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Social Opportunity Structures and the Escalation of Drug Market Offending

Abstract

Objectives: This study looks at whether social opportunity structures are associated with transitions into more serious drug market offending. Our focus is on the speed at which transitions occurred, and whether variations in criminal embeddedness play a role in explaining this.

Methods: A survey of 520 North American cannabis cultivators allowed us to assess one dimension of the criminal career – escalation – looking at the speed of transitions from cannabis user to grower. Our main predictor, criminal embeddedness, was measured through the presence of a cultivation mentor involved in cannabis cultivation.

Results: Cox proportional hazard regression analysis demonstrated late cannabis use onset and an indicator of the number of drugs used beyond cannabis were found to accelerate transitions. In addition, within-person changes in mentorship was found to influence the timing of escalation, with meeting a mentor associated with quicker transitions into cannabis cultivation.

Conclusions: Findings emphasize the role of mentors as gateways into new milieus. Results support increased attention to the immediate social networks and broader social opportunity structures in which offenders and would-be offenders are embedded as major factors driving the timing of onset into more serious criminal pathways.

Keywords: escalation; mentorship; criminal career; cannabis cultivation

Introduction

The criminal career can be divided into offenders with stable offense-type patterns, and offenders who escalate into more serious crimes. Most research has focused on what separates the subset of offenders who escalate from their more stable counterparts (Armstrong and Britt 2004, p. 843); however, few studies have examined differences across offenders who escalate into more serious crimes. Research on escalation has shown that not all offenders who escalate do so in the same manner, for the same reasons, or at the same pace. Escalation may occur early in the career for some, while others refrain from partaking in serious criminality until the late stages of their criminal career. Focusing on the timing of escalation, the current study aims to examine why some offenders involved in the same crime-type (drug offenses) have accelerated, or conversely, delayed, transitions into more serious offending. Understanding rapid onset into new crime types could help identify offenders at greater risk of criminal persistence and recidivism, creating opportunities for targeted deterrence to prevent or delay escalation in offending.

To examine the timing of escalation we use a self-report survey of 520 North American cannabis cultivators who were asked about their entry into the cannabis milieu and the onset of their growing career, providing a measure of escalation - the time between transitions from cannabis user to cultivator. The logical progression that characterizes cannabis cultivation, with the majority of growers starting as users, provides a unique opportunity to examine the timing of escalation. This sequence allows us to capture variation in the timing of onset. Only a very small fraction of cannabis users' transition into growing, which makes our respondents' offending pathways particularly important to study. For those who do transition, marijuana use typically begins in adolescence and cultivation in early adulthood (Weisheit 1991; Plecas, Malm, and Kinney 2005; Bouchard 2007). To identify correlates of escalation, we focus on within-person

changes in social opportunity structures specific to cannabis cultivation, while also considering individual traits.

Escalation and Social Opportunity Structures

Our theoretical approach is guided by the work of early subcultural theorists of crime who emphasized the importance of learning the necessary skills and attitudes favored within a particular delinquency subculture, and of criminal mentors in the transmission of these skills (Sutherland 1947; Cohen 1955; Cloward and Ohlin 1960; Short and Strodtbeck 1965). Much of this work was centered on juvenile delinquents and their differential exposure to adult criminal role models – the assumption being that the form and nature of their criminal trajectories was contingent on the form and nature of the social opportunity structures in which they were embedded. Criminal achievement was stressed by these theorists because they viewed subcultural delinquency first and foremost in anomic terms; the desire for success was considered to be the main motivation driving most individuals, but only a subset of these individuals selected delinquent solutions to fulfill these desires. Achievement took many forms, from monetary success to establishing a reputation as a street warrior, depending on the subculture (Cloward and Ohlin 1960). But it is those delinquents focused on monetary goals who were most likely to be integrated in adult criminal networks, and to pursue crime as a career.

Extending from the work of subcultural theorists, more recent studies have emphasized the role of experienced offenders in explaining onset, persistence, and desistance in the criminal career. Rational choice theories have pointed to the role of experienced offenders to explain onset into more restricted crime types (Paternoster 1989), while social learning theories have emphasized the role of criminal peers in onset and persistence (Akers 1990; Akers and Lee 1999; Akers 2009). More recently, studies have explicitly demonstrated that experienced co-offenders can extend an

offender's criminal career (Hodgson and Costello 2006). These studies have all stressed the opportunity structures embedded in offending ties; however, it wasn't until Kleemans and de Poot (2008), who coined the term social opportunity structures, were the two underlying theories - opportunity theory and network theory explicitly merged. Social opportunity structures explicitly linked criminal opportunities as directly linked to an individual's co-offending ties. However, while studies often turn to mentors as an explanation, few have explicitly measured the role of mentorship in shaping criminal pathways.

