent in 2006, the Coleman and Plata plaintiffs requested a reduction in the prison population (Fazzi, 2013; U.S. Eastern and Northern District Courts of California, 2009). Mutual decisions by two district court judges, and affirmed by the U.S. Court of Appeals and Supreme court, led to the convening of a three-judge panel to enforce a court-ordered reduction in the prison population (Schlanger, 2013). The ruling was based on the determination that a significant factor in deficiencies of the services provided by the prison system was prison overcrowding (U.S. Eastern and Northern District Courts of California, 2009).

To comprehend how the prison overcrowding problem had become so severe, it is imperative to understand how probation and parole were used as supervision methods before the enactment of AB 109. In the classic model, parole is used as a method of reentry when an individual is determined fit for community supervision even though there might be time left in their sentence. It is intended to provide a transition into society and usually conditions are imposed to regulate conduct (Clear, Cole, & Reisig, 2009, p. 400). In California,37 the Determinate Sentencing Law that was passed and enacted in 1976 made parole, in effect, a three-year mandatory release program (Dansky, 2008). With a few exceptions for very serious crimes, individuals convicted of felonies that were denied probation were sentenced to a determinate sentence length along with a mandatory three-year parole stint.38

Probation in California, like in most other states, was strictly a sentence administered by the judge after a misdemeanor or felony conviction as an alternative to incarceration with a set of conditions imposed on the probationer. It was administered locally, by county government agencies, so that the individual remains in the community (Clear et al., 2009, p. 189). Individuals

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37 Parole is administered by the state, specifically, by the California Department of Corrections (CDCR),
38 Additionally, the DSL created a Board of Parole Hearings with the right to revoke parole and send an individual back to prison-for up to one year and then restarting the parole clock upon release- without going through a trial judge to obtain a conviction (Dansky, 2008).
under probationary supervision could have their supervision revoked only after a hearing from the Superior Court, and the punishment could be as severe as imposition of the original term\(^{39}\) (Taylor, 2009a).

**California’s Criminal Justice System Left Critical Problem Unaddressed**

Much of the prison growth described above was driven by parolees returning to prison through a policy structure termed “back-end sentencing” (Lin, Grattet, & Petersilia, 2010). In 2009, the recidivism rate\(^{40}\) for those released from prison was 66% (the national average is around 40%) and parolees returning to prison before the end of their supervision term in 2006 accounted for 64% of all prison admissions, meaning that the inflow of prison admissions was dominated not by new convictions but by parole revocations (CDCR Expert Panel on Adult Offender and Recidivism Reduction Programming, 2007, p. 24; Grattet, Petersilia, Lin, & Beckman, 2009). The DSL exacerbated the problem, as it forced most prison releases to spend at least three years under supervision, thereby increasing the likelihood they would violate their parole conditions and churn in and out of prison- a pattern coined as “doing a life-sentence on the installment plan” (Grattet et al., 2009). This became a vicious cycle leading to the number of individuals released from prison to parole per year between 1987 and 2007 to increase from 50,512 to 137,590, and with 29% of inmates (compared to 18% nationally) having six or more sentences even though there was no evidence prisoners in California actually engaged in more violence (Davis et al., 2011; Petersilia, 2006).

Another important driver in the growth of California’s prisons was reoffending among felony probationers. About 19,000 probationers in a given year were being sent to prison for a violation\(^{41}\), which made up 40% of all new court-sentenced prison admissions\(^{42}\) (Taylor, 2009a, p. 19). While detailed data is not available, there is qualitative evidence that, like parole revocations, many probation revocations leading to prison admissions were due to repeated violations (p. 18). As the courts are administered by counties, a substantial amount of discretion with respect to determining prison admissions was yielded to counties (p. 5). This created a problematic incentive structure, as probationers revoked to state prison would incur a cost on the State as opposed to the county (p. 19). Finding a way to get counties to decrease the amount of probationers they revoked to state prison was becoming increasingly important, given that the 168,000 felony probationers in 2007 reflected an increase over the last decade of 28% (p. 8).

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\(^{39}\) See California PC1203.3

\(^{40}\) Recidivism is a broad term used for the “return of a former correctional client to criminal behavior” (Clear et al., 2009, p. 203). The measurement used here is for parolees returning to prison within three years.

\(^{41}\) This includes both new criminal violations or violations of the conditions of probation.

\(^{42}\) This excludes the sample of parolees, as most that return to prison do so through parole violations and not the court system.
An underlying reason for high recidivism rates among both parolees and probationers was unaddressed problem behaviors. Estimates of the parole population showed that at least two-thirds of parolees had substance use disorders (CDCR Expert Panel on Adult Offender and Recidivism Reduction Programming, 2007; Grattet et al., 2009). Within prisons, 56% of the prisoners could be qualified as having a “high need” for a drug treatment program, yet only 2.5% of these inmates were receiving professionally run treatment (Petersilia, 2006). Similarly, on the probation side, a survey of 31 counties found that most rehabilitation programs were not available to probationers, and even those that were offered suffered from capacity and quality limitations (Taylor, 2009a). When an innovative approach to supervising high-risk, high-need probationers, Intensive Probation Supervision (IPS), was evaluated, it was deemed to have failed to lead to the decrease in rearrests that deterrence theory would have predicted because supervision without the treatment component was not sufficient (Petersilia & Turner, 1991). For California to significantly reduce its prison population, rehabilitation through community corrections was necessary (Alpert, 2007; CDCR Expert Panel on Adult Offender and Recidivism Reduction Programming, 2007; Petersilia, 2003; Petersilia & Cullen, 2015; Visher & Travis, 2003).

Policies Leading up to Realignment

AB 109 and Proposition 47 were preceded by a number of policies that were more limited in scope but revealed the State’s intentions and priorities (Turner, 2016). These laws, Proposition 36, SB 1453, AB 900, SB x3-18, and AB 678, demonstrated a few consistent themes, and identifying these can help us understand the policy problems that the counties would be expected to resolve with the enactment of AB 109. Below I will describe how each policy fits into the context of the revolutionary change that was to come. It should be noted that it is beyond the scope of this section to describe and analyze the effects of any specific policy leading up to Realignment.

The Substance Abuse and Crime Prevention Act (SACPA) was enacted on July 1, 2001 as a public health approach with the explicit policy goal of preserving prison space for serious and violent offenders (Appel, Backes, & Robbins, 2004; Evans, Jaffe, Urada, & Anglin, 2012). It required all convicted nonviolent drug offenders to be given the option of probation as an

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43 Problem behaviors, a term I will use frequently, is used in the literature to describe behaviors such as illicit drug use that are related to more serious criminality (e.g. theft and property crime in general) (Laub & Sampson, 2001; Visher & Travis, 2003).

44 In defining nonviolent drug offenses, it included all of the felony offenses in California’s criminal code that have to do solely with drug possession: HS 11377 and HS 11350, which are laws against personal possession of a controlled substance; HS 11357, which applies to possession of less than an ounce of marijuana; and HS 11550, which applies to being under the influence of a controlled substance ("Substance Abuse and Crime Prevention Act," 2000).
alternative to incarceration, conditioned on enrollment in a substance use disorder (SUD) treatment program (Longshore et al., 2004). SACPA clients would be supervised by the county probation department, which would conduct the initial criminal record assessment for eligibility and supervise the client throughout treatment, and be provided treatment through the county’s public health system (Burns & Peyrot, 2008). This type of public health approach meant an increase in responsibility for county governments, with probation and public health departments having to work together to ensure that drug offenders were complying by their conditions. Probation departments would have the responsibility of linking eligible offenders to assessment and treatment, and would then submit the treatment progress reports and any violations to the courts. (Burns & Peyrot, 2008). The responsibility and relationship among departments of local governments in supervising and linking convicted offenders to services would become very important when AB 109 was enacted, as that law made counties solely responsible for a much larger, and more serious, set of convicted offenders.

Seeking to continue to improve rehabilitation take-up of prison inmates, the State legislature passed SB 1453, AB 900, and SB x-18 towards the second half of the decade. In 2006, SB 1453 provided incentives for eligible prisoners to participate in SUD treatment in prison and immediately after release, allowing for discharge from parole once the parolee completed a 150-day residential aftercare SUD treatment program (Hennessy, 2007). The following year, while AB 900 mostly provided funds for construction of new jails and prison infrastructure, there was $50 million allocated for SUD treatment and improving information technology systems that could improve programming (Taylor, 2009b). Finally, SB x-18 focused on reentry among those being released from prison, requiring risk-assessments of parolees for more manageable and better matched caseloads for parole agents, as well as creating incentives for parolees to complete programming (California Department of Corrections and Rehabilitation, 2010). These policies ultimately only had an effect of “nibbling around the edges” due to limited scale and funding, but they were a signal that the State was focusing on individuals whose prison commitments were a product of problem behaviors (Turner, 2016).

In a move that would set the scene for Realignment’s focus on community corrections, AB 678 was enacted in 2009 with the goal of reducing felony probation revocations. The legislation set to achieve this by pushing the county probation departments towards evidenced-based practices (EBPs) that would reduce recidivism among their clients (Cantil-Sakauye, Jahr, & Child, 2013). It set up a funding stream to help initiate these EBPs and improved the monetary incentive structure of probation departments by allowing them to share in the cost savings if fewer probationers were committed to prison (Cantil-Sakauye et al., 2013). Most of the documented EBP programming implemented by probation departments post-Realignment started

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45 Or continued probation if the individual was already under probation supervision.

46 At the time SACPA was enacted, these were referred to as substance abuse programs. The County has recently tried to implement the new terminology and I will use the term “SUD” in this paper.
as a result of AB 678, demonstrating the importance of the policy as a catalyst for counties to start implementing recidivism-reduction strategies (Turner et al., 2015).

The laws California enacted in the decade preceding the revolutionary change demonstrated several policy goals related to Realignment and Proposition 47. First is an acknowledgement that individuals committing nonviolent (usually drug and property) crimes should not be taking up valuable space in prison. Second, a belief that local communities should have more control over treatment as it related to the nonviolent population, and the need to incentivize counties to use practices shown to decrease recidivism. Finally, the policies focused on the need for reducing supervision revocations, especially those pertaining to nonviolent offenses.

Whether these policies were working or not—prison growth had slowed in this time-overcrowding, prison were approaching 180 percent capacity, was still an issue at the end of the decade (Misczynski, 2011). To abide by the previously-described court mandate, politicians were facing the political nightmare of simply freeing individuals that the State had previously considered worthy of being imprisoned.47 In April of 2011, with an ongoing budget crisis also affecting the State, Governor Brown signed AB 109 and AB 117 (which together came to be known as “Public Safety Realignment”)48 into law, which was enacted on October 1, 2011 (Fazzi, 2013). While AB 109 was a political consequence of the overcrowding issue, the context under which overcrowding became an issue is informative with regards to the problems counties would have to solve. The laws passed in the decade preceding Realignment were a response to the problems facing the State, problems that were now shifted to individual counties.

Public Safety Realignment and Proposition 47

AB 109

Target Population

The text of AB 109 identifies around 500 statutes from the California Penal Code, the California Health and Safety Code, and the California Vehicle Code that were determined to be non-violent, non-serious, and non-sexual (commonly referred to as “non-non-non’s”) felony offenses (Petersilia & Snyder, 2013). The types of crimes that are eligible for AB 109 have been frequently categorized in the literature as drug and property offenses (Lofstrom, Raphael, & Grattet, 2014). By specifically demarcating the targeted crimes, the law created a distinct

47 A Three-Judge Panel, convened in 2009, ordered the State to decrease the population of its prisons to 137.5 percent of capacity within two years, and an appeal ruling by the Supreme Court upheld that the mandate to decrease the prison population size by approximately 33,000 inmates was constitutional.

48 The legislation is commonly referred to in the literature as AB 109 or as Realignment. AB 117 was only a minor addition and not usually referred to. I will use the terms AB 109 and Realignment interchangeably throughout to refer to the law.
population (often referred to as “realigned offenders”) within California’s criminal justice system for which the responsibility was now of the individual counties. This population now supervised by counties can be broken out into four groups (Couzens & Bigelow, 2017; Petersilia & Snyder, 2013):

1. **Post-Release Community Supervision (PRCS):** Any individual released from prison after October 1, 2011 whose primary charge for the current case qualifies for AB 109, is now supervised by the county probation department upon release of prison. The mandatory length of supervision is of one consecutive year without a new violation leading to a custodial sanction, with the total length of a probation case capped to three years.49 The revocation process is handled by superior courts and these revocations must be served in county jail as opposed to state prison. Finally, there are very few exceptions based on criminal history, beyond the current primary charge, for PRCS eligibility.

2. **“Straight sentenced” new convictions:** Any individual that is sentenced for an AB 109-eligible crime50 after October 1, 2011 now serves their sentence in county jails (Cal. Penal Code §1170(h)). There are no explicit changes to sentence lengths for the same crime offense, only where these sentences are to be served. This group does not serve any post-custody supervision. It is also important to note that there are some exceptions made for criminal history, which do not exist for the PRCS group.

3. **“Split-sentenced” new convictions:** For the same set of new convictions as group #2, the law gave the trial judge authority to sentence the defendant to serve their sentenced time partly under custody and partly under “mandatory supervision” by the county probation department (Cal. Penal Code §1170(h)(5)). This is different than the pre-Realignment method of choosing between probation and incarceration,51 as the judge is imposing a determinate amount of time under custody and under supervision. A violation of a condition of probation can lead to a revocation of probation, where the individual is sent back to jail to serve the remainder of the sentence.

4. **Parole and probation revocations:** Those that are released from prison for an offense that is not eligible for PRCS will continue to be supervised by the state parole agency, CDCR, and counties will still have the option of probation for individuals convicted of misdemeanor or felony-prison52 crimes. Unlike the revocation process for parolees

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49 Counties also have the option of using discretionary termination after only six months without a new violation.
50 Because the sentencing rules for these crimes under AB 109 are laid out in Penal Code 1170(h), these crimes are commonly referred to as “1170(h) offenses.”
51 Cal. Penal Code §1203.1 allows the judge the discretion to impose an incarceration period as part of the probation sentence. This option is still available to judges after AB 109 and in fact can be used to circumvent sentence length restrictions for AB 109-eligible offenses (Ball & Weisberg, 2014).
52 Note that AB 109-eligible crimes are technically under the umbrella of “felony prison” crimes, as the law only changed where these would be served.
that existed before AB 109 (the Board of Parole Hearings), though, parole revocations would now be administered by county superior courts in the same way that probation revocations have traditionally been (and continue to be) handled. Moreover, a revocation of parole or probation can only be served in county jails and limited to six months in custody (compared to the previous 1-year term).

A large share of the realigned population, more so than the more serious justice-involved group not eligible for AB 109, are individuals that continuously cycle in and out of the criminal justice system (commonly referred to as “churners” or “frequent flyers”). Examining the criminal characteristics of the population in California that would become eligible for AB 109 makes this point clear. Gerlinger and Turner (2015) use data from a pre-Realignment cohort of prison releases to estimate that the group that would have been eligible for PRCS under AB 109 rules had a re-arrest rate within three years of almost 80% and a return to prison rate of almost 70%. This compares to 71% and 65%, respectively, for the group that would still be supervised by parole. In another study tracking parolees during calendar years 2003 and 2004, the authors found that those that were released from prison with a primary offense that fit AB 109 criteria were actually more likely, compared to those convicted of more serious offenses, to acquire new parole violations (Grattet et al., 2009). Finally, a recent recidivism study that created a proxy PRCS control group from a cohort of pre-Realignment prison releases estimates that the average number previous arrests for this group is 18.1 and past convictions is 7.1 (higher than the averages for all prison releases in the same time period) (Bird, Grattet, & Nguyen, 2017).

The reason for the long criminal histories is that AB 109 primarily affected individuals sentenced with drug and property crimes, among which previous drug use is highly prevalent (Mumola, 1999; Zhang, 2004). Research on desistance from crime has long maintained that problem behaviors, such as substance use disorders, are important factors in entrenched criminal careers (Harrison, 2001; Visher & Travis, 2003). Moreover, research specific to California has argued that treating these problem behaviors is essential to reducing recidivism (CDCR Expert Panel on Adult Offender and Recidivism Reduction Programming, 2007; Petersilia, 2003; Petersilia & Cullen, 2015). Given that the length of one’s criminal history among California’s parolees before Realignment was more informative, in terms of predicting future prison commitment, than the seriousness of the current charge, AB 109 essentially transferred to counties responsibility for a large portion of the group with high recidivism rates described in the previous section (Grattet et al., 2009).

It should be noted that criminal characteristics will vary across the four targeted groups, and that the data above most closely applies to the PRCS group. Even within the PRCS group,

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53 One cannot simply look at the criminal history of the current realigned population because Realignment changed the whole structure of the system and was implemented differently across counties, making it impossible to disentangle compositional changes (Bird & Grattet, 2015).

54 The determination of fitting AB 109 criteria is made by the author based on the criminal history characteristics of the sample described in the study.
the subset released in the first year post-Realignment is made up of a higher composition of those incarcerated due to a parole violation than later cohorts, since prison sentences for parole violations were limited to one year. Much less is known about the characteristics of the 1170(h) straight- and split-sentenced population. Nevertheless, we can infer that this group will create similar issues as the PRCS group because they are being sentenced to the same drug and property crimes, although the 1170(h) exemption based on a violent, serious, or sexual criminal history does mean this population may demonstrate less serious problems. In fact, in a study of 12 California counties, the sample of the PRCS and 1170(h) populations demonstrate near identical criminal histories and similar re-arrest and re-conviction rates; with the one major difference being that the PRCS population is, on average, three years older (Bird et al., 2017).

A Decentralization of the Criminal Justice System

The theory behind AB 109 was that by placing all responsibility for a defined set of individuals under the umbrella of a county government, community corrections would work collaboratively with county social service agencies to address issues affecting recidivism. More accountability would result from making each agency that provides (or oversees) service provision for justice-involved individuals (including public health, mental health, physical health, and other local entities) a stakeholder in reducing recidivism (Petersilia & Snyder, 2013). This goal was spelled out with specific programming options from across the justice system point of contact spectrum\(^{56}\) in Cal. Penal Code §17.5. It called for counties to develop programs, interventions, or other strategies that have evidence backing their ability to reduce recidivism and the overall use of custodial sanctions ("Postrelease Community Supervision Act," 2011). The law also mandated the use of Community Correction Partnerships (CCPs) to facilitate the development and creation of these programs across the continuum of the criminal justice system (Brown, 2012). CCPs, instituted in each county as part of AB 678, were a working group composed of the heads of all the organizations and departments in the county that have some stake in lowering recidivism.\(^{57}\) They were intended to increase collaboration and to give a voice

\[^{55}\] Refer to Tables 2 and 3 for descriptive data and Figures 2 and 5 for recidivism data on the PRCS and 1170(h) populations, respectively.

\[^{56}\] A useful framework for this spectrum was developed by the Substance Abuse and Mental Health Services Administration (SAMHSA), identifying five points of contact: community and law enforcement, arrest and initial detention, jails or problem solving courts, reentry from jail and prison to community, and community corrections (Substance Abuse and Mental Health Services Administration, 2016).

\[^{57}\] The Partnerships are “chaired by the county’s Chief Probation Officer and [are] comprised of the following membership: (A) The presiding judge of the superior court, or his or her designee; (B) A county supervisor or the chief administrative officer for the county or a designee of the board of supervisors; (C) The district attorney; (D) The public defender; (E) The sheriff; (F) A chief of police; (G) The head of the county department of social services; (H) The head of the county department of mental health; (I) The head of the county department of employment; (J) The head of the county alcohol and substance abuse programs; (K) The head of the county office of education; (L) A representative from a community-based organization with experience in successfully providing
to all stakeholders in a county’s criminal justice system by creating a venue to meet (Cantil-Sakauye et al., 2013).

