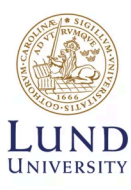

SCHOOL OF ECONOMICS AND MANAGEMENT

Bachelor's Programme in Economy and Society

Marijuana Legalization's Outcomes on Higher Education Decisions

Student Progression into University in the USA

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EGESO
Bachelor's Thesis (180 credits ECTS)
August 2024
Supervisor: Erik Green
Examiner: Faustine Perrin
Word Count: 10,502

Abstract

The legalization of marijuana in the United States has prompted extensive debate and research, particularly concerning its impacts on various societal aspects. This study examines the influence of marijuana legalization on university education by comparing three Pacific Northwest states: Oregon (OR) and Washington (WA), which have legalized marijuana, and Idaho (ID), which maintains prohibition. The focus is on evaluating whether marijuana legalization affects university application and enrollment patterns among first-time freshmen.

Utilizing data from 2002 to 2018, this research analyzes trends in student applications and enrollments in relation to marijuana's legal status, alongside other socioeconomic factors such as high school GPA, state median income, population size, and unemployment rates. The findings indicate that, despite the growing body of research on marijuana's broad societal impacts, its legalization has had a minimal effect on higher education decisions in the studied states. This study's hypotheses, that marijuana legalization would lead to decreased university applications and enrollments, were not supported by the data.

The results suggest that while marijuana legalization is reshaping various aspects of society, including public health and economic factors, its direct impact on higher education remains modest. Future research should explore long-term effects and additional variables such as economic opportunities created by the marijuana industry, as well as the broader implications for educational attainment and societal change. This study highlights the importance of continuing to monitor and analyze the ever changing dynamics of marijuana legalization and its implications for educational decisions.

Key Words: Marijuana, United States, Oregon, Washington, Idaho, Legalization, Education

Acknowledgments

I would like to thank my teachers, family, friends, and my boyfriend for the utmost support throughout the process of writing this thesis. Their encouragement and belief in me made this achievement possible, and I am forever grateful to have had them by my side.

With much love and appreciation, thank you.

Abbreviations and acronyms

RML - Recreational Marijuana Laws

MML - Medical Marijuana Laws

OSU - Oregon State University

WSU - Washington State University

BSU - Boise State University

HS GPA - High School Grade Point Average

CDS - Common Data Sets

COVID-19 - Coronavirus Disease

PNW - Pacific Northwest

OR - Oregon

WA - Washington

ID - Idaho

NSDUH - National Survey on Drug Use and Health

DiD - Difference in difference

OLS - Ordinary Least Squares

IMRI - Iterative Robust-Model Imputation

THC - delta-9-tetrahydrocannabinol

DEA - Drug Enforcement Administration

OMMP - Oregon Medical Marijuana Program

NHSDA - National Household Survey on Drug Abuse

STEM - Science, Technology, Engineering, and Mathematics

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1 Introduction

The legalization of marijuana has been a highly debated topic in the United States (US) dating back to the early 1900s (Hammond et. al., pg 2, 2020). It is an intricate debate as each state has the right to enact its state laws, while there is also a division between state and federal laws that are not always aligned. Federal law in the US has prohibited the sale, use, and possession of marijuana since 1937 in all 50 states (Pacula & Smart, pg 398, 2017). In the Pacific Northwest (PNW), Oregon (OR) and Washington (WA) have both passed state laws allowing the sale, use, and possession of marijuana medicinally and recreationally (Houser & Rosacker, pg 133, 2014). However, this is not the case for their neighboring state Idaho (ID), as Idaho maintains full restrictions on marijuana use (Fredericksen & Riggins, pg 18, 2017). The differing legislation across the US creates a compelling view of the potential impacts and outcomes of legalization or prohibition in a multitude of socioeconomic aspects, including university education. While there are differing state policies, the state universities all follow federal laws within their campuses, therefore prohibiting anything and everything regarding drugs, including marijuana (OSU, 2022; WSU, 2019; BSU, 2020).