The research problem posed in the current study has specific characteristics that influence the way we consider the role of social opportunity structures in general, and mentorship in particular. First, we study a subset of individuals who have all escalated into the same activity. Our focus is on the speed at which this transition occurred, and whether variations in social opportunity structures play a role in explaining this. Second, our respondents did not all start into cannabis cultivation or meet their mentors when they were adolescents. Some started as adults which itself may have accelerated the transition from onset of cannabis use to an activity like cannabis cultivation which requires resources (e.g. money, access to a car, unstructured time) that may not be available to adolescents (Bouchard and Nguyen 2010; Nguyen and Bouchard 2013). Yet, the role and importance of meeting a mentor, we argue, is not age-dependent. The cultivation and production of cannabis, although arguably less complex than other forms of illicit drug production, such as the chemical synthesis of synthetic drugs, requires a degree of technicality and experience not common to the majority of other crimes (Bouchard et al. 2013), requiring a process of apprenticeship that neither adolescents nor adults can fully circumvent (Potter 2010).

Although not always explicit, previous studies on criminal escalation stressed the potential impact of experienced offenders on others. Looking at the causal ordering of escalation, Conway

and McCord (2002) found that co-offenders directly impacted progression into more serious crimes. Using official data across a longitudinal sample of offenders, they demonstrated that violent co-offenders increased the chances of non-violent offenders using violence in the future. They suggested that violent co-offenders transmitted violent behavior to individuals inexperienced to violence, serving as bridges into more serious offense-types. These same social opportunity structures have also been used to explain why some offenders experience late onset into their illicit careers. Looking at the criminal careers of adult organized crime members, Kleemans and de Poot (2008) found that social opportunity structures explained the phenomenon of ‘late starters’, with some social ties and situations emerging only later in a person’s life. Focusing on individuals who did not engage in organized crime activities until their thirties, they found that social relations formed through family ties, work contacts, and leisure activities served as key links for entry into criminal organizations. Cannabis cultivation, for reasons stated above, is a natural candidate for the emergence of late starters.

Informal social ties are key for transmitting knowledge and moral frameworks – both elements that may influence or expose entry into new crime types. However, not all criminal contacts are equally important, and equally influential. Offenders’ networks may consist of both weak, peripheral ties, along with strong, stable relationships (Tremblay 1993). Recent research has emphasized the role of the latter, specifically of criminal mentors, on shaping offending pathways (Morselli et al. 2006; Bouchard and Nguyen 2011). Mentorship consists of criminal tutelage relationships between more experienced and novice offenders, forming a ‘proto-apprenticeship’, where novices learn crime-specific knowledge from the former (Morselli et al. 2006, p. 18). Being embedded in networks with strong ties to mentors may influence the social opportunities available for entering into specific crime types. Conducting interviews with 268 convicted offenders,

Morselli et al. (2006) found that over a third of the offenders were introduced into a specific criminal milieu by a mentor. Important to the current paper, the timing of meeting this mentor was an important factor in their pathway toward more profitable criminal careers. While meeting the mentor was not associated with an ‘apprentice’s’ age of *initial* criminal onset, it did correlate with the *timing* of specific crime-types – that is, access to more lucrative crime opportunities. These findings suggest that mentors may play a key role in offenders’ transitions from more minor to complex crimes that have a higher requisite of skill and tutelage.

Mentors may not only provide the necessary tutelage and opportunities to enter into new and potentially more complex crime types, but also the moral framework to manage the perception of risks and expectations associated with different criminal milieus (Sutherland 1947). Demonstrating this, Bouchard and Nguyen (2011) interviewing a sample of professional growers found that two types of mentors were key to understanding growers’ transitions into cannabis cultivation: social mentors and technical mentors. Social mentors provided the moral consent to grow, while technical mentors provided specialized skills and practical knowledge to set up a first cultivation site (p. 116). This study highlighted the multiplex roles of experienced growers, providing not only social approval to enter into a new role, but also the competency to do so. These findings also support Sutherland’s (1947) assertion that mentorship can explain why individuals faced with the same opportunities and risks, decide to engage in crime or not. Yet, as demonstrated by prior studies, not everyone has the opportunity to meet a mentor, and go through this sort of apprenticeship. Having already acquired a sought out skill set, mentors have the option of selecting from a surplus of contenders for these tutelage positions (Cloward and Ohlin 1960). Novices may have to possess characteristics, such as skill level, reliability or reputation that make them suitable

for selection. This differential exposure to mentorship may have all kinds of implications for the career that has yet to be explored by researchers, specifically on the timing of offending patterns.