The Postrelease Community Supervision Act gives the county’s supervising agency the jurisdiction to enforce conditions of supervision. Conditions of supervision are rules set to regulate conduct linked to future criminality, and enforceable by the supervising agency (Clear et al., 2009, p. 400). The Act specifies a list of general conditions applicable to all counties (Penal Code 3453) but also allows the probation department to create their own (Penal Code 3454). Possible conditions include the right to require “provision of appropriate rehabilitation and treatment services,” drug testing, and education and housing programs ("Postrelease Community Supervision Act," 2011). Violating a condition is grounds for the sanctions described above, including a revocation of probation.

Most other decisions would be left to the individual counties. The law, by design, left a lot of leeway for counties to use different community- and evidence-based practices as they saw fit to limit recidivism and overall incarceration (Couzens & Bigelow, 2017). The probation and sheriff departments would decide how to manage supervision violations and new arrests, respectively, which directly impacts the number of individuals within the county’s criminal justice population. The county’s different social services and health departments would be in charge of implementing the different programs intended to deal with problem behaviors, which could determine how much reoffending occurs among the target population. Even Superior Court judges and county district attorneys still had significant leeway in terms of criminal codes they can charge and convict on, and there was considerable variation in how officers understood segments of AB 109 (Ball & Weisberg, 2014). As a result of the discretion provided to local actors, there has been variation across counties in both the services and programming used as well as the composition of those that use those services, making Realignment a set of unique policy experiments as opposed to an experiment with observations (Rabinowitz & Davaran, 2017).

Navigation Systems

With regards to providing social services to the justice-involved population, the responsibility that would be transferred from the State to county governments had as much to do with navigation systems than actual service provision. The State did operate some of its own treatment centers before Realignment, mostly for outpatient cases, but it relied heavily on case management to link its clients to more intensive community-based residential services. Davis et al. (2011), in examining access to health care for prison releases, describe access for ex-prisoners

rehabilitative services to persons who have been convicted of a criminal offense; (M) An individual who represents the interests of victims” (Cantil-Sakauye et al., 2013).

Violations refer to an individual breaking any of the rules stipulated by their community supervision. The rules are based on improving identified behavioral problems and are not necessarily based on legality in the criminal sense. Violations may lead to an incarceration if supervision is revoked as a consequence.
as highly dependent on referral from the California Department of Corrections and Rehabilitation (CDCR). CDCR operated the Parole Outpatient Clinics (POCs), which treated some mental health problems but referred the most severe cases to county- or community-run programs. With regards to SUD treatment, the most common way for ex-prisoners to receive residential treatment was through the Parole Services Network (Davis et al., 2011), which is a collaboration between state agencies and county-run programs (CDCR Expert Panel on Adult Offender and Recidivism Reduction Programming, 2007, p. 158). The challenge for counties in implementing AB 109 was that CDCR had developed these partnerships with local providers, and now the counties would have to develop their own system to connect their realigned individuals (Davis et al., 2011, p. 145).

Creating an integrative systems approach to ensure that individuals under PRCS have access to treatment would be one of the fundamental implementation tasks for each county. An adequate system for providing services had been lacking before Realignment, as interviews with health care and social service providers found that ex-prisoners had a lot of problems navigating complicated county systems (Davis et al., 2011, p. 106) and that a system was needed to help released prison inmates navigate the complicated county systems (p. 111). Moreover, two separate institutions examining California’s prison problem a few years before Realignment had recommended an inter-agency task force (Alpert, 2007, p. 15) and an integrated systems model (CDCR Expert Panel on Adult Offender and Recidivism Reduction Programming, 2007, p. 14) to improve implementation of service programs. Success in implementing Realignment would depend “on counties’ ability to develop the necessary expertise and service delivery systems to effectively manage and rehabilitate this population” (Davis et al., 2011, p. 147).

Counties did have some existing infrastructure for supervising probationers in need of services, but the new population presented a much higher level of needs. The Substance Abuse and Crime Prevention Act (SACPA) of 2001 had put county probation departments in charge of supervising felony drug offenders that would be diverted to community substance abuse treatment. Years later, SB 678 led to much of the infrastructure and inter-agency collaboration that probation departments used to supervise realigned individuals (Taylor, 2009a; Turner et al., 2015, p. 28). In fact, Realignment funding from the state was mostly used to “enhance programs and services already in existence [as a result of AB 678] for education, employment, substance abuse treatment, and mental health services for realigned offenders” (p. xii). Nevertheless, Realignment caught county systems off guard and under-prepared, with only a few months to prepare, for such a revolutionary change (Petersilia, 2014b). Moreover, the populations affected by both SACPA and SB 678 were mostly felony probationers who had been spared from a prison sentence and at worse, were returning from a short stint in county jail. These populations are very different than former prisoners, who typically have poor health that has gone untreated for

59 CDCR runs the parole system in California.

60 The Community Correction Partnerships were first mandated as part of SB 678.
long periods (Davis et al., 2011, p. 86); and are more likely to have used drugs in the past 30 days, less likely to receive social support, more likely to be homeless, and have more problematic drug use histories (Evans et al., 2012).

Post-Realignment State-provided Funding for County Services

The State has provided counties with a few sources of funding to implement the significant changes in responsibility that it has instilled on local governments. Counties have received AB 109 funding each fiscal year based on a formula using variables from pre-Realignment and adjusting for post-Realignment workload, and rewarding counties that prioritized re-entry over incarceration (California Department of Corrections and Rehabilitation, 2013; Lofstrom, Bird, & Martin, 2016). The funds are to be used on criminal justice needs within the county but there are very few other requirements or approvals required from state agencies (Lin & Petersilia, 2014). Other than some idiosyncratic programs funded by counties for the purpose of Realignment implementation, the funds in most counties are distributed amongst the same agencies that form the CCPs (described earlier in this section).

Separate analyses have found that there is considerable variation in how counties are distributing the funds. Spending allocated to “sheriff and law enforcement” varies from 3.5% to as much as 71.5% of AB 109 county budgets, averaging around 35% for all counties in the state. “Programs and services” are allocated as little as no money in some counties to 78.5% in Lake County, and average 23% of spending in the state (See Figures 5 and 6 in Lin & Petersilia). Analysis of county implementation plans (for which funding is provided by AB 109) shows that, in terms of emphasis, more than half the county plans described the need for substance abuse, mental health, and cognitive behavioral treatment elements; and almost all counties mentioned needs assessments (Bird & Grattet, 2014).

Proposition 47

Policy Specifics

One of the concerns with Realignment was that it would merely transfer the overcrowding problem to the county jails (Petersilia & Snyder, 2013). Although the total statewide incarceration rate did drop precipitously due to Realignment, counties were facing increasing pressure after a few years (Lofstrom & Raphael, 2016). The total number of sentenced jail inmates in the state released early had increased by 70% (from 3,527 to 6,006) between the month preceding Realignment and the last month before Proposition 47 was passed ("Jail Profile

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61 Budget allocation for Los Angeles, for example, is distributed across the following agencies: Alternative Public Defender, District Attorney, Public Defender, Health Services, Mental Health, Probation, Public Health, Sheriff, Fire Department, and other entities dealing with inter-agency collaboration or data systems (annual budgets can be found at: http://ccjcc.lacounty.gov/).

62 Note that these figures are from AB 109 Budgets and may not reflect the total amount a county spends on each category.
Survey," 2016). In a study surveying various stakeholders a few years into Realignment, the authors found that one of the biggest challenges for sheriff departments was overcrowding in jails and that 37 of the 58 counties were “operating under either a self-imposed or court-ordered population cap” (Petersilia, 2014, p. 14).

In this context, Proposition 47 was put on the ballot for referendum in the November 4, 2014 election and was approved by a 60-40 margin, going into effect immediately (Ballotpedia). The new law reclassified nine felony offenses, all of which were also eligible for AB 109, into misdemeanor offenses. These nine offenses fit into two categories: petty theft and possession of (almost all) drugs. In addition to new arrests, any individual that had already been convicted of one of the specified eligible statutes on their criminal record could also petition to have the offense reduced to a misdemeanor. Petitions may be submitted for resentencing (if currently serving an imposed sentence) or for reclassification (if already completed an imposed sentence) of eligible convictions (Couzens & Bigelow, 2016, pp. 36-37). Resentencing can apply to someone currently serving time in jail or prison or under supervision by PRCS or another type of probation, if the primary charge is Proposition 47-eligible. In the case of community supervision, a resentencing will most likely allow the individual to have the case terminated, along with all the conditions that come with it. In addition to meeting criminal history criteria, resentencing cases must convince the court that the petitioner is “no longer unreasonably dangerous to the community” where this is defined as not likely to commit a new serious violent felony (Couzens & Bigelow, 2016, p. 55).

Proposition 47 in a Realigned World

Proposition 47 did not much affect the number of individuals within county jurisdiction in the context of the post-Realignment landscape. The fact that the criminal statutes included in Proposition 47 are a subset of AB 109 offenses means that both new and resentenced cases

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63 This includes “wobblers,” which are crime types that can be sentenced as either a felony or a misdemeanor at the discretion of the courts.
64 The offenses are: Shoplifting (less than $950), check forgery (less than $950), writing bad checks (less than $950), grand theft (less than $950), receiving stolen property (less than $950), theft with prior convictions, and possession of illegal drugs.
65 Resentencing is the process of applying a new adjudication and sentence to a case because the level of the charge in which the defendant was convicted for has changed.
66 Reclassification does not apply to individuals currently being supervised so I will not discuss it in this paper.
67 These are termed “super-strikes” and are offenses considered more serious than the “violent” offenses eligible for AB 109.
68 There are some exceptions. For example, an individual with a violent criminal history may have been ineligible for 1170(h) sentencing after a new Proposition 47-eligible arrest (so sentence would be served in prison), but have the arrest be charged as a misdemeanor because the Proposition 47 criminal history exemptions are more constrained than those of 1170(h).
would be made up of the group serving felony probation sentences in the county\textsuperscript{69} or the groups that make up the realigned population.\textsuperscript{70} In the Realignment landscape, all of the justice system options for individuals either committing Proposition 47-eligible crimes or currently being supervised for such a crime, were within the county jurisdiction. In fact, calculations performed by the author of state data of total quarterly felony sentencing revealed that the drop in absolute number of sentences was almost eight times higher for convictions leading to county supervision (felony probation and straight/split 1170(h) offenses) than for convictions leading to prison sentences (Judicial Council of California 2018).\textsuperscript{71} Thus, taking the county-wide perspective (versus one specific to criminal justice), the number of justice-involved individuals did not change.

The change created by Proposition 47 is in the punishment choice set for counties, as it gave actors working within the criminal justice system fewer options by limiting these crimes to misdemeanors. Proposition 47 reduced the probability that an arrestee charged with one of these offenses would spend time in jail because the common practice in dealing with misdemeanor offenses in California is to “cite and release.” In fact, the jail population in California dropped by 8.5% in the first year after enactment, which underscores the effect on Proposition 47-eligible crimes because the policy allowed sheriff departments to keep other inmates in for longer (Bird, Lofstrom, Martin, Raphael, & Nguyen, 2018). Drug-related crimes before Proposition 47, even when they did not lead to custody time, could be used as leverage to incentivize the individual to enter some sort of drug treatment program (Castellano et al., 2016). Resentencing of felonies for those on PRCS, probation, or in custody affected participation in programming, treatment, and other interventions because individuals would no longer be required to participate as part of their supervision or custody. In Los Angeles County, for example, as of September 1, 2016, the number of felony and PRCS caseloads since the enactment of Proposition 47 had dropped from 50,804 to 45,697 (Hunter et al., 2017, p. 41).

The more limited scope of the criminal justice system is important because contact with the system does provide an opportunity to provide services to deal with problem behaviors. As I showed earlier in this section, reducing problem behaviors was going to be essential for counties given the target population of AB 109. Proposition 47 not only limited the avenues for

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\textsuperscript{69} As previously noted, the composition of felony probationers will be partly determined by the actions of county judicial officials in cases where AB 109-eligible offenses could have been charged, so this population is not independent of the post-Realignment justice system restructuring (Ball & Weisberg, 2014).

\textsuperscript{70} Including those currently in prison who would have been released to PRCS in the future. The counties would have eventually received these individuals as well if not for Proposition 47.

\textsuperscript{71} Calculations were performed by comparing the total quarterly sentences in the third quarter of 2014 (the last full quarter before the policy was enacted) and the third quarter of 2016 (when sentences had stabilized). The number of quarterly prison sentences dropped from 9,324 to 7,186 (an absolute drop of 2,138 sentences per quarter). For felonies that lead to county supervision, the number of felony probation sentences dropped from 25,507 to 14,916 (an absolute drop of 10,591 per quarter), and 1170(h) cases (straight and split) dropped from 7,938 to 3,510 (a drop of 4,428 sentences per quarter).
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accomplishing this, but because realigned individuals are likely to be “frequent flyers,” they are also more likely to be affected by Proposition 47 (Lofstrom et al., 2014). Moreover, because there is no limit on the number of Proposition 47-eligible crimes one may commit, a consistent complaint from law enforcement was that the law had emboldened some individuals to commit low-level crimes without fear of punishment (Saslow, 2015). Interviews and arrest data indicate that local law enforcement officials appear to have reacted by making much fewer arrests altogether (Associated Press, 2016; Bird et al., 2018; Mooney et al., 2018). Even if this helps achieve one Realignment goal, mainly decreasing the burden on criminal justice agencies, it may come at the expense of the longer-term goal of rehabilitating the realigned population if counties don’t adjust to the new landscape.

Post-Realignment Reentry in Los Angeles County

This section will narrow its focus to the system put in place by Los Angeles County (LAC) for supervising the Post-Release Community Supervision (PRCS) population. The PRCS group would have the most immediate post-Realignment impact on county systems. As many prisoners were serving parole revocation sentences that carried a maximum of one year, there would be a large initial wave. And for those being released after a substantial amount of time in prison, they would be in need of significant upfront behavioral and physical health services (Davis et al., 2011). Having already spent time in prison, many for multiple stints, individuals under PRCS were different in terms of needs and criminal history than the 1170(h) straight-sentenced group. Given the different processes the County follows for the two groups, this analysis narrows the focus to reentry services.

It should be noted that because the PRCS group is in the community, it is also interacting in the larger picture of Realignment implementation in LAC. As AB 109 encouraged counties to use every possible contact point throughout the system to treat problem behaviors (Cal. Penal Code §17.5). One useful framework for categorizing the different contact points, and one that has been used in Los Angeles in the context of mental health, is the Sequential Intercept Model (Lacey, 2015). It identifies five points of contact: community and law enforcement, arrest and initial detention, jails or problem solving courts, reentry from jail and prison to community, and community corrections (Substance Abuse and Mental Health Services Administration, 2016). The last two points in the Model apply directly to the group in PRCS and this part is the scope of this analysis. Over the years since the enactment of AB 109, though, LAC has implemented various programs applicable to each contact point in the Model and individuals in PRCS would continue to be affected by the other points of contact.

72 It should be noted that the 1170(h) split-sentenced group were also supervised by the probation department and would experience a similar reentry structure to the PRCS group. Until 2016, though, LA County very rarely used the split-sentence option and therefore this is a very small group and I will refer only to PRCS as the reentry population (Chief Probation Officers of California, 2014).
Most of the information in this section comes from the author’s internship work with the offices of probation and public health complemented by county documents published online. An important source of information is an implementation report published the month before Realignment went into effect (described further below) detailing the process and roles of each department (Community Corrections Partnership, 2011). The County also publishes reports after stakeholder meetings, which occur a few times a year, with updates and relevant data from each agency. Of course, parts of the process may not have been followed in practice, and I will draw from my experiences to note when the actual process is not clear. Moreover, site visits to a “Hub” (described below) location and to a Community Assessment Service Center (described below) inside a county jail allowed the author to assess how certain procedures were being implemented.

Los Angeles County’s System of Government

The previous section described AB 109 funding more generally, and a note is required for how this is implemented in LAC. The Chief Executive Office (CEO), which serves directly under Board of Supervisors, oversees all budget funding and staff management decisions, including that of Realignment. The County has a fund to provide services, across many agencies, specifically for individuals that are under supervision or custody by the County as a result of AB 109 rules. Importantly, this means that there are AB 109 administrative and supervisory probation offices that are separate and independent of the Probation Department, completing basically the same functions but only for the AB 109 population. And when the AB 109 Probation Office refers an individual to services from one of the social service agencies, these will be funded through the AB 109 budget. A consequence of this is that individuals using AB 109 services are specifically identified in data systems. Moreover, because counties were given so much freedom in spending AB 109 funds, in recent years LAC has used it to fund services more loosely related to Realignment (Katz, 2017).

LAC’s system of government works in a horizontal structure with agencies mostly acting as independent silos according to their distinct mission. Realignment has increased the urgency to improve inter-departmental collaboration because multiple agencies are serving the same population, and improving outcomes benefits the same pot of money that funds all of these agencies. The County addressed the challenge of collaboration through the already-existing Countywide Criminal Justice Coordination Committee (CCJCC), established in 1981 to improve coordination and planning in the justice system. The committee is composed of most of the same members as the CCPs described in the previous section and will be used interchangeably in this section. The CCJCC developed the “Implementation Plan” in the days leading up to

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73 These reports can be found here: [http://ccjcc.lacounty.gov/Public-Safety-Realignment#10229310-2013](http://ccjcc.lacounty.gov/Public-Safety-Realignment#10229310-2013).

74 Information can be attained at the CCJCC website: [http://ccjcc.lacounty.gov/Public-Safety-Realignment](http://ccjcc.lacounty.gov/Public-Safety-Realignment).
Realignment, as was required of all CCPs according to AB 109. This Plan is the starting point for understanding LA’s system of service provision for the realigned population.

In its Implementation Plan, LAC outlined a system for AB 109 whereby the AB 109 bureau of the LAC Probation Department (referred to henceforth as Probation) would act as a hub for the PRCS population. This was a standard practice across California, given that probation departments would supervise the PRCS population and they are viewed as an intermediary between law enforcement and programs and services (Lin & Petersilia, 2014). It is why the Chief of Probation sits as the chair of the CCP. It is important to remember that probation departments, as the supervisory agency, would be ultimately measured by the number of clients that successfully transition out of the criminal justice system.

A major idea of Realignment was that non-justice agencies would also become stakeholders in rehabilitating justice-involved individuals, thus over time reducing the burden on the justice system. The county service agencies, namely the Departments of Public Health (DPH), Mental Health (DPH), Health Services (DHS), and Public Social Services (DPSS), as well as the Los Angeles Homeless Services Agency (LAHSA), administer the services most commonly required by the realigned population. Generally, though, the agencies contract out the provision of services to Community-Based Organizations (CBOs), adding an extra layer of complexity to the process. The Sheriff’s Department provides the law enforcement aspect and manage the county jails. The District Attorney, Public Defender, and Alternate Public Defender Offices, as well as the Superior Court, are important for the revocation hearing process where probationers can also be diverted to services.