1.1 Research Problem

The evolution of medical marijuana laws (MMLs) and recreational marijuana laws (RMLs) in the US may have created a new environment and lifestyle, inherently affecting norms and routines. Understanding the effects of these laws is crucial, specifically when looking at university education, as the student body is easily susceptible to changes in their environment (Jones, Jones & Peil, pg 256, 2018). In the most recent accessible data to the public, the year 2022, young adults in the US aged 18-25 reported a 51.9% use of marijuana in their lifetime (NSDUH, 2022). While undergraduate students (some college/associate's degree) reported lifetime marijuana use being 53.7% (NSDUH, 2022). This shows an average of half the US student body has tried marijuana at some point in their lives. Furthermore, undergraduate students reported a 26.9% use of marijuana in the past month across the US (NSDUH, 2022). These demographics highlight the significant portion of young adult lives that have been exposed to the controlled substance (Martins, et. al, 2016). If exposed, previous research shows that there are lasting socioeconomic effects, ranging from addiction problems to amotivational syndrome and decreasing human capital accumulation (Van Ours, 2007; Van Ours & Williams, 2014; Pacula, 2010; Pomykacz, 2020).

Looking specifically at the three PNW states; OR, WA, and ID, all show an increase in undergraduate student past-month marijuana usage between the years 2002 and 2014 (SAMHSA, 2016). Marijuana is the most commonly used illicit drug among college students (Suerken, et. al, pg 137, 2016). The National Survey on Drug Use and Health (NSDUH) reports give an initial overview that marijuana has been and continues to be a likely attribute to changes in rational life decisions, such as education and job opportunities. These brief findings leave questions as to

how the use of an illicit drug may affect users in every aspect; financially, emotionally, and physically. Therefore, this research will add to previous research on marijuana consumption effects on rational thinking and decision making, specifically filling the gap as the research focuses on higher education choices.

1.2 Aim and Scope

This case study aims to investigate the effects marijuana legalization has on university students, focusing on three states in the US. By focusing on Oregon, Washington, and Idaho, the purpose of this study is to find whether easy and legal marijuana access changes the priorities and motivations of young adults and their pursuit of higher education attainment.

To accomplish this research objective, the case study will investigate this research question:

Has there been a change in student application and enrollment patterns for university students between US states associated with the legalization of marijuana?

This will be investigated by comparing the amount of first-time first-year freshman applications, enrollments, high school grade point average (HS GPA) of enrolled first-time first-year freshmen, state median income, state population, state unemployment rates, and state marijuana legal status (illegal/medical (0), and recreational (1)). The three states observed are the previously mentioned Oregon, Washington, and Idaho, with the period of the years 2002-2018. The different variables are categorized by the dependent variables: first-time first-year freshman applications and first-time first-year freshman enrollments, the control variables: state marijuana legal status (illegal/medical (0), and recreational (1)), and the independent variables: HS GPA of enrolled first-time first-year freshmen, state median income, state population, and state unemployment rates. These independent variables set the tone of the human capital already developed at the suggested time of application and enrollment. The human capital theory will therefore guide this study and will be further explained in the theoretical framework section.

These specific three states in the US were chosen for multiple of their comparable attributes. The three states make up the Pacific Northwest of the United States, all following their separate state laws. As of 2024, Oregon and Washington have legalized the use, sale, and possession of marijuana medically and recreationally. Idaho remains an illegal status on both medical and recreational use. Though, the three universities within these states, Oregon State University (OSU), Washington State University (WSU), and Boise State University (BSU), all have similar characteristics. Each university is located in settings which bring possible activities for those subsiding there. There are mountains, leaving the ability for outdoor activities such as hiking and skiing. They each all have a specific focus on STEM (Science, Technology, Engineering, and Mathematics) education, with programs that attract students interested in these fields (Koretsky