Current Study

Despite their importance in seminal theories of delinquency as structuring criminal opportunities, the role of mentors in offending pathways has rarely been explicitly tested. Following the lead of earlier works (Morselli et al. 2006), we empirically test the role of mentors as moderators of criminal career outcomes, focusing on the timing of escalation. With previous escalation studies aiming to distinguish offenders who transition into more serious crimes from those who do not, we build on this research by taking a more nuanced perspective, concentrating on the speed of escalation across offenders who transition into more serious offenses. This is in line with the yet unanswered call to examine the timing between sequences of criminal onset in order to further understand the criminal career (Farrington et al. 1990). Aiming to contribute to our understanding of escalation, this focus can assist in identifying instances in which escalation may have been prevented, providing opportunities for diverting offenders already on these pathways.

The current study examines the effect of mentorship across a sample of self-reported cannabis cultivators who all transitioned from users to cultivators. Focusing on the impact of social opportunity structures on the timing of escalation, we posit that mentorship accelerates transitions into offending. Meeting a mentor may be important to switching into a new criminal milieu, exposing individuals to new crime-types, providing capability in this crime-type, and mitigating the risks associated with it. We examine this link using Cox proportional hazard models, to see whether mentorship and/or background characteristics accelerate or delay the transition into

growing. In the analysis, we challenge the social opportunity structure hypothesis with a series of other indicators of transitions into more serious careers, such as other drug use, criminal record, severity of sanctions, and the motivation to grow for profit.

Data and Methods

To examine the timing of onset of the cannabis cultivation career, we use the results from an online self-report survey completed by 1,070 cannabis growers in North America.¹ Participants were recruited through advertisements posted on cannabis cultivation forums from February to December 2012. Individuals on the site were invited to click on the survey advertisement, from where they would then be directed towards the introductory page of the online questionnaire. All participants were screened to only include individuals who reported having participated in cannabis cultivation at least once, were currently living in the United States (US) or Canada, and were at least 18 years of age. Participants who met this criterion were then directed to the 58 item survey. The questionnaire, part of the global comparative study – the International Cannabis Cultivation Questionnaire (ICCCQ) (Barratt et al. 2012; Decorte et al. 2012) – covered questions on growers’ experiences, motivations for growing, drug use and criminal history, as well as their personal growing network. Important to the current study, it asked participants their age of first cannabis use and the start date of their cannabis growing career. Only respondents who had reported smoking cannabis prior to growing cannabis, had provided valid responses to at least fifty percent of the survey, and reported growing illegally, were considered, restricting the final sample

¹ We are not necessarily equating these cannabis cultivators as ‘career criminals’; rather, we use it as an opportunity to study clandestine behavior where escalation does occur, perhaps for similar reasons as with other illegal drug supply offenders more generally. Further, our sample consists of individuals who self-reported not growing for legal purposes and operated in environments where cultivation was still criminalized. The survey was conducted in 2012, before citizens of Washington State and Colorado were asked to vote on the legalization of cannabis.

to 520 growers.² This allowed us to measure the outcome variable – *time to first grow* – capturing the number of years between the first use of cannabis and the first cultivation site.

Our primary model predictors of time to first grow included two measures of social opportunity structures in which offenders may be embedded: presence of a mentor in the cultivators' social network and family members who were also involved in cannabis cultivation. Mentorship was assessed by asking respondents whether they had a mentor who had introduced them to growing. Table 1 shows that twenty percent ($n=105$) of growers reported having met a mentor. Recognizing that structural opportunities are not necessarily static across an offender's time at risk, growers were also asked the year that they met this mentor. This allowed us to create a dynamic variable of mentorship, indicating that there was a *change to their network* between using and growing. On average, cannabis cultivators met their mentor eight years before they started their first grow (median: 5; SD : 9.23). Growers were typically younger than their mentors; with most meeting them during their youth (median age: 17.5), while mentors were in their adulthood (median age mentor: 28). However, given that few participants reported the age of their mentor (24%), perhaps due to the late placement of this question in the survey, respondents' lack of knowledge regarding their mentor's age, or aiming to protect the identity of their mentor this variable was not included in the multivariate analyses.