**PRCS Implementation**

LA County starts to work with the California Department of Corrections (CDCR) on a planned prison release at least a month before that individual is released. During this time, CDCR recommends conditions of probation, using a static risk assessment based on criminal history and the individual’s drug and mental history. Once the inmate is released from prison, he/she becomes the responsibility of LA Probation as a Postrelease Supervised Person (PSP). Within two days of their release from prison, a PSP is required to show up at an assigned “Hub” location operated by LA Probation.

The Hub is referred to in the Implementation Plan as an “intake,” in similar parlance to what would be considered an initiation in the healthcare model. It is an opportunity to assess the

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75 The information in this sub-section, unless otherwise noted, comes from the implementation report described previously.
76 While the Implementation Plan states that only a subset of PSPs (those identified with specific treatment needs) would need to attend this Hub after release, in practice every released inmate has been required to attend (this is clear from the CCJCC biannual reports).
At the Hub, a specialized officer will run the PSP through a process that includes: a full orientation, a needs assessment identifying an initial risk level determination for caseload placement as well as any emergent issues or needs (such as transportation and housing), and the assignment of a case Deputy Probation Officer (DPO) in one of the AB 109 offices. The assessment can help the PSP get access to government assistance and navigation services, although only referrals and no services or registration for services are administered at the Hub.

Most important for the purposes of SUD treatment, a behavioral health screening is conducted at the Hub. The screening is conducted by an employee of Probation who use information from a pre-release packet provided by CDCR to learn about each individual’s documented problem behaviors. They then complement this information by administering to the client the Level of Service/Case Management Inventory (LS/CMI), a standard risk and needs assessment used for the re-entry population. These two pieces of information will guide the DPO determination for whether a substance use and/or mental health disorder referral is required. Depending on the determination, a referral will be given to the PSP instructing them to schedule an appointment with the appropriate agency (either DMH or DPH). It is not clear from the documentation whether DMH takes precedence over DPH in the case of referrals to both agencies. Regardless, if a PSP is assessed to need treatment for both mental health and SUDs, which is common, services are provided separately by the two agencies (Chavira, Botello, & Lagomasino, 2016).

Based on the referrals provided, conditions of supervision are placed upon a PSP requiring adherence to a “treatment plan.” The treatment plan refers to the determination made in the professional assessments from DPH/DMH staff. It is important to note that DPH and DMH staff that are immediately available to assess referred individuals may be co-located at the Hub, but co-location of service agency representatives was not part of the initial plan and their presence seems to have fluctuated over time and differed by location. This is important because

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77 Regardless of the assessment, the PSP will be required to check-in with his/her assigned DPO within 30 days. Again, this follows guidelines best practices for engagement within 30 days in a healthcare model.

78 The Level of Service/Case Management Inventory (LS/CMI) test is used to make this assessment.

79 There are four types of risk levels (low, medium, high, and very high) and they determine how often a PSP must check-in with the assigned DPO.

80 LA Probation contracts out navigation services, which include transitional housing, to only one CBO (currently HealthRight 360)

81 Other referrals are given as well, but these two are the most important and the most relevant to this analysis.

82 In my site visit to the Hub, PSPs that were referred to DMH would see a staff member from DMH co-located at the Hub, and this person would then decide whether to refer the PSP to DPH. There were no indications that this was a standard practice.

83 In the case of some serious co-occurring disorders, the PSP may be referred to the Co-Occurring Integration Network (COIN), a collaborative effort run by various county agencies. Only 20 residential beds appear to be reserved for AB 109 clients, though.
otherwise Probation must rely on PSPs making an appointment and showing up for an assessment at another location.

Outside of the Hub, Probation would still act as a hub in the context of providing services to the PSP. The DPO, at the first meeting with a PSP, was tasked with identifying the dosage of rehabilitative services needed and creating an Individualized Treatment Plan (ITP). DPOs would check-in with the probationer periodically\(^{84}\) (the number of times per month is based on the PSP’s risk-level) and have the enforcement power to require probationers to meet their conditions of supervision. Probation could also still wield this enforcement power as a supervisory agency by referring a client, and thus adding a condition of supervision, to various types of treatment at any point during the probationary period. This frequently occurs, in the context of substance use for example, if a PSP with a supervision condition requiring periodic drug testing has a test come up “dirty,” or positive. At this point, the DPO may add a condition of supervision requiring a SUD treatment plan (Bingham, 2016).

Using these referrals as sanctions for violating rules is part of the gradual sanctions tool that was recommended by the Post-Release Community Supervision Act described in the previous section. This tool was implemented in LAC through a matrix that guides DPOs on sanctions for a violation based on the number of times it has occurred (Bingham, 2016). These sanctions are intended to address the problem, so a violation associated to drugs likely will lead to adding a condition of supervision for a SUD treatment plan. Unfortunately, there is no publicly available information detailing how DPOs have used this mechanism to induce clients into required services.

Although Probation wields the enforcement, once the PSP leaves the Hub, it is up to him/her and all the other agencies working independently for the required service provision to be met, with Probation acting as the supervisory agency. There was no mention in the Implementation Plan as to which agency (if any) had the responsibility of helping a probationer navigate through the system of services, although the ultimate responsibility for a successful supervision period (i.e. no new violations or arrests) rests with Probation. According to the “Realignment Year-Three Report,” Probation contracts with a CBO for system navigation services, but it is not clear how need is determined and how the CBO providing navigation interacts with the other agencies (Public Safety Realignment Team, 2015). It should be noted that PSPs may be entering services through other re-entry programs operated by government or private agency. Many of these programs provide comprehensive supports that include SUD treatment.

Substance Abuse Treatment Provision

In this sub-section I will describe the linkage system for one specific service provided to realigned individuals: substance use disorder (SUD) treatment administered by Department of

\(^{84}\) DPOs document progress or setbacks identified in these meetings in a management system.
Public Health-Substance Abuse Prevention and Control (DPH-SAPC). The goal is to provide a finer grain into how LA Probation works with a service agency to provide treatment for the PRCS group. I stick to one agency, DPH-SAPC, because each specific service agency that corresponds with PSPs will present its own idiosyncrasies. Moreover, SUD treatment is viewed in the County as the most widespread need for justice-involved individuals (Los Angeles County Department of Health Services, 2017). Much of the discussion will also apply to mental health services, another major player in reentry. As a supplement, Figure 1 below shows the full process in a diagram.

As described above, the PSP may be referred to DPH-SAPC services through either the Hub or the use of a sanction sometime during the supervision spell. The first step for a realigned individual after receiving a referral is to attend a Community Assessment Service Center (CASC) administered by DPH-SAPC (Viernes, 2012). The CASC is composed of eight lead contracted community-based organizations located throughout the County’s eight Service Planning Areas (SPAs). To facilitate the transition from Probation to DPH-SAPC, a CASC assessor may be located at Hub locations, at certain AB 109 probation area offices, Revocation Court,85 and at the LAC Sheriff’s Community Re-entry Resource Center86 (Public Safety Realignment Team, 2015). As previously mentioned, there is no public information on these co-locations and it is unclear how this in-house referral process works (regardless, it is clear that the process has changed over time and that CASCs have become more involved within Probation offices). Based on the workload and number of assessors available, it is possible clients will not be assessed in-house even if co-located staff are present. If clients cannot be assessed immediately after referral, it adds an extra barrier for PSPs to get an assessment and ultimately receive SUD treatment services.

CASCs act as the front desk to the DPH ecosystem, where different types of SUD rehabilitation services are provided by CBOs. During the assessment, PSPs are administered the Addiction Severity Index (ASI), a lengthy questionnaire that helps determine which, if any, treatment is needed (Viernes, 2012). If it is determined that treatment is needed, the PSP is referred to a specific provider. This system is not new to Realignment, as DPH used CASCs for SACPA clients, and state parole and county felony probation referrals, to link to the appropriate treatment providers.

A CASC assessment may result in a referral to a treatment provider or a determination that treatment is not required at the moment. If treatment is not required, the PSP is in compliance with the condition of probation as the condition only requires the PSP to comply with a treatment plan (Bingham, 2016). There does not appear to be a policy regarding whether

85 The Revocation Court is located at the Central County Jail and is a specific court for PSPs that are arrested and booked in jail.
86 This Center opened in 2014 to provide services in a similar way to the AB 109 Hub to people exiting jail but not entering community supervision (C. Chang, 2014). The need for such a system was created by the straight-sentenced AB 109 population.
the treatment condition is to be subsequently removed, though a condition requiring regular drug testing is available to DPOs. If the client has been referred to a treatment provider, the PSP will be given a specific location and date for admission. This will be based on the type of treatment required (type of drug problem, residential or outpatient, etc.) and the availability of such treatment. Once the client is “linked” (term used for a client that has been processed at intake and admitted for treatment by a treatment provider), a treatment plan is developed by the provider. The last step for a PSP requiring SUD treatment is to be discharged with positive compliance, which is determined by the treatment type and plan.

Throughout this process, Probation is the only entity that can coerce a PSP to participate in treatment through the use sanctions. These sanctions, which are the intermediate outcomes shown to the sides of Figure 1, can be as mild as a referral to services, get harsher through a flash incarceration, or finally may be a revocation served in jail. Such actions may induce SUD treatment as this is an avenue by which PSPs may be referred to a CASC (as shown in the figure). But the link from CASC to provider and the subsequent time in treatment is part of the DPH ecosystem, and they have the most information regarding the SUD needs of the client. Moreover, the agencies must navigate the Health Insurance Portability Accountability Act (HIPAA) of 1996, which protects an individual’s right to privacy regarding substance abuse treatment information (Petrila & Fader-Towe, 2010).

Probation and DPH-SAPC can communicate information regarding the SUD referrals of PSPs through the Treatment Court Probation Exchange (TCPX). The TCPX system was first developed as part of implementation of SACPA, where the coordination between Probation and DPH was also essential to successful outcomes (Viernes, 2011). Updated for AB 109 needs, it allows DPH and providers to share information with each other and with LA Probation so as to track the needs that have been assessed for an individual and current status of treatment (Public Safety Realignment Team, 2015). It can be used as a tool to track whether clients are utilizing services as required by their probation terms, though it does require all parties to actively check with and manage the system (Viernes, 2011).

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87 If providers have no beds available, a client is put on a waiting list. AB 109 clients have special priority, though, and are rarely put on a waiting list.
Discussion

This paper has developed a foundation by which to study local social services provision to the justice-involved population in the post-Realignment era in California. Through a historical perspective, I have demonstrated that improving the provision of social services for the realigned population is an essential task for county governments. These local governments would otherwise face huge stresses to their criminal justice systems, since the realigned population is composed of individuals with entrenched criminal histories caused by unaddressed problem behaviors, such as substance use disorder (SUD). Given the infrastructure in place when AB 109 was enacted, to adequately provide services, counties had to figure out not so much what services to provide but how they were going to get people into those services.

As an application, I describe the general system in place in Los Angeles County, demonstrating the responsibility placed on LA Probation. Probation plays a type of system navigator role through the referrals it provides, while also wielding the power to coerce clients to take-up necessary services. Most research evaluating the policy lever of coercion to induce treatment has ignored the role of probation departments, simply asking whether one was under probation supervision (J. F. Kelly et al., 2005; S. M. Kelly, O’Grady, Jaffe, Gandhi, & Schwartz, 2013; Kiluk et al., 2015; Marshall & Hser, 2002; Wild, Yuan, Rush, & Urbanoski). Other
research has treated justice-related coercion as a unitary policy, ignoring the heterogeneity in how it is used (Farabee, Prendergast, & Anglin, 1998). My description of Probation’s dual role as a system navigator and supervisory agency provides a framework by which to assess how to improve the linkage between reentry and social services. One specific avenue for research in this regard is to study methods that DPOs use (or fail to use) to persuade probation clients into needed services.

Another important issue highlighted by this paper is the relationship between community supervision and service agencies. As agencies exist in silos, there can be a lack of coordination and difficulties creating data systems compatible across departments (Hunter et al., 2017). This can make it difficult to follow-up and ensure probationers are engaged and getting the help they need to meet goals that will assist in their rehabilitation. For PSPs in LA, each step in the process to successful SUD treatment, as described in Figure 1, is an extra hurdle for a clientele that struggle with navigating a complex bureaucracy (Chavira et al., 2016). In fact, retention and engagement among the general SUD treatment population has been shown to be a very difficult task (Dennis & Scott, 2012; Scott & Dennis, 2003). The next step for this research is to focus on each decision point (including the intermediate outcomes), to understand how agencies can create a more seamless process to improve retention through the path to successful treatment. This type of research would have broader policy implications given that, within the criminal justice system, probation and parole referrals represent the largest source of SUD admissions (Substance Abuse and Mental Health Services Administration, 2011).

Finally, I have described how the enactment of Proposition 47 three years after AB 109 changed the landscape for county Realignment implementation efforts. The same systems that were used to provide services are no longer as useful after Proposition 47 reduced the reach of justice agencies. For example, although exact data is not publicly available, the resentencing clause has allowed a substantial number of PSPs in LA to have their probation supervision terminated (this can be deduced from the biannual CCJCC reports). In fact as mentioned earlier in this paper, the number of felony and PRCS caseloads since the enactment of Proposition 47 had dropped from 50,804 to 45,697 (Hunter et al., 2017, p. 41). This means that the avenues for inducing SUD treatment shown in Figure 1 (or other services) are no longer available. No doubt, this is a problem shared by all counties.

Counties must find new ways to reach populations at risk of being involved with the justice system. Los Angeles County has started to head in this direction. One important development in LA has been the Office of Diversion and Reentry (ODR), created to “expand...clinical services for ODR target populations” and to “develop collaborative relationships with justice partners” (Office of Diversion and Reentry). ODR is administering a number of county initiatives and diversion programs funded by AB 109 and a recent Proposition 47 grant (Katz, 2017). Another development has been the creation of the Los Angeles County
Health Agency, combining DHS, DPH, and DMH to better integrate services. Finally, as part of the Drug Medi-Cal Organized Delivery System (DMC-ODS) that began in July of 2017, the System Transformation to Advance Recovery and Treatment (START) aims to ease the entryways into the County’s SUD treatment system (Los Angeles County Department of Public Health, 2016).

To help these ambitious projects target the elusive group that could benefit from social services, and hence reduce repeated criminal behavior, future research must better understand those benefited by Proposition 47. Very little is known about the Proposition 47 group at the moment- LA County has defined a broad group of 500,000 individuals- and it is difficult to create programs that target such an elusive group (Los Angeles Chamber of Commerce, 2017). Further, it is unclear exactly what the effect of Proposition 47 has been on retention of clients that were receiving services under AB 109. It is believed that many have dropped out of services that they would otherwise be receiving, but this has never been formally evaluated (Hunter et al., 2017). This paper takes the first step for such evaluation, by identifying the problem in the context of California’s evolving criminal justice system and by describing the mechanisms in place to serve an important group (PRCS) within LA County.

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88 The mission is described in the Agency’s website: [http://healthagency.lacounty.gov/leadership/](http://healthagency.lacounty.gov/leadership/).
Chapter 3: Does Community Supervision Lead to More Substance Use Treatment Engagement? A Case Study from Los Angeles

Introduction

As local jurisdictions across the country attempt to reduce their reliance on incarceration, one popular approach is to use the justice system to increase receipt of treatment for problem behaviors that are associated with crime, such as substance use disorders (SUDs). A major motivation for SUD treatment as a means to reduce crime and incarceration is the evidence that there is a strong connection between criminal behavior, particularly for drug- and property-related crimes, and SUDs (Bronson et al., 2017; Harrison, 2001). And clinical trials of SUD treatment programs have been demonstrated to reduce recidivism (Gottfredson, Najaka, & Kearley, 2003; Mitchell, Wilson, & MacKenzie, 2007). Moreover, the justice system holds the power of legal pressure that can induce individuals into treatment, an important component for a population that is difficult to engage (Dennis & Scott, 2012; Marlowe, 2002). Legal pressure, accomplished through mechanisms such as imposing a condition of supervision that an individual follow-through on a referral to SUD treatment, with the threat of sanction, can serve as a “stick” to keep clients engaged with services. The result is that the criminal justice system plays a large part in the take-up of SUD treatment within local public health systems, making up about one-third of all referrals in treatment admissions (Substance Abuse and Mental Health Services Administration 2016). And the largest component of the justice system performing this role is community supervision (i.e. probation or parole) (Kaeble & Cowhig, 2018; Substance Abuse and Mental Health Services Administration 2016).

Studies have long-examined the use of community supervision (CS) to retain clients in SUD treatment, but less is known about the role CS plays in providing the type of engagement required to treat SUD as a chronic disease. Most studies examining the role of legal pressure and SUD treatment utilize a prospective sample of SUD treatment participants that have self-identified as being referred by the justice system, allowing these studies to only measure retention and other outcomes associated to that episode (Coviello et al., 2013; S. M. Kelly et al., 2013; Kiluk et al., 2015; Wild et al., 2016). This single-episode process, though, does not reflect the recovery trajectory, or “treatment career,” experienced by many people afflicted by addiction, who frequently drop out of treatment and relapse (Anglin, Hser, & Grella, 1997; Dennis, Scott, Funk, & Foss, 2005). The actual process of recovery more closely resembles that of a chronic disease, requiring a model of care composed of monitoring and quick re-engagement (Dennis & Scott, 2012; Institute of Medicine, 2006).
A management model of care requires programming that facilitates quickly engaging individuals with treatment on an ongoing basis (Martin, O’Connell, Paternoster, & Bachman, 2011; Scott, Grella, Dennis, & Nicholson, 2018), and there is reason to believe that CS may be able to fulfill the requirements of such a model (Scott, Dennis, & Lurigio, 2017). CS agencies have frequent contact with their clients and the responsibility to help their clients reintegrate to the community (Clear et al., 2009). By using the power of the “stick,” these agencies can require individuals to re-enter treatment if they relapse (or commit a new crime associated with their drug use) and maintain the individual in treatment while needed. While CS does not provide medical expertise for a client that has relapsed, it is viable that through a referral enforceable by sanctions, CS may be sufficient to increase the probability that an individual that needs treatment gets it.

Research has explored the effectiveness of various interventions to engage justice-involved individuals with SUD treatment, but these commonly use an entity other than CS to act as the case manager. One type of program, the most common example being Treatment Accountability for Safer Communities, has utilized CS to link clients to case management interventions (Heaps, Lurigio, Rodriguez, Lyons, & Brookes, 2009; Longshore, Turner, & Fain, 2005). But in these cases, a case manager that is separate from CS is responsible to link those clients to SUD programming. More recently, drug courts have gained prominence as an alternative to incarceration because of findings that they induce SUD treatment provision and reduce recidivism (Gottfredson et al., 2003; Rempel & Destefano, 2001; Wilson, Mitchell, & MacKenzie, 2006). Drug courts, though, have a strong judicial monitoring component that does not exist in CS where the supervision agencies are responsible for monitoring a much larger group of people and don’t require frequent hearings in front of a judge.

