Going Green: Medical Marijuana Laws in the U.S. States

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Abstract

This paper examines medical marijuana policy in the U.S. states. First, I investigate which characteristics are most likely to affect a state’s adoption of this policy. I analyze the twenty-three states that have adopted medical marijuana legislation from 1996-2014. I find that internal determinants and institutional features have a significantly greater effect on adoption than external determinants, such as neighbor adoption. In particular, state ideology, fiscal needs, and access to the ballot initiative increase the probability of adoption.

Next, I examine the substance of current medical marijuana laws. I introduce a new provisions-based measure that can be used to compare laws in similar policy domains. An analysis of the first 18 laws passed in the states shows that the laws vary markedly in scope and focus. I determine that medical marijuana laws vary by two distinct dimensions: bureaucratic oversight and the regulation of dispensaries.

Using these new measures, I explore how state politics, resources, and interactions with other states combine to affect statutory language. I find that politics and resources have little effect on the complexity of a statute and demonstrate that medical marijuana laws are becoming increasingly complex over time. Second, I challenge the assumption that initiatives are not written as well as laws crafted by the legislature and find that, on average, the authors of the laws matter less than the time in which they are written.

Marijuana policy, and medical marijuana policy specifically, is rapidly evolving. Moreover, this policy has consequences on public health, public safety, crime, and law enforcement. This paper makes an effort to address some of the key empirical puzzles moving forward and aims to inform both scholars and practitioners.

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Marijuana Policy: A Moving Target

Keeping up with marijuana policy in recent years is no easy task. By any metric, marijuana policy is quickly changing. Whether one is observing public opinion, the courts, crime policy, or state and federal laws, liberalizing trends appear everywhere (Pew 2013). Over the past eighteen years, twenty-three states and the District of Columbia have passed medical marijuana laws. In just the last two years, four states and the District of Columbia have legalized marijuana. Public policy on marijuana has changed so quickly that law schools have begun to offer seminars with a sole focus on marijuana law and policy (Sloan 2014).

Yet little empirical work has examined the extent to which different factors have driven the radical sweep in marijuana policy. This paper examines medical marijuana policy, the most developed and widely in force policy on the issue. Medical marijuana policy is already established in the four states that have legalized marijuana, and in the eleven states that are likely to consider legislation in the next two years (Chokshi 2014). It is likely that the factors that drive states to pass medical marijuana laws are consistent with broader trends in marijuana policy. Moreover, these developments have significant implications for the fabric of American civil society by reshaping two fundamental policies: the War on Drugs and health care.

This paper is composed of three parts: First, I explore which factors lead states to adopt medical marijuana policies. I discover that states adopt medical marijuana policies for a number of reasons, but most are based on internal determinants rather than external factors. Next, I examine the content of medical marijuana laws. I find that the laws vary

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2 And in the District of Columbia.
remarkably and have multiple dimensions. Finally, I examine the extent to which state-level characteristics affect the specificity in state laws. I find that many state-level characteristics have little effect, meanwhile laws are increasing in complexity. The unifying theme in each of these analyses is that time matters: not only are more states adopting medical marijuana laws at a faster rate; they are also adopting more complex laws. Finally, I conclude by discussing strategies for moving forward and using our understanding of the substance of laws to examine implementation of laws.

I. Why Do States Pass Medical Marijuana Laws?

A Brief History

The federal government first targeted marijuana as a drug in the Marihuana Tax Act of 1937. Even then, the American Medical Association (AMA) challenged this act, arguing the medical profession should be allowed to develop and use the drug as a viable treatment for many conditions. Despite the AMA's opposition, the act passed and all medicinal products containing marijuana were pulled from the market (Eddy 2010).  

The Controlled Substances Act of 1970 reclassified marijuana as a Schedule I drug and stiffened the penalties related to its use. The federal government was forced to backtrack in 1976 for some medical cases when a Washington, DC, resident, arrested for using marijuana to treat his glaucoma, successfully challenged the federal government by using the medical necessity defense. This led to the FDA's creation of the Investigational New Drug Compassionate Access Program in 1978. While in force for 14 years, the act

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3 In 1941, marijuana was removed from The National Formulary and the United States Pharmacopoeia, where it had been listed for nearly a century.

served less than 100 patients. Finally, in 1992, the Bush Administration closed the program to new applicants due to a large increase in applications from AIDS patients (Eddy 2010).

These events, along with liberalizing attitudes towards medical marijuana, set the state for states to bypass federal law and create their own medical marijuana policies (Pickerill and Chen 2008). The earliest states primarily used the direct initiative to pass legislation. Starting with Hawaii in 1999, policy has also been passed by state legislatures. Figure 1 shows which states currently have laws on medical marijuana.

