

Co-opt or co-exist? A study of medical cannabis dispensaries' identity-based responses to recreational-use legalization in Colorado and Washington

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Abstract

When recreational cannabis dispensaries first entered the U.S. market in 2014, how did incumbent medical cannabis dispensaries react? Did they emphasize their distinct identity as medical providers, distancing themselves from recreational dispensaries and those consumers who consume cannabis recreationally, or did they downplay their medical orientation in order to compete directly for potential resources? In this study, we seek to develop understanding of how local resource and sociopolitical contexts shape and constrain incumbents' strategic responses to new category emergence. We propose and find that medical dispensaries in communities with weak sociopolitical support for recreational cannabis legalization advance identity claims that sharpen their medical orientation as the recreational cannabis dispensary density increases. In contrast, medical dispensaries faced with a local population that supports recreational use move to directly compete for control of overlapping regions of resource space by de-emphasizing identity-based distinctions between medical and recreational dispensaries. We further find that the preferences of a medical dispensary's existing customer base also influence the identity claims it advances in response to recreational dispensary competition. Our findings help to advance understanding of processes underlying the strengthening and weakening of boundaries in the organizational world.

In 1996, California became the first state to legalize cannabis use with the passage of Proposition 215, the Compassionate Use Act (Sacco and Finkle 2014). Drafted by a broad coalition of activist groups, Prop. 215 promoted the right of “seriously ill” patients to obtain and use cannabis for medical purposes based on the recommendation of a licensed physician (Heddleston 2013). In the years since its passage, influential social movement organizations such as The National Organization for the Reform of Marijuana Laws (NORML) and Americans for Safe Access (ASA) have continued to frame cannabis as medicine that relieves the pain of patients suffering from a variety of illnesses, from debilitating conditions such as cancer, multiple sclerosis, and AIDS, to milder health problems such as insomnia, anxiety, and migraines (Dioun 2014). This depiction of cannabis as therapeutic has been bolstered by a number of scientific studies indicating some benefit of cannabis for conditions such as chronic pain, spasticity, and nausea (for a review, see Whiting et al. 2015). The success of cannabis’s therapeutic framing can be seen through the spread of statewide ballots legalizing cannabis for medical purposes; 18 states had enacted pro-medical cannabis legislation by the end of 2011 (Pacula and Sevigny 2014).

In late 2012, this steady progression became unsettled when citizens in Colorado and Washington voted on ballot initiatives legalizing the sale of cannabis for adult recreational use. Rather than framing cannabis use as a medical issue, initiative proponents emphasized the economic, public health and safety, and social justice benefits of regulating the sale of a substance deemed less harmful than alcohol (Leon and Weitzer 2014). Both state-wide ballots passed with roughly 55% of the vote. This paved the way for the earliest entrants into a new market category in 2014: the recreational cannabis dispensary.

The core empirical question our study investigates is how medical cannabis dispensaries reacted to the entry of recreational dispensaries in markets where both co-exist. After decades of medical use dispensaries as the only legally sanctioned retail entities in this

market, the regulatory creation of this new organizational form represented not only a threat to existing lines of resources but also a fundamental challenge to the “meanings and order” underlying the social identities medically focused dispensaries had cultivated over the years (Fligstein and McAdam 2011:5). Medical dispensaries could thus be expected to engage in strategic and identity-based actions to defend their interests and social positions (Fligstein, 2001; McDonnell and King 2013; King and Walker 2014). But how did medical marijuana dispensaries attempt to do so? Did they emphasize their distinct identity as medical-use providers, distancing themselves from recreational dispensaries and those consumers who consume cannabis for recreational purposes? Or did they downplay their medical orientation in order to compete directly for potential consumers?

Reframed in theoretical terms, did medical cannabis dispensaries advance identity-based claims that strengthened or weakened the boundary separating them from their recreational counterparts? There exist numerous studies in organizational theory, organizational and economic sociology, and strategy that illustrate processes underlying the strengthening and weakening of boundaries in the organizational world (e.g., Ruef, 2000; Lounsbury and Rao 2004; Weber, Heinze, and DeSoucey 2008; Sine and Lee 2009; Khaire and Wadhvani 2010; Negro, Hannan, and Rao 2011; Jones, Maoret, Massa, and Svejnova 2014). Some show that incumbent category members respond to new category emergence by directly competing for control of overlapping regions of resource space--for example, by adding new technologies, products, or services that incorporate salient features from the new category (Benner 2010; Rao, Monin, and Durand 2003, 2005). Others show that organizations shift location in resource space in order to reaffirm the distinctive nature of their existing social position and thereby increase differentiation in targeted positions vis-à-vis new category rivals (Negro et al. 2011). Currently, we lack a clear understanding of the

social, economic, and institutional conditions that push organizational actors in one direction versus the other (King, Clemens, and Fry 2011).

A key focus of our study is on factors that constrain incumbent category members' identity-based responses to the threat presented by new category emergence. Constraint plays a foundational role in the creation of new categories (Pontikes 2012). Presumably, new category members are able to enter and thrive when incumbents are unable to effectively respond to changes in their resource and market conditions. Considerable literature highlights internal sources of constraints, such as an organization's age, size and prior history of changes (Hannan and Freeman 1977; Freeman and Hannan 1983; Delacroix and Swaminathan 1991; Haveman 1993; Amburgey, Kelly, and Barnett 1993; Dobrev, Kim, and Carroll 2003). We complement this rich literature by focusing on external constraints—pressures emanating from external stakeholders such as regulatory agencies, local voting populations, and clientele—that shape the actions incumbent category members take in response to an emerging category. Integrating insights from several subfields within organizational and economic sociology, we develop theory regarding the factors that shape the way incumbent category members respond to and manage their identities vis-à-vis new category competitors.

We begin by briefly outlining the evolution of the cannabis industry in the U.S., with a particular focus on the two states that passed recreational cannabis-use ballots—Colorado and Washington. We then develop hypotheses of how varying resource-based and sociopolitical factors affected the way in which medical cannabis dispensaries reacted to the emergence of the competing recreational form where both co-exist. We focus on medical dispensaries' strategic reactions during the early period of new category emergence—from July, 2014 to July, 2015. It is during this unsettled period, when there is considerable uncertainty regarding the “what the purpose of the field is, what positions the actors occupy,

and how actors come to understand what others are doing” that we are particularly likely to capture concerted efforts by dispensaries to jockey for favorable market positions (Fligstein and McAdam 2011:5). We use a unique dataset gathered from a collection of online, government, industry, and academic-run resources to test our theory.

The cannabis industry in the U.S.

Since 1970, the federal government has deemed cannabis a Schedule I drug, indicating “a high potential for abuse, no accepted medicinal value in treatment in the United States, and evidence that there is a general lack of accepted safety for its use even under medical supervision” (U.S. Drug Enforcement Administration 2013). Possession of any amount of cannabis is considered a federal offense, punishable through jail time and substantial fines. This position diverges considerably from what national surveys indicate about the evolving public stance on cannabis, however. From 1997 to 2010, the percentage of Americans who support legalizing cannabis for medical use grew from 69% to 81% (Langer 2010). National Gallup polls also find growing national support for recreational-use cannabis legalization, from 34% in 2004 to 50% in 2013 (Saad 2014).

By mid-2013, voters in 21 states and the District of Columbia had passed state ballots allowing for some degree of possession and use of medical-use cannabis by qualified patients (Sevigny, Pacula, and Heaton 2014). Medical cannabis laws vary across states; for example, while some states created state-licensed medical cannabis dispensary programs, others only permit home cultivation of cannabis, while still others are silent as to the source of supply (Pacula and Sevigny 2014). Laws further vary within states, as local communities often diverge in their views on cannabis legalization despite general growth in support for legalization. Many local municipalities within legalized states have enacted laws banning

cannabis dispensaries within their jurisdictions; others have adopted a range of cultivation, zoning, signage, and licensing and permitting restrictions (Salkin and Kansler 2010; Daley 2012).

Amid this complicated patchwork of regulatory stances towards cannabis, a growing number of medical-use cannabis dispensaries have set up shop. Exact numbers are difficult to come by at the national level given the murky legal status of dispensaries in many geographic locations. Based on consulting firms' estimates, Mullaney (2013) reports the number of legal cannabis dispensaries operating in the U.S. to be around 2,000 in 2013, with roughly \$1.5 billion in annual legalized sales. In 2014, the legal market was estimated to have grown to \$2.6 billion (The Economist 2015). Studies suggest that regulations allowing the production and sales of cannabis have contributed to a maturing of the market by driving down prices and thereby increasing the prevalence of cannabis use (Pacula and Sevigny 2014; Pacula and Lundberg 2014).