Other policies and programs have specifically diverted justice-involved individuals to community-based treatment enforced by CS, which has allowed researchers to test the stick mechanism of CS. Policies such as Proposition 36 in California and Proposition 200 in Arizona, and interventions such as the Breaking the Cycle, have attempted to integrate CS with public health agencies (Harrell, Mitchell, Merrill, & Marlowe, 2004; Marlowe, 2003). But these interventions, which have been found to induce participation in SUD treatment, have focused on pretrial diversion for first- and second-time offenders. There is room for research on how to engage a population that has been in treatment before and likely entrenched in the justice system for many years (H. Pollack, Reuter, & Sevigny, 2011).

In this paper, I employ a case study to test the effectiveness of the stick mechanism used by CS to maintain individuals engaged to SUD treatment, where I define engagement as taking up and staying enrolled in SUD treatment services for at least 30 days. I take advantage of a specific community-supervised group created by a state policy in a large, urban jurisdiction where there was an explicit process by the jurisdiction to improve SUD treatment provision for this group. Moreover, the group is composed of individuals with histories of drug use and criminal behavior much longer than the typical justice-involved individual. A policy shock three
years later that led some members within the group to be released from supervision allows me to estimate the supervision’s effect on engagement for this group.

Public Safety Realignment (aka “Realignment”), set off by the enactment of AB 109 on October 2011, created a group of justice-involved individuals (herein referred to as the “realigned” population) that would be supervised by counties. The policy required counties to supervise individuals convicted of nonviolent, nonserious, and nonsex crimes (“non-non-nons”), which used to be supervised by state agencies, within their own jurisdictions. Prior work has described that the goal of creating the realigned population was to incentivize counties to provide services as an alternative to incarcerating individuals convicted of drug and property crimes, whose criminal behavior is commonly a result of problematic drug use (Weinberger, 2018). One way counties could fulfill this goal was to integrate their justice systems with other social service agencies to provide services, particularly SUD treatment, to the realigned population (Weinberger, 2018).

In this study, I focus on one subgroup created within the realigned population: individuals being released from prison for an AB 109-eligible crime to Post-Release Community Supervision (PRCS), a group that would be supervised by county probation departments. More specifically, the case study makes use of the PRCS group that was supervised by the Los Angeles County (LAC) Department of Probation (herein “Probation”). A product of Realignment in LAC was the implementation of a plan to use Probation as a hub that connected the PRCS population to needed services (Community Corrections Partnership, 2011; Weinberger, 2018). The creation of this well-defined group, which I will show had long criminal histories associated to drug use that made SUD treatment provision a priority for LAC, allows me to study a population with relatively similar problems affected by a similar supervision process.

The method used to identify the effectiveness of the stick mechanism used by CS as a mechanism to increase receipt of SUD treatment engagement is to exploit a policy shock introduced by Proposition 47. Proposition 47, enacted in California on November 2014, affected a subset of the realigned population and threw a wrench into the work counties, such as LAC, were doing to implement Realignment (Weinberger, 2018). Proposition 47 reclassified nine offenses from felony to misdemeanor, providing “relief” for individuals convicted of these crimes. One of the consequences of the law was that it affected the mechanisms that the county justice systems were using to funnel people into services (Weinberger, 2018). Misdemeanor charges bring about a more limited choice set for actors within the justice system, reducing the system’s leverage to connect this individual with services. In LAC, this concern has been stressed consistently by the committee created to oversee the implementation of Realignment (Countywide Criminal Justice Coordination Committee, 2015a, 2015b). For example, the committee was concerned that some individuals who were released from CS as a consequence of Proposition 47 subsequently stopped attending SUD and/or mental health treatment (Countywide Criminal Justice Coordination Committee, 2015a).
The specific component of Proposition 47 used as the policy shock is the resentencing clause. Resentencing, in the context of Proposition 47, is a process of having a conviction for an open case,\textsuperscript{89} that was adjudicated before Proposition 47 was enacted, reduced from a felony to a misdemeanor if the conviction would have qualified for a misdemeanor under the new law. A reduced conviction of an active case where the individual is being supervised, either in a correctional facility or community supervision, leads to the adjudication of a new sentence based on the reduced conviction (Couzens & Bigelow, 2016). Resentencing applied to active PRCS cases in LAC and led to early terminations of supervision for the individuals receiving Proposition 47 relief. I exploit the fact that the adjudication of resentences, and thus sudden early supervision terminations, in LAC were concentrated over a one-year period after the enactment of Proposition 47, leading to variation in the timing when individuals in PRCS received the “intervention” (i.e. the early termination). In making the case that the effect I estimate is causal, I will demonstrate that the timing of the adjudications was unpredictable to the people that got relief, effectively creating a plausibly exogenous shock whereby PRCS is removed. Moreover, because resentencing occurred based on crimes that were carried out, policed, and adjudicated before the policy was even on the ballot, the group being studied could not have selected itself into the sample.

I utilized the unpredictable variation by analyzing a novel dataset of all publicly-administered SUD treatment episodes for a cohort of active PRCS cases being supervised by LAC Probation that received an early termination at some point during the sample period. Because the sample period covered both the cohort’s time under PRCS once Proposition 47 was enacted as well as after their supervision had ended, I was able to compare pre- and post-supervision periods. Moreover, the variation in the unpredictable timing of the adjudications of the resentenced PRCS cases during this period allowed me to use later-occurring adjudications as control groups to estimate a causal effect of using CS as mechanism to increase the likelihood of maintaining individuals engaged in SUD treatment.

This study makes three important contributions. First, it describes an important population that as of this writing has not been described with regards to SUD problems and treatment histories. I use descriptive data to show the differences between the general criminal justice, PRCS, and Proposition 47 resentenced groups in LAC. Second, the study estimates the effect of the early supervision terminations for those on PRCS on total SUD treatment engagement in the largest county in California. A descriptive analysis of the PRCS population that received a resentencing in LAC showed that this group did not have a higher proportion of individuals discharged with negative compliance, but that they did have shorter stays in SUD treatment, compared to the average justice-referred client (Hunter et al., 2017). The hypothesis

\textsuperscript{89} A “case” is used to refer to specific series of interventions taken by the criminal justice system pertaining to an arrest and subsequent charge of a crime. Active cases are those where the individual is still serving some type of sanction resulting from the case. An individual may have multiple cases at once.
that resentencing led to a reduction in service provision (measured here by SUD treatment) among the PRCS population, an important component of Proposition 47, has never been formally tested in LAC or in other jurisdictions. Generalizable to the broader literature that explores using CS as a mechanism to increase receipt of SUD treatment, this study will also contribute by estimating the effect of PRCS on total treatment engagement. Data on both treatment and supervision (i.e. PRCS) spells for individuals in a comparable cohort allows me to investigate dynamic changes in treatment engagement while under CS and after the supervision has ended.

Background

**PRCS and SUD treatment provision in Los Angeles**

One of the most significant parts of AB 109 was the creation of Post-Release Community Supervision (PRCS), a type of CS administered by county probation departments as opposed to state parole ("Postrelease Community Supervision Act," 2011). Eligibility for PRCS is determined based on the current charge upon release from prison. The applicable current charges are generalized as nonviolent, nonserious, nonsex-related offenses and they have been frequently categorized in the literature as drug and property offenses (Lofstrom et al., 2014). It is widely accepted that, among people incarcerated for these types of offenses, previous drug use is highly prevalent (Mumola, 1999; Zhang, 2004). Moreover, individuals on PRCS (labeled the “PRCS group” in this paper) present much more serious behavioral problems than the traditional probation population because this group was released from prison and criminal history was not a factor in PRCS eligibility. An individual that is released from prison has either been convicted of a serious enough crime to warrant a prison term or a criminal history extensive enough to warrant one, both of which are associated to more serious behavioral problems (Evans et al., 2012; Gerlinger & Turner, 2015). Weinberger (2018) shows that to incentivize counties to treat these problem behaviors, AB 109 provided a number of ways for counties to improve service provision for the PRCS population, with probation departments at the center of this system acting as the intermediary between enforcement and social service agencies.

Individuals who received PRCS must be supervised for one year if the individual commits no further violations, but the clock on supervision is reset after an individual incurs

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90 A spell is a term used to designate the time-period between a start and end date under CS.

91 The composition of criminal history among PSPs changes slightly based on whether the PSP entered prison before or after the enactment of AB 109 because the likelihood of being admitted to prison is reduced after Realignment. In my analysis, I will control for whether the PSP was on PRCS for an offense adjudicated before or after AB 109.

92 The law allowed for counties to release people within six months based on discretion of the probation officer, but this provision was not used in LAC.
another violation in many cases. On the other hand, the PRCS group must also be released within three years regardless of the number of violations. An important caveat to this supervision policy is a process called “tolling,” where the clock is paused when an individual in the PRCS group absconds. This may extend a PRCS spell beyond three years, something that I will show is fairly common in my sample. Any revocation of PRCS, which may be a result of a new crime or simply a result of breaking agreed-upon supervision rules, must be served in county jail (as opposed to prison) and counts towards the three-year maximum time-period allowed on PRCS (a thorough description of the rules applied to PRCS can be found in Weinberger (2018)).

Similarly to other counties, as a result of AB 109, Los Angeles County (LAC) created a system in which the AB 109 bureau of the LAC Probation Department (referred to henceforth as Probation) acts as a hub for the PRCS population, whom they refer to as Post-released Supervised Persons (PSPs) (Weinberger, 2018). The most significant part of the system was the development of an innovative mechanism whereby Probation administered “Hubs” (these are physical locations with representatives from different County service agencies) to connect PSPs to services immediately upon release from prison (Community Corrections Partnership, 2011). PSPs are required to attend a Hub within two days of their release, where they are assessed for various service needs. As Probation does not provide any services itself, referrals are given for the service needs that are determined to be required at the Hub assessment. Throughout the PRCS spell, probation officers are also allowed to refer their clients to services, such as SUD treatment, at any time. Because PSPs are mandated to check-in with their probation officer as frequently as twice a month, depending on their risk-level, Probation is best suited to act as a de-facto case manager (see Weinberger (2018) for a detailed description of Probation’s role in supervising the PRCS population).

In the case of SUD treatment needs, PSPs are referred to the Department of Public Health-Substance Abuse Prevention and Control (DPH-SAPC) (Community Corrections Partnership, 2011). DPH-SAPC provides assessments of SUD problems and administers the provision of SUD treatment. To provide assessments and link individuals to the appropriate treatment program, they operate Community Assessment Service Centers (CASCs) funded by AB 109 in sites across the county (including some Probation-operated offices). Individuals deemed in need of SUD treatment are referred to a private SUD treatment provider under

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93 A violation means to break a rule agreed upon as part of the supervision, and is not necessarily a new crime.
94 Abandoned is the term used by LAC Probation to refer to clients whose whereabouts are unknown and therefore are not being actively supervised.
95 This mandate is in the AB 109 implementation document. Whether PSPs are held accountable to regularly check-in with their DPO has not been evaluated to the knowledge of the author.
96 Risk-level is determined by administering the Level of Service/Case Management Inventory (LS/CMI) every six months (Community Corrections Partnership, 2011).
97 There are a few CASCs “co-located” within Probation-run Hubs and offices where PSPs report. Little information is available regarding their operations (see Weinberger (2018) for a more detailed explanation).
contract with DPH-SAPC to provide services. These providers are reimbursed through a variety of funding streams available to DPH-SAPC, and services for PSPs are billed to AB 109 funds (Community Corrections Partnership, 2011).98

Although Realignment made both DPH-SAPC and Probation a stakeholder in the success of a PSP, the agencies to a large part are operating independently. DPH-SAPC periodically receives a list from Probation of PSPs that have received a referral from Probation after being identified as needing to complete a SUD treatment plan at the Hub assessment. A treatment plan refers to getting an assessment at a CASC and may lead to either a referral to a SUD treatment provider or a determination that treatment is not required. Regardless of whether the assessment identifies a need for treatment, DPH-SAPC does not have any enforcement power to retain a PSP in SUD treatment. DPH-SAPC may provide a case manager through their own independent process, but they do not coordinate with Probation in this regard. On the other side of the coin, section 42 CFR Part II prevents DPH-SAPC from sharing their administrative data with Probation, making it more difficult for Probation to monitor receipt of SUD treatment by a PSP. There is, though, a communication tool, the Treatment Court Probation Exchange (TCPX), where Probation can log-in to a webpage to check whether the PSP has been assigned to a treatment program by DPH-SAPC and whether the PSP is currently enrolled in a SUD treatment program (Viernes, 2011).

The mechanism to pressure a PSP to enroll in and attend SUD treatment services must come from Probation, which has enforcement mechanisms at its disposal. Probation has the power to add and enforce conditions of supervision, which are enforceable rules set out to regulate conduct by the supervising agency (Clear et al., 2009, p. 400). A PSP that is referred to SUD treatment services will also have a condition placed on their supervision (aka an “X88 condition”) that stipulates that a PSP follow a SUD treatment plan (Bingham, 2016). If the treatment plan (i.e. the assessment conducted at the CASC) determines that treatment is not required, or the PSP declines treatment, the probation officer will be alerted to this (through TCPX). The condition of supervision should pressure the PSP to get assessed by the CASC and follow the treatment plan (as opposed to declining treatment) because Probation has the right to sanction a PSP that does not abide by a condition of supervision.

Using sanctions that adequately addressed a PSP’s behavioral problems were an important part of the implementation of Realignment (Community Corrections Partnership, 2011). The instrument for probation officers in LAC to assess the adequate sanction that should be used to enforce conditions of supervision is the gradual sanctions tool (Bingham, 2016). Gradual sanctions are “structured, incremental responses to noncompliant behavior of probationers while they are under supervision...designed to respond quickly to noncompliant acts through a series of actions” (Taxman, Soule, & Gelb, 1999). By providing probation officers

98 Payment mechanisms have changed since DMC-ODS (part of California’s Medicaid expansion) began being implemented in July 2017, but this is after the time period in this study.
with incremental and quicker responses to sanction noncompliance or new arrests, as opposed to only possessing the threat of revocation, the gradual sanctions choice set allows a probation officer to get a PSP into treatment as an alternative to incarceration.\(^9\) Under the gradual sanctions protocol, even after a PSP has entered treatment and subsequently been discharged (or been deemed not to require treatment), any PSP that has had a history of drug use continues to be drug tested when they report for periodic check-ins (as well as in random check-ins if the PSP is designated “high-risk”) through another condition of supervision (Community Corrections Partnership, 2011). Upon a failed drug test, according to the gradual sanctions manual, the probation officer may enforce a treatment referral by re-instating an X88 condition instead of sending the PSP to jail (Bingham, 2016). Another avenue for referring a PSP to SUD treatment services is at the county jail after an arrest. There are structures in place at the jail, specifically for PSPs, to induce the individual to SUD treatment upon release or even as an alternative to incarceration (Weinberger, 2018). It is important to note, though, that as of this writing, there are no publicly available studies or reports available regarding how probation officers in LAC are utilizing the gradual sanctions tool in practice.

**The Theory of Coercion**

The role played by LAC Probation in connecting PSPs to SUD treatment through a referral is consistent with the role of community supervision (CS) agencies (i.e. probation and parole) across the nation dating back to the 1970s (Farabee et al., 1998). Given that these agencies are tasked with reintegrating individuals back to society and have the power of the “stick” (through sanctioning violations) to induce participation, using them as a tool to increase rehabilitation appears to be a worthy goal. Studies have found that individuals self-identifying as entering treatment because of a mandate from a criminal justice entity get at least as much dosage of SUD treatment as is experienced by the population that enters voluntarily (Coviello et al., 2013; Hough, 2002; J. F. Kelly et al., 2005; Stevens et al., 2005). While studies have been inconsistent and unspecific in their terminology (Farabee et al., 1998; Klag, O'Callaghan, & Creed, 2005), I will use “legal coercion” to reference the use of referrals from CS (probation or parole) to induce individuals into treatment (Seddon, 2007). This definition, as opposed to including other methods such as drug courts or pre-trial diversion, is the most applicable to the specific case of LAC Probation supervising the PRCS population. The distinction is important because the lumping of all criminal justice entities into one group may have produced inconsistent results in previous studies (Klag et al., 2005).

Studies that have examined the effectiveness of legal coercion on treatment are typically prospective, identifying the sample from an index treatment episode and measuring criminal

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\(^9\) The reasoning for the potential importance of this tool is that it was common before Realignment for SUD treatment (and other services) to be interrupted by a revocation that sent an individual back to prison (Grattet et al., 2009).
justice referral through self-reporting at baseline. Thus, most studies have tested the effect of coercion on treatment retention for the index episode (Coviello et al., 2013; Hiller, Knight, Broome, & Simpson, 1998; S. M. Kelly et al., 2013; Kiluk et al., 2015; Perron & Bright, 2008). Some studies have been able to extend the time horizon beyond the index episode, typically measuring longer-term outcomes such as drug use or recidivism (J. F. Kelly et al., 2005; Kiluk et al., 2015). But because these studies start with a sample already in treatment and do not have information on the timing of the CS spell, they do not attempt to analyze the role of CS in inducing treatment. Using administrative data of SUD treatment episodes linked to spell data from LAC Probation, my study will be able to explore SUD treatment as a process over a defined time-period instead of an index episode. I show in the next subsection why this is important.

Moreover, there is a significant problem of selection bias when analyzing the effect of legal coercion without randomizing admission into CS. Admission into probation or parole is part of the criminal justice landscape, determined by sentencing laws and actors within the system such as judges and district attorneys. Therefore, it is not common for a study to randomize the admission into CS itself. Studies that have examined clients in treatment through direct referrals from CS must deal with selection bias issues of comparing the CS-referred clients to either those that enter voluntarily or through different types of referrals, who may demonstrate differences in motivation and extent of drug use (Farabee et al., 1998). In this study, I avoid the problem of selecting into a treatment referral by identifying changes in treatment take-up as a function of an unexpected change in CS status.

Studies that have randomized individuals into specific justice system-referred programs have measured effects from different types of programming than this study. Interventions that randomize CS clients into case management, such as Treatment Accountability for Safer Communities, are measuring an effect where the service provider does not have the power to enforce participation. (Heaps et al., 2009; Longshore et al., 2005; Martin & Inciardi, 1993). Studies of other interventions using CS agencies, such as Breaking The Cycle, focus on first- and second-time offenders so as to intervene early in a criminal career (Harrell et al., 2004). But it is not common for interventions within the criminal justice system to target, with services, groups that have been entrenched in the justice system for many years (H. Pollack et al., 2011). In this study, I explore a unique population of justice-involved individuals that LAC targeted for providing services as a way to end a persistent cycle of incarceration.

Addiction as a Chronic Disease

Since the late 1990s, the literature on substance use disorders (SUDs) has moved towards the “career perspective,” as research has shown that recovery is a process lasting multiple episodes and should be viewed holistically (Hser, Anglin, Grella, Longshore, & Prendergast, 1997). This research on treatment careers has shown that SUD treatment episodes over many years follow a pattern that exemplifies a cyclic process, with incremental gains and longer lengths of stay in subsequent episodes (Hser, Grella, Chou, & Anglin, 1998). And even in cases
where treatment is shown to have been effective, relapses are likely (Dennis & Scott, 2012; Dennis et al., 2005). Due to these findings, addiction is no longer viewed as an acute case, but as a chronic illness requiring long-term management care strategies (Institute of Medicine, 2006; McLellan, Lewis, O'Brien, & Kleber, 2000).