**Figure 1: States that have adopted medical marijuana laws.**

![Map of the United States showing states that have adopted medical marijuana laws.](image)

NOTE: Alaska and Hawaii have each passed medical marijuana laws.
These developments lead to a critical question: why do states pass medical marijuana laws? Moreover, why do states pass laws that put them at risk of violating federal law?

Analysis

Data were collected on the 50 states from 1996 through 2014. Of these states, 23 have passed medical marijuana laws, either by voter initiative or statute. The time period starts in the year immediately preceding the first passage of medical marijuana legislation, when voters approved Ballot Proposition 215 in California.

I employ event history analysis (EHA) to explain why states adopt medical marijuana laws (Berry and Berry 1990). Starting in 1995, each of the 50 states are “at risk” of adopting a policy. In 1996, California adopts a policy and leaves 49 states “at risk”. By 2014, twenty-seven states remain in the risk set. As each of the 23 states adopts, or “fails” in the EHA language, we learn additional information about the states that fail, information that might set them apart from states that remain in the risk set. Following the example of diffusion scholars, I explore a number of factors that might affect whether a state adopts. Specifically, I look at state liberalism, state marijuana use, state fiscal growth, neighboring policy, and the ballot initiative.
State Liberalism

To measure state liberalism I use the percentage of votes for the Democratic presidential candidate in each state from 1996 to 2004 (Woolley and Peters 2014). A recent Pew Research Center report found distinct differences in party identifiers on attitudes towards marijuana policy (2013). In fact, there is a 22-point difference in opinion on whether marijuana should be legalized (59% of Democrats support legalization compared to 37% of Republicans). This is not just a difference in policy preferences; the same study finds that 47% of Republicans think marijuana use is morally wrong compared to 26% of Democrats. Therefore, I expect that more liberal states are more likely to adopt medical marijuana laws.

State Marijuana Use

The Substance Abuse and Mental Health Services Administration (SAMHSA) of the U.S. Department of Health Services collects survey data on drug use and estimates the percent of marijuana users by state. I expect states with higher incidences of marijuana use to be more likely to pass medical marijuana legislation. First, increased marijuana use might be endogenous to more liberal attitudes within a state. Second, some citizens may be using marijuana for legitimate medical reasons, thus increasing demand of legal access to the drug. Third, states with higher incidence of marijuana use

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5 I use this measure rather than other state measures such as Erikson, Wright, and McIver (1993) and Berry et al. (1998) for a few reasons. First and foremost, neither measures fully cover the data; EWM does not include estimates for 2 adopters (AK and HI) and Berry does not have measures updated to 2014. Meanwhile, presidential vote share captures important dynamics over time such as liberalizing trends in the mid-Atlantic and more conservative trends in the Deep South. The values stay constant after each election until the next (e.g. % Democratic vote in 1996 is constant from 1996-1999, then changes to the 2000 % Democratic vote and so forth.)

6 Currently using 2006-07 numbers. I hope to update this to a complete, dynamic time-series dataset.
may be overburdened with enforcement and prefer legitimate medical access to marijuana in hopes of alleviating some enforcement efforts (RAND 2011).

*State Fiscal Growth*

Medical marijuana gives states a fiscal opportunity. Not only can governments raise fees and tax revenue, they also undermine a black market, bringing potential consumers into the light (and their money into the state’s coffers). States not only levy taxes on individuals, they also tax dispensaries and distributors (Hickey 2014). In many states, this has led to significant windfalls (Oosting 2014, Stern 2015).

The motivation to find new revenue sources is greatest when states face fiscal downturns. Therefore, I expect that states in fiscal downturns will consider adopting medical marijuana policy as a means to raise revenue. Rather than using a measure of the size of a state’s economy, I use the percentage change in real per capita gross state product (GSP) in the preceding year. GSP data is collected annually by the U.S. Department of Commerce (BEA 2014).

*Adopting Neighbors*

A number of studies show that states learn from and borrow from their neighbors. Whether proximity allows state to be inspired by other states (Walker 1969) or motivates states to compete with other states (Berry and Berry 1990), neighbors matter.

Neighbors might be especially important to medical marijuana policy as marijuana is coveted by at least a minority of populations. This can affect states in two

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A 2011 report by RAND showed that medical marijuana dispensaries lowered crime in nearby areas. It is worth noting that this study was redacted due to both pressure from law enforcement and methodological concerns.
ways. States might see their neighbor implementing a successful and lucrative program and be motivated to join. However, the nature of medical marijuana might also lead to negative consequences for neighbors. A public radio account in Nebraska (Kelly 2013) reports,

High-grade medical marijuana, legal in Colorado, is “flooding” Nebraska where the drug remains illegal, according to law enforcement agencies. The impact is being seen, primarily in western counties, in the amount of staff time spent by narcotic enforcement officers, court cases, and on the market for marijuana across the state.