In Colorado and Washington, the possession and use of cannabis for medical purposes has been legalized since 1998 and 2000, respectively. Voters in both states passed ballot initiatives legalizing the sale of cannabis for adult recreational use in November 2012. Key aspects of both recreational legalization programs are similar; both legalize up to one ounce possession for state residents ages 21 and over for recreational use, set similar DUI policies, establish extensive licensing, taxation, and product safety testing programs for recreational cannabis growers, processors, and retailers, and impose higher tax rates on recreational relative to medical use cannabis sales (Henchman 2014; Wallach and Hudak 2014).¹ In both states, medical dispensaries continue to exclusively service customers with qualifying medical conditions. Consumers are required to present a medical cannabis recommendation

¹ In Washington, medical cannabis dispensaries are not sanctioned or licensed through the state, and are therefore not subject to the state's cannabis taxes.

issued by an approved healthcare provider, as well as proof they are state residents and at least 18 years of age.

Factors shaping medical cannabis dispensaries' identity-based claims

Our theory development concerns factors influencing the identity-based claims medical cannabis dispensaries made in response to the early emergence of the recreational-use competitor form. These responses were likely shaped not only by the intensity of resource competition posed by recreational dispensaries in local markets, but also by concerns with identity, legitimacy, and reputation (King and Pearce 2010; Fligstein and McAdam 2011; McDonnell and King 2013; Walker and Rea 2014). Organizational actions are strongly influenced by the desire to be seen as socially acceptable and appropriate (Meyer and Rowan 1977; DiMaggio and Powell 1983). By adopting and maintaining socially approved practices and features, organizations gain legitimacy (Zuckerman 1999; Hannan, Pólos, and Carroll 2007). Changes in these accepted features may violate the premises upon which existing resource relationships have been established and harm an organization's standing in its local community. This suggests a key constraint on medical dispensaries is the loss of sociopolitical legitimacy that may result from identity-based claims that indicate a movement away from a medical-use orientation and towards recreational consumption of cannabis.

Existing studies find that the rise of a new category often represents a disruption of the status quo, as new category entrepreneurs seek to invoke alternative, culturally resonant logics that reorient the institutional and material infrastructure supporting a market (Haveman, Rao, and Paruchuri 2007; Schneiberg 2007; Schneiberg, King, and Smith 2008). In the cannabis case, proponents of recreational legalization in Colorado and Washington attempted to reorient the existing focus on cannabis as medicine by appealing to economic,

public safety, and criminal justice benefits of regulating cannabis in a manner akin to alcohol (Leon and Weitzer 2014). Yet, the extent to which these alternative logics gained traction within local communities varied considerably in the two states studied. County-level voter support for recreational legalization ranged from a low of 31.9% to a high of 79.1% in favor of recreational legalization in Colorado, and from 37.8% to 68.3% in favor in Washington. We expect this variation in local institutional support for recreational legalization to be an important contextual driver of variation in medical dispensaries' subsequent identity claims (King, Clemens, and Fry 2011).

More specifically, if the community a medical cannabis dispensary is embedded within is generally distrustful or disapproving of recreational-use dispensaries, association with the new category is likely to be viewed as a threat to the dispensary's legitimacy. Phillips and Kim (2009) observe this kind of dynamic in their study of Victorian Era music recording firms' entry into the early jazz market. Despite the rapidly increasing demand for "lowbrow" jazz, members of the cultural elite disapproved and actively sanctioned lowbrow jazz. In order to preserve their identity and existing ties to the elite, recording firms concealed their entry into lowbrow jazz through the use of pseudonyms. This suggests that, in communities where recreational legalization is not supported by the voting citizenry, a dispensary's material concerns (such as gaining new potential customers) and non-material concerns (such as maintaining a positive public perception) may be in tension. As recreational dispensaries begin retail operations and grow in proximate locations, medical dispensaries are expected to advance claims that sharpen the identity and ideological distance between themselves and their recreational-use counterparts.

On the other hand, in communities where recreational use legalization enjoys greater sociopolitical legitimacy, medical cannabis dispensaries are likely to find it more socially accepted to engage with recreationally focused customers (Aldrich and Fiol 1994; Sine,

Haveman, and Tolbert 2005; Hannan et al. 2007). In this kind of climate, increasing recreational density is likely to be viewed as a sign of potential market opportunities, pushing medical cannabis dispensaries to shift toward the recreational category in their identity claims. The resulting action would contribute to a blurring of categorical boundaries, as members of the incumbent category engage in actions that bring them closer to the identity/resource position of the new category. We thus expect the following:

Hypothesis 1a: In locations where sociopolitical support for recreational cannabis legalization is weak, medical cannabis dispensaries will advance more identity claims that emphasize their medical orientation as recreational cannabis dispensary density increases.

Hypothesis 1b: In locations where sociopolitical support for recreational cannabis legalization is strong, medical cannabis dispensaries will advance more identity claims that emphasize their appeal to recreational consumers as recreational cannabis dispensary density increases.

Another contextual factor likely to shape medical cannabis dispensaries' strategic responses is their own category's standing within their states' regulatory and political infrastructures. Major differences existed between Colorado and Washington's stances towards medical cannabis dispensaries. Colorado already had a well-developed infrastructure closely overseeing the licensing and regulation of medical cannabis dispensaries at the time of its 2012 recreational vote. The structure of the state's recreational cannabis licensing/regulatory structure largely mirrored its medical counterpart. The existing medical sector supported the ballot initiative, in no small part because it privileged existing medical cannabis businesses in granting the earliest "conversion" licenses to recreational retail sales (Gray 2013; Brohl, Kammerzell, and Koski 2015; Leon and Weitzner 2014).

In contrast, Washington's medical dispensaries occupied a legal grey area since medical-use dispensaries have never been formally allowed or regulated at the state level. When adopting its new recreational cannabis structure, Washington imposed strict licensing,

production, and tax-based constraints on dispensaries operating in the recreational domain and prohibited the conversion of existing medical to recreational dispensaries (Gray 2013; Brohl, Kammerzell, and Koski 2015). In contrast to the Colorado case, the medical cannabis sector in Washington vocally opposed recreational legalization, citing the measure as too restrictive (Leon and Weitzner 2014).

Scholars of field theory suggest that incumbent actors' status and social position will shape how they respond to rules as well as to new challengers to their markets (Fligstein and McAdam 2011; 2012; Waldron, Navis, and Fisher 2012). In unsettled times, incumbents who hold considerable power and standing are expected to engage in actions that protect and maintain the existing power arrangements that favor them. Translating this to the realm of impression management, McDonnell and King (2013) find that organizations with higher reputational standing are more likely to increase pro-social claims that reaffirm their positive public images in response to social movement boycotts relative to organizations lower in the market hierarchy.

In the cannabis case, Colorado medical dispensaries enjoyed greater standing in the state's political infrastructure relative to Washington's. This suggests that they will more likely than their Washington medical counterparts engage in identity-based claims that reaffirm their existing medically-focused orientation, sharpening the boundaries between themselves and their recreationally focused counterparts.

Hypothesis 2: Relative to medical cannabis dispensaries in Washington, medical cannabis dispensaries in Colorado will advance more identity claims that emphasize their medical orientation as recreational cannabis dispensary density increases.

We also expect dispensaries to be influenced by the existing set of exchange relationships they are embedded within. A diverse body of research holds that organizations rely on network ties as conduits to key resources such as information, funding, labor, and

clientele (e.g., Galaskiewicz and Wasserman 1989; Davis 1991; Burt 1992; Uzzi 1997; Stuart 1998; Ingram and Roberts 2000; Podolny 2001; Lounsbury 2001; Owen-Smith and Powell 2004). Not surprisingly, the preferences exhibited by key exchange partners influence the actions adopted by the focal organization (Pfeffer and Salancik 1978). For example, Beckman and Phillips (2005) find that law firms' promotion of women to partner rank is influenced by the gender composition of their corporate clientele. Law firms whose corporate clients had females in key leadership positions experienced greater growth in the number of female partners.

This suggests that, when considering responses to the growing threat presented by a new category, medical cannabis dispensaries will be influenced by the characteristics, preferences, and needs of their existing customer base (Christensen and Bower 1996; Sull, Tedlow, and Rosenbloom 1997). A dispensary that has built up a base of clientele clearly situated within its existing medical-use niche faces pressure to remain there. Its identity is strongly tied to a medical orientation; an identity that is likely reflected in internal practices, structures, and values. As Selznick (1957: 18) notes, these supportive external ties "bind the organization to specific aims and procedures" and limit its strategic flexibility in the face of external change. The constraining nature of these ties help in part to explain why organizations that have been historically successful often persist with their existing strategies through environmental change (e.g., Ghemawat 1991; Rumelt 1995; Audia, Locke, and Smith 2000; Kraatz and Zajac 2001).