² Restricting the sample to the 520 growers, meant excluding respondents who reported using cannabis at the same time or after they started growing ($n=120$), who did not provide valid answers to at least fifty percent of the survey questions ($n=385$), and respondents who reported growing legally ($n=45$). Looking across our sample and individuals who used after they started growing there are few significant differences across our predictors. Individuals who grew cannabis prior to using (or did not use) reported fewer reasons for growing, used fewer different types of drugs, and started using cannabis at an older age (mean: 21.3; SD : 11.3). These same differences were also found across our sample and individuals who did not answer at least fifty percent of the questions. However, they were slightly younger at time of first cannabis use (mean: 14.3; SD : 4.2), reporting being convicted of fewer criminal offenses, and consisted of more individuals who sold cannabis for profit. There were also significant differences between our legal and illegal cannabis cultivators. Legal growers reported fewer convictions ($p<.05$), using fewer drugs ($p<.05$), and fewer reasons for growing cannabis than illegal growers ($p<.001$).

Our second measure of criminal embeddedness identified respondents who grew with family members. Previous research has highlighted how family members embedded in crime can serve as transmitters of criminality, sanctioning and providing direct access to illicit opportunities (Kleemans and de Poot 2008). Individuals with a co-offending network that includes family members may have grown up in a normative cultivation environment, or had access to space and resources to begin their first cultivation site at an earlier age. Capturing this, a binary variable indicating whether respondents *grew with a family member* was included. In our sample, 18 percent of respondents reported growing with family members (n=94). Environments that approve of growing may prompt the onset of cannabis cultivation.

To capture growers' delinquency, we looked at their self-reported criminal record and drug use. The first variable – *number of criminal convictions* – was created by summing the total number of offenses they reported having been convicted of as an adult. These offenses included convictions related to cannabis possession/use, driving-related offenses, property and violent crimes. Most offenders did not have an adult criminal record (mean: .26; median: 0; *SD*: 0.61) with a select few growers reporting up to three convictions. The second variable – *other drug use* – consisted of a continuous measure capturing the sum of drugs respondents used. Self-reported drug use included mushrooms, methamphetamine, amphetamine, ecstasy, LSD, other opioids and benzodiazepines (for non-medical purposes), cocaine, and heroin. Very few offenders in the current sample used drugs other than cannabis (mean: 1.36 median: 1; *SD*: 1.66). Extensive drug use may demonstrate a higher propensity for risk and delinquency which could translate into greater embeddedness into criminal offenses (Gottfredson and Hirschi 2003).

Recognizing that not all respondents began using cannabis at the same age, we included age of first cannabis use as a variable in our analyses. This not only allowed us to control for its

influence on the dependent variable (time from first cannabis use to first grow), but also examine whether age of first cannabis had an influence on transitions into growing. For instance, did early onset cannabis users have a greater criminal propensity that led to earlier growing (Hirschi and Gottfredson 1983), or were early onset users more likely to start growing at later time periods, lacking the necessary resources/opportunities at a younger age to start a cultivation site. On average respondents first used cannabis at the age of 15.63 (median: 15; *SD*: 4.01).

To control for the fact that cannabis cultivators may face higher penalties depending on the jurisdiction in which they are growing, a variable that measured the sentence length for cultivation in the offender's state/province was constructed. For US growers, sentence length was obtained from the National Organization for the Reform of Marijuana Laws website,³ and for Canadian growers from the *Canadian Criminal Code*. The US website provides state legislation and sentences for cultivation-related offenses in the US. Given that participants in this survey consisted primarily of small-scale, domestic, non-profit growers, the minimum sentence length was selected, reflecting the fact that if detected they were likely to face lower sanctions.⁴ Average sentence length was 796.12 days (median: 365; *SD*: 910.45). Given its skew, logarithmic transformation of this variable was conducted.

An additional variable allowed us to assess individuals' reasons for growing. Asked "Why do/did you grow marijuana?" respondents were provided with a list of possible answers and instructions to check all that apply. Possible answer choices included: to avoid criminal contact, less risk than buying, cheaper/easier than buying, improved quality and consistency of product, and pleasure/curiosity of growing. From participants' responses, a continuous variable was

³ <http://norml.org/>

⁴ This is consistent with Nguyen, Malm and Bouchard's (2015) study on restrictive deterrence which also took the minimum sentence length for a similar sample of cannabis cultivators.

constructed to measure the sum of reasons an offender checked off. The median number of responses selected was 11 across respondents (mean: 10; *SD*: 3.64). A high number of reasons may capture individuals whose decision to offend is motivated by a range of factors, possibly providing additional incentives to engage in the behavior.⁵

Capturing a different dimension of motivation for growing, we also dichotomized growers into two groups according to their primary utilitarian motivation for growing: for-profit or not for-profit. All respondents who identified “so I can sell it” as a motivation for growing marijuana were classified as for-profit growers, creating a binary variable of all profit-motivated growers. A quarter of the growers in the sample grew for-profit (24%; *n*=123). This variable also allows us to capture a sub-group of growers who escalated into a riskier type of activity. Profit-motivated growers may be at a higher risk of detection, possessing a higher number of criminal contacts, as well as larger grow sites to supply others. Similarly, recognizing alternative motives for growing, we also created a variable for cultivators who reported growing for medical purposes, either for themselves or for others (80%; *n*=414). All medical growers included in this sample, reported that they were not growing legally.