As one state officer reported, “Marijuana out of Colorado is having a local impact…It is flooding, just flooding the market place. It’s everywhere.” So while some states might be positively influenced by a neighbor state’s experience, others might be more inclined to resist adopting policy as they experience the negative effects from their neighbors.

Direct Initiative

I expect that access to the direct initiative increases a states’ likelihood to adopt. While the negative stigma of marijuana is decreasing over time, it is far from negligible (Pew 2013). Therefore, few legislators will find championing medical marijuana policy worth the political risk. The direct initiative gives interest groups and dedicated citizens and opportunity to bypass the legislature and pass policies (Lupia and Matsusaka 2004).

Results

Table 1 displays the results of the model. Model 1 utilizes logistic regression and does not control for time. Model 2 utilizes a logistic regression with splines to account for time and serves as a discrete analog to the Cox proportional hazards model (Buckley and
Westerland 2004, Carter and Signorino 2010). Each are reported to illustrate the consistency of the results across models and functional forms.

Table 1 Why do states pass medical marijuana laws?

<table>
<thead>
<tr>
<th></th>
<th>Model 1 – Logistic Regression (No time dependence)</th>
<th>Model 2 – Logistic Regression (Time splines)</th>
<th>First Differences Model 2 (1 Standard Deviation)</th>
<th>Cox Proportional Hazard Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Democratic Presidential Vote</td>
<td>0.07* (0.04)</td>
<td>0.08* (0.04)</td>
<td>+1.5%</td>
<td>1.08* (0.03)</td>
</tr>
<tr>
<td>% Marijuana Users in State</td>
<td>0.78** (0.22)</td>
<td>0.80** (0.25)</td>
<td>+2%</td>
<td>2.00** (0.29)</td>
</tr>
<tr>
<td>Change in per capita GSP</td>
<td>-0.18** (0.05)</td>
<td>-0.23** (0.08)</td>
<td>-1%</td>
<td>0.70* (0.11)</td>
</tr>
<tr>
<td># of Adopting Neighbors</td>
<td>-0.18 (0.36)</td>
<td>-0.23 (0.34)</td>
<td></td>
<td>1.19 (0.25)</td>
</tr>
<tr>
<td>Initiative Availability</td>
<td>1.18 (0.75)</td>
<td>1.32+ (0.71)</td>
<td>+1.5%</td>
<td>2.50* (0.97)</td>
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<tr>
<td></td>
<td></td>
<td>0.91** (0.33)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>-0.11* (0.04)</td>
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<tr>
<td></td>
<td></td>
<td>0.00 (0.00)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>-11.47** (2.78)</td>
<td>-14.10** (3.47)</td>
<td></td>
<td></td>
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<tr>
<td>N</td>
<td>816</td>
<td>816</td>
<td></td>
<td>791</td>
</tr>
<tr>
<td>Pseudo R²</td>
<td>0.25</td>
<td>0.28</td>
<td></td>
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</tr>
</tbody>
</table>

The models confirm several of the hypotheses. More liberal states are more likely to adopt although the effects are not that strong. The probability of passing a medical marijuana law increases by 1.5% with a 1 standard deviation shift in Democratic vote share (8.25%). The probability of passing a medical marijuana law in a state increases by 2% when the percent of marijuana users increases by a standard deviation. While this sounds negligible at first, the probability of a state passing a law with the most users...
(Rhode Island 10.3%) is 33% higher than the probability of passing a law in the state with the least users (Iowa 3.9%). Finally, state fiscal growth is significant and in the expected direction. As state economies grow, the probability of passing an initiative decreases, meanwhile states become more likely to adopt in periods of decline. The probability of passage changes a full 15% between the range of values (-10% to 18%).

Surprisingly, the count of neighboring states that adopt do not affect a state’s probability of adoption. There may be a few factors that mitigate the influence of neighbors. First, this result might suggest that medical marijuana facilities are well secured and effective at serving only state citizens, thus fears of a neighbor’s adoption leading to citizens crossing the border in search of medical pot is unfounded. Second, in the canon of diffusion literature and studies, medical marijuana is a fairly young policy. This might allude to a broader trend of states being less influenced by physical neighbors and more influenced by ideological neighbors (Sponsler 2010).

II. The Substance of Medical Marijuana Legislation

The previous model attempts to answer why and when medical marijuana laws are passed. In many ways, the model confirmed expectations about the role of internal determinants and time in adopting medical marijuana laws and questioned the influence of neighbors. However, this model only predicts states that adopt. In this section, I examine what is being adopted. I examine the text of medical marijuana laws to

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8 Rhode Island passed a medical marijuana law in 2007. Iowa has not passed a medical marijuana law.
9 The reported model uses count of neighbors, neither proportion of neighbors nor a simple indicator of a neighbor adopting are significant.
10 Or perhaps it causes a negative reaction.
determine whether they are consistent across the states, and if not, if there are particular factors that explain the differences.