The outcomes for the PSP population measured in this study will be based on three ideas that follow from the treatment careers literature: 1) longer treatments are more beneficial than shorter ones, 2) treatment retention and re-engagement is extremely challenging, and 3) treatment usually does not resolve the identified drug problem, but over time each subsequent treatment episode increases the odds of future success. Together, these ideas imply that to accomplish long-term reduction in drug use among people with SUDs, it is imperative to maintain SUD treatment engagement. In this context, I have defined engagement as having exposure to treatment services for at least 30 days, an essential element to long-term recovery (Dennis & Scott, 2012).

Given the importance of engagement, it is crucial to study ways in which individuals that have entered SUD treatment continue to engage in it even after exiting from an initial index episode. One way to provide this type of management that increases engagement is through CS. CS lasts for a relatively long period of time in comparison to a treatment episode and incorporates constant check-ins. A recent study found that women exiting jail and randomized into a recovery management checkup program had similar improvements in SUD treatment participation as those that were not in the program but randomized into a specialized probationary supervision instead (Scott et al., 2017). This probationary program, like LAC Probation in its implementation of PRCS, incorporates probation officers with specialized caseloads that refer women exiting custody to community-based services and provide motivation through a cognitive behavioral curriculum.\footnote{Although not described here, Probation incorporates an evidence-based cognitive behavioral program called Cognitive Behavioral Therapy for its PRCS cases (Community Corrections Partnership, 2011).} Testing the effect that Probation had on treatment engagement for the PRCS population will shed light on a promising tool for increasing service provision among the justice-involved population.

**Proposition 47 Relief**

This study will test the effect that Probation had on treatment engagement by taking advantage of a form of relief for justice-involved individuals brought about by Proposition 47. Proposition 47 relief meant having an eligible felony conviction, where the eligible crimes have been categorized as petty theft and possession of (almost all) drugs, reduced to a misdemeanor (Weinberger, 2018). Relief could manifest in three different ways: new arrests, reclassification of old convictions, and resentencing of active cases.\footnote{An active case refers to a case where the individual is currently serving any part of a sentence, whether it be in an institution or in the community.} The benefit applicable to this study is that of
resentenced active PRCS cases, where the primary charge in the original conviction is reduced from a felony to a misdemeanor and thus a new sentence is adjudicated (i.e. “resentenced”). In cases where the individual was under PRCS pursuant to the resentenced offense, he/she would most likely have the PRCS case terminated upon receiving Proposition 47 relief (Couzens & Bigelow, 2016, p. 77). The termination would occur immediately, meaning the individual was no longer under PRCS, regardless of the amount of days remaining in the individual’s resentenced case.\(^{102}\) Therefore, resentencing had a large effect on the PRCS population, who were already under the auspices of the justice system based on crimes committed before Proposition 47 was enacted.

The possibility of a case being resentenced, and subsequent PRCS termination, could not have been expected by the beneficiaries when the offense leading to the resentenced case was committed. Proposition 47 was passed by a ballot initiative and wasn’t officially announced to be on the ballot until June 2014, when the initiatives with sufficient valid signatures were announced.\(^{103}\) This means that for the group getting cases resentenced in the months following the initiative passing, the crime leading to the prison sentence\(^{104}\) was committed well before any news of the forthcoming policy.

**Proposition 47 resentencing petition process**

For an individual under PRCS to get a case resentenced, there is a process that affects the timing of the final adjudication, and thus a termination of PRCS for that individual. As shown in Figure 1, the timing of when individuals experienced case resentencing was staggered over time in my sample.\(^{105}\) The terminations start to appear in January, 2015, 80% occur in that first year, and they mostly stop by halfway through 2016. The petition process that leads to this timing is important because it incorporates some self-selection and is an event we do not observe in this study, which could lead to potential bias in the estimated effect of the outcome studied.

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\(^{102}\) Days remaining in a case refers to the number of days before the criminal case is closed because the individual has fulfilled all the requirements in a sentence.


\(^{104}\) All individuals under PRCS are serving the community supervision part of a prison sentence. By rule, they cannot be exiting a short revocation sentence because revocations are served in county jail post-Realignment.

\(^{105}\) Note that this includes only individuals on PRCS and not those that were presently incarcerated.
I argue that the variation in timing of PRCS terminations is not driven by factors correlated with the outcome because a variety of stakeholders and factors were involved in getting a petition for Proposition 47 relief filed and processed. Community organizations, public defenders, and the Superior Court all play important parts in this process, as does the judge who is the final person to decide the case. In Appendix A.1, I explain that conversations with three organizations that were on the ground during the implementation of Proposition 47 resentencing (Drug Policy Alliance, LA Regional Reentry Partnership, and A New Way of Life Reentry Project) and data from the LAC Superior Court all demonstrate that many external factors were involved in determining when an individual had a case heard for resentencing. When the resentencing case was finally heard by the Court after it made its way through the process, it was adjudicated immediately and if the petition was successful, the individual’s PRCS case was terminated. It was not common for the defendant to appear in court, though, as the public defender would usually contact the defendant regarding their probationary supervision being terminated (Archie, 2018). Therefore, it is likely that most defendants were not actively anticipating their release from PRCS. The details of the process demonstrate that the staggered timing observed in Figure 1 was not determined by how connected a PSP was to social services offered by County agencies (such as help with petitioning and/or SUD treatment).

To receive relief from Proposition 47, the petition must demonstrate that the current primary conviction charge in the individual’s active case is eligible\textsuperscript{106} and that the individual meets the criminal history criteria. The criteria excludes individuals from Proposition 47 relief

\textsuperscript{106} This is not straightforward in the cases involving theft because the petition must show that the value stolen was lower than $950.
that have designated violent offenses107 or crimes that require registering as a sex offender (Couzens & Bigelow, 2016, p. 51). In addition to meeting criminal history criteria, the judge must decide that the petitioner does not present an “unreasonable risk” to commit a new serious violent felony (Couzens & Bigelow, 2016, p. 55). These requirements mean that some cases, regardless of the current primary charge, are restricted from receiving resentences. It should be noted that quite serious violent histories are required for one to be excluded from benefits, though, as even robbery and gang crimes are not included as a designated violent crime (see Appendix II in Couzens & Bigelow for a complete list).

Data

Sample

The study incorporates a novel dataset of realigned individuals in Los Angeles County (LAC) that entered a substance use disorder (SUD) treatment service administered by DPH-SAPC after being referred through PRCS, and who received a resentencing through Proposition 47 relief. Data on SUD treatment episodes came from the Los Angeles County Participant Reporting System (LACPRS), the system used by DPH-SAPC to track all clients that have entered a treatment program that is publicly funded (including the use of AB 109 funds). This system records information on the treatment provided at intake (as well as discharge) for administrative purposes, making it a reliable census of all (publicly-funded) treatment provision. It also includes responses to a lengthy questionnaire at admission that yields information on primary drug use, severity of drug use, mental health, and demographics. Data is available through the 2017 calendar year, well after all the individuals being studied had been affected by the policy change.

To identify which of the treatment episodes are PRCS cases, information from individual episodes in LACPRS were matched to the list of PSPs that were referred to treatment at LAC Probation’s Hub assessment described above. Because a unique individual identifier that can be matched across agencies does not exist in the County, probabilistic matching was used based on name (first and last), gender and date of birth.108 All matches of individuals with treatment episodes beginning after the individual was released to Probation are considered a PRCS case and included in the sample.109 Importantly, based on this match, we can also observe all other

107 These are termed “super-strikes” and are offenses considered more serious than the “violent” offenses eligible for AB 109.

108 SAPC staff performed this match. Any PSP that was referred to treatment by Probation but did not match to an episode in LACPRS was further checked to find whether a match existed, as SAPC used this data to inform Probation on the number of PSPs that enrolled in treatment. SAPC is confident that they matched close to 100% of the PSPs that have enrolled in treatment (Kim, 2017).

109 These procedures are consistent with previous studies on legal coercion that match treatment admission histories to criminal justice databases (Evans, Li, Urada, & Anglin, 2014; Hser & Evans, 2008).
treatment episodes that exist in LACPRS for the matched individual through a unique individual identifier in the dataset.

Additionally, there is important information regarding each individual’s PRCS case. Probation shares a termination list with DPH-SAPC that provides the reason for a termination, thus allowing for identifying the PSPs that were released from PRCS supervision through resentencing. Furthermore, the study incorporates criminal-justice related data regarding the current offense on PSPs from Probation, the Superior Court system, and the Sheriff’s Department attained though the Justice Automated Information Management System (JAIMS)\(^{110}\) and the Enterprise Linkage Project (ELP).\(^{111}\) These databases were created by the County to match records from different justice systems (and in the case of ELP, other service agencies) through common identifiers. Through the JAIMS database, I identified precise dates for the conviction associated to the PRCS case and the dates in which the PSP entered/exited PRCS. I also obtained information on bookings into county jail through the ELP.\(^{112}\) Unfortunately, criminal history information for the individuals in the sample was not available.

To test the role of CS to keep individuals engaged in SUD treatment using Proposition 47 resentencing as the policy shock, I used the data described above to create a retrospective cohort based on a few rules. Important dates used to create the cohort are outlined in Figure 2 below. The sample I started with included PSPs that had been released to PRCS between October, 2011, and September, 2017. First, the sample was limited to PSPs entering PRCS between the dates that AB 109 (October 2011) and Proposition 47 (November 2014) were enacted. Additionally, the PSP must have entered a SUD treatment episode (I will refer to this as the “index” episode) throughout this same time-period. Since my sample frame consisted of individuals that have been admitted to a treatment episode, I had to create my analysis sample through an index episode beginning before the policy of interest was enacted so that the policy itself did not correlate with the composition of the analysis sample. Second, the PSP had to have been under PRCS when Proposition 47 was enacted, making it possible that they were affected by the policy. Finally, the cohort created included PSPs released from PRCS at some point after Proposition 47 was enacted, November 2014, until December 2015. I cut off the sample on December 2015 because Figure 1 shows that terminations per month after this date are much lower, and later cohorts are more likely to have had self-selected factors determining the timing of their termination.\(^{113}\) One will note that on November 2014, the sample would have been under PRCS for any length of

\(^{110}\) For more information, see (Countywide Criminal Justice Coordination Committee, 2016).

\(^{111}\) For more information, see (Byrne et al., 2012).

\(^{112}\) This data only goes back to 2006 when the ELP was created. Charge codes are not available before 2015, so I only measure times an individual was booked into a county jail.

\(^{113}\) Individuals that were resentenced after 2015 went through the process when much fewer other people were doing so. This means they were most likely not part of the initial group of individuals that were affected by all of the external factors that created the variation in resentencing during 2015.
time up to three years (PRCS was first implemented on October 2011) and a good portion of this cohort would have been on PRCS longer than the one-year minimum. Additionally, some would have eclipsed the three years maximum (see previous section) at some point in the post-Proposition 47 enactment period (“analysis period”). This is possible because the one-year clock resets after a violation and one can even be under PRCS longer than 3 years due to tolling.\textsuperscript{114} More detailed information for this sample is provided in Appendix A.2.

**Figure 2: Important Dates for Creating of Retrospective Cohort**

PSPs may enter probation at any point (“probation start date”)

PSPs may enter treatment at any point (“index episode”)

PSPs may have probation terminated at any point (“analysis sample”)

Sub – Cohort 1

Sub – Cohort 2

Sub – Cohort 3

Oct 2011

Nov 2012

Nov 2013

Nov 2014

December 2016

AB 109 is enacted and LAC Probation starts to receive PSPs

Proposition 47 is enacted, so PSP must have been in PRCS at this date (“Prop 47 enactment date”)

Period in which PSPs may enter SUD treatment (“analysis period”)

**Outcome**

Engagement in SUD treatment, the outcome, was measured as being enrolled in treatment for 30 days or longer during the analysis period. The widely adopted definition for engagement (as opposed to mere initiation) in the field is 30 days in treatment receiving at least two services.\textsuperscript{115} The LACPRS data does not incorporate information regarding the intensity of services provided while in treatment, but DPH-SAPC uses the 30-day definition arguing that

\textsuperscript{114} In tests conducted by the author, the time on PRCS preceding November 2014 is not predictive of the date a PSP eventually received a resentencing.

\textsuperscript{115} Definition is established in the Healthcare Effectiveness Data and Information Set (HEDIS) created by the National Committee for Quality Assurance (https://www.ncqa.org/hedis/measures/initiation-and-engagement-of-alcohol-and-other-drug-abuse-or-dependence-treatment/).
internal research showed that over 90% of clients in treatment for that long will have received at least two services (Kim, 2018).

I argue that observing someone in my sample as engaging in treatment, even though they have already (at least) initiated an earlier episode, is an important and positive outcome. In the literature on treatment careers, studies with different samples have found that the average number of prior episodes for someone entering treatment is almost three (Anglin et al., 1997) and that “treatment careers typically involve” three to four episodes before being abstinent for one year (Dennis et al., 2005). Moreover, these estimates are most likely in the low-end given that the Proposition 47-eligible population demonstrate the characteristics associated with individuals in the right side of the distribution of treatment careers. As I will show below, this group has a higher rate of mental health diagnoses, more drug-related arrests, and is more likely to have had a prior treatment episode, all of which are associated with longer treatment careers (Anglin et al., 1997; Dennis et al., 2005). Finally, studies that have explored the length of treatment careers have defined as a desired stable state, abstinence from use for at least 30 days at treatment discharge (Dennis et al., 2005; Frimpong, Guerrero, Kong, & Kim, 2016). The analysis sample in this study is limited to those that had not yet fulfilled this goal, meaning their treatment career was ongoing.

I used engagement as an outcome, as opposed to treatment completion, because it sufficiently captures the first step required to treat a SUD, including a relapse. It is the outcome one would expect to observe if CS is in fact an adequate mechanism for recovery management (Dennis & Scott, 2012). Moreover, even though most studies examine treatment completion, engagement has also been shown to correlate with a decreased likelihood of arrest or incarceration in the following year (Garnick et al., 2014) and other factors that lead to better criminal justice outcomes in the long term, such as higher rates of employment (Dunigan et al., 2014) and a legal composite score (Harris, Humphreys, Bowe, Tiet, & Finney, 2010). Treatment episodes that last longer than 90 days, the widely accepted length for a “successful” episode, are also quite rare during the analysis period for the sample I analyze.

**Empirical Strategy**

**Analysis Sample**

Before estimating anything, I first limit the sample to those that received the intervention (i.e. resentencing). The reason for doing this can be explained as follows. On the day that Proposition 47 went into effect, each individual active on PRCS had some probability that they remain on PRCS for a given number of days, represented by the function $f(X,U,e)$. In this function, $X$ captures the observed characteristics that determine length in supervision (e.g. Whether the current charge is drug-related or number of previous arrests for drug-related crimes), $U$ are factors that are unobserved (i.e. how the individual heard about Proposition 47
relief and when he/she petitioned for relief), and $e$ represents idiosyncratic variation. Ideally, if $U$ could be removed from the function, $f$, then PSPs with similar characteristics but not receiving an early termination could be used to model the days that the individuals receiving the intervention would have been on PRCS in the absence of an early termination. I describe in Appendix A.3 the specifics of Proposition 47 rules that make it unlikely that we could model the counterfactual of the group that received a Proposition 47 resentencing using observable data. Thus, the analysis can only be done on the population who would eventually receive a termination of their PRCS case through a resentencing. In order to provide some perspective regarding the sample analyzed, and because there is very little published information on the population that received Proposition 47 relief, I begin the analysis by comparing the characteristics of this population to the rest of the PRCS population and to the rest of criminal justice population that has received SUD treatment in LAC.

**Identification Strategy**

The goal of this analysis was to estimate the total amount of engagement in SUD treatment, conditional upon the length of a supervision period. Therefore, it was essential that the length of a supervision period was not related to other factors that affect SUD treatment engagement. I exploited the plausibly exogenous variation (shown in Figure 1) in the timing of early terminations of PRCS cases (individuals under PRCS that would receive an early termination are referred to thereafter as “ET_PRCS”), within the analysis group and time-period described, to identify the effect of PRCS on engagement to SUD treatment. I call these early terminations because the resentencing and subsequent PRCS termination leads to fewer total days under supervision once Proposition 47 went into effect. While the actualized outcome of the counterfactual ET_PRCS spell, determined by $f(X,U,e)$, is unobserved for the treatment sample, a resentencing creates an outcome $f'$ where $f' < f$. I argue that the difference between $f'$ and $f$ is exogenous and that the early termination is unpredictable, meaning that the effect being analyzed is not biased by pre-trends (Borusyak & Jaravel, 2016).

The identifying assumption is that, conditional on the controls, the timing of the early termination is uncorrelated with the outcome or factors correlated to both (Dobkin, Finkelstein, Kluender, & Notowidigdo, 2018). For example, if the cohort that are first to receive an early termination also exhibit less serious problem behaviors that are correlated with engaging in treatment, then shorter probation spells would correlate with a higher likelihood of entering treatment, biasing the estimated effect of probationary supervision on treatment downwards. A subsequent assumption in this study is that the relapse rates among the analysis sample are not determined by the timing of the early termination. Following the previous example, if the cohorts that are first to receive an early termination are also less likely to relapse because they exhibit

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116 A spell, in the CS context, refers to the time-period that an individual is under supervision.
less serious problems, then we may observe that group engaging less frequently with SUD treatment. This would bias the effect of probationary supervision on treatment upwards.

There are reasons to believe that the identifying assumption holds. The background to the implementation of Proposition 47 resentencing described above demonstrates that very few of the individuals who got relief through resentencing were aware of the policy benefits when the policy went into effect, negating possible pre-trends. Moreover, the timing of when the resentences happened was highly affected by external factors, which makes it unlikely the timing was correlated to the outcome being investigated. The exogeneity of the timing becomes less plausible for ET_PRCS individuals that were resentenced later in the analysis period, as it becomes more likely these individuals were less engaged in their rehabilitation. I account for this potential problem by limiting the analysis to the sample that was resentenced in 2015, which accounts for 80% of the ET_PRCS group. In Appendix A.1, I further show results from regressions of individual characteristics on the timing of the ET_PRCS terminations, and argue that this is evidence against the type of selection bias that would bias the identifying assumption.

**Empirical Model**

The purpose of this analysis was to determine whether being under PRCS affected an individual’s willingness to engage in SUD treatment. The variation in timing of ET_PRCS terminations described above provides a plausibly exogenous variation in the explanatory variable of interest (i.e. PRCS status). In this section I describe why a conditional logit model, which uses panel data, was the most adequate model for this analysis. The disadvantage of using a cross-sectional model to describe the choice-making procedure of engaging in treatment is that it could not account for the timing of the decision as a function of the current PRCS status because the explanatory variable would have to be measured as the total days in PRCS from the enactment of Proposition 47. To explore the hypothesis that PRCS status increases the likelihood that one engages in treatment (either to stay engaged, or to enter a new episode, or to not leave a current episode), one would want to model the decision of engaging in treatment as a function of the PRCS status at the time this decision was made. A longitudinal model would be more adept at modeling this decision by taking advantage of precise dates available in the data regarding both ET_PRCS spells and SUD treatment episodes. Before discussing the specific longitudinal empirical model used to model the individual’s behavior, I explain the panel dataset created to conduct this analysis.