In the cannabis case, medical dispensaries whose existing customer base displays a clear medical orientation are unlikely to respond to the emergence of the recreational dispensary category with identity claims that blur the boundaries separating the two. Instead, we expect the following:

Hypothesis 3: Medical cannabis dispensaries whose existing clientele display a clear medical orientation will advance more identity claims that emphasize their medical orientation.

Data sources

To test our hypotheses, we collected data on cannabis dispensaries and user characteristics come from Weedmaps.com--a website often referred as the “Yelp of Cannabis” (Robinson 2014). Although a number of websites covered aspects of the cannabis industry during this period, we chose Weedmaps because a comparison of data available from the popular websites in July 2014 showed that Weedmaps.com provided substantially higher coverage of the dispensaries operating in the United States relative to the other websites.² Using Weedmaps, consumers can look up dispensaries in their local area and access information such as product menus, discounts, and user reviews. We obtained the data from Weedmaps on a bimonthly basis for a year, from July 2014 to July 2015. For the purposes of our current study, we focus on medical cannabis dispensaries located in Colorado and Washington.

Weedmaps provides four major types of data about the dispensaries. The first type is information on the dispensary’s characteristics, including name, physical address, hours of operation, phone number, website and email address, and current number of “hits” (i.e., the number of times the dispensary’s online profile page has been visited). The website also displays whether the dispensary is a medical or recreational dispensary, and whether it has a physical storefront location or is delivery based.

The second type of information is the self-description dispensaries post on their Weedmaps webpages. The description section is typically divided into “general description,” “announcement,” and “for first time patients.” Third, dispensaries list their full product

² In our July 2014 searches, the website Leafly listed 1,051 dispensaries, THC Finder listed 3,365, and Potlocator listed ~2,500. In comparison, Weedmaps listed 4,423 dispensaries.

menus on the website. The menu contains lists of cannabis strains sold, prices, and other items, such as edibles, concentrates, or drinks. All of this information is uploaded and refreshed by the dispensaries that pay a monthly fee in order to be listed on Weedmaps.

Lastly, clients of the dispensaries may post reviews to the Weedmaps.com websites (see Figure 1 for an illustration). A review includes (1) a rating, which comprises of one to five star ratings along five dimensions (price, staff, accessibility, bud quality, and atmosphere), (2) a textual review (optional), (3) the timestamp when the review was posted, and (4) the user ID of the submitter of the review. Dispensaries may also post replies to specific comments; roughly one-third of the dispensaries in our sample posted at least one reply to its reviewers.

-- Insert Figure 1 here --

Medical dispensaries' identity statements.

To capture the identity-based actions medical dispensaries took in response to recreational dispensary emergence, we analyzed identity-related features referenced in dispensaries' self-created general descriptions on Weedmaps over time. The following are excerpts from two dispensaries' self-descriptions on Weedmaps:

Trenchtown Medical Marijuana Center (Denver, Colorado)

Welcome to Trenchtown Medical Marijuana Center - Music, Art, and Love Inspired Cannabis. Trenchtown is a Denver, Colorado Medical Marijuana Center dedicated to providing high quality and affordable cannabis to patients. We aim to educate our patients about cannabis treatments and other alternative health approaches to supplement their medicine. Trenchtown advocates for a change; change in the way medical cannabis is sold, change in the way medical cannabis is regulated, and change in the way medical cannabis is viewed. We seek to be a voice for the implementation of the best practices in our industry. The Trenchtown brand was launched on August 5th, 2011. Trenchtown launched on the belief that many patients are not happy with the new look of their primary caregiver. The Trenchtown brand is about people first, not profits. As Trenchtown grows, our advocacy and patient services grow, too.

High Country Healing 2 (Alma, Colorado)

Come on up to 10,600 feet and experience the highest incorporated medical cannabis center in North America, and the home of Ammericamm.org. Jack Herer once said, “Cannabis grown at higher elevation is more potent and if grown anywhere above 5,000 feet it’s twice as potent.” We can all agree the cannabis enjoys growing in the mountains and has deep genetic roots that have been gifted to us from mountain regions all around the world.

As these examples show, a dispensary’s self-description provides a reflection of its identity—the features that organizational members believe define the kind of organization it is (Albert and Whetten 1985). Identity statements not only reflect the kind of organizational category a dispensary belongs to (e.g., “medical marijuana center”), but also the features that the dispensary believes makes it and/or its offerings distinctive relative to competitors (e.g., Trenchtown’s emphasis on its advocacy orientation; High Country Healing’s emphasis on the potency of its products). Identity statements may also reflect a dispensary’s orientation toward external stakeholders such as clientele (Brickson 2005). For example, Trenchtown’s self-description includes explicit reference to their efforts to educate patients, reflecting both a key aspect of its client orientation (educational) and the particular type of clientele that it targets (qualified medical patients).

To measure medical dispensaries’ identity-based claims with respect to the boundary separating medical from recreational forms, we first developed a coding scheme of identity-related features referenced through dispensaries’ self-descriptions. Two of the study authors independently coded 100 dispensary self-descriptions from Weedmaps each (200 self-descriptions total). The authors then compared and contrasted coded features, discussing how each was used in the dispensary self-descriptions as well as how each related to broader themes (such as “medical-uses”, “quality”, “legal compliance”). Over several iterations, agreement was reached on the set of relevant feature terms and the broader themes each related to. The two study authors then coded 50 additional randomly selected dispensary self-

descriptions, verifying that the coding scheme adequately captured what dispensaries were aiming to convey and adding any additional features not covered in the first coding step. The study authors also coded two sets of randomly selected dispensary reviews (50 reviews each) to verify the applicability of the feature/theme list to external stakeholders' assessments of dispensaries and to determine if any additional features should be added. The final set of codes consists of 838 feature terms, grouped across 16 themes. Table 1 presents the set of themes, with examples of phrases coded under each.

We then created a software program to search the full set of dispensaries' self-descriptions and create a dataset of dispensaries and the number of times that they referenced each identity-related theme in each batch. In some cases, dispensaries did not show up in a particular batch but reappeared in the next batch.³ In those cases, we assigned the average of the previous batch's and following batch's theme counts to the current batch. In other cases, dispensaries never provided a self-description to Weedmaps; these 291 dispensaries (~28%) were omitted from our sample. The final dataset is an unbalanced sample of 750 medical dispensaries.⁴

As noted earlier, we presume that identity statements reflect a dispensary's beliefs about the kind of organization it is and what makes it and/or its offerings distinctive relative to those of competitors. We check the validity of this assumption by examining the relationship between a dispensary's average price for cannabis strains and the proportion of its total themes focusing on price. Dispensaries that are less competitive in their pricing should be less likely to emphasize this dimension. We find that dispensaries that charge higher prices focus less on price in their self-descriptions ($p < 0.05$). We further find that

³ Interviews with dispensary personnel suggest this may be due to a missed payment to Weedmaps.

⁴ We also use data from 185 recreational dispensaries operating in CO and WA during the time period to construct key independent and control variables. 27 Colorado-based medical dispensaries in our dataset converted to recreational-use dispensaries during the study period. After converting, these dispensaries were dropped from analyses focusing on medical dispensaries only.

dispensaries with more extensive product menus tend to have a higher proportion of total themes focused on products ($p < 0.05$).⁵

Measures

Medical dispensaries' identity statements with respect to the boundary between medical and recreational forms. Figure 2 compares the thematic content of medical versus recreational dispensaries' self-descriptions. Overall, the two most frequently referenced categories are 'medical use' and 'products'. As one might expect, medical dispensaries focused significantly more on 'medical use' ($p < 0.001$), while recreational dispensaries focused more on 'products' ($p < 0.001$). A comparison of the themes in reviewers' comments shows that reviewers of medical dispensaries similarly focus significantly more on 'medical use' ($p < 0.001$), and less on 'products' ($p < 0.01$). We use dispensaries' focus on these two themes to construct our dependent measures of identity claims that emphasize a dispensary's medical orientation versus appeal to recreational consumers.

-- Insert Figure 2 here --

Our first measure reflects to extent to which each dispensary's self-description reflects a clear medical orientation. The following is an example of a dispensary whose self-description emphasizes its medical orientation by listing specific medical conditions their services cater to:

<dispensary name> offers safe access to consulting and dispensary services for registered medical marijuana patients suffering from AIDS, cancer, glaucoma, multiple sclerosis, hepatitis C, crohn's disease, chronic pain and other debilitating conditions.