As "laboratories of democracy," states operate as havens for policy innovation and experimentation (New State Ice Co. v. Liebmann 1932). States borrow policies and learn from other states. This diffusion process is facilitated by policy entrepreneurs that promote similar policy ideas in statehouses across the country through organized interest and citizen groups (Mintrom 1997). Because of this, states often have laws that are similar, if not identical in their language (Walker 1969). At other times, policies vary widely in their scope and content. Moreover, laws are often complex and can focus on a number of topics. That is, policies can be multidimensional. I determine which mechanisms drive this variation and along which dimensions. In particular, I examine three mechanisms that affect the specificity of the policies that states write: legislative capacity, political motivation and environment, and policy learning.

Figure 2 displays the number of words in each of these laws. I show this to emphasize that these laws are likely very different in their scope and content. While word counts demonstrate that these laws may not be perfectly comparable, the provisions-based measure further illuminates these differences.
Figure 2: The length of medical marijuana laws ranges from a few hundred to several thousand.

In particular, what factors cause some states to craft detailed and specific laws while others choose ambiguous and vague laws? I utilize a new multidimensional measure of language that allows scholars to parse out more information from the laws. I use an original dataset of characteristics of the first eighteen laws to test these hypotheses.

**Measuring Statute Specificity**

I employ a provisions-based approach to measure statutory language. Previous efforts have used word counts (Huber and Shipan 2002), continuous measures of sentence complexity (Gunning and Kallan 1994, Chun and Rainey 2005) or subjective criteria that are policy specific and difficult to replicate (Meier and McFarlane 1996, Berkman and Plutzer 2011, Makse and Volden 2011, Marschall et al. 2011). Each of these practices have limitations. In particular, the former two are agnostic to the content...
of the law. The latter method is preferable, but it can be costly and is specific to each policy. The method I introduce involves carefully reading each law, but allows factor analysis methods to identify latent dimensions. Instead of imposing my own criteria for what a 'specific' bill should contain, I identify each unique provision in each bill and use factor analysis methods to determine the dimensions and provisions that most adequately discriminate between different laws.

The approach I use involves identifying and counting the unique and specific provisions in each law. I define a provision as any instruction in a law that requires action by a government actor or service recipient. While the subjects of provisions are most often government agents, these may also include recipients of services or lawmakers. For medical marijuana policies, instructions are directed to agents in the Department of Health, state-licensed physicians, dispensary entrepreneurs, law enforcement, patients, and their caretakers.

Some sections of text in the law do not fit my definition of a provision. For example, many state laws begin with a defense for medical marijuana policy. These includes medical evidence of the therapeutic value of marijuana, listings of the other states that have passed medical marijuana laws, and assurances that the state is not violating federal law. In fact, six statutes (33%) note that crime data reveals that 99% of marijuana possession arrests are made by state law enforcement, not federal enforcement. The goals of such statements are to defend the policy, not to direct implementation.

This method leads to the identification of 74 unique provisions included in the 18 medical marijuana laws. The most thorough statute contains 56 of the 76 unique
provisions and the least thorough contains only one provision. Patterns are difficult to identify due to the complex nature of the laws. However, patterns do emerge after using a two-factor, obliquely rotated solution. The first factor (Dispensary factor score) loads highly on each of the 17 unique provisions related to dispensaries and their operation. The second factor (Oversight factor score) loads highly on provisions related to the government agency's operating procedures. In particular, the provisions related to raising finances, filing reports, and collecting data on the program are all important aspects of this dimension. The factor analysis produces two factor scores, each with a mean of 0 and a standard deviation of 1.

Figure 3 contrasts the two major factor scores: those laws driven by provisions related to dispensaries and laws driven by provisions related to bureaucratic oversight. The figure shows that Arizona and Delaware's laws are detailed in both dimensions, while California and Nevada's laws lack detail in either. Meanwhile, some state laws are only driven by one dimension (e.g. Michigan and Rhode Island). The correlation between the two dimensions is low ($r = 0.24$) and the figure demonstrates that the laws can vary on each dimension, if not, the values would line up on a 45-degree line and there would be no need to consider both dimensions. Instead, the analysis produces two unique dimensions that can be useful in empirical tests. These dimensions also deviate from standard measures such as word counts. The dispensary dimension correlates at 0.81 with word count while the oversight dimension only correlates at 0.54.
Figure 3: Factor scores of medical marijuana laws on dispensary and bureaucratic oversight dimensions.