et. al., 2015; Peterson et. al., 2015; Callahan et. al., 2014). They each also had similar undergraduate enrollment rates in the 20 to 30 thousand range for Fall 2022 (US News, 2023). The three universities have differing characteristics as well. OSU is located in Corvallis, OR, an urban setting. WSU is located in Pullman, WA, a rural setting. BSU is located in Boise, ID, an urban setting. In the 2023 US News & World Report, OSU ranked 142 in National University rankings. WSU ranked 178, and declared tuition fees at $29,073 (out-of-state) and $12,997 (in-state) (US News, 2023). OSU declared tuition fees at $35,664 (out-of-state) and $13,494 (in-state). BSU ranked 332 and declared tuition of $26,976 (out-of-state) and $8,782 (in-state) (US News, 2023). Whether it is out-of-state or in-state charges depends on where the student is coming from, and the current state of residence. The US university ranking system methods are based on nearly 19 measures of calculations across more than 1,500 US 4-year degree granting institutions (Morse & Brooks, 2023). The measures range from university characteristics such as academic quality to campus culture (Morse & Brooks, 2023). These comparisons and differences show potential drivers for applications and enrollments for each university.

Investigating the freshman application and enrollment patterns over the years 2002-2018 with regards to the changing legal policies and economic factors, the desired result is to conclude a deeper understanding of drug decriminalization and legalization. A deeper understanding will include the correlations between marijuana legalization and upper secondary educational attainment. In other words, this research will aim to provide insight on the potential outcomes legalization has on society and the future of higher education. This timespan being 2002-2018 was chosen due to other research timelines within relative topics, stopping before the Coronavirus disease (COVID-19) pandemic. Other socioeconomic hurdles during this time period will be discussed and accounted for, such as alcohol prohibition and the 2008 market crash, as well as future mentioned challenges. The start year for the research is 2002 due to limited available data prior to this year. The universities chosen are subject to four-year universities, with focus on the age group 18-25, specifically first-time first-year freshman, and will not further investigate other illicit drug use. This research will be of a quantitative study, through self-attained data from a multitude of reliable government and university sources.

The economic and social costs of using illicit drugs has been studied a multitude of times in the past (Van Ours, 2007; Van Ours & Williams, 2014; Pacula, 2010; Pomykacz, 2020). It is a topic thats' influence is continuous over time and ever evolving as the impacts grow more apparent. The impact of using marijuana has been demonstrated in every regard, whether that be the economic, social, safety, and production costs. The gap in literature this specific study aims to fill is the education costs, may the findings prove this. Previous research has addressed marijuana use among university students, however this case study focuses on the first-time first-year freshman choosing to move forward into adult society at a crucial turning point in one's life. Academically, less attention has been on the decisions for higher education in regards to marijuana legalization. Focusing on a comparison perspective, states that have legalized marijuana versus a state that is actively prohibiting the drug, this research provides a more

concentrated analysis. By looking at multiple variables within the model, further correlations and relationships within the socioeconomic and political realm are now accessible. Creating this model opens doors for scholars and policy makers to address the outcomes or consequences of legalization on academic choices, making future policies have a thorough grasp on how a state can effectively mitigate their evolving environment.

1.2.1 Hypotheses

Before further research and analysis, two hypotheses have been created based on basic knowledge of the subject. These are:

Marijuana legalization in a state leads to a decrease in annual university application rates due to changing priorities and altered perceptions of education's value.

Marijuana legalization in a state leads to a decrease in annual university enrollment rates, as students could decide on immediate labor market entry instead.