INSERT TABLE 1 HERE

Potter (2010) has emphasized that profit motivation does not always perfectly correlate with size. Thus, to validate the two categories of grower-types, Table 2 examines whether cultivation sites were distinct across for-profit and not for-profit growers. Specifically, we looked

⁵ Alternatively, others may argue that some reasons for growing are more important than others (e.g. utilitarian reasons versus enjoyment) as predictors for escalation and continuity. Our analyses accounted for this, with models being run with each individual motivation independently and then the sum of motivations. However, only the sum of motivations drove the significance, with individual motivations not significantly associated with the timing of escalation.

at the size of their first cultivation site (measured by the number of plants), a cultivator's time investment into their first site (indicated by the number of hours they spent cultivating), and whether their first site was successful in generating a yield. Across grower-types, differences emerged in the number of plants ($p < .001$) and hours spent cultivating ($p < .001$) for a grower's first site. Specifically, for-profit growers grew more plants and dedicated more hours per week to cultivate their plants, in comparison to not for-profit growers.

INSERT TABLE 2 HERE

These findings also demonstrate that the self-reported cultivation sites in the current study resembles the number of plants found in other criminal justice samples of growers. Using seizure data Bouchard (2007) found that the median size of sites across small to medium size grow-ops ranged from seven to 51 plants in Québec, Canada (p. 225). Similarly, using arrest data, Gallupe, Bouchard, and Caulkins (2011) found that arrested Australian growers, maintained on average 14 plants per cultivation site. This closely aligns with the current study which found that for-profit growers had a median number of twelve plants, with not for-profit growers maintaining smaller sites with a median of six plants, at the time of their first grow-op. However, our sample does report substantially smaller cultivation sites than those reported in studies on large-scale professional cannabis cultivators, such as that of Spapens, Van de Bunt, and Rastovac (2007) who find that professional growers had on average 300 to 400 cannabis plants.

Analytic Strategy

To identify predictors of the timing of escalation into the grower career, a series of Cox proportional hazard models were conducted (Cox 1972). This method provides a means to examine

the longitudinal progression of the probability that an event will occur, while also accounting for predictors that may vary over time (Allison 1984). The discrete-time survival method is used, accounting for the fact that the outcome variable consisted of year intervals, examining the time span in years to first grow for all cannabis cultivators

To test the Cox regression analyses' proportional hazards assumption, all covariates were interacted with time. Any significant interactions indicated a violation of the assumption and were included in the Cox model to properly account for the violation (Allison 1984). Given that a high number of individuals experienced the event at the same recorded time, the Efron method to handle ties was used. Efron approximation handles ties by using probability weights to adjust for risk (Efron 1977) and is considered a more accurate method than Breslow approximation, which is more appropriate for cases that have a small number of failures relative to overall group size (Cleves et al. 2010). All analyses were conducted in STATA/IC 13.1 for Windows.

To increase the reliability of the data, multiple imputation was conducted to account for missing values in four of our independent variables: other drug use (5%; $n=26$); criminal record (4%; $n=22$), and sentence length (3%; $n=17$).⁶ Missing values were missing not completely at random (MNAR) and followed an arbitrary pattern of missingness. Accounting for this, Stata's Chained Equation command was used to model missing values. The imputation model included the outcome variable, all covariates, and the Nelson-Aelan estimate of the baseline cumulative hazard, to maintain the association between the survival of time to first grow and covariates as

⁶ The Cox regression analysis was ran with both the imputed and non-imputed data, excluding the 47 individuals (9%) for which there was missing information on at least one of the predictors. All substantive results stayed the same, with mentorship, number of convictions, number of other drugs used, and age of first cannabis use all significantly associated with time to first grow.

recommended by White and Royston (2009). A total of 30 imputations were conducted and the pooled results are reported.

Results

Table 3 shows the bivariate analysis for all growers' time to first grow. Findings demonstrated that the age of first cannabis use, the number of criminal convictions, and other drug use were all associated with time to first grow. Individuals who started using cannabis at an older age transitioned into cannabis growing at a quicker pace ($p < .01$). Quicker onset into growing was also associated with other drug use ($p < .05$) accelerating time to first grow. In contrast, individuals with a high number of convictions took longer to start their first grow ($p < .05$). Neither of the measures of criminal embeddedness, presence of a mentor and family members involved in cannabis cultivation, were significant at the bivariate level.