I have demonstrated that medical marijuana laws vary markedly in their substance. I have also presented a method to construct measures from the laws that capture the multidimensionality of laws and contain more information than traditional measures. These measures can become dependent variables when trying to explain why states write the laws they do.

**III. Explaining Statute Specificity**

The first explanation for different levels of specificity is that states’ laws are based on a state’s capacity to construct legislation. These include the resources accessible to legislators and bureaucrats and the availability of the direct initiative - a mechanism used to bypass the state legislature in a number of states. The concept of a
state's capacity has been most successfully measured by Squire's measure of legislative professionalism (Squire 2007). But there are also other factors that affect a state's capacity, including whether legislators are term-limited and the capacity of the bureaucracy to implement legislation (Barrileaux 1999, Kousser 2005). While scholars have evaluated legislative professionalism's role in the composition and behavior of legislatures, little work has investigated how professionalism affects the policies produced. Finally, a number of states make the direct initiative available to their citizens, circumventing the legislature and allowing citizens to vote directly for policy. While scholars and journalists have suggested that initiatives may be poorly written (Lindsay 1982, Collins and Oesterle 1995, Gerber et al. 2001, Bozzo and Irvine 2010), empirical work has not directly tested this assumption.

The second explanation for variation in statutory language is a state's political environment. Political conflict leads to the watering down of legislation to satisfy a number of competing actors (Matland 1995, VanSickle-Ward 2010). If this theory is correct, then it is likely that during times of divided government or heightened partisan competition, statute specificity suffers. On the other hand, political uncertainty and conflict might drive actors to write even more specific laws as a way to have a lasting influence over policy - making law writing a zero-sum game (Huber and Shipan 2002).

Finally, disparities in statutory language may be explained by states learning from other states. There exists a rich body of research on policy diffusion that predominantly explains the circumstances under which states adopt a policy (Walker 1969, Berry and

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11 The only work that tests the effects of legislative professionalism on statute specificity does not find significant effects (VanSickle-Ward 2010). However, this article only investigates mental health bills.
Berry 1990). However, scholars have pointed out that this body of work rarely examines what, in particular, is being adopted (Karch 2007, Boehmke 2009, Makse and Volden 2011). Makse and Volden (2011) argue, “what has been missing from this literature is a direct focus on the nature of the different policies themselves” (p.110). In this analysis, I test whether policies evolve and become more or less specific.

**Analysis**

I use these newly constructed measures of specificity on two unique dimensions to test hypotheses related to statute specificity. The analysis is limited due to the limited number of observations; therefore I construct a number of OLS models to examine certain groupings of variables.\(^{12}\)

**1. State Capacity**

It is likely that some states have greater means to produce specific and thorough policies. Some state legislatures meet frequently and have large staffs, likely affecting their ability to be policy innovators and craft clear and followable laws (Mazmanian and Sabatier 1989, Squire 1992, Meier and McFarlane 1996). And some states operate with larger budgets and a larger executive agency than others, affecting their ability to delegate to bureaucratic agencies (Barrileaux 1999).

The professionalism of state legislatures varies across the country (Squire 1992, Mooney 1994). The job of a state legislator differs in compensation, available staff, and

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\(^{12}\) I have also used selection models to increase the analytical \(N\) from 18 to 50. This also adjusts the standard errors to control for the potential selection bias related to unobserved similarities in the data. The substantive results do not change in a selection model, however the test statistic \(r\) suggests that selection models are inappropriate for this analysis.
days spent in session. As a consequence, states with highly professional legislatures should be equipped to research and craft more specific statutes than in those states with less professional legislatures.

**Hypothesis 1**: States with more professional legislatures will write laws with more specificity.

**Bureaucratic Professionalism**

Not long after a policy is passed, it is passed on to bureaucratic agencies to oversee its implementation. Barrileaux (1999) observes, “This absence of drama and interest leads some state decisions to be made quietly and to be influences mainly by organizations, interests, or individuals with a stake in the outcome and with information at hand rather than by public demand” (p.97). The size and organizational structure of state bureaucracies varies and might affect the way lawmakers delegate policy. While most observers are comfortable with the notion of bureaucrats as ‘neutral policy implementers’, viewing these agencies as fully engaged in the policymaking process is more controversial (Barrileaux, 1999, p.98). But there is evidence to suggest that agencies do both. Bawn (1995) argues that law writers may be unable to anticipate the consequences of a policy and therefore intentionally construct laws that defer to bureaucratic experience and expertise. Similarly, law writers may construct laws with flexibility due to the belief that a bureaucrat’s judgment is more appropriate for carrying out a policy.