**Panel Data**

As described in the Data section, the sample is a retrospective cohort for which I can identify precise dates of the ET_PRCS case (i.e. start and termination dates) and all SUD treatment episodes. To capture the longitudinal structure of the intervention and outcome (ET_PRCS and SUD treatment, respectively), a monthly panel dataset was created where observations are delineated into person-calendar months. The period of months, for each
individual, runs from November 2014 to December 2016 (the analysis period). Variables in the
dataset identify whether the individual, each month, is enrolled in SUD treatment and the
individual’s ET_PRCS status. ET_PRCS status is identified by an indicator variable that was
defined as “1” in the months an individual is under PRCS (and the month in which the
termination is granted) and “0” for all months subsequent to the PRCS termination.¹¹⁷ For
example, if the resentencing and subsequent termination is adjudicated on March 10, 2015, this
variable will turn to “0” in April and every subsequent month in the panel. Turning to the
indicator for SUD treatment, an indicator variable was created that was defined as “1” for a
given month if the individual was admitted to treatment at any point during the calendar month
and were not discharged until at least the following month. An individual will not be considered
enrolled in SUD treatment for the month in which the individual was discharged. For example,
for an episode starting on March 10, 2015 and ending April 15, 2015, the monthly indicator
variable will be identified as “1” in March and “0” in April.¹¹⁸ This method was developed to get
as close to the 30-day definition of engagement given the complication of treatment episodes
beginning and starting mid-month.¹¹⁹ Another complicating factor created by the panel data that I
will discuss going forward is the duration-dependence nature of a treatment episode. The
duration of an episode is dependent on the prior time already spent in treatment, and it is
problematic to assume that the choice to be in SUD treatment is independent in each cell. As I
have shown in the Background section, though, treatment episodes are frequently short-lived and
constant supervision is required not only to induce treatment, but also to continue a treatment
episode. Moreover, the intent of this analysis was to estimate the total time in treatment and not
to disentangle the effect of inducing a new treatment episode from maintaining retention in an
ongoing episode. The empirical model described below further addresses the duration-
dependence problem.

Figure 3 shows the overall rates for the analysis sample, over time, of the two main
variables of interest. The histogram shows the percentage of the sample that has received an
ET_PRCS termination by a given month and the solid line tracks the percentage of the
population enrolled in SUD treatment in that month. One important note is that the percentage of
individuals in treatment is likely highest at the start of the analysis period because the sample
was created such that one’s index episode had to begin before the start of the analysis period but
this episode did not have to end (i.e. discharged) at this time. This is an adequate approach given

¹¹⁷ This is counterintuitive in the sense that commonly an indicator turns to “1” when the treatment or policy being
studied is adopted. I use this approach to make the coefficients consistent with the research question of the effect of
probation supervision (since the policy ends supervision).
¹¹⁸ In the case of an episode with the same starting date but with a discharge on March 28, 2015, the individual will
not be identified as being engaged in treatment in any month, as treatment duration is less than 30 days.
¹¹⁹ One could consider creating this variable by not counting the month in which an individual enrolled but counting
the month of discharge. Any difference from using this method should be random, and I check for using this method
as a sensitivity analysis.
I am not trying to disentangle the mechanism by which PRCS affects total engagement (i.e. inducing a treatment admission or retention of an episode). Moreover, my empirical model will account for secular trends.\textsuperscript{120} It appears in Figure 3 like the trend in overall SUD treatment engagement continues to decrease while more individuals in the sample receive ET_PRCS terminations. One last observation from Figure 3 is that the overall rate of treatment engagement is low, as 15\% of the sample is in treatment during the peak month.

\textit{Figure 3: Percent of Individuals Enrolled in Treatment and under ET_PRCS, Over Time}

Conditional Logit Model

My analysis incorporated a conditional logit model to model the overall likelihood of choosing to engage in SUD treatment. In a conditional logit model, an individual, $i$, is said to choose from a set of options, $J$, based on the attributes, $Z$, that maximize the individual’s utility (McFadden, 1973). The model requires repeated observations within the individual making the decision to identify whether a change in attributes affect the likelihood of choosing a distinct alternative. Thus, by clearly defining the distinct alternatives, in this case whether to engage in SUD treatment, and by assuming the individual is repeatedly making this distinct choice, I can test whether the choice is affected by a specific attribute in $Z$ (i.e. current ET_PRCS status), conditional on other attributes. I used the conditional logit model to test the hypothesis that being

\textsuperscript{120} A sensitivity analysis will show that results are not affected by only including individuals that had been discharged from a treatment episode by the start of the analysis period.
under ET_PRCS leads to a greater probability of choosing to engage in SUD treatment. It has been shown that the model I describe can be estimated by the following (Terry Long, 2004):

\[
\text{Prob}(y_{it} = 1) = \beta Z_{it} + v_i
\]

Where \( y_{it} \) is a distinct decision within \( J \) that indicates that individual, \( i \), chose to engage in SUD treatment during month, \( t \). \( v_i \) represents the intrinsic tastes of the individual. \( Z_{it} \) is a vector of choice attributes for individual, \( i \), in month, \( t \), and in the context of my empirical framework, the components of \( Z \) yield the following reduced form model that I estimate:

\[
\text{Prob}(y_{it} = 1) = \delta C_{S_{it}} + \beta X_{it} + \tau Time_t + v_i + \varepsilon_{it}
\]

Where \( y_{it} \) is the same as above. It has been shown that a maximum likelihood estimation with a logit link function can be used to estimate the probability of choosing a distinct alternative (Chintagunta, Jain, & Vilcassim, 1991). This model has the same empirical characteristics as a fixed effects logit model where \( y_{it} \) is a binary variable, in this case representing whether the individual decided to engage in SUD treatment. The conditional logistic framework controls for \( v_i \) by using repeated choices made by the individual, which controls for unobservable characteristics that are fixed for an individual over time. \( CS_{it} \) indicates whether individual, \( i \), in month, \( t \), is still under ET_PRCS (as described earlier in this section), so \( \delta \) is the coefficient of interest because it represents the estimated effect of community supervision’s role in inducing SUD treatment for this sample. I use \( X_{it} \) to represent other time-varying attributes that may affect the decision to engage in SUD treatment. While not all variables will be shown in the results, I use variables measuring the number of bookings into county jail since the beginning of the analysis period and whether the individual is currently in jail, at month \( t \), respectively. It is likely that arrests over this time-period may affect PRCS status and engagement in SUD treatment\(^{121}\) while having been booked into jail may also affect one’s ability to engage in SUD treatment\(^{122}\). To further account for possible duration-dependence, I also show a specification with a lag of the outcome variable. \( Time_t \) represents the continuous calendar time trend, starting on the first month of the analysis period, and controls for secular trends\(^{123}\). This is important because it is likely that there are trends, which are a function of unobserved variables such as the changing supply of treatment beds, in SUD treatment over time that affect the entire sample. Finally, the random nature of the ET_PRCS terminations over time, as described in the identification strategy, minimizes the risk that the main variable of interest, \( CS \), is biased by unobserved

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\(^{121}\) Weinberger (2018) shows that LAC has a system in place to persuade individuals currently under PRCS into SUD treatment when they are booked into county jail for a new arrest. So new arrests may actually induce SUD treatment.

\(^{122}\) One may note that supply-side variables, such as treatment beds available in time, \( t \) may also be important. I do not have measures of supply but it is important to note that individuals seeking treatment through AB 109 received preference and thus waiting periods were extremely short (descriptive information on waiting periods for treatment episodes, by referral group, can be provided by the author upon request).

\(^{123}\) I explored models that included only a linear time trend and ones that add a second order variable. The results are similar but I use the model with a second order term because the overall trend does not appear linear.
variables in $\varepsilon_{it}$. Because individual-specific attributes, such as the probability of a relapse, are not related to the timing of the ET_PRCS terminations, I can be confident that $CS_{it}$ is independent of other attributes that, in this model, are part of $\varepsilon_{it}$. Finally, I accounted for standard errors that are robust to clustering within individuals.

One of the characteristics of the conditional logit model is that it requires variation in the outcome variable within the panel group. This was an advantage in modelling the choice to engage in SUD treatment because it accounts for unobserved heterogeneity across individuals. The disadvantage with regards to my analysis is that there was not a lot of variation in the outcome for the individuals in my sample. I show in Table 1 below that of the 129 individuals in my analysis sample, only 38 ever engaged in SUD treatment within the analysis period. To account for the small effective sample size in the conditional logit model, I also show results using a cross-sectional model that estimated the linear relationship between the number of days under PRCS (since the enactment of Proposition 47) and two measures of engagement. While this cross-sectional model cannot identify changes over time, it provides an estimation using the entire sample.

<table>
<thead>
<tr>
<th>Sample of Resentenced Individuals (i.e. N for ET_PRCS)</th>
<th>129</th>
</tr>
</thead>
<tbody>
<tr>
<td># (%) At least one month in treatment</td>
<td>38</td>
</tr>
<tr>
<td>(30%)</td>
<td></td>
</tr>
<tr>
<td>Median/Avg. total months in treatment, conditional on treatment</td>
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</tr>
</tbody>
</table>

Table 1. Descriptive Measures of the Outcome Variable in Conditional Logit Model

Results

Population Comparisons

Table 2 below compares the demographic and substance use characteristics of treatment admissions of the individuals in the ET_PRCS group to the general PRCS population and the rest of the population referred by criminal justice agencies (referred to as “CJ-general”).¹²⁴ The table incorporates the data assembled for this analysis, which includes data in LACPRS for all

¹²⁴ This population is a mixture of the parole and probation populations, which if supervised in LAC will also get SUD treatment from DPH-SAPC.
treatment admissions between October 2011 and November 2014. The first clear interpretation from Table 1 is that the PRCS group created by Realignment was older and had been dealing with SUD issues for longer than the CJ-general population. They are also entering treatment for more serious drugs, as a higher proportion entered for heroin, methamphetamine, or cocaine as the primary drug whereas the general criminal justice group is more likely to enter for marijuana. There are a few notable differences within the PRCS groups. The group that received a resentencing (ET_PRCS) is even older than the rest of the PRCS population, having been using the substance for longer and more likely to have enrolled in treatment before. They were also more likely to have reported a prior mental health diagnosis or treatment and are more likely to be homeless when they entered treatment. Given these differences in characteristics that are important in the context of SUD treatment involvement and contact with the justice system, it appears the treatment sample in this study presents unique issues for public social services provision.

125 This is the “baseline” period, when individuals that would eventually receive a resentencing were admitted to at least one SUD treatment episode and can be compared to other individuals that were admitted SUD treatment during this time-period.
Table 2: Characteristics of Treatment Admissions for the Criminal Justice Population in LAC

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>CJ-general</th>
<th>PRCS</th>
<th>ET_PRCS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black</td>
<td>21%</td>
<td>26%</td>
<td>28%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>54%</td>
<td>50%</td>
<td>43%</td>
</tr>
<tr>
<td>Employed</td>
<td>10%</td>
<td>14%</td>
<td>13%</td>
</tr>
<tr>
<td>Age</td>
<td>30.0</td>
<td>38.6</td>
<td>40.6</td>
</tr>
<tr>
<td>Homeless</td>
<td>21%</td>
<td>21%</td>
<td>28%</td>
</tr>
<tr>
<td>Mental health</td>
<td>27%</td>
<td>16%</td>
<td>25%</td>
</tr>
<tr>
<td>Days used substance 30 days pre-admission</td>
<td>7.3</td>
<td>6.6</td>
<td>8.1</td>
</tr>
<tr>
<td>Primary substance at admission</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heroin</td>
<td>10%</td>
<td>15%</td>
<td>18%</td>
</tr>
<tr>
<td>Meth</td>
<td>32%</td>
<td>39%</td>
<td>45%</td>
</tr>
<tr>
<td>Cocaine</td>
<td>9%</td>
<td>15%</td>
<td>14%</td>
</tr>
<tr>
<td>Alcohol</td>
<td>12%</td>
<td>11%</td>
<td>10%</td>
</tr>
<tr>
<td>Marijuana</td>
<td>35%</td>
<td>18%</td>
<td>13%</td>
</tr>
<tr>
<td>Other</td>
<td>1%</td>
<td>2%</td>
<td>1%</td>
</tr>
<tr>
<td>Prior episode to index</td>
<td>52%</td>
<td>56%</td>
<td>64%</td>
</tr>
<tr>
<td>Years used primary substance</td>
<td>12.6</td>
<td>19.2</td>
<td>20.7</td>
</tr>
</tbody>
</table>

Total observations (N)                  | 5,172      | 3,013 | 240     |

Notes: P-values for statistical significance aren’t shown because there are three samples. Values represent responses at admission for all SUD treatment admissions between October 2011 and November 2014. Because the data represents admissions and not unique individuals, the number of total observations for the ET_PRCS column is higher than the PSPs in the sample as shown in Table 1. Mental health represents whether individual was ever identified with mental health disorder.

Cross-Sectional Model Results

In Table 3 I show the results of OLS cross-section regressions that examine the impact of the number of days in CS on two measures of engagement in SUD treatment. The first measure, for which results are shown in specifications (1) and (2), identified whether the individual engaged with treatment (i.e. spent 30 days in a treatment episode) at any time during the analysis period. Specifications (3) and (4) show results of specifications where the outcome was measured by the total days spent in SUD treatment by the individual throughout the analysis period.126 This measure of the outcome variable allows for more variation because I included anyone that has engaged in treatment during the analysis period. For the explanatory variable of interest in these models, the continuous variable measuring the number of days under CS, the variation was generated by the random timing of ET_PRCS terminations because individuals receiving an earlier termination had fewer days in CS. Finally, it should be noted that the analysis sample is slightly different than that described for the longitudinal model. Due to the

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126 The total time may expand over multiple episodes, though in this sample few individuals entered treatment more than once during the analysis period.
stationary nature of the cross-sectional model, I had to limit the sample to those who were discharged from their index episode by the start of the analysis period.

The results in Table 3 are shown for two specifications. I first show the model with no other covariates, specifications (1) and (3), to check whether the explanatory variable was correlated to the outcome before other variables are introduced. I show a model with no covariates because given the small number of observations, the number of degrees of freedom could factor into a null finding for the variable of interest. Next, I show results using a model with other covariates, specifications (2) and (4). Variables available for the model with covariates are the same that were used to test the identifying assumption and are discussed in Appendix A.1. In Table 3, I chose a sparse model to focus on the variable of interest.127

There appears to be no relationship between number of days spent on CS after the enactment of Proposition 47 and either measure of SUD treatment engagement. Note that the coefficients should be interpreted differently in the two sets of specifications, as the outcome variable is binary in the first set and continuous in the second. While adding covariates does not appear to affect this coefficient of interest across the different models, there are a number of coefficients that are associated to the outcome. The most important variables are race, primary substance of abuse, prior mental health diagnosis, and homeless status. Hispanic individuals are less likely to engage in treatment than White individuals, as is the case with those with a previous mental health diagnosis. Individuals whose primary drug problem is methamphetamine or cocaine engage in treatment for less time compared to heroin users. Having been homeless during the index episode increases both the likelihood of subsequent engagement and the length one is in treatment. The lack of relationship found between the main explanatory variable and the outcome may be due to the small sample and low rate of SUD treatment engagement shown in Table 1. But it may also be the case that total days under CS is not an adequate measure to compare the difference in how one makes a decision when under CS and when one is not supervised.

127 The variables used in specifications (2) and (4), shown in Table 3, were chosen using the square root lasso method to find the most sparse regression model available (Belloni, Chernozhukov, & Wang, 2011).
Table 3. OLS Regression Estimates for the Effect of PRCS on Engagement in Treatment, Using Cross-Sectional Data

<table>
<thead>
<tr>
<th>Variable</th>
<th>(1) Engaged in treatment</th>
<th>(2) Length in Treatment Post-P47</th>
<th>(3) Length in Treatment Post-P47</th>
<th>(4) Length in Treatment Post-P47</th>
</tr>
</thead>
<tbody>
<tr>
<td>Days in CS post-Prop47</td>
<td>0.00038</td>
<td>0.00042</td>
<td>0.027</td>
<td>0.021</td>
</tr>
<tr>
<td></td>
<td>(0.00040)</td>
<td>(0.00040)</td>
<td>(0.041)</td>
<td>(0.042)</td>
</tr>
<tr>
<td>Black</td>
<td>-0.14</td>
<td>-8.24</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.11)</td>
<td>(11.4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hispanic</td>
<td>-0.19*</td>
<td>-5.48</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.094)</td>
<td>(9.83)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>0.11</td>
<td>-5.32</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.23)</td>
<td>(23.5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meth primary substance</td>
<td>-0.15</td>
<td>-30.8*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.13)</td>
<td>(14.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cocaine primary substance</td>
<td>-0.22</td>
<td>-33.9*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.16)</td>
<td>(16.2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other primary substance</td>
<td>0.030</td>
<td>-13.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.12)</td>
<td>(12.5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Homeless</td>
<td>0.17*</td>
<td>19.3*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.082)</td>
<td>(8.52)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mental health</td>
<td>-0.19*</td>
<td>-15.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.090)</td>
<td>(9.40)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sentenced pre-AB 109</td>
<td>-0.093</td>
<td>-12.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.088)</td>
<td>(9.16)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total jail bookings</td>
<td>-0.0093</td>
<td>-0.67</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.0071)</td>
<td>(0.74)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2011-2012 sub-cohort</td>
<td>0.20</td>
<td>14.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.11)</td>
<td>(11.3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2012-2013 sub-cohort</td>
<td>0.052</td>
<td>4.60</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.099)</td>
<td>(10.3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>0.096</td>
<td>0.28</td>
<td>10.9</td>
<td>39.6*</td>
</tr>
<tr>
<td></td>
<td>(0.085)</td>
<td>(0.18)</td>
<td>(8.72)</td>
<td>(18.4)</td>
</tr>
<tr>
<td>( R^2 )</td>
<td>0.008</td>
<td>0.222</td>
<td>0.004</td>
<td>0.188</td>
</tr>
<tr>
<td>Observations</td>
<td>113</td>
<td>113</td>
<td>113</td>
<td>113</td>
</tr>
</tbody>
</table>

Standard errors in parentheses; * \( p < 0.05 \), ** \( p < 0.01 \), *** \( p < 0.001 \)

Mental health represents whether individual was ever identified with a mental health disorder. White, non-Hispanic is the baseline variable for race. Sub-cohorts correspond to the date PSP enters PRCS, as shown in Figure 2 (2013-2014 cohort is the baseline). Heroin is the omitted category for primary substance. “Other” substance category includes marijuana and alcohol (as well as other substances) together because they are not common primary substances among this population. Variables not included in specifications (2) and (4) are those listed in Appendix A.1 but not shown here. More detailed information on variables presented in Appendix A.1.