INSERT TABLE 3 HERE

To examine time to an individual's first grow a Cox proportional hazard regression was conducted. The outcome variable, time from first use to first grow, showed that on average participants started growing 7.11 years after their first cannabis use (median: 4; *SD*: 7.59). Our sample captures a wide variation in the time to a user's first cultivation site, with some starting their cultivation site shortly after they started using and others waiting until late adulthood – up to 44 years later – until they started their first site. Illustrating the overall pattern of time to first grow, Figure 1 shows the Kaplan-Meier survival curve. Across all cannabis cultivators, the downwards slope indicates that the majority of individuals were at highest risk of transitioning to cultivation

within the first few years of using cannabis. The vertical distances across horizontal ‘steps’ demonstrate the change in cumulative probability, providing step-wise estimates of risk. The slope of the curve substantially decreases as the number of years increases, with fewer cannabis cultivators transitioning as time passes since their first cannabis use. The greatest drop in these ‘steps’ demonstrates that individuals within our sample were at greatest risk of transitioning into cultivation three years after they first used cannabis.

INSERT FIGURE 1 HERE

Table 4 shows the results for the Cox regression analysis for time to first grow. Findings demonstrate that meeting a mentor accelerated escalation into cannabis cultivation. Recall that not all growers met their mentor at the same time period in their cannabis career; however, the time that they met the mentor had a significant impact on when they started growing. However, whether respondents grew with a family member, or not, had no effect on how quickly they transitioned into cannabis cultivation. Age of first cannabis use was also associated with when subjects first grow. Individuals who started using cannabis at an older age were also more likely to start growing within a shorter time span. In addition, drug use was also an important determinant of time to first grow. Individuals who used a high number of drugs transitioned quicker into growing careers. However, our other measure of delinquency – criminal record – had the opposite effect on respondents’ time to first grow, delaying transitions. In addition, sanction severity (sentence length) was not associated with the timing of individuals’ transitions into cannabis cultivation.

INSERT TABLE 4 HERE

Discussion

This study shows that social opportunity structures influence offending patterns, impacting the timing of escalation. Specifically, key contacts – mentors – served as gateways into the new milieu of cannabis cultivation. This finding lends support to recent studies on mentorship. For instance, Morselli et al. (2006), while not finding a link between criminal onset and the time an offender met a mentor, did find a relationship between the time an offender met a mentor and when they derived greater benefits from crime. This result led to the suggestion that mentors were more “enhancers than triggers of criminal careers” (p. 27), a claim which also aligns with the current study’s findings. Mentors were not associated with growers’ first cannabis use, but did help explain offenders’ onset into a more specialized crime-type, cultivation. Mentors may provide the new opportunities that allow offenders to transition into more complex crimes (Cloward and Ohlin 1960; Morselli et al. 2006). A finding consistent with Bouchard and Nguyen (2011), who showed that mentors served as turning points in cultivators’ careers, facilitating onset and transitions into new opportunities.

While mentors facilitate entry, the number of drugs used was also found to have a similar effect on transitions – accelerating individuals’ entry into cannabis cultivation. However, we expect this effect on the criminal career to be driven by a different mechanism. On one hand, we would expect extensive drug users to have higher risk-taking tendencies and be more willing to adopt behavior that resulted in immediate gratification (Kirby et al. 1999), traits that may not be compatible with cannabis cultivation, requiring investment and patience to reap returns. This was confirmed by the number of criminal convictions measure, which found that individuals with more extensive criminal records, had delayed entries into cannabis cultivation. However, accelerated

transitions on the part of extensive drug users may be related as a by-product of drug use. For one, prolific drug users may be more immersed into the drug culture and therefore aware of resources to enter this field, facilitating their entry. This, coupled with drug users possible increased and continued need for money, may contribute to an accelerated entry into cultivation.

Lastly, later onset of cannabis use was also associated with accelerated transitions into cultivation. On one hand, we would expect late onset to be associated with quicker transitions given that time of first cannabis use was the starting point to measure time to first grow. However, this finding also points to the unique characteristics of cannabis cultivation, requiring investments in terms of time and resources, such as space to grow, factors which may not be available at younger ages (Bouchard, Alain and Nguyen 2009). This is consistent with age trends in cannabis markets, which find that cannabis use typically begins in adolescence (Boak et al. 2013) and cannabis cultivation at later ages (Plecas et al. 2005). For instance, across 15,588 suspected cannabis cultivators in British Columbia, Canada, the average age of growers was 35, with only two percent of all growers under the age of 18. Similarly, the average age of growers in the current sample was 23, with less than a quarter of growers under 18. This lower average age may be in part due to the fact that Plecas et al. (2005) were looking at the age of suspected growers, and not their age at first grow. However, both cases represent later offending than typical criminal offenses. Thus, offenders with late cannabis use onset were already at a later stage in their life, where they may also have greater access to space and the financial resources for starting a first grow-op.