I argue that states with more professional bureaucracies are more likely to write laws with less specificity. In states with a large and well-compensated bureaucracy,
legislators will have more confidence in the ability of bureaucrats to implement legislation. Therefore, legislators can afford to write less specific laws with the trust that the agencies are better equipped to handle the details. On the other hand, legislators will expressly write out details in states where bureaucrats are presumably undermanned and under-qualified. I use a measure of bureaucratic productivity created by Barrileaux (1999) that is measures as the ratio of state government salaries to state government gross domestic product. While the most recent calculation dates back to 1992, Barrilleaux’s research suggests that bureaucratic characteristics are relatively stable over time.

Hypothesis 2: States with more professional bureaucracies will write laws with less specificity.

Direct Democracy

Just as state legislatures vary in size of legislative staffs, number of bureaucrats, and length of legislative sessions, they also vary in whether citizens can create and vote on initiatives. There is a general assumption that initiatives are not written as well as laws written by the legislature. However, this has not been empirically tested and the assumption might be based on a few anecdotal cases. But there are good reasons to believe that initiatives are less specific than comparable laws written by legislators.

Initiative sponsors are likely to be inexperienced in drafting legislation. Second, unlike laws passed through the legislature, once an initiative passes through the immediate procedural steps, the draft becomes permanent. This feature denies proponents the opportunity to revise an the language in an initiative. Conversely, statutes in the legislatures go through a rigorous review process that might include legislative or
administrative reviews, committee hearings, testimonies of interested parties, clarification of ambiguities, and negotiation over the most contested parts of the bill (Collins and Oesterle 1995, Gerber et al. 2001).

Initiative writers may also have a motivation to use ambiguity to deceive voters. A study conducted by Charlene Simmons of the California Research Bureau (1997) argues that “ballot measure proponents and/or opponents do not have an incentive to provide clear information to voters”. In a 1990 *Los Angeles Times* poll, 78 percent of respondents answered that they found some or only a few of the propositions understandable. But this survey does not compare initiatives to bills passed by legislatures, which may be equally confusing. Regardless, there are reasons to believe that initiative sponsors may utilize ambiguity to persuade voters.

I argue that laws are likely to be more ambiguous when passed by a popular initiative. Initiative sponsors are less likely to have the expertise in writing legislation, thus leaving their ideas vulnerable to reinterpretation by bureaucrats and the courts. Secondly, even if initiative sponsors have comparable expertise to other legislators, legislators benefit from the iterative process of lawmaking. In a representative legislature, passed laws have been filtered through numerous representatives for many steps in the policy process. At each step, interested legislators can negotiate or add to the law, thus clarifying any ambiguity. Meanwhile, initiated legislation can be characterized as a “one-shot game” where initiative sponsors are unlikely to anticipate everything (Lewis 2011).

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13 Quoted in Collins and Oesterle (1995), p. 11
All of these factors leave initiatives particularly vulnerable to reinterpretation or inaction by the bureaucracy, the courts, and the state legislature.

**Hypothesis 3:** Laws passed by the state legislature, instead of the direct initiative, will be written with more specificity.

There is a plausible outcome that runs counter to my hypotheses on direct democracy. The fact that initiative writers do not get opportunities to revise their law later in the process might mean they write more detailed laws. Not only do they lack control of revising the law, they also lack oversight controls that legislators possess. Statutory language provides lawmakers *ex ante* control over bureaucratic agencies. Additionally, lawmakers often include ongoing controls into the legislation (Epstein and O’Halloran 1994). Meanwhile, ballot initiative sponsors exercise *ex ante* control in the writing process but lack ongoing controls such as legislative oversight or budgetary powers. It is quite possible that initiative authors anticipate the fact that they possess *ex ante* influence over the implementation of a policy, therefore they construct laws with more specificity than laws written by state legislators that have ongoing controls over policy implementation (Huber and Shipan 2002). This leads to an alternate hypothesis.

**Hypothesis 3b:** Laws passed by the state legislature, instead of the direct initiative, will be written with less specificity.

The fact that the relationship between specificity and direct democracy is insignificant for medical marijuana laws suggest that initiative sponsors are writing laws at least as detailed as legislatures and challenges previous assumptions about the quality of direct initiatives.
2. State Politics

Partisan Conflict

There is debate on the role that political conflict has on the production of laws. VanSickle-Ward (2010) describes the two competing perspectives. The first perspective, supported by public law and policy scholars, contends that policy conflict leads to less specificity as law writers have to compromise over language. “Many legislative compromises depend on language sufficiently ambiguous that diverse actors can interpret the same act in different ways” (Matland 1995, p.158).