⁵ Based on fractional logit analyses conducted on the most recent batch of data downloaded from Weedmaps.com (July 15, 2015) (Papke and Wooldridge, 1996).

In other cases, dispensaries do not list specific conditions, but emphasize their medical orientation through general references to medicine and patient care. For example:

Our mission is to provide a way for our members to collectively and cooperatively cultivate and distribute marijuana for medical purposes to qualified patients and primary caregivers who come together to collectively and cooperatively cultivate physician-recommended marijuana.

We operationalize a dispensary's identity statement medical orientation through the proportion of total codes that reference the 'medical use' theme in its self-descriptions. Words or phrases that fall under the 'medical-use' theme include references to the therapeutic functions of cannabis, diseases, symptoms, and medical conditions, as well as general references to medicine and patient care. The following are excerpts from a Washington dispensary's self-description that shows increased focus on medical uses of cannabis over the time period studied:

July, 2014: A local, quality access point. We strive to give you an experience that feels accessible to everyone. ...

March, 2015: Medical patients only please. A local, quality access point. We strive to give each patient the quality time they need to leave happy. ...

In the more recent self-description, the dispensary highlights up front its focus on medical patients and changes from stating it provides an accessible experience for "everyone" to "each patient". By increasing its emphasis on the medical uses of cannabis, the dispensary sharpens the distinction between it and its recreational use counterparts, and explicitly defines its client base as patients who use cannabis for medical purposes. A similar dynamic can be seen in change in introductory sentences of the following dispensary's self-description:

Feb, 2015: Hello, We are NW BEST! We have been involved in the MMJ community for years. We strive to bring you great service and a timely delivery.

May, 2015: Hello friends and fellow patients, we are a collective of medicinally oriented gardeners in Clark County that are dedicated to offering medicine of a pristine quality for a fair and reasonable donation.

Our second measure is the proportion of dispensary identity themes that reference the types of products sold. Words or phrases that fall under this theme include “shatter”, “indica”, “medible”, “pre-roll”, and “vapor pen.” Colorado and Washington both implemented regulations designed to control the production and supply of recreational cannabis in the markets’ early stages, providing medical dispensaries with pricing and product advantages (Hickey 2014; Huden 2014). Medical dispensaries attempting to attract or retain recreationally-oriented consumers are likely to highlight products (and de-emphasize medical uses of cannabis) in their identity statements. In the following excerpts, a Washington dispensary increased its focus on products by adding a list of product types promoted through its daily specials:

July, 2014: we guarantee all of our products. If you don't like it, you may bring it back. Patient satisfaction is our number one goal. New patients are always welcome. All you need is your WA state ID, and your original copy of your medical marijuana authorization and you get access to all of our amazing products. Like us on Facebook!
...
Daily Specials! Monthly raffle for an ounce of patient’s choice! Wheelchair accessible!

March, 2015: We Guarantee ALL of our Amazing Products 100%!! Patient Satisfaction is Our Number One Goal!! New Patients are always Welcome! Please bring your WA State ID, and Original copy of your Medical Marijuana Authorization. Like us on Facebook! Follow us on Instagram! ...
Check out our daily deals!!! Medible Monday! Enjoy a free \$5 medible on us! Tincture Tuesday! Save 10% on any tincture! Wax Wednesday! Take \$5 OFF any gram of wax! Take a toke Thursday! Enjoy a free joint on us! Free gram Friday! Enjoy a free gram on us! Shatterday Saturday! Take \$5 off any gram of wax/shatter!

There is a moderate negative correlation between dispensaries’ focus on medical use versus products (-0.31). While high values of one constrain the range of possible values of

the other, most dispensaries do not hit a ‘ceiling’ in terms of focus along either of these two dimensions. The mean proportion of dispensaries’ themes in both categories is 0.39, suggesting there is considerable room for most dispensaries to adjust focus along both dimensions. Together, these two variables reflect different aspects of the positioning of medical dispensaries in identity space with respect to the boundary distinguishing them from their recreational counterparts.

Independent Variables: Our first independent variable is the 1-month lagged localized density (LD) of recreational dispensaries each medical dispensary faces. We construct this measure for each medical dispensary by weighting recreational dispensaries by the inverse of their distance from the focal medical dispensary and summing these weighted values (Sorenson and Audia 2000). The following formula describes the localized density measure for each dispensary i in each batch (batches are indexed by t).

$$LD_{it} = \sum_{j \in \text{recreational-at-time-}t} \frac{1}{(1+d_{ij})} \quad (2)$$

where j indexes all recreational dispensaries in the focal dispensary’s same state and d_{ij} is the geographical distance between the dispensaries.

Our next independent variable is the localized sociopolitical legitimacy of recreational dispensaries, measured through the percentage of voters in the county who supported the introduction of recreational cannabis in Colorado and Washington’s state-level ballots legalizing recreational cannabis.⁶ Note that because we only have one observation for each county, this measure is time independent. In a number of our models, we split counties into high versus low recreational dispensary legitimacy, based on whether their vote supporting recreational legalization was above or below the state-wide level of support (55%) for both the CO and WA ballot measures.

⁶ Data collected from <http://data.denverpost.com/election/results/amendment/2012/64-legalize-marijuana/> and http://results.vote.wa.gov/results/20121106/Initiative-Measure-No-502-Concerns-marijuana_ByCounty.html, both accessed Nov 17, 2014.

We check the criterion validity of this measure by examining its relationship with rates of user profile deletions from Weedmaps. We expect that recreational dispensary reviewers in locations with lower recreational dispensary legitimacy will be more prone to deleting their user profiles relative to reviewers in other locations. To test this, we assume that a user deleted his/her profile if all of the reviewers' reviews disappear from Weedmaps from a given point on, even though at least one of the dispensaries they had reviewed continues to exist. We compare the mean proportion of dispensaries' reviewers who delete their profiles for recreational dispensaries in high versus low legitimacy locations (N=239).⁷ Figure 3 shows that the mean proportion of recreational dispensary reviewers who delete their profiles is significantly higher in low legitimacy locations ($p < 0.05$, t-test of means). A fractional logit model including controls for each dispensary's state, whether it belongs to a larger organizational grouping, and the natural log of count of Weedmaps page visits, confirm that recreational dispensary legitimacy has a significant negative effect on the likelihood of a user profile deletion ($p < 0.05$).

-- Insert Figure 3 here --

To examine the impact of existing customers' medical orientation on medical dispensaries' likelihood of re-sharpening boundaries, we constructed time-varying measures of each dispensary's reviewers' focus on 'medical use' themes in the text of their reviews. To construct this measure, we applied the same coding scheme and process as in the dispensary coding to construct measures of the theme focus within each review. We then calculate the proportion of a dispensary's reviews that include references to medical uses of cannabis and

⁷ Based on deletion rates calculated as of June 1, 2015.

lag this proportion by one month in the models presented. Dispensaries with no reviews were excluded from models of the effects of client base preferences.

Control variables. We include a number of controls for dispensary characteristics that may affect medical dispensaries' identity statements. The first is tenure on Weedmaps, based on the number of years since first listing, since more established dispensaries may be more tied to their original identity. The second is whether the dispensary is a member of a larger organizational chain (reflected in a shared website, email, or phone number with other dispensaries listed on Weedmaps). In our models, we separate organizational chains into two types—those that include only medical dispensaries, and those that include both medical and recreational dispensaries—in case these differences affect medical dispensaries' identity-based positioning choices. We also control for whether a dispensary is delivery-based or a storefront operation and the natural log of its number of Weedmaps "hits", or webpage visits. In some models, we control for each medical dispensary's focus on medical use and product themes at the time it first entered the dataset (original proportion medical use and product themes, respectively). This allows us to determine the extent to which a dispensary's existing identity shapes its subsequent moves towards or away from a medical orientation, and whether our hypothesized effects of localized sociopolitical legitimacy, competitive pressures, and customer orientation hold when early identity-based orientation is included in our estimation.

We also construct localized measures of external factors that may affect dispensaries' strategic positioning choices. The first is general interest in cannabis dispensaries, based on aggregated counts of Weedmaps visits across neighboring dispensaries. This variable is inverse-distance weighted and summed using the following equation:

$$Int_i = \sum_{j \in \text{dispensaries}} \frac{int_j}{(1+d_{ij})} \quad (3)$$

where j indexes all cannabis dispensaries in dispensary i 's same state, int_j indicates the count of Weedmaps visits to dispensary j ; and d_{ij} denotes in miles the geographical distance between the dispensaries. Because of skew, we use the natural log of this measure in our models.