1.3 Delimitations

This study does not assume flawlessness, including personal boundaries within the experiment. The choice for the beginning year (2002) was due to data availability. Though, the end year (2018) was decided upon avoiding the COVID-19 pandemic. This choice was based on the extreme impact COVID-19 could have on students, as schooling was moved to online teaching, global lockdowns, potential job loss, among a multitude of other potential factors to account for (Sahu, 2020). The overall mental state of students due to this pandemic could alone influence their educational decisions (Sahu, 2020). The relatively small sample size of 17 years could absolutely affect the definitive results of causality. As well as the geographical scope, as the limitation section describes the potential issues with only three states, and they are all on the West Coast of the US. Only one region of the US is being studied, therefore there could be different results if the study was based on the East Coast, for example.

There are also delimitations in the theoretical framework. The human capital theory views educational attainment as an investment, and this study is more focused on the initial decision of education, not necessarily the outcomes of educational attainment (Marginson, 2017). Though, this approach is concentrated on the impacts of a certain policy change, therefore examining the initial reactions deems fit. As well as considering variables such as median household income, state unemployment rates, and state populations allow for other capital investments to be assessed.

1.4 Outline of Thesis

This thesis is formulated by first the introduction on what will be investigated and what are the expected outcomes the research will develop. The following section will be the theoretical framework for this study. Proceeding will be the previous research conducted. Then, data collection will be explained. The next section will be the case methodology employed. Following, the empirical analysis will describe the results and discussion of findings. Lastly, the conclusion section will complete this study.

2 Theoretical Framework

As this study considers the choices made by students entering university, and the environment these students are in which may alter the motivations for decisions made, the human capital theory becomes intricate to understand. The human capital theory will be the grounding theory of this research. "Human capital" has been outlined by the knowledge, skills, traits, and capability of an individual (Fleischhauer, pg 4, 2007). These individual characteristics create output into the economy and society when practiced. The capabilities can be grouped into two different categories, natural skills and acquired skills (Fleischhauer, pg 4, 2007). The human capital theory distinguishes the earnings of individuals based on their conscious decisions and actions while entering higher education and the workforce. Theodore Schultz was the first to refer to 'human capital' (Fleischhauer, pg 4, 2007). He shed a new light on education and training fees, labeling this expenditure as an asset rather than an expense. This created a snowball effect into the economic study on human capital and education intake and returns.

Becker (1993) was one of the first economists to review individual activities which provide future incomes. These activities include anything within the bounds of education, health, information, training, and labor mobility (Fleischhauer, pg 4, 2007). Though, future earnings are not the sole result of human capital. Internal aspects such as inheritance, could also have an impact. Human capital is not defined by how much money a person has. It is the individuality within these outputs, not physical nor financial, but the attributes which blossom through one's identity (Becker, 1993). Therefore, as the development of students' perspectives on education shifts, their human capital could as well.

Bryant, et. al (2000) further use a human capital model which stresses the personal history of drug use when observing lifetime earnings. They find that long-term use of both soft drugs (marijuana and hashish) and hard drugs (cocaine, heroin, psychedelics) results in a decline in wages and larger wage penalties (Bryant, et. al., pg 661, 2000). Overall, several academicians have concluded that drug habits reduce an individual's human capital when behavior oriented (Bryant, et. al, 2000). Therefore, utilizing the human capital assumptions on educational outcomes, this study can begin to highlight the lasting effects of marijuana use on university applications and enrollments.

This approach is aimed to gather the necessary information in order to evaluate and answer the question of shifts in application and enrollment patterns of university students in the US, given the state-by-state marijuana policies. Applying the human capital theory to the investigation allows for information gathering regarding academic performance and socioeconomic status, emphasizing the different potential outcomes of using marijuana, both heavily and occasionally. The status of these factors have the potential to shift overtime, if perceived notions begin to differ with marijuana legal statuses. Therefore, organizational and individual behavior can also be considered through decisions made by university entering students when using a human capital framework. These decisions being choosing to apply to a college, or enroll in said college after being admitted.