The second perspective, most prominent in literature on the bureaucracy, contends that policy conflict leads to more specificity “because statute construction aims to be more specific and prescriptive in a fragmented context in order to assure the permanence of otherwise temporary victories” (VanSickle-Ward 2010, p.5). This perspective is advocated by Huber and Shipan (2002), who find that political uncertainty leads to legislators writing laws with increased \textit{ex ante} control.

I argue that the public law perspective more accurately portrays the debate over these two policies. Politics in the states are dynamic and fluctuate between periods of collegiality and agreement and periods of tension and conflict. During periods of heightened partisan competition, laws may have to be written with ambiguity in order to pass through the legislature (Matland, 1995).

Hypothesis 4: High party competition will lead to laws written with less specificity.
Electoral Competition

While intense party competition or polarization can lead to political uncertainty, so can electoral vulnerability. Huber and Shipan (2002) find that legislators vulnerable to losing an election are more likely to want to leave a lasting legacy on the laws they do pass - thus writing more specific laws.

Hypothesis 5: State with electorally vulnerable legislators will lead to laws written with more specificity.

Divided Government

Research has also demonstrated that divided government affects policy outcomes (Alt and Lowry 1994). Divided government can lead to policy gridlock in a number of policy areas (Bowling and Ferguson 2001). With such conclusions, it is likely that statutory language may be amended in order to push some bills through that would otherwise fail in times of divided government. Conversely, it is easier to pass a law with specificity when the same party controls both the governor’s seat and the legislative majority.

Hypothesis 6: Laws written during times of unified government are likely to be written with more specificity.

However, there is a plausible counter story to this hypothesis. In periods of divided government, legislators may be motivated to write more detailed legislation in order to limit the governor’s discretion in implementation (VanSickle-Ward 2010). Therefore, a significant finding that runs counter to my hypothesis still tells an interesting
story.

**Hypothesis 6b:** Laws written during times of unified government are likely to be written with less specificity.

### 3. Policy Diffusion and Learning

Since Walker’s fundamental work on policy diffusion, scholars have taken interest in how policies disseminate in a federal system. Walker and subsequent scholars (Berry and Berry 1990) have primarily focused on what internal and external determinants affect a state’s adoption of a policy. While the diffusion research has developed a rich understanding of the factors that affect adoption, most of the works explain dichotomous outcomes. Makse and Volden (2011) argue, “what has been missing from this literature is a direct focus on the nature of the different policies themselves” (p.110). In this analysis, I can test whether policies evolve and become more or less specific and this can be examined on a few particular dimensions.

The policy diffusion literature revolves around three fundamental questions (Karch 2007). Why does policy diffusion occur? Which political actors or forces facilitate diffusion? What is being diffused? It is this third question that I focus on. In terms of statutory language, what is being diffused? It is likely that policy makers borrow language for other states and adjust parts of the statute that are vague or misunderstood. I test whether statutes increase in clarity as they diffuse from one state to the next.

**Hypothesis 7:** States are likely to learn from the experience and example of other states. Therefore, states that write their statutes later are more likely to write more specific laws.
To test this I use the number of years since the first statute passed for each subsequent value. Since the first medical marijuana law passed in 1996 in California, California’s law is scored a ‘0’. Subsequent laws are scored as 1996 subtracted from the year they passed the law.

Results

Table 2 shows the results from the OLS models predicting language specificity in state laws. The dependent variable is the specificity loading score, which has a mean of 0 and a standard deviation of 1. Bureaucratic productivity is also significant in the model, but runs counter to my hypothesis. This suggests that law writers write more complex laws when the bureaucracy is more professional, but only related to dispensaries.

The larger takeaway is that neither the capacity nor the politics explanations for specificity suffice for medical marijuana policy. Meanwhile, time is significant and positive in each model, suggesting that states are writing more complex laws over time. While it cannot be proven in this paper that it is due to learning, anecdotal evidence and some preliminary textual analysis suggests this is the case.
Table 2: OLS models predicting the language specificity of medical marijuana laws on two dimensions.