The second measure is the proportion of the focal dispensary's county population that is age 15-34, since regular consumption of cannabis is heavier among younger age brackets (Doherty, Tyson, and Weisel 2015).⁸ We also control for the localized density of medical dispensaries, to account for the impact that competition from neighboring medically focused competitors may have dispensaries' identity-based positioning. To construct this measure, we use the localized density measure presented in equation 2, weighting neighboring medical dispensaries by the inverse of their distance from the focal medical dispensary.

-- Insert Table 2 and 3 here --

In some models, we also include measures related to dispensary's product and pricing strategies: the extensiveness of each dispensary's product inventory (the natural log of the count of different products listed on its Weedmaps product menu) and the dispensary's mean price per gram for cannabis strains sold. Product menus are available for only a subset of dispensaries (597 of the 750 medical dispensaries in our dataset), limiting sample size for models in which these measures are included. All time-variant measures used by independent or control variables are lagged by one month. Descriptive statistics and correlations for the variables used in our main dispensary-level regressions are provided in Tables 2 and 3, respectively.

⁸ Based on data from the 2013 American Community Survey.

Estimation strategy

We estimate panel models at the dispensary level, investigating the effects of recreational dispensary density, clientele focus on medical use, and their interactions with local sociopolitical support for recreational use dispensaries on medical dispensaries' focus on specific identity themes.

Fixed and random effects specifications product consistent results vis-a-vis our hypotheses despite Hausman specification tests that indicate systematic differences in coefficients (Hausman 1978). Because we are interested in estimating interactions of competitive density with time-invariant local characteristics, we present findings from random effect specifications as well as fixed effects specifications where we split our sample into high versus low legitimacy locations and estimate the impact of recreational dispensary density within each separately.

Results

Table 4 presents the results of panel models estimating the extent to which medical dispensaries focus on medical uses of cannabis in their identity statements. Models 1-5 estimate panel models with random effects at the dispensary level. In Model 1, the effect of neighboring recreational dispensary density is positive and significant, while the interaction effect between recreational density and localized recreational legitimacy is negative and significant. This suggests that, when recreational legitimacy is low, medical dispensaries increase their identity statement focus on medical uses of cannabis as recreational dispensary density increases. That is, consistent with Hypothesis 1a, medical dispensaries respond to increasing competitive pressures by emphasizing the boundaries that separate them from their recreational counterparts in locations where sociopolitical support for recreational dispensaries is weak. In places with higher localized legitimacy for recreational dispensaries,

however, medical dispensaries are less likely to respond to increases in recreational density by emphasizing medical use (consistent with Hypothesis 1b).

Similar effects are found in Model 2, which excludes dispensaries with no Weedmaps reviews. Model 2 also shows that a higher proportion of lagged reviewer focus on medical uses of cannabis increases a dispensary's subsequent focus on medical use in its identity statements. This supports Hypothesis 3, which holds that medical dispensaries whose existing customer base shows a stronger medical orientation will emphasize their medical origins in response to the emergence of the recreational competitor form. These main effects hold in Model 3 (which includes medical dispensaries' original focus on medical use in their identity statements), Model 4 (which includes lagged product and pricing measures), and Model 5, which includes lagged neighboring medical dispensary density.

-- Insert Table 4 here --

Models 6 and 7 estimate fixed effects specifications on dispensaries in high versus low legitimacy locations, respectively. These results are consistent with those in the random effects models. In high legitimacy locations, medical dispensaries decrease focus on medical use as recreational density increases, while in low legitimacy locations they increase focus on medicine use. According to the estimates in these fixed effects models, the expected difference in medical use focus between a medical dispensary in a high versus low legitimacy location in response to a one standard deviation increase in lagged rec. disp. density is 5% (focus decreases by 2% in a high legitimacy location, while it increases by 3% in a low legitimacy location). We also find that the effects of reviewers' medical orientation hold in low legitimacy but not high legitimacy areas.

Table 5 shows opposite patterns for medical dispensaries' focus on products in terms of medical dispensaries' reactions to increasing recreational dispensary density. In localities where recreational dispensaries experience low legitimacy, medical dispensaries respond to increases in recreational dispensary density by decreasing focus on products in identity statements. As recreational legitimacy increases, however, medical dispensaries' focus on products in their identity statement increases. This suggests (in line with Hypothesis 1a and 1b) that, in areas where recreational sociopolitical legitimacy is weak, medical dispensaries reinforce their existing niche in response to the recreational category's increasing presence rather than move to compete more directly by emphasizing products, as medical dispensaries in high legitimacy areas do. We also find that, while a stronger base of medically oriented reviewers decreases medical dispensaries' focus on products in high legitimacy locations, it does not have a significant effect in low legitimacy locations.

A number of control variables have significant effects on dispensaries' focus on medical uses of cannabis and on cannabis products. Dispensaries that are members of chains are less likely to focus on medical uses and more likely to focus on products in their identity statements. Meanwhile, medical dispensaries in locations with high local interest in cannabis dispensaries are less likely to focus on products. We also find that dispensaries' early identity focus influence their subsequent moves in identity space: dispensaries with greater 'original' focus on medical uses were more likely to increase focus on medical uses of cannabis, while dispensaries with greater 'original' focus on products were more likely to increase focus on cannabis products. Importantly, the introduction of these controls did not change the significance of our main variables.

Table 6 presents results of random effects models estimating effects for Colorado- and Washington-based medical dispensaries separately. We continue to find the expected effects of lagged recreational dispensary density and local sociopolitical legitimacy in

Colorado, but the effects are much weaker in Washington. This suggests, in line with Hypothesis 2, that medical dispensaries in Colorado (who enjoy greater standing in their legal and regulatory infrastructure relative to medical dispensaries in Washington) are more likely to advance identity claims that emphasize their medical orientation in response to recreational cannabis dispensary density increases. The effects of existing customer base orientation weaken considerably when the sample sizes are reduced to the state level.

Robustness checks

We perform several sets of supplementary analyses to investigate the robustness of the effects found in our main models. First, we conduct analyses at the locality level, using fixed effects models to estimate the impact of lagged recreational dispensary density on the average focus on medicine and product among medical dispensaries within each city. We find effects consistent with the dispensary-level analyses. Greater localized recreational crowding decreases focus on medical uses of cannabis in high legitimacy areas, and increases focus in low legitimacy areas (Table 7, Models 1-2). We find converse effects for focus on products (Table 7, Models 3-4): greater recreational crowding increases medical dispensaries' focus on products in high legitimacy areas, while it decreases product focus in low legitimacy areas.

We also estimated effects using (i) mixed models with random intercepts at the state, locality, and dispensary level and (ii) random effects poisson count models (with count of mentions of medical use themes as the dependent variable and controlling for count of words in dispensaries' self-descriptions on the right hand side).⁹ We also complement the panel models with logit models that estimate whether each dispensary increases its identity

⁹ Tables are provided for reviewers in supplementary file.

statement focus on medical use from the first to last time period it appears on Weedmaps during the time period studied (July 2014 - 2015), clustering standard errors at the locality level. Results using alternative specifications are similar to those in our main models estimating dispensaries' medical use focus, but substantially weaker for models estimating dispensaries' focus on products. The larger effect sizes for medical use are perhaps not surprising given that medical use is a historically resonant dimension that defines medical dispensaries, while product themes are less distinguishing as an identity marker.

Lastly, we re-estimated our main models, excluding several different subsets of the dispensaries in our main models: 1. dispensaries that did not change their Weedmaps self-descriptions over the time period studied (7% of sample), 2. had fewer than five unique reviewers (11% of sample), and 3. was a member of a larger organizational chain in which there was a recreational dispensary (5% of sample). Results using these limited samples are consistent with those presented in our main models for both focus on medical use and on products.

Discussion

In this paper, we have proposed a set of resource- and institutional- factors that affect whether members of an incumbent category will respond to new category emergence through actions that help to strengthen versus erode the boundaries that separate them. To test our theory, we focused on a setting with considerable variation in material and institutional conditions at both the organization and geographic locality level. We found that medical cannabis dispensaries in locations where boundary blurring poses greater threat to their own legitimacy are likely to respond to new category growth by emphasizing the identity-based differences between themselves and recreational dispensaries. In contrast, medical

dispensaries in locations where recreational dispensaries enjoy high sociopolitical legitimacy respond to new category growth by directly competing for control of overlapping regions of resource space. Dispensaries' existing influence and status also shaped their responses. Medical dispensaries in Colorado, who enjoyed greater standing in their state political infrastructure, were more likely to engage in identity-based claims that reaffirmed their distinct medical orientation relative to their less influential counterparts in Washington.