3 Previous Research

Marijuana is a greenish colored hemp plant, referred to as Cannabis sativa, which commonly arrives as a mixture of the dried and shredded leaves, stems, seeds and flowers (Hanson, pg 1, 2002). While under the influence of marijuana's main active chemical, called delta-9-tetrahydrocannabinol (THC), studies show it to cause mind-altering effects (Hanson, pg 1, 2002). Along with the immediate effects, long-term effects of marijuana consumption can consist of memory and learning impairment, addiction, and increased risk of chronic cough diseases and cancers (Hanson, pg 3, 2002). In 2001, the National Household Survey on Drug Abuse (NHSDA) reported more than 83 million Americans aged 12 and older to have used marijuana in one of these forms at least once in their life (Hanson, pg 2, 2002).

Over the past few decades, US marijuana state policies have been transitioning into a cannabis-friendly lifestyle. Whether it be policies which legalize the drug as medicinal or recreational, newly enacted MMLs and RMLs in the US have been altering the daily routines for many Americans (Pacula, 2010). As state-level penalties for possession, use, and sale of marijuana disappear across states, many more questions surrounding the impact of this available drug appear. As of 2024, 38 states have legalized medical marijuana, and 24 states have legalized medicinal marijuana (NCSL, 2024). As the more states legalize, the motivations behind legalization are questioned. This legalization is questioned as there is a multitude of research connecting marijuana use with lower human capital accumulation.

The defiant innovation within states, the process in which states pass legislation on factors which do not align with the federal government, is most apparent when beginning to understand why this illicit drug has been made available for the public (Hannah & Mallinson, 2018). The main reasons for legalization can be divided into 4 categories: economic benefits, social justice reform, medical benefits, and the public opinion. Legalizing marijuana allows for a new source of tax revenue for the states, which have been deemed necessary since state strained budgets (Pacula & Smart, pg 398, 2017). Regarding social justice, the costs of arrests and incarcerations

of nonviolent offenders have additionally increased state budgetary costs (Pacula & Smart, pg 398, 2017). Lastly, medicinal benefits have been highlighted in recent decades, with scientific proof that the cannabinoids have the potential of therapeutic results, which all heighten the public's opinion in approving the utilization of the marijuana plant (Pacula & Smart, pg 399, 2017). This public support is apparent in a gallup poll showing 50% of Americans supporting the legalization in 2014 (Houser & Rosacker, pg 131, 2014). The state's defiant innovation of legalizing marijuana is still quite the phenomenon despite these reasons, as the federal government continues to classify marijuana as an illegal, dangerous drug.

The previous research on the topic of marijuana legalization in the US has explored different perspectives and multiple considerations. One study by Harwood et.al (pg 659, 1984) targeted the economic costs of using marijuana, resulting in finding nearly $26 billion in lost wages across the US. Other previous academic papers have stated to have found a positive correlation between drug use and wages, especially when isolating marijuana (Bryant, et. al, 2000). One will find a substantial amount of different outlooks on the impact of drugs, though awareness on the topic grounded in human capital result in new insights. A multitude of previous research has aimed to differentiate chronic and non chronic marijuana use in an individual. The way one research study has done this is by identifying four separate use groups, finding that heavy and ex-users exhibit lower levels of overall motivation in life (Creason & Goldman, pg 451, 1981).

This differentiation between users allows for a deeper analysis on the outcomes of marijuana use. Adjacent to the different types of users is the amount of overall population consumption following legalization and whether this may change. Pacula (2010) states through this particular case study focused on California, that total consumption will rise following legalization as the number of new users is likely to occur, resulting in a larger amount of regular and heavy users. The study also emphasizes that the individual consumption of regular users will increase to heavy user numbers as availability grows (Pacula, pg 10, 2010). This increase in marijuana use across subgroups could inevitably have a life-long effect, moving through the economic life cycle ranging from higher education to the labor market.