<table>
<thead>
<tr>
<th></th>
<th>Capacity Model</th>
<th>Capacity Model</th>
<th>Politics Model</th>
<th>Politics Model</th>
<th>Learning Model</th>
<th>Learning Model</th>
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<tr>
<td></td>
<td>Dispensary</td>
<td>Oversight</td>
<td>Dispensary</td>
<td>Oversight</td>
<td>Dispensary</td>
<td>Oversight</td>
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<td>Legislative</td>
<td>0.06</td>
<td>-1.98</td>
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<td>Professionalism</td>
<td>(1.86)</td>
<td>(2.22)</td>
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<td>Bureaucratic</td>
<td>0.49*</td>
<td>0.08</td>
<td>0.41*</td>
<td>(0.14)</td>
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<tr>
<td>Productivity</td>
<td>(0.19)</td>
<td>(0.23)</td>
<td></td>
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<td>Direct Initiative</td>
<td>-0.49</td>
<td>-0.09</td>
<td>0.02</td>
<td>0.04</td>
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<tr>
<td></td>
<td>(0.45)</td>
<td>(0.53)</td>
<td></td>
<td></td>
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<tr>
<td>Party Competition</td>
<td>1.43</td>
<td>3.03</td>
<td>0.43</td>
<td>2.69</td>
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<tr>
<td></td>
<td>(4.40)</td>
<td>(4.95)</td>
<td>(1.82)</td>
<td>(2.66)</td>
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<td>-0.16</td>
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<td>Divided Government Learning</td>
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<td>-0.52</td>
<td></td>
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<td></td>
<td>(0.52)</td>
<td>(0.79)</td>
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<tr>
<td>Government Learning</td>
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<td></td>
<td>0.11*</td>
<td>0.09*</td>
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<td></td>
<td></td>
<td>(0.03)</td>
<td>(0.05)</td>
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<tr>
<td>Constant</td>
<td>0.31</td>
<td>0.48</td>
<td>-0.67</td>
<td>-2.21</td>
<td>-1.27</td>
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<td></td>
<td>(0.47)</td>
<td>(0.56)</td>
<td>(3.21)</td>
<td>(3.62)</td>
<td>(1.73)</td>
<td>(2.54)</td>
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<td>Adj. $R^2$</td>
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<td>0.07</td>
<td>0.24</td>
<td>0.03</td>
<td>0.66</td>
<td>0.20</td>
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<tr>
<td>$N$</td>
<td>18</td>
<td>18</td>
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</table>

$p < 0.05$

Finally, there is no evidence that the direct initiative process leads to less clear laws. This finding suggests that the authors of initiatives are accounting for their lack of expertise and access to the law by some means - it is unclear whether that is by learning from other states or that they understand that their lack of control of the law after it is passed means they write clear laws. This also questions the assertion that initiatives are written by political novices - direct democracy has become a multi-million dollar industry and many policy entrepreneurs and organizations take their show on the road and strategically target one state after the next (Lupia and Matsusaka 2004). Regardless, the evidence does not suggest that they write more specific laws, nor does it suggest that they are implemented at similar levels to laws written by the legislature. That is still an open question.
I plot the predicted values of learning to illustrate the magnitude of time on specificity. Figures 4 and 5 show the effect of time to be substantive, especially for dispensaries. One can expect that as more states pass medical marijuana laws, the laws will be even more specific on the expectations of agency oversight and on the regulation of dispensaries. These findings are supported by anecdotal evidence that vague medical marijuana laws have had negative consequences in some states. For example, Montana legislators passed a new law in 2011 to account for a number of shortcomings in a 2004 initiative (Etter 2010, Johnson 2011).

**Figure 4:** Specificity related to dispensaries increases over time in medical marijuana laws.
IV. Discussion

A recent Brookings Report laid out the “Eight Big Things to Watch” for marijuana policy in 2015 (Hudak 2015). The seventh point was “Data, data, data.” The author writes, “A good New Year’s resolution for marijuana policy watchers: take a deep breath (preferably of clean air) and think about data empirically, not emotionally.” This work contributes to that charge and attempts to understand medical marijuana policy at a nuanced, yet empirical level.

This analysis improves our understanding of why states adopt medical marijuana policies. I find that internal determinants and institutional features have a significantly greater effect on adoption than external determinants, such as neighbor adoption. In particular, state ideology, fiscal needs, and access to the ballot initiative increase the
probability of adoption. These same factors are likely to affect the adoption of other marijuana policies such as legalization and decriminalization.

It is clear that statutory language matters and that it varies even in similar policy domains. Moreover, the weak correlations between different dimensions of the law, as expressed in the factor analysis, illustrate that laws on the same broad topic may differ greatly on the details. This should caution scholars to consider the content of a policy. Most diffusion studies reduce these complex policies into dummy variables. Scholars should note whether a state law at time $t$ is really inspired by another state law at $t-1$ or if they are very different in content. This is missed when policies’ content is treated as afterthought (Hacker 2010).

Second, the results strongly support that law writers over time are opting for more specificity and, as a consequence, more control over the implementation of policies. While this mitigates Lowi’s (1969) fears of “policy without law,” it adds to the thick rule books that Howard (2014) believes obstruct human judgment.

This preliminary study makes three contributions: it provides an empirical explanation for why states adopt medical marijuana policy, it provides a method to measure statute specificity systematically that should be applicable to other policy areas and it provides a basic model for predicting specificity. Moreover, this essay sheds light on a number of empirical puzzles that must be considered as scholars and practitioners address marijuana policy.
References


http://medicalmarijuana.procon.org/


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