**Conditional Logit Model Results**

In Table 4 I show how CS impacts the likelihood of engaging in SUD treatment, conditional on having engaged in SUD treatment during the analysis period. This is my preferred
model because it accounts for changes to the decision to engage in SUD treatment, conditional on a change in attributes. I show two specifications of the conditional logit model, where the coefficients are shown in odds ratios. The first specification did not include a lag of the outcome variable. In the second specification, I added variables of the lagged outcome to check for duration-dependence. Overall, there appears to be a significant positive effect from CS on the likelihood of choosing to engage in SUD treatment. While adding a lag of the outcome diminishes the magnitude of the effect, the result is still marginally significant.\textsuperscript{128} Moreover, it appears that the effect of previous choices to engage in treatment are only present for the immediate preceding month. In the first specification, the results show that being on CS increases the odds by more than 3.5.

Table 4. Estimated Effects of PRCS on the Likelihood to Engage in Treatment, Using a Conditional Logit Model

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No Lagged Outcome</td>
<td>Lagged Outcome</td>
</tr>
<tr>
<td>CS Effect</td>
<td>3.54\textsuperscript{*}</td>
<td>2.20\textsuperscript{*}</td>
</tr>
<tr>
<td>(1.78)</td>
<td>(0.90)</td>
<td></td>
</tr>
<tr>
<td>Booked Indicator</td>
<td>0.41</td>
<td>0.47</td>
</tr>
<tr>
<td>(0.26)</td>
<td>(0.30)</td>
<td></td>
</tr>
<tr>
<td>Times Arrested</td>
<td>1.46</td>
<td>1.27</td>
</tr>
<tr>
<td>(0.99)</td>
<td>(0.68)</td>
<td></td>
</tr>
<tr>
<td>Lag of Outcome</td>
<td>10.7\textsuperscript{*}</td>
<td>3.56</td>
</tr>
</tbody>
</table>

Coefficients shown as odds ratios; Standard errors in parentheses; \textsuperscript{*} \textit{p} < 0.05
Panel: 38 individuals
Second specification includes the lag of the outcome variable as a control. Booked indicator measures whether individual was booked in given month. Arrested variable measures number of times one has been booked to county jail since start of analysis period, in a given month. All models include a continuous time trend (not shown). Another variable, number of months in which the individual had spent in jail during the analysis period, was available but not included in the specifications because it did not add any new information and was correlated to the covariates in these models. All models account for clustered standard errors within individuals.

Sensitivity Analyses

Table 5 shows the results of a few sensitivity analyses that I summarize in this section (see Appendix A.4 for sensitivity analysis using a fixed effects OLS regression). Each row represents a new analysis and the coefficients shown are associated to the variable indicating CS status. The first sensitivity analysis further limits the analysis sample. I restrict those in the

\textsuperscript{128} Another specification that included lagged variables of the outcome from the two previous months was also run but not included in Table 4 because the results were qualitative similar to the specification with one lag.
analysis sample to individuals that had already been discharged from a treatment episode at the
time the analysis period begins. This should mitigate the possibility that the results are driven by
the sample of individuals that were currently in treatment when the analysis period begins.

The subsequent two analyses slightly change how the SUD treatment indicator variable is
declared in the panel data. First, for the analysis in the second row, an indicator variable was
created that was defined as “1” for a given month if the individual was discharged from
treatment at any point during the calendar month. For example, for an episode starting on March
10, 2015 and ending April 15, 2015, the monthly indicator variable will be identified as “0” in
March and “1” in April. In the third row, the analysis was conducted defining the SUD
treatment indicator variable more strictly. In this case, for the SUD treatment indicator variable
to be defined as “1,” the individual must have been enrolled in treatment for the entire month.

The results of the sensitivity analyses shown in Table 5 demonstrate very similar findings
to the main analysis. One will note that while the coefficient in the first row of specification
(1) is now only partially significant, the magnitude is similar to that of the main analysis.
Because the panel of individuals identified in the conditional logit model is reduced to 28 when
we limit the sample to those having been discharged from a treatment episode before the
beginning of the analysis period, it is likely that the coefficient is now partially significant
because of fewer degrees of freedom. In the subsequent two rows, the coefficient is at times
larger and at times smaller than the main analysis, but the qualitative findings remain similar.

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129 On the other hand, if the episode were to begin on the same date but the discharge occurs on March 28, 2015,
then the individual will not have engaged in treatment in any month.

130 Again, these sensitivity analysis models were attempted with a specification that included variables of the log of
the outcome from the previous two months. Results are not shown because they are qualitatively similar to the
specification with only one lag.
Table 5. Sensitivity Analyses to the Conditional Logit Model, Examining Coefficients for PRCS Status Indicator

<table>
<thead>
<tr>
<th></th>
<th>(1) No Lagged Outcome</th>
<th>(2) Lagged Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Only discharged</td>
<td>3.39*</td>
<td>2.22</td>
</tr>
<tr>
<td>Panel: 28 individuals</td>
<td>(2.15)</td>
<td>(1.10)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Discharge Month</td>
<td>5.03*</td>
<td>2.94*</td>
</tr>
<tr>
<td>Panel: 44 individuals</td>
<td>(2.69)</td>
<td>(1.37)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full Engagement Month</td>
<td>2.66*</td>
<td>1.49</td>
</tr>
<tr>
<td>Panel: 28 individuals</td>
<td>(1.56)</td>
<td>(0.75)</td>
</tr>
</tbody>
</table>

Coefficients shown as odds ratios; Standard errors in parentheses

\* \( p < 0.10 \), \* \( p < 0.05 \)

Each row shows coefficients for the CS status variable for a separate analysis. Specifications include the same covariates as the main analysis but not shown here. All models include a continuous time trend (not shown). All models account for clustered standard errors within individuals.

Discussion

The criminal justice system, particularly community supervision (CS), plays a major role in local public health systems’ provision of substance use disorder (SUD) treatment. By using law enforcement’s power of the stick, justice agencies can pressure into treatment a population that is very difficult to engage. But as most jurisdictions across the nation attempt to decarcerate, a common strategy is to reduce sanctions for drug-related crimes (Pew Charitable Trusts 2018). After California enacted Proposition 47, four more states enacted laws that reclassified drug possession from a felony to a misdemeanor (Elderbroom & Durnan, 2018). Ohio had a referendum on the ballot for the 2018 midterm elections that would apply a reclassification of drug possession retroactively (Nichanian, 2018). Within California, Proposition 64, legalizing the use of marijuana, also applied retroactively and a few counties have expunged previous crimes without even requiring a formal petition.131 What is not yet known is how these new lenient drug policies will affect the role of the justice system being a major referral source for community-based SUD treatment.

131 District attorneys in the counties of San Francisco, Alameda, San Diego, Sonoma, and Yolo have all announced they will proactively vacate past marijuana convictions. See: https://norml.org/news/2018/03/22/more-california-counties-move-to-expunge-past-marijuana-convictions.
In this case study, I explored this question by analyzing engagement to SUD treatment for a group in community supervision that unexpectedly had their supervision terminated at different times over the span of a year. I took advantage of a novel dataset matching administrative data of SUD treatment histories with CS case information that included dates of entry and termination. Information at such a fine level allowed for examining the role that CS can play in generating engagement to treatment, compared to the time-period immediately following supervision. Additionally, the case study approach took advantage of an easily identifiable population, and by analyzing within a single jurisdiction it mitigated problems associated with heterogeneity in how a policy was implemented across jurisdictions (Rabinowitz & Davaran, 2017). Moreover, by comparing outcomes within a cohort during the same time-period, it limited the probability that a subset of the sample experienced other concurring policies or programming. Finally, the study used institutional knowledge to exploit plausibly exogenous variation that allowed the author to estimate a causal effect of the role supervision played in maintaining engagement to SUD treatment.

In the first set of results, I compared the PRCS group and the subset that received a resentencing as part of Proposition 47 relief (ET_PRCS), to the general community supervision-referred population. Among those that have entered a SUD treatment episode in LAC, there were significant differences across the groups. The PRCS groups are older and demonstrate characteristics of people that have been entrenched in the justice system for longer. The PRCS group had been admitted to SUD treatment for more serious drugs and were more likely to have been in treatment before. These results are consistent with qualitative evidence from treatment providers regarding the PRCS population (Chavira et al., 2016) and an analysis of criminal history among the AB 109-target population (Gerlinger & Turner, 2015). Within the PRCS group, the group that received a resentencing demonstrated even more extreme drug-use severity characteristics. Given that Proposition 47-eligible crimes are relatively minor, it is likely this population is made up of individuals that have long criminal histories associated to severe drug use, but these individuals are not committing serious crimes.

With regards to SUD treatment engagement, I found that termination from CS does appear to diminish the likelihood of engaging in treatment. While the cross-sectional analysis found null results, it is likely not the correct model to assess total engagement in treatment. The hypothesis motivating this analysis was that the decision to engage in treatment is continuously being made by individuals based on several attributes, including whether they are currently being supervised by the criminal justice system. My preferred model that incorporated decisions made over time while attributes were changing as well, found a positive effect on treatment engagement from being under CS. The results are consistent with previous findings on the use of legal pressure to induce SUD treatment participation. Studies have generally shown that individuals under CS can be induced to treatment (Hser, Maglione, Polinsky, & Anglin, 1998) and those in treatment while under CS stay at least as long as those who enter voluntarily (Hiller et al., 1998; S. M. Kelly et al., 2013; Kiluk et al., 2015; Perron & Bright, 2008).
In interpreting these results, a short discussion of the analysis sample is required. There are reasons to believe this sample suffers from substantial behavioral problems. The group that was resentenced demonstrated severe drug use characteristics and most of the analysis sample had been in PRCS for longer than the one year that is intended for successful supervision spells. Moreover, the data only captures individuals that had at least been admitted to a SUD treatment program before the time-period analyzed, which is a subset of all people in PRCS that LAC Probation referred to treatment. These are individuals that have successfully navigated the various steps between referral and treatment intake (Weinberger, 2018). This may be an indicator of engagement to the county’s system of services or, on the other hand, seriousness of needs that landed them in treatment. Nevertheless, this is an important sample to study because of their high needs and the possibility for an intensive margin effect. As a group who LAC Probation had already been able to pressure into treatment once (but had not yet been discharged from an episode that they completed successfully), more treatment should increase the probability of improving drug use outcomes. Moreover, since this is a group that Probation had identified criminal behavior related to their substance use, it is especially important, given the ultimate goal of reducing recidivism, to provide them with SUD treatment.

There are a few limitations to the study that are worth addressing. The first set deal with the empirical model. The conditional logit model used in the main analysis suffered from limited variation in the outcome variable. This led to only 29 panels of individuals being used for analysis, which severely restricts the power. Moreover, the use of panel data was complicated by the difficulty in measuring the duration-dependence of a treatment episode. I try to account for this problem in a couple ways. First, by using a conditional logit model, I relax the assumption that each individual-month observation is independent. Second, I explored specifications in my model that added a lag of the outcome as a covariate. I found similar results in these analyses.

Another limitation is the lack of information regarding an individual’s intermediate outcomes or life changes (such as experiencing homelessness) while under PRCS makes it more difficult to assess if other factors played a role in determining the likelihood of SUD treatment engagement. The empirical strategy was based on the assumption that the timing of resentencing adjudications was not correlated to the outcome. It is possible that PSPs that were more engaged to social services being provided by the County also were quicker to apply for resentencing under Proposition 47. It should be noted that if this particular case were true, it would bias the estimate of the role of CS towards zero, as those receiving an earlier termination would be expected to continue using services such as SUD treatment. I also provided evidence that the identifying assumption holds, using both data on the analysis sample as well as institutional knowledge of the implementation of the Proposition 47 resentencing process in LAC. There was no evidence that baseline demographic characteristics were correlated with the

132 Intermediate outcomes refers to outcomes within a supervision spell that don’t lead to a termination or the end of a successful spell. Examples include sanctions, completion of a required program, or a revocation of supervision.
timing of receiving an early termination, suggesting that changes in these characteristics may not have had effects on the timing either.

This analysis also suffers from a lack of detailed information regarding Probation’s implementation of PRCS. While Probation’s “Implementation Plan” provides details on the structures in place for an individual in PRCS (see Weinberger (2018)), it is possible that the fidelity to the implementation plan is low. In a thorough review of Probation practices by a consulting firm, the auditors found that Probation was lacking in a number of evidence-based practices, such as how it utilized risk assessment tools and in its over-use of flash incarcerations (Resource Development Associates 2018). Of course, no organization will be able to perfectly implement its plan, so fidelity should be interpreted as part of the context of this study. Information of the Implementation Plan was also supplemented by the author’s internship at LAC Probation and numerous site visits. Further research should focus on better understanding the implementation of Realignment by LAC Probation, which would help to contextualize the results of this study.

While this paper has dealt primarily with mechanisms on the demand side to explore the effect on SUD treatment provision, the supply of treatment is also important for understanding enrollment. It may be the case that SUD treatment provider capacity was changing throughout the analysis period, affecting enrollment rates. This is highly unlikely. A recent report has found that the number of SUD treatment episodes referred by criminal justice agencies funded by DPH-SAPC has been dropping consistently since before the implementation of AB 109 (Hunter et al., 2017). Unless provider capacity was decreasing at the same rate at which referrals have been decreasing, and there is no reason to believe that it has been, it would not be the case that observed decreases in treatment engagement are a result of changes in provider capacity.

This study paves the road for research on longer-term outcomes of reducing community supervision, such as drug use and recidivism. While the most common type of Proposition 47 relief came from new arrests, which get the bulk of the attention, the unexpected relief from case resentencing created a scenario more conducive to research that allows policymakers to learn about the potential impacts from Proposition 47. Resentenced cases provide the advantage that the crime was committed and adjudicated before Proposition 47, which is important because the policy changed how actors within the justice system behaved (Weinberger, 2018). And just like a new arrest, a resentenced case decreases the contact one has with the justice system compared to having committed the same crime in the pre-Proposition 47 context. Therefore, future research in Los Angeles and other counties should use the sample that received Proposition 47 relief to explore whether the relief affected the medium- and long-term outcomes of individuals.

Policymakers should not interpret the findings as reason to widen the net of community supervision. While providing SUD treatment is a positive outcome of supervision, further research must dig into the costs and benefits of using CS (or other criminal justice agents) to provide or link to social services. In terms of benefits, the next step of this research is to explore the moderating effect that a decrease in SUD treatment had on recidivism. And there are many
costs to take into consideration. For example, research on intensive supervision practices has found that these practices usually lead to an increase in recidivism due to the added layer of contact with the justice system (Grattet, Lin, & Petersilia, 2011; Marlowe, 2003; Petersilia & Turner, 1991). A re-incarceration, even for a short time, can prevent recovery. Before Realignment, high recidivism rates for individuals under CS in California meant that rehabilitation would constantly be interrupted (Grattet et al., 2009). More research is needed to assess whether an increase in the likelihood of engaging in SUD treatment is worth the cost of likely increasing the number of incarcerations.

There are other ways to engage people in treatment that do not involve increasing our reliance on incarceration. Recovery Management Checkups, as well as other services that provide case management, are also effective mechanisms to re-engage individuals with SUD treatment when needed (Dennis & Scott, 2012; Scott et al., 2017). Treatment take-up can also be induced through contact points other than the justice system for individuals in need, such as primary care (Scott et al., 2018). In Los Angeles, for example, the enactment of Medicaid expansion led the County to implement a new system of coordinated care in August 2017, which provides other mechanisms to link individuals to SUD treatment (Los Angeles County Department of Public Health, 2016). Finally, jurisdictions should increase funding for social services that meet other needs that are correlated with engaging in SUD treatment, particularly housing (Chavira et al., 2016).

Finally, it is also important to better understand the overall effect for a community of a policy that reduces contact with the justice system such as Proposition 47. Part of the text of Proposition 47 called for savings from supervising fewer people to be diverted to increase social services in communities. In the last year, savings from Proposition 47 were used to provide grants for jurisdictions to implement public health approaches to deal with problem behaviors (Mooney et al., 2018). It remains to be seen if this money is used more effectively to rehabilitate members in the community than using CS or custodial sanctions. It may be the case that even though people that exited community supervision were less likely to engage in SUD treatment afterwards, Proposition 47 led to other programs that increased overall participation in SUD treatment in the community. Research has shown that an increase in overall use of SUD treatment leads to a reduction in crime (Vogler, 2017; Wen et al., 2017).

Appendices

Appendix A.1: Evidence that timing of resentencing adjudications was exogenous

This appendix provides more details to show that the timing of the resentencing petitions was not correlated to an individual’s engagement in services, such as SUD treatment. I describe both the institutional reasons and correlations that show that the timing was not related to variables we might expect to be correlated to engagement.
Institutional factors

Conversations with associates from the Drug Policy Alliance (DPA), LA Regional Reentry Partnership, and A New Way of Life Reentry Project (organizations that were working on the ground in LAC during the implementation of Proposition 47) made it clear that a number of organizations impacted Proposition 47 resentencing. According to these organizations, most beneficiaries of resentencing were not aware of the policy when Proposition 47 was enacted (Archie, 2018; Hernandez, 2018; Petitt, 2018). Moreover, the petition process is difficult to navigate and any small mistake in the form will lead to long delays, which forced the Public Defender’s (PD) office to play a large role (Harvis, 2018). To raise awareness and recruit possible beneficiaries, the PD office, in conjunction with community-based organizations, ran a number of outreach efforts across the County promoting Proposition 47 petition filing (P. Anderson, 2018). As of March 2016, the PD (and Alternate PD) offices filed almost 72% of all Proposition 47 petitions (including both resentences and reclassifications) that were submitted in the County, demonstrating their importance to the process (County of Los Angeles, 2016).133

Moreover, the randomness in the timing of when PSPs experienced Proposition relief was accentuated by the process of case resentencing in the first year as implemented by the Superior Court. The Court took up to six months to hear resentencing cases in a process that has been said, by members of organizations that were helping in the outreach efforts, to be idiosyncratic in terms of which cases were heard first (Hernandez, 2018; Petitt, 2018). Organizations that were involved with resentencing in the first year mentioned a variety of factors that determined timing: case jurisdiction within the county, specific court factors, judge discretion, and the complexities of a particular case (Hernandez, 2018; Johnson, 2018; Petitt, 2018). Moreover, a state-level report shows there was a heavy backlog of resentencing petitions across the state and processing times varied highly across courts (Judicial Council of California 2016). It is very likely this variation in processing was present within a county as large as Los Angeles, which would affect the timing of adjudications for those on PRCS. Data on resentencing petitions received by LAC Superior Court134 shows a similar change over time to that of the resentence adjudications, but with the resentences occurring with a three-month lag. While it is likely that the time in which a petition was filed (which itself was determined by many external forces as described in the previous paragraph) is predictive of the timing in which it was adjudicated, the three-month lag as well as the other case-specific factors noted above leave room for random variation to play a part in the date the individual experienced Proposition 47 relief through a resentenced case. Variation occurring as a result of these factors is especially likely in the first

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133 This was calculated by the author by taking the 50,306 applications that the Superior Court has processed and dividing it by the 36,145 applications the Public Defender and Alternate Public Defender offices (30,748 and 5,397, respectively) have filed according to the cited County report. Given that these offices prioritized active cases over reclassification applications from the outset, it is likely more than 72% of the PRCS petitions were filed by the PD or APD as opposed to by individuals.