This study offers a first look at the factors that accelerate escalation into growing across a sample of cannabis cultivators. However, several limitations should be considered when interpreting the findings. First, our study only represents a partial test of mentorship on escalation. By focusing on a subset of individuals who have all transitioned into cannabis cultivation, our

variance is limited to the speed of transitions. Further, we are looking at a specific sample of cannabis cultivators, acquired through a non-random, online selection method. While web-surveys provide a means to ensure the anonymity of participants and have been demonstrated as a reliable method to access this hidden population (Barratt and Lenton 2015), they may over-represent domestic small-scale growers while under-representing commercial, large-scale growers, who may be less prone to disclosing riskier behavior. Our sample reflects this, primarily consisting of non-profit growers (only 24 percent reported growing for profit), who's cultivation sites were relatively small (median: 12 plants per site). While our data precludes us from testing whether our findings extend to samples of professional growers, we would expect mentorship to be an important factor when deciding to start a grow site. Large-scale cannabis cultivation requires not only a greater degree of complexity, managing a higher number of plants while avoiding detection, but also greater access to suppliers and distributors. Mentors have been shown to serve both these functions, providing the skills to avoid detection, but also the necessary contacts to enter into a more restricted market (Bouchard and Nguyen 2011) both factors which could facilitate escalation. Another limit of our sample is that the survey only selected individuals over the age of 18. This means it excluded people who transitioned into growing and who may have stopped prior to this age. No longer identifying as cannabis growers, or frequenting the discussion forums used to recruit growers, they are not targeted by the survey.

The third limitation is with the timing of variables. The analysis examined the time between two onsets (cannabis use and cannabis cultivation); however, some of the predictors were “current” while the “transitions” may have been past. Respondents were asked questions about their drug history and criminal record during their adult years. While the majority of our respondents entered cannabis cultivation in their early adult years, some respondents may not have had the same contact

with the criminal justice system or drug habits prior to entering cannabis cultivation. In addition, in contrast to our mentorship variable we are limited by the causal ordering of our predictor of drug use. While individuals disclosed their drug use, they were not asked about the time period for which they used these drugs.

Fourth, the study may be missing important variables that are linked with timing of onset. Previous studies have demonstrated that onset of growing is linked to heavy cannabis use (Bouchard et al. 2009); however, this information was not available from respondents. In addition, a high number of missing demographic variables precluded us from including them in the analyses. Other studies have also emphasized the roles that cannabis cultivators took on in growing as an important factor in understanding the grower career (Bouchard et al. 2009). The factors that could influence onset of growing for owners of cultivation sites may be distinct from those who are hired as helpers, which could help explain variation in onset. Further, our dependent variable is measured in years, and thus may be missing important determinants of the timing of onset across smaller increments.

There are also limits to generalizations to other offenses. The cannabis cultivation career is unique in that cultivation requires elements of planning and delayed gratification, characteristics not typically used to define offenders. In these contexts, mentors may facilitate the offending process, providing the necessary skills to cultivate, tend, and harvest plants. Previous studies have suggested that onset into crimes with high barriers to entry are more likely to occur with the presence of an experienced offender (Paternoster 1989). Future studies could benefit from looking across crime-types, and the role of mentors from less to more complex offenses. In addition, these studies may benefit by distinguishing between the different types of mentors in influencing

offending pathways, looking at the impact of social mentors, who provide the moral consent, and technical mentors, providing the competency for criminal offenses.

Conclusion

This study emphasizes the role of mentors as gateways into new criminal milieus. Using a self-report data set of cannabis growers, we find that growers who met an individual within the cannabis milieu are quicker to enter into cannabis cultivation. This aligns with studies that have demonstrated the social opportunity structure that facilitates entry into specific criminal milieus (Morselli et al., 2006; Kleemans and de Poot 2008; Bouchard and Nguyen 2011) and is consistent with research that has focused on the role of peers in structuring offending patterns across the criminal career (Sampson and Laub 1993; Piquero and Mazerolle 2001). Specifically, it provides empirical support for earlier theoretical claims that the form and nature of social opportunity structures also impacts the form and nature of the criminal career. These findings are consistent with Morselli et al.'s (2006) assessment that “mentors are...not necessarily key accomplices in the criminal event, but key criminal contacts across the life course” (p. 37). The skills and risks associated with entering a new criminal milieu, may be mitigated through connections to individuals already embedded within these crimes. These results provide further support for increased attention to the immediate social networks and broader social opportunity structures in which offenders and would-be offenders are embedded as major factors driving offending pathways.