We also found evidence that dispensaries are further constrained by the preferences of their existing customer base. Dispensaries—particularly those in low legitimacy locations—emphasize medical uses of cannabis more when they have a reviewer base that exhibits a medical use orientation. Dispensaries with a medically oriented reviewer base are also likely to focus less on products in their identity statements--particularly in high legitimacy locations. Preferences of existing clientele for medical use strengthen the dispensary focus on medicine in low legitimacy areas and attenuate the focus on product in high legitimacy locations. We suspect that this is because medical dispensaries balance the preferences of their proximate exchange partners with the need to maintain perceptions of appropriateness and legitimacy among the broader community base (Suchman 1995). When their existing client base exhibits a medical use orientation in a community that does not support recreational legalization, medical dispensaries have strong incentive to emphasize the identity boundary distinguishing them from recreational dispensaries. In localities with higher support for recreational legalization, medical dispensaries are less constrained by concerns of general propriety and more open to attracting new recreationally focused customers. However, direct exchange partners' preferences still matter. When their direct ties exhibit a strong medical orientation, they are less likely to target recreational customers by emphasizing the appeal of their products. Future investigation into how dispensaries are shaped by diffuse versus

proximate ties may prove a fruitful avenue for enhancing understanding of how organizations navigate competing pressures in ambiguous contexts (Stark 1996; Lounsbury 2007).

Overall, we find considerable support for our framework, which identifies a set of key resource and institutional conditions that push incumbent category members to react in different ways to new category emergence. By developing this framework, we begin to address Lamont and Molnar's (2002: 187) push to "move beyond an accumulation of disconnected case studies" and develop general statements regarding "key *mechanisms* associated with the activation, maintenance, transposition, or the dispute, bridging, crossing and dissolution of boundaries." Along these lines, we hope to establish the generalizability of our findings in other settings. We expect, for example, that our theory extends to cases such as traditional energy companies' responses to the emergence of fracking companies, medical care facilities' responses to the entry of abortion clinics, tobacco retailers' responses to the entry of vape shops, and current "brick-and-mortar" universities' responses to online competitors. We expect in each of the cases that whether incumbent category members respond to new category emergence by adopting features from the new category or strengthening/resharpening boundaries will be influenced by exchange dependencies and localized sociopolitical legitimacy.

Our research also contributes to research on organizational identity, which has focused considerable attention on how entrepreneurs entering new market categories build a compelling shared identity—one that is both legitimate and distinctive enough to gain the consideration and appeal of audience members (Lounsbury and Glynn 2001; Navis and Glynn 2010; Kennedy 2008; Khaire and Wadhvani 2010; King, Clemens, and Fry 2011). On the one hand, legitimacy is often cultivated through the adoption of familiar practices and features (e.g., Glynn and Abzug 2002; Baron 2004; Navis and Glynn 2010). For example, Ruef (2000) finds that new health care organizational categories gain legitimacy by adopting

similar features and locating in positions close to incumbent categories in identity space. At the same time, members of the new category must emphasize the distinctiveness of their new ventures in order to successfully cultivate relationships with existing resource-holders or draw new audience members into the market (Deephouse 1999; Lounsbury and Glynn 2001).

King et al. (2011) further explore the impact of local institutional context on the extent to which new organizations adopt distinctive identity attributes. They find that diversity of organizing templates and repertoires in an organization's local environment play a key role—organizations are more likely to differentiate from related others when they are located in contexts where alternative organizational models already exist. In a similar spirit, we highlight the importance of local institutional and material resources on incumbent category members' identity-based moves in response to new category emergence. Our research contributes to understanding of how local conditions shape the way in which organizations shift their identities in response to new category threat, and thus paves the way for a broader understanding of institutional change mechanisms (e.g., Washington and Ventresca 2004).

Our research also contributes to work on competitive dynamics among organizational categories. As theories of competitive exclusion suggest, there are two general paths towards long-run equilibrium for organizational categories targeting similar regions in resource space: either a single category survives, or each category carves out a differentiated location and come to co-exist within their specialized niches (Popielarz and Neal 2007). Existing research points to several factors that may affect how new category members situate themselves vis-à-vis related incumbent categories. For example, according to resource partitioning theory, when resources are concentrated in a market's center and scale-based advantages in the center exist, new categories often enter and proliferate in specialized, peripheral niches (Carroll 1985; Boone, van Witteloostuijn, and Carroll 2002; Negro, Visentin, and

Swaminathan 2014). Alternatively, new categories may emerge in overlapping regions of resource space when supported by collective social movements that directly attack the foundations undergirding incumbent categories (Rao et al. 2003; Weber et al. 2008; Sine and Lee 2009). Such contextual factors shape the initial positioning of emerging categories and, as a result, the coevolution of “old” and “new” within a market.

Yet, as Geroski (2001) points out, the nature of this coevolution is also shaped—perhaps to an even greater extent--by the actions taken by incumbent category members in response to the new category. By developing understanding of external factors driving incumbent category members’ responses to the threat presented by new category emergence, we contribute to understanding of what leads categorical pairings down particular evolutionary paths. In future work, we hope to expand our consideration of incumbent/new category evolution by considering the coordination efforts and social movement activities among medical dispensaries in the states in which recreational legalization is taking place. For example, dispensary owners, growers, and investors frequently meet at conferences and other events (such as the Cannabis Cup). Growers and investors may work with multiple dispensaries, creating an invisible network of dispensaries that may act in a more coordinated fashion. Our paper points to fruitful avenues for future research that draw upon insights regarding incumbent/challenger dynamics in social action fields (Fligstein and McAdam 2011).

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Figure 1. Example of dispensary review from Weedmaps.com

Overall Rating ★★★★★ 4.2

Price ★★★★★ 3.0

Bud Quality ★★★★★ 4.0

Atmosphere ★★★★★ 5.0

Staff ★★★★★ 5.0

Accessibility ★★★★★ 4.0

Great Eastside Shop

Went to the IMAX and had stopped by these guys on our way there. Good thing we did, great staff and just wonderful shop all around. Thanks guys!

Please [login](#) or [sign up](#) to comment.



Lester15378
April 13th, 2015

Figure 2. Thematic content in medical versus recreational dispensaries' self-descriptions

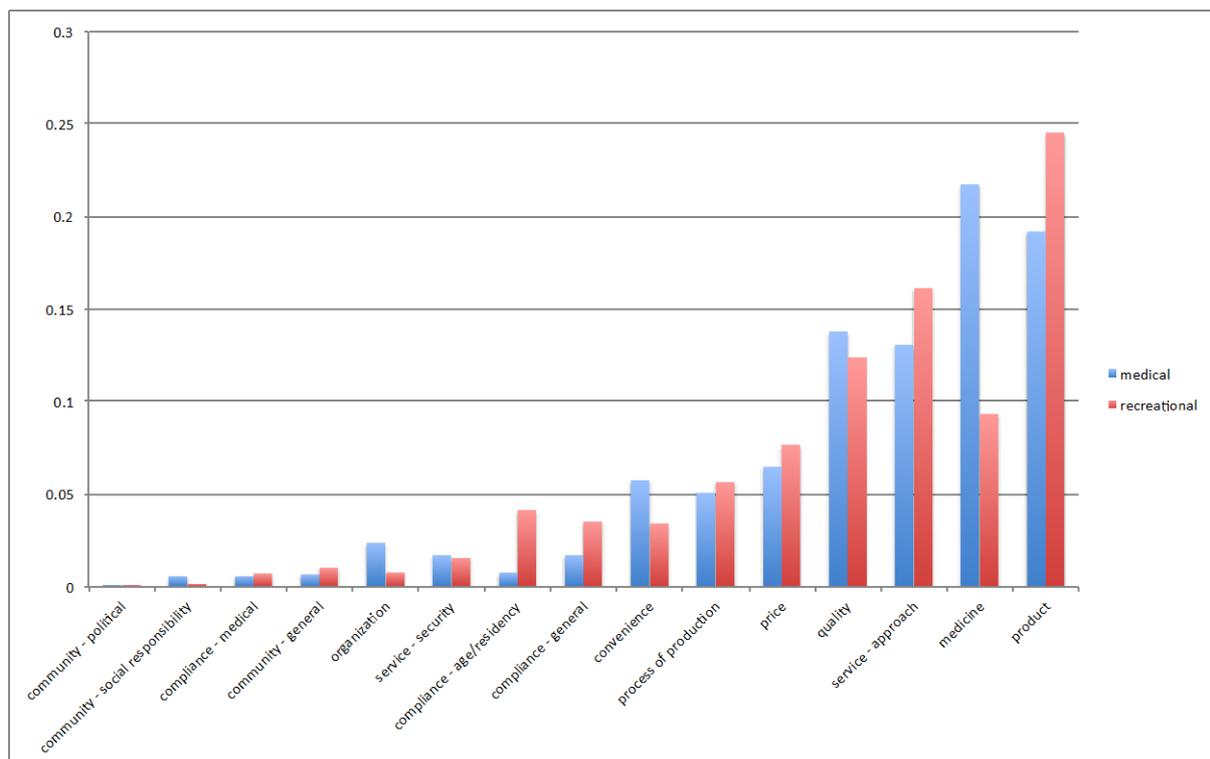


Figure 3. Recreational reviewers' rate of deleting profile in high vs. low sociopolitical legitimacy locations