The impact of marijuana decriminalization and legalization is encapsulated by the human capital theory. French, et. al, (pg 746, 2022) further emphasizes legalization increases adolescent use. The outcomes of this increased use at a young age is what this study wishes to find, and whether this growth is creating new perceptions on the worth of higher education. Out-of-state university students reported a higher past-month marijuana use when compared to in-state students, raising the question of whether the legal status of marijuana is now a consideration when choosing undergraduate studies as well (French, et. al, pg 746, 2022). The integration of legal marijuana into societies is clearly altering priorities and lifestyles, therefore human capital is the prime theoretical framework to base this study on.

3.1 Drug Classifications

In the US, the federal government classifies the different types of drugs through a system called drug scheduling (DEA, 2018). Every version of a drug, controlled substance, and specific chemicals which are used for the creation of a drug are differentiated into five separate categories, or schedules. The abuse prevalence is the focal point for each category, meaning the higher the risk of abuse or dependence, specifies which schedule the drug will be classified as. For example, Schedule I drugs have a high risk of abuse and dependence, which in turn could create negative psychological or physical effects (DEA, 2018). As the category shifts to Schedule II, Schedule III, Schedule IV, and Schedule V, so does the abuse rate. The abuse rate and dependency risk decrease through each classification. Marijuana is currently classified as a Schedule I illicit drug by the federal US government (DEA, 2018). This can infer that under federal law, marijuana is a high risk drug, with extreme potential for negative effects regarding health and wellness. Federal law continues to not align with certain state's laws, considering marijuana as a drug with high potential of abuse as well as no lawfully medical use. Therefore, people making decisions about their education could experience alterations to rational thoughts and choices if marijuana is being used and abused, despite legalization.

3.2 Marijuana Legalization History

Industrial hemp, a plant within the botanical class of Cannabis sativa, has been capitalized in the US since the 1600s (Houser & Rosacker, pg 131, 2014). Marijuana also has a large global history of medicinal use for many centuries (Houser & Rosacker, pg 131, 2014). Though, in 1921 the US constitution began prohibiting the consumption of intoxicating chemicals, specifically alcohol, including marijuana, through the 18th amendment (Houser & Rosacker, pg 132, 2014). Not long after, in 1937, the federal government came to the realization that prohibiting certain substances was not sustainable, and lifted these prohibitions, and began trying to benefit off of this human behavior through taxation (Houser & Rosacker, pg 132, 2014). This resulted in the Marijuana Tax Act of 1937, which was eventually deemed unconstitutional in 1969 (Houser & Rosacker, pg 132, 2014).

The Comprehensive Drug Abuse Prevention and Control Act of 1970 then followed, with the implementation of the Drug Enforcement Administration (DEA) in 1973, which was created by President Nixon (Houser & Rosacker, pg 132, 2014). These enactments highlighted the War of Drugs, aiming to combat the use of harmful substances, those being classified into the five schedules. A large magnitude of arrests were made in the following decades, costing taxpayers over one trillion US dollars (Houser & Rosacker, pg 133, 2014).

As decades pass, and marijuana use is increasingly normalized, the federal government has begun to shift their ideology. The 2013 Cole Memo highlights this, as it emphasized shifting priorities regarding marijuana consumption. The cole memo stated that the federal government altered their focus to:

- "Preventing the distribution of marijuana to minors;
- at Preventing revenue from the sale of marijuana from going to criminal enterprises, gangs, and cartels;
- Preventing the diversion of marijuana from states where it is legal under state law in some form to other states;
- as Preventing state-authorized marijuana activity from being used as a cover or pretext for the trafficking of other illegal drugs or other illegal activity;
- Preventing violence and the use of firearms in the cultivation and distribution of
  Marijuana;
- Preventing drugged driving and the exacerbation of other adverse public health consequences associated with marijuana use;
- Preventing the growing of marijuana on public lands and the attendant public safety and environmental dangers posed by marijuana production on public lands; and
- Preventing marijuana possession or use on federal property"

(Houser & Rosacker, pg 135, 2014).