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Table 1. Cannabis Cultivator Characteristics (Non-imputed Values)

Variables	Mean	Median	S.D.	Min	Max
Years to first grow	7.12	4	7.59	1	44
Mentor	.20	0	.40	0	1
Grew with family	.18	0	.39	0	1
Nb of reasons to grow ¹	10.00	11	3.64	0	16
Nb of convictions	.26	0	.61	0	3
Nb of drugs used	1.36	1	1.66	0	9
Age first cannabis use	15.63	15	4.01	4	46
For-profit grower	.24	0	.43	0	1
Medical grower	.80	1	.40	0	1
Sentence length (days)	796.12	365	910.45	90	4365

N=520

Table 2. Cultivation Sites across Cultivators

Cultivation Sites	Not For-profit			For-Profit			Sig
	<i>Mean</i>	<i>Median</i>	<i>S.D.</i>	<i>Mean</i>	<i>Median</i>	<i>S.D.</i>	
Size (# plants)	10.20	6	16.16	26.53	12	49.53	.000
Hours spent cultivating	11.88	7	16.23	19.81	10	32.58	.000
First grow successful	.74	1	.44	.74	1	.44	1.000
<i>N</i> =		397			123		

Table 3. Bivariate Analysis: Years to First Grow

Variables	Mean	Median	S.D.	Min	Max
Mentor	7.88	4	8.30	1	39
Grew with family	7.44	4	8.24	1	39
Nb of reasons to grow ¹	7.27	4	7.91	1	42
Nb of convictions	8.99	6*	9.34	1	42
Nb of drugs used	6.69	4*	6.98	1	42
Age first cannabis use	6.85	4**	7.70	1	44
For-profit grower	6.66	4	6.96	1	39
Medical grower	7.44	4	7.87	1	42
Sentence length	7.20	4	7.65	1	44

N=520

****p*<.001; ***p*<.01; **p*<.05

Note¹ For continuous variables, the median was used as a cut-off point to examine the number of years from a subject's first cannabis use to their first cultivation site.

Note² These results represent the non-imputed variables.

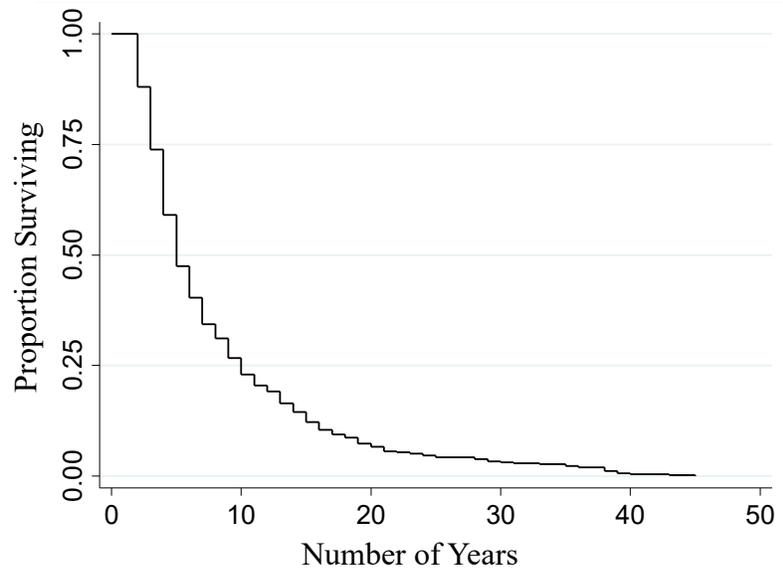


Figure 1. Overall Kaplan-Meier Survival Estimates: Escalation of the Cannabis Cultivation Career

Table 4. Cox Regression Models for Time to First Grow

Variables	Time to First Grow
	<i>b</i> (SE)
Mentor	.42 (.14)**
Grew with family	-.07 (.11)
Nb of reasons to grow ¹	.01 (.01)
Nb of convictions	-.14 (.07) ⁺
Nb of drugs used	.13 (.03)***
Age first cannabis use	.09 (.02)***
For-profit grower	.05 (.10)
Medical grower	-.14 (.11)
Sentence length (logged)	-.07 (.05)
<i>N</i> =	520

*** $p < .001$; ** $p < .01$; * $p < .05$; + $p < .10$

Note¹ Reasons to grow was interacted with time to account for violation of the proportional hazards assumption across all models (results not shown).