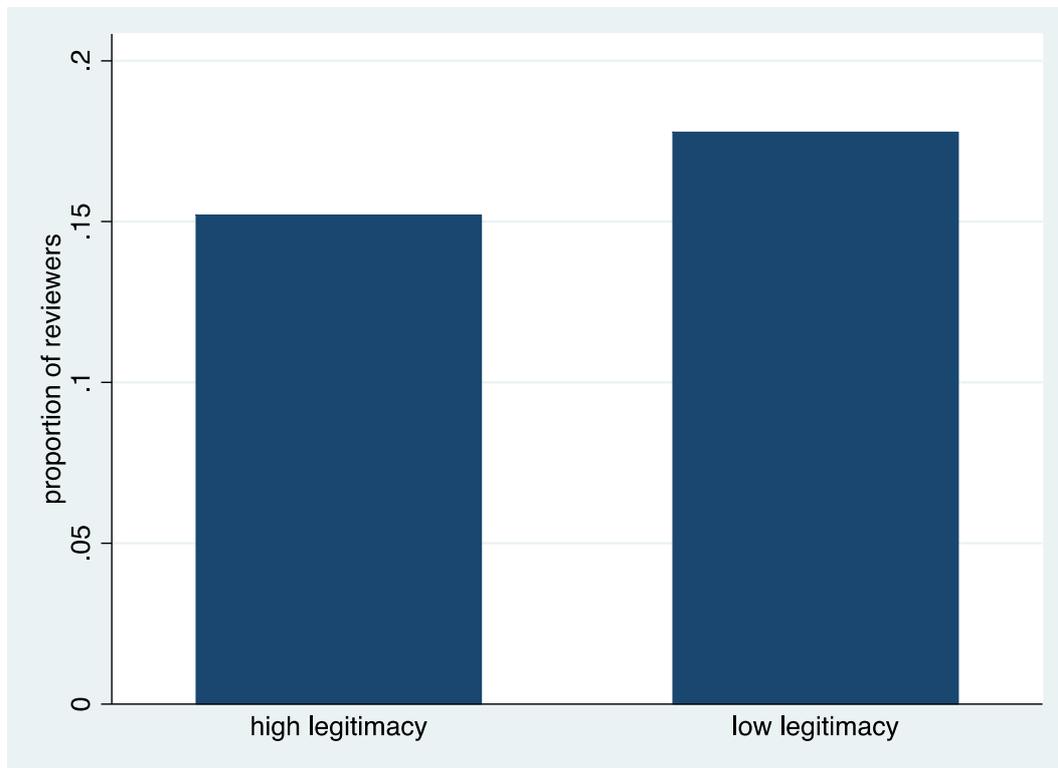


Table 1: Dispensaries' Self-Description Themes and Example Features

Themes	Example Features
community - general	locally-owned, family, community
community - political	activist, patients' rights, NORML
community - social responsibility	charitable, citizen, earth friendly
compliance - general	application, background check, lawfully authorized
compliance - medical	doctor's rec, medical card, registered MMJ patient
compliance - age or residency	21+, age of 18, resident
convenience	easy, convenient, ATM on site
medical use	medication, insomnia, depression
organization	collective, nonprofit, private association
price	affordable, budget, pricing
product	edible, sativa, kush, strain
promotions	raffle, discount, refer a friend
quality	highest grade, top shelf, connoisseur
process of production	cold water extract, freshly farmed, greenhouse
service - approach	friendly, honest, professional
service - security / protection	privacy, unmarked cars, security

Table 2: Summary statistics

Variable	Mean	Std. Dev.	N
Prop. medical use identity themes	0.21	0.17	11073
Prop. product type identity themes	0.19	0.19	11073
Rec. legitimacy	0.58	0.07	11073
Lagged rec. disp. density	5.5	6.84	11073
Lagged rec. density X Rec. legitimacy	3.42	4.49	11073
Time trend	14.78	6.92	11073
Weedmaps tenure	3.87	1.64	11073
Med.-Rec. chain	0.07	0.26	11073
Med. chain	0.06	0.23	11073
Delivery based	0.16	0.36	11073
Colorado	0.44	0.5	11073
Lagged Weedmaps hits, ln	9.83	1.5	11073
Lagged local interest, ln	13.69	1.3	11073
Prop. age 15-34 in locality	0.29	0.03	11073
Lagged reviewer med. focus	0.44	0.19	10668
Lagged product count, ln	4.17	0.77	9432
Lagged mean strain price	10.4	1.94	8550
Lagged med. disp. density	20.55	13.1	11073

Table 3: Cross-correlation table

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1. Prop. medical use themes										
2. Prop. product type themes	-0.35									
3. Rec. legitimacy	-0.03	0.01								
4. Lag. rec. disp. density	-0.07	0.13	0.52							
5. Lag. rec. density X Rec. legit.	-0.07	0.12	0.55	1.00						
6. Time trend	0.03	0.06	-0.02	0.12	0.11					
7. Weedmaps tenure	-0.10	0.04	0.23	0.37	0.37	-0.10				
8. Med.-Rec. chain	-0.02	0.11	0.23	0.31	0.32	0.03	0.15			
9. Med. chain	0.09	-0.08	-0.09	-0.15	-0.14	0.06	-0.23	-0.07		
10. Delivery based	0.00	-0.15	-0.15	-0.27	-0.26	0.04	-0.31	-0.12	0.53	
11. Colorado	-0.09	0.19	0.20	0.67	0.65	-0.00	0.52	0.31	-0.21	-0.38
12. Lag. Weedmaps hits, ln	-0.09	0.04	0.16	0.26	0.26	0.00	0.70	0.10	-0.26	-0.34
13. Lag. local interest, ln	-0.11	0.14	0.40	0.62	0.61	0.08	0.32	0.17	-0.16	-0.27
14. Prop. age 15-34 in locality	-0.10	0.04	0.51	0.53	0.55	-0.04	0.30	0.17	-0.10	-0.19
15. Lag. reviewer med. focus	0.14	-0.14	-0.10	-0.14	-0.13	-0.12	0.18	-0.10	-0.04	0.02
16. Lag. product count, ln	0.03	0.10	0.09	0.03	0.03	0.07	0.20	0.04	-0.13	-0.40
17. Lag. mean strain price	0.06	-0.02	0.22	0.02	0.03	-0.05	-0.05	0.05	0.05	0.10
18. Lag. med. disp. density	-0.12	0.09	0.49	0.84	0.83	-0.05	0.36	0.17	-0.14	-0.27
Variables	(11)	(12)	(13)	(14)	(15)	(16)	(17)			
12. Lag. Weedmaps hits, ln	0.33									
13. Lag. local interest, ln	0.54	0.22								
14. Prop. age 15-34 in locality	0.41	0.26	0.42							
15. Lag. reviewer med. focus	-0.18	0.20	-0.14	-0.12						
16. Lag. product count, ln	0.08	0.37	0.12	0.12	0.06					
17. Lag. mean strain price	-0.10	-0.07	-0.07	-0.01	0.01	-0.01				
18. Lag. med. disp. density	0.54	0.24	0.74	0.53	-0.13	0.06	-0.05			