134 Data was submitted to the author by the Judicial Council as part of a request for administrative records.
year after the policy was enacted, when 80% of resentences occurred, because that is when the Court was struggling to implement the new policy.

Data analysis

One check on the identifying assumption is to test whether factors that should affect the outcome (engagement in treatment) and may be correlated with factors that determine the length of probation spells (i.e. those in f(X,U)), absent the resentencing, are correlated to the actual observed timing of the early terminations. I check whether the following characteristics that research has found to be correlated with treatment retention are correlated to the timing: employment at time of admission, education, age, ethnicity, prior treatment, primary drug, severity of drug use, treatment type, homeless at time of admission, mental health diagnosis, number of previous bookings, prison stay preceding PRCS, and outcome of in index episode (see Evans and, Li, & Hser for a summary of the literature). More specifically, Table A.1 defines each variable that I use to measure these characteristics. In Table A.2, I show results from univariate regressions of each of these variables related to the timing of CS termination\textsuperscript{135}, for each sub-cohort (Figure 2 describes the sub-cohorts).\textsuperscript{136} I find only very few significant correlations and never for all three sub-cohorts. This is evidence that, at least on observed characteristics, the termination timing appears to be random within the analysis group assessed.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>30+ days to index episode</td>
<td>Indicator for not entering treatment within 30 days of Hub referral</td>
</tr>
<tr>
<td>Black</td>
<td>Indicator for black, non-Hispanic</td>
</tr>
<tr>
<td>Hispanic</td>
<td>Indicator for Hispanic ethnicity</td>
</tr>
<tr>
<td>Outpatient treatment</td>
<td>Index episode was an outpatient type</td>
</tr>
<tr>
<td>Residential treatment</td>
<td>Index episode was an residential type</td>
</tr>
<tr>
<td>Mental health</td>
<td>Previous mental health diagnosis</td>
</tr>
<tr>
<td>Arrests 1yr post-prison</td>
<td>Times PSP was arrested in the one year after PRCS spell started</td>
</tr>
<tr>
<td>Days in prison</td>
<td>Number of days PSP spent in prison for sentence that is associated to current PRCS case</td>
</tr>
<tr>
<td>Sentenced pre-AB 109</td>
<td>Indicator for PSP having been sentenced in current PRCS case before AB 109 went into effect</td>
</tr>
</tbody>
</table>

\textsuperscript{135} These variables come from LACPRS, which requires this data to be taken at initiation of a treatment episode. I use the responses at admission to the first treatment episode, which by design in this sample occurred before Proposition 47, and thus they can be used as baseline characteristics.

\textsuperscript{136} One would expect that these variables may affect an individual’s length in probation differently depending on how long they have already been on probation at the time Proposition 47 was enacted.
<table>
<thead>
<tr>
<th>Days used drug last 30</th>
<th>Days used primary substance at admission of index episode</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heroin primary substance</td>
<td>Primary substance is heroin at admission of index episode</td>
</tr>
<tr>
<td>Meth primary substance</td>
<td>Primary substance is methamphetamine at admission of index episode</td>
</tr>
<tr>
<td>Cocaine primary substance</td>
<td>Primary substance is cocaine (in any form) at admission of index episode</td>
</tr>
<tr>
<td>Alcohol primary substance</td>
<td>Primary substance is alcohol at admission of index episode</td>
</tr>
<tr>
<td>Prior episode to index</td>
<td>Indicator for having been admitted to treatment before index episode</td>
</tr>
<tr>
<td>Homeless</td>
<td>Homeless status at time of admission to index episode</td>
</tr>
<tr>
<td>Years used drug</td>
<td>Years having used primary substance</td>
</tr>
<tr>
<td>Employed</td>
<td>Employed at time of admission at index episode</td>
</tr>
<tr>
<td>High School grad</td>
<td>Graduated from High School (including GED)</td>
</tr>
<tr>
<td>Age</td>
<td>Age</td>
</tr>
<tr>
<td>Length of index episode (days)</td>
<td>Length of days in which PSP was enrolled in treatment for index episode</td>
</tr>
</tbody>
</table>

Table A.2. Coefficients Results for Univariate Regressions, Where the Outcome is the Days under PRCS from Enactment of Proposition 47

<table>
<thead>
<tr>
<th></th>
<th>Cohort 11-12</th>
<th>Cohort 12-13</th>
<th>Cohort 13-14</th>
</tr>
</thead>
<tbody>
<tr>
<td>30+ days to index episode</td>
<td>-58.42</td>
<td>8.625</td>
<td>-37.97</td>
</tr>
<tr>
<td>Black</td>
<td>-35.51</td>
<td>6.397</td>
<td>41.04</td>
</tr>
<tr>
<td>Hispanic</td>
<td>17.63</td>
<td>5.904</td>
<td>-3.951</td>
</tr>
<tr>
<td>Residential treatment</td>
<td>-22.9</td>
<td>7.472</td>
<td>10.13</td>
</tr>
<tr>
<td>Mental health</td>
<td>-34.12</td>
<td>-19.24</td>
<td>-7.143</td>
</tr>
<tr>
<td>Arrest 1yr post-prison</td>
<td>-0.574</td>
<td>1.397</td>
<td>0.874</td>
</tr>
<tr>
<td>Days in prison</td>
<td>-0.00636</td>
<td>-0.0201</td>
<td>0.00052</td>
</tr>
<tr>
<td>Sentenced pre-AB 109</td>
<td>-42.16</td>
<td>-7.529</td>
<td>-11.49</td>
</tr>
<tr>
<td>Days used drug last 30</td>
<td>0.917</td>
<td>-1.299</td>
<td>-0.0593</td>
</tr>
<tr>
<td>Heroin primary substance</td>
<td>-31.6</td>
<td>111.5*</td>
<td>-7.540</td>
</tr>
<tr>
<td>Meth primary substance</td>
<td>17.28</td>
<td>-28.91</td>
<td>75.73</td>
</tr>
<tr>
<td>Cocaine primary substance</td>
<td>26.02</td>
<td>-30.4</td>
<td>-56.68</td>
</tr>
<tr>
<td>Alcohol primary substance</td>
<td>-56.48</td>
<td>-28.9</td>
<td>45.33</td>
</tr>
<tr>
<td>Prior episode to index</td>
<td>-26.79</td>
<td>25.15</td>
<td>-3.333</td>
</tr>
<tr>
<td>Homeless</td>
<td>-40.75</td>
<td>-70.19*</td>
<td>76.21</td>
</tr>
<tr>
<td>Years used drug</td>
<td>-0.0714</td>
<td>0.0952</td>
<td>0.622</td>
</tr>
<tr>
<td>Employed</td>
<td>76.26*</td>
<td>39.19</td>
<td>31.17</td>
</tr>
<tr>
<td>High School grad</td>
<td>3.815</td>
<td>6.357</td>
<td>10.63</td>
</tr>
<tr>
<td>Age</td>
<td>-0.98</td>
<td>1.406</td>
<td>-1.097</td>
</tr>
<tr>
<td>Length of index episode (days)</td>
<td>-0.0653</td>
<td>0.094</td>
<td>-0.445*</td>
</tr>
<tr>
<td>Total Observations</td>
<td>48</td>
<td>52</td>
<td>32</td>
</tr>
</tbody>
</table>

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
The cohorts refer to the sub-cohorts defined in Figure 2, where “Cohort 11-12” are the group from ET_PRCS that started their PRCS spell between October 2011 – November 2012.

Moreover, a proxy variable that represents the type of churning within the system that should be correlated to engagement with services is the number of days the PSP has been under PRCS before the enactment of Proposition 47. This is a type of compositional effect, as longer probation spells are an indicator of suffering from more problems that lead to violations and revocations, extending a probation spell. If the timing of early terminations was correlated with the number of days one has already been on PRCS, this would be an indicator of bias. I find that this variable is not correlated with the timing of an early termination.

**Appendix A.2: More information on the retrospective cohort created**

This appendix goes into more detail on a few characteristics of the retrospective cohort that was created for this analysis.

The sub-cohorts labeled in Figure 2, which represent the date in which the PRCS spell started, are important because of the compositional effects that may exist within the analysis sample. For example, at the date of the policy enactment, an individual that began PRCS on January 2013 will have been on supervision for one year longer than someone that started on January 2014. Because rules state that PSPs must be under supervision for at least one year, but that violations or having been absconded will move the clock back, we can infer that the PSP that started in 2013 did not successfully complete (without violations) the first year under supervision. The same is not true for the PSP released from prison in 2014, who may (or may not) be close to successful termination when Proposition 47 was enacted. It can be presumed that, on average, the composition of PSPs with longer probationary periods are more “serious” (higher likelihood of exhibiting factors that correlate with not achieving one year without violations).

There is another compositional effect based on the date that the PSP originally began the PRCS spell. Individuals on PRCS may have committed a crime before or after AB 109 was enacted, and this distinction changes the composition of the possible criminal histories among this population. Based on AB 109 sentencing rules, a PSP that was sentenced to prison after AB 109 was enacted must exhibit a criminal history with at least one of the criteria excluding one from serving felony time in county jail. Otherwise, this individual would have been sentenced to county jail and thus not been eligible for PRCS upon release. This is an important distinction from a PSP released from prison whose case was adjudicated before AB 109. In this case, because the individual’s sentence was not adjudicated under 1170(h) guidelines, the PSP may or may not have a criminal history excluding him/her from jail sentencing.

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137 Separate tests (not shown) demonstrate this variable does in fact correlate with the social character presented in Table A.2.
I make a few other restrictions from the sample not discussed in the text. First, I exclude PSPs whose treatment during their PRCS stint before the passage of Proposition 47 involved medication-assisted treatment (MAT). This group is expected to have different treatment trajectories because a successful episode is expected to last much longer than other modalities (Simpson, Joe, & Brown, 1997). Individuals in MAT also have disproportionately more treatment episodes and a longer treatment career compared to other modalities (Anglin et al., 1997). I also remove from the sample any individual whose treatment episode before the analysis period resulted in 30 days of abstinence at discharge. This is a very small number and it is likely a PSP that has remained abstinent during a previous treatment episode is further along in their treatment career.

The sample of SUD treatment episodes also has a few explicit omissions that deserve mention. First, treatment episodes for detox are removed because these are very short and entering such an episode involves different mechanisms that other types of treatment. If someone entered into a residential (or outpatient) treatment through detox, LACPRS identifies these as two separate treatment episodes and I capture the non-detox episode. Second, the sample of treatment episodes does not include those with a missing discharge status (and corresponding survey questions performed at discharge). The reason for this is that there is no information on the date of discharge for these episodes, making it impossible to identify the length of the episode.

**Appendix A.3: Proposition 47**

Based on Proposition 47 eligibility criteria and what criminal history can tell us according to the literature, there is evidence to suggest that the group receiving a Proposition 47 resentencing is different than the rest of the PRCS population. Prior research has shown that individuals being released from prison with drug-related crimes (including property crimes, usually attributed to drug abuse) experience more arrests and technical violations (but for less serious offenses) (Grattet et al., 2009), are more likely to fail treatment (Huebner & Cobbina, 2007), and are admitted to more treatment episodes over their treatment career (Anglin et al., 1997). This implies that in the context of criminal justice coercion into services, the population that benefited from Proposition 47 likely had unique trajectories we can’t account for with observed data. As of this writing, though, the author is not aware of any published detailed demographic or criminal history information regarding the Proposition 47-eligible population.

**Appendix A.4: Fixed Effects OLS Regression**

I estimate an average treatment effect of CS on engaging in SUD treatment, using the panel data described in the main analysis, by conducting the following fixed effects OLS regression model:

\[ Y_{it} = \beta_0 + \delta_iCS_{it} + I_i + \beta Time_t + \epsilon_{it} \]
Where $y_{it}$ represents individual $i$, having engaged in SUD treatment for at least 30 days during month, $t$. $CS_{it}$ is an indicator variable defining whether individual $i$, in month $t$, is under PRCS. $Time_t$ represents the continuous calendar time trend, starting on the first month of the analysis period (I discuss the specific month below). $I_i$ represents individual fixed effects, or time invariant factors that may be correlated with the outcome. Finally, the standard errors are robust to clustering within individuals. Unfortunately, the dataset does not include individual-level variables that change over time, which may be problematic for meeting the identifying parallel trends assumption.

Results are shown in Table A.4 below. Similar to the main analysis, PRCS appears to predict a statistically significant increase in the likelihood to engage in SUD treatment.

**Table A.4. Results for the Effect of PRCS on SUD Treatment Engagement, Using a Fixed Effects OLS Model**

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PRCS Effect</td>
<td>0.0561**</td>
<td>(0.0171)</td>
<td></td>
</tr>
<tr>
<td>Booked Indicator</td>
<td>-0.0344*</td>
<td>(0.0143)</td>
<td></td>
</tr>
<tr>
<td>Times Arrested</td>
<td>0.00505</td>
<td>(0.0175)</td>
<td></td>
</tr>
</tbody>
</table>

Standard errors in parentheses
Observations: 129 individuals
All models include only the sample resentenced in the first year. All models account for clustered standard errors within individuals. All models include a continuous time trend (not shown).

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
Policy Implications

This dissertation has discussed three major policies that have been implemented in California since the turn of the century. In each case, the policy has made the criminal justice system less punitive towards drug use that was previously sanctioned. Moreover, each of these policies have left ample discretion for local actors to make decisions in implementation. Other jurisdictions are moving to pass similar policies that diminish the reach of the criminal justice system in dealing with problematic substance use. This dissertation provides various lessons:

1) **Less punitive policies don’t have to result in more crime, but policies will have collateral consequences that ongoing research can address.**
   The first chapter in this dissertation finds that making marijuana more available through a legal market did not lead to the spike in crime predicted by some. Almost any attempt to reduce our reliance on incarceration is met with opposition that trumps the potential increase in crime resulting from the policy. Research such as this is crucial for providing an evidence base to address the fear of policymakers so that they continue passing common-sense reforms that can make a dent in the reach of the criminal justice system. Of course, the fact that crime did not increase was not a given and likely occurred because of specific actions taken by stakeholders. The next wave of research must learn what actions work best so that these lessons may be used as policies are scaled up.

On the other hand, policies may have collateral consequences that are counterproductive with regards to the long-term goals of policymakers. In this case, policymakers must confront these problems as soon as possible to counteract the collateral consequences. For example, in “Liberal but Not Stupid,” the authors argue that the problem with closing psychiatric hospitals in the 1950s was that they were not replaced in communities with other providers to treat those in need (Petersilia & Cullen, 2015). The result was that county jails became the main provider of mental care. The implication in this example is not that psychiatric hospitals should be re-opened, but that rigorous research and smart policy must follow liberal reforms or the intended goals will not be met.

This dissertation plays a role in understanding potential collateral consequences from the policies of interest so as to help policymakers adjust. In my third chapter, I find that one of the fundamental goals of Realignment (as demonstrated in Chapter 2), to increase provision of social services, was made more difficult by Proposition 47. In my first chapter, while crime rates did not increase as a result of allowing for medical marijuana dispensaries, it appears driving under the influence may have increased. These negative outcomes do not imply that the solution set be limited to walking back existing policies but policymakers can use the findings from this dissertation to address the collateral consequences.
2) **Individuals that cycle through the criminal justice system remain an important policy problem for local governments, and these governments need to continue working (outside the purview of the criminal justice system) to improve navigation systems and case management to increase service provision.**

Chapter 2 demonstrated how a major target population of Realignment were “frequent flyers,” or individuals that cycle through the justice system. Frequent flyers are likely to be committing low-level drug or property crimes, and before Realignment they were sentenced to prison due to their long criminal histories and would often return through revocations of community supervision. For county jails to avoid suffering the same fate of overcrowding as the state prison system, county justice systems would have to find a way to reduce recidivism rates for this population. Because frequent flyers usually require multiple services, such as housing in addition to SUD and mental health treatment, the success of Realignment would hinge on how well county governments could implement navigation systems to connect target individuals across county social service agencies. The probation departments would play an important role here, tasked with the de-facto role of case management.

In my third chapter I show that those receiving Proposition 47 relief were an extreme version of the frequent flyer population affected by Realignment. They were more likely to be homeless or diagnosed with a mental health problem, and they were older and more likely to have previously enrolled in SUD treatment. Proposition 47 would also limit the reach of the justice system to provide services to this target population, as I find in Chapter 3 that the policy may in fact have affected provision of social services. Thus, counties were thrown a curveball as they struggle to implement Realignment.

The holistic approach of treating various needs for one individual, though, does not necessarily need to involve the criminal justice system. The immense monetary and social costs that have been attributed to the criminal justice system imply that it is not sustainable to use the justice system as the principal stream into social services. The passage of Proposition 47 through referendum is evidence of this and to some degree forced counties to accept it as well. Medicaid expansion is one interesting avenue to replace the justice system. In Los Angeles, it led to the implementation in July 2017 of the System Transformation to Advance Recovery and Treatment (START), which aims to ease the entryways into the county’s SUD treatment system through a “no wrong door policy” (Los Angeles County Department of Public Health, 2016). But housing and other social services are also important and county governments should expand the provision of these services to mitigate the need for incarceration.

3) **I add to the foundation for research in the new world of Realignment.**

With 58 natural experiments occurring at once, Realignment promises to be a fountain of new research to learn about “what works.” Yet, relatively little research has been conducted so far. This dissertation adds to the foundation that can be used for future research by
identifying policy problems through a historical context of California. Chapter 2 describes the problems that led to Realignment, the details of AB 109 and its target population, and release Realignment to county-specific implementation (Los Angeles). Moreover, between Chapters 2 and 3 it describes the changes created by Proposition 47 and shows why any research encompassing time periods pre- and post-2014 must address changes caused by Proposition 47. In Chapter 3 I also show how changes caused by Proposition 47 can be used for research. Finally, the first chapter demonstrates the need for researchers to study state-level policies through variation at the local-level, instead of comparing across states. These state-level analyses miss a lot of heterogeneity by ignoring where implementation is actually taking place.

4) **Policy actors hold a lot of power through discretion, but when their discretion cannot achieve necessary change, legislation may force change. While the blunt instrument of legislation may create collateral consequences, these may be necessary.**

The three policies I study in this dissertation have tackled issues that in other contexts have also been addressed through discretion by criminal justice actors. For example, laws prohibiting the use of marijuana can be de-facto ignored, and commonly are, by police or court administrators. Similarly, district attorneys and judges can choose to divert individuals to services after arrests for crimes associated to drugs instead of incarcerating them. Finally, police can choose to ignore drug possession crimes unless another more serious crime is occurring concurrently. The three policies studied in this dissertation have shown that if criminal justice actors cannot address public safety issues through their own discretionary actions, the legislature or public may force them to take specific actions.

As I have shown, in some cases, the loss of discretion can lead to collateral consequences that these policy actors consider a threat to public safety. But there are times when these consequences must be a necessary cost of reform. The case of California before Realignment is a case-in-point. In the years leading up to AB 109, California passed haphazard measures to deal with the issue of overcrowding and could not get the problem under control (see Chapter 2). Even after reports from multiple research agencies highlighted the problematic role of recidivism in creating overcrowding, recidivism continued to drive overcrowding in prisons. In the end, California solved the problem through Realignment, and studies have shown that crime rates did not balloon as a consequence.

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