Table 4: Medical dispensaries' 'medical use' focus in identity statements

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Full Sample	Random Effects 1+ Reviews			Fixed Effects High Legit Low Legit		
Rec. legitimacy	0.086 (0.11)	0.227* (0.11)	0.229** (0.08)	0.246** (0.09)	0.249** (0.09)		
Lagged rec. disp. density	0.014* (0.01)	0.019** (0.01)	0.023** (0.01)	0.025** (0.01)	0.025** (0.01)	-0.003** (0.00)	0.004** (0.00)
Lagged rec. density X Rec. legitimacy	-0.022* (0.01)	-0.033** (0.01)	-0.039** (0.01)	-0.041** (0.01)	-0.042** (0.01)		
Lagged reviewer med. focus		0.020* (0.01)	0.046** (0.01)	0.059** (0.01)	0.059** (0.01)	-0.026 (0.02)	0.074** (0.01)
Time trend	0.000* (0.00)	0.001** (0.00)	0.001** (0.00)	0.001** (0.00)	0.001** (0.00)	0.001** (0.00)	0.000* (0.00)
Weedmaps tenure	-0.005 (0.00)	-0.004 (0.00)	0.001 (0.00)	0.002 (0.00)	0.002 (0.00)		
Med.-Rec. chain	0.005 (0.01)	0.004 (0.01)	-0.000 (0.01)	-0.010 (0.01)	-0.010 (0.01)		
Med. chain	-0.008 (0.01)	-0.025** (0.01)	-0.052** (0.01)	-0.181** (0.01)	-0.181** (0.01)		
Delivery based	-0.002 (0.01)	-0.013 (0.01)	-0.027** (0.01)	0.003 (0.01)	0.003 (0.01)		
Colorado	0.001 (0.02)	0.003 (0.02)	-0.011 (0.01)	-0.008 (0.01)	-0.008 (0.01)		
Lagged Weedmaps hits, ln	-0.002 (0.00)	-0.002 (0.00)	-0.002 (0.00)	-0.006* (0.00)	-0.006* (0.00)	-0.001 (0.00)	-0.004 (0.00)
Lagged local interest, ln	-0.002 (0.00)	-0.002 (0.00)	-0.000 (0.00)	-0.000 (0.00)	-0.000 (0.00)	0.017** (0.00)	-0.003* (0.00)
Prop. age 15-34 in locality	-0.196 (0.22)	-0.204 (0.23)	0.305* (0.15)	0.347 (0.18)	0.353 (0.18)		
Orig. prop. medical use identity themes			0.626** (0.02)	0.636** (0.02)	0.636** (0.02)		
Lagged product count, ln				0.006* (0.00)	0.006* (0.00)	0.025** (0.00)	-0.014** (0.00)
Lagged mean strain price				0.001 (0.00)	0.001 (0.00)	0.001 (0.00)	-0.001 (0.00)
Lagged med. disp. density					-0.000 (0.00)		
Constant	0.286** (0.07)	0.193** (0.07)	-0.136** (0.05)	-0.171** (0.06)	-0.174** (0.06)	-0.112 (0.07)	0.314** (0.04)
Observations	11,073	10,668	9,767	7,551	7,551	4,362	3,927
R-squared						0.024	0.018
Number of disp_idnum	750	694	606	519	519	293	304

Standard errors in parentheses
 ** p<0.01, * p<0.05

Table 5: Medical dispensaries' 'product' focus in identity statements

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Full Sample	Random Effects 1+ Reviews			Fixed Effects High Legit Low Legit		
Rec. legitimacy	-0.063 (0.12)	-0.115 (0.13)	-0.154* (0.08)	-0.125 (0.09)	-0.158 (0.09)		
Lagged rec. disp. density	-0.024** (0.01)	-0.028** (0.01)	-0.027** (0.01)	-0.026** (0.01)	-0.032** (0.01)	0.001 (0.00)	-0.008** (0.00)
Lagged rec. density X Rec. legitimacy	0.037** (0.01)	0.044** (0.01)	0.043** (0.01)	0.040** (0.01)	0.046** (0.01)		
Lagged reviewer med. focus		-0.018 (0.01)	-0.047** (0.01)	-0.061** (0.01)	-0.059** (0.01)	-0.041* (0.02)	-0.033 (0.02)
Time trend	0.001** (0.00)	0.001** (0.00)	0.001** (0.00)	0.001** (0.00)	0.002** (0.00)	0.002** (0.00)	0.002** (0.00)
Weedmaps tenure	-0.003 (0.00)	-0.005 (0.01)	0.006 (0.00)	0.010** (0.00)	0.010* (0.00)		
Med.-Rec. chain	0.022* (0.01)	0.022** (0.01)	0.023** (0.01)	0.026** (0.01)	0.029** (0.01)		
Med. chain	0.044** (0.01)	0.058** (0.01)	0.080** (0.01)	0.131** (0.02)	0.131** (0.02)		
Delivery based	-0.056** (0.01)	-0.053** (0.02)	-0.005 (0.01)	-0.018 (0.01)	-0.016 (0.01)		
Colorado	0.090** (0.02)	0.086** (0.02)	0.007 (0.01)	-0.002 (0.01)	-0.001 (0.01)		
Lagged Weedmaps hits, ln	-0.005* (0.00)	-0.002 (0.00)	-0.004 (0.00)	-0.005 (0.00)	-0.005 (0.00)	-0.010* (0.00)	-0.006 (0.01)
Lagged local interest, ln	-0.010** (0.00)	-0.011** (0.00)	-0.011** (0.00)	-0.011** (0.00)	-0.013** (0.00)	-0.018** (0.00)	-0.014** (0.00)
Prop. age 15-34 in locality	-0.120 (0.24)	-0.141 (0.25)	-0.032 (0.15)	-0.006 (0.18)	-0.090 (0.18)		
Lagged product count, ln				-0.007* (0.00)	-0.007* (0.00)	-0.011** (0.00)	0.015* (0.01)
Lagged mean strain price				-0.002 (0.00)	-0.002 (0.00)	-0.006** (0.00)	0.003 (0.00)
Orig. prop. product identity themes			0.839** (0.02)	0.811** (0.03)	0.813** (0.03)		
Lagged med. disp. density					0.002** (0.00)		
Constant	0.407** (0.08)	0.453** (0.08)	0.299** (0.05)	0.337** (0.07)	0.375** (0.07)	0.639** (0.07)	0.368** (0.06)
Observations	11,073	10,668	9,767	7,551	7,551	4,362	3,927
R-squared						0.034	0.015
Number of disp_idnum	750	694	606	519	519	293	304

Standard errors in parentheses
** p<0.01, * p<0.05

Table 6: Colorado vs. Washington medical dispensaries' medical use focus

VARIABLES	(1)	(2)	(3)	(4)
	Colorado		Washington	
Rec. legitimacy	0.562** (0.16)	0.143* (0.07)	-0.139 (0.16)	0.028 (0.15)
Lagged rec. disp. density	0.040** (0.01)	0.027** (0.01)	-0.024 (0.01)	-0.032* (0.02)
Lagged rec. density X Rec. legitimacy	-0.062** (0.01)	-0.044** (0.01)	0.032 (0.02)	0.050 (0.03)
Lagged reviewer med. focus	-0.010 (0.01)	0.006 (0.02)	-0.002 (0.01)	0.039* (0.02)
Time trend	0.000 (0.00)	0.000 (0.00)	0.002** (0.00)	0.001** (0.00)
Weedmaps tenure	-0.001 (0.01)	0.002 (0.00)	0.002 (0.01)	0.007 (0.01)
Med.-Rec. chain	0.007 (0.01)	-0.001 (0.01)		
Med. chain	0.035 (0.02)	-0.006 (0.03)	0.015 (0.01)	-0.069** (0.02)
Delivery based			-0.021 (0.01)	-0.013 (0.02)
Lagged Weedmaps hits, ln	-0.006* (0.00)	-0.006 (0.00)	-0.002 (0.00)	-0.004 (0.00)
Lagged local interest, ln	-0.005 (0.01)	0.003 (0.01)	-0.001 (0.00)	0.001 (0.00)
Prop. age 15-34 in locality	-0.224 (0.33)	0.345* (0.17)	-0.093 (0.31)	0.229 (0.27)
Lagged product count, ln		0.003 (0.00)		0.010** (0.00)
Lagged mean strain price		0.002* (0.00)		-0.001 (0.00)
Orig. prop. medical use identity themes		0.886** (0.02)		0.444** (0.04)
Lagged med. disp. density		-0.000 (0.00)		0.000 (0.00)
Constant	0.080 (0.13)	-0.184* (0.09)	0.342** (0.10)	-0.019 (0.10)
Observations	4,801	3,018	5,867	4,242
Number of disp_idnum	282	190	412	303

Standard errors in parentheses
 ** p<0.01, * p<0.05

Table 7: Locality Level Analyses of Dispensaries' Identity Statements

VARIABLES	(1)	(2)	(3)	(4)
	DV: Medical Use Focus		DV: Product Focus	
	High Legit.	Low Legit.	High Legit.	Low Legit.
Lagged rec. disp. density	-0.015** (0.00)	0.026** (0.01)	0.010** (0.00)	-0.026** (0.01)
Lagged local interest, ln	0.068** (0.02)	-0.001 (0.01)	0.003 (0.01)	-0.011 (0.01)
Time trend	0.002** (0.00)	-0.005** (0.00)	0.000 (0.00)	0.006** (0.00)
Constant	-0.616** (0.19)	0.250** (0.06)	0.102 (0.15)	0.346** (0.08)
Observations	1,014	1,261	1,014	1,261
R-squared	0.063	0.043	0.036	0.048
Number of localities	53	77	53	77

Standard errors in parentheses

** p<0.01, * p<0.05