Though the federal government changed their expectations of marijuana in the US lifestyle, it is important to note that the federal government still gives warning that if states do not comply with their expectations, they will interfere (Houser & Rosacker, pg 138, 2014). This means that although states are given the opportunity of individual law expression, they are not alone nor in control. Therefore, state-by-state laws still must be in compliance with federal laws, and there is still a risk of prosecution by federal law, whether in compliance or not, as the federal government decides when interference is deemed necessary. Though, as the federal government continues to advocate for heavy marijuana regulation, states have begun to decriminalize the Schedule I drug instead, due to the socioeconomic motivations earlier discussed.

Oregon was one of the first states to alter the perception of marijuana, treating possession of the drug as a simple traffic ticket in 1973 (Houser & Rosacker, pg 133, 2014). In the following decades, the Oregon Medical Marijuana Program (OMMP) was enacted in 1998 (NCSL, 2024). Recreational marijuana use, for ages 21 and older, was then passed through Ballot Measure 91 in 2014, which went into effect July 1st, 2015 (Fox 12, 2014). Washington led this change by legalizing medical marijuana in 1998 through Initiative 692 (Shaefer, 1998). Legal recreational

use for ages 21 and older was passed in 2012, by initiative 502, going into effect December 6th, 2012 (Ruhomally, et. al, pg 1112, 2022). Idaho currently continues to keep medical and recreational use of marijuana illegal (Fredericksen & Riggins, pg 18, 2017). The reason why Idaho has not followed its neighboring states in legislation is not explicit, though it could be due to concerns of public safety (Fredericksen & Riggins, pg 18, 2017). Though, as Oregon and Washington report revenue gains, Idaho legislation will likely see the topic of marijuana enter the legislature (Fredericksen & Riggins, pg 18, 2017). Public safety and enforcement costs rising at state borders and the commodities' profits in the neighboring states will potentially change the status of legality in coming years (Fredericksen & Riggins, pg 18, 2017).

3.3 The Socioeconomic Effects

As marijuana legislation develops throughout the US, and prior research shows an increase in consumption and negative human capital outcomes, the socioeconomic effects are in question. A multitude of studies find positive correlations between marijuana use and decreased wages, along with decreasing educational attainment (Van Ours, 2007; Van Ours & Williams, 2014; Pacula, 2010; Pomykacz, 2020). These are central aspects to accumulating human capital, therefore marijuana legalization and common consumption could be associated with lower human capital outcomes. As the foundation for life itself varies, outcomes from development begin to blur the lines of 'the right choice'. Interchanging socioeconomic environments have established norms, rules, or behaviors which shape current social and organizational behavior (Dacin, et. al, pg 46, 2002). The legalization of marijuana in the US is notably changing societal views on what is acceptable, healthy, and profitable, highlighting the potential shift in academic choices.

Alongside decreasing labor market success and educational attainment, mental health effects have been previously associated with marijuana use (Van Ours & Williams, pg 993, 2014). There has been an overwhelming amount of epidemiology literature, including medical studies, in recent decades with the aim of education on the health effects that moderate and frequent use of marijuana brings (Van Ours & Williams, pg 999, 2014). Through these papers, it is apparent that although the Schedule I drug has been legalized in many US states, people should not assume no adverse effects from consumption. Heavy long-term use of marijuana has been found positively correlated with depression and schizophrenia (Van Ours & Williams, pg 999, 2014). The correlation between heavy and current marijuana use and psychosis has been documented to have unreliable results, though could have an effect nonetheless (Van Ours & Williams, pg 999, 2014). The three economic studies Van Ours & Williams (2014) refer to regarding mental health affects overall find that marijuana use has a negative relationship with psychological well-being.

As frequent marijuana use has been found to negatively impact a person's mental well-being, the spillover effects could be seen through labor market outcomes. One study emphasizes these spillover effects by observing prime-age male workers in Amsterdam who use the drug (Van Ours, 2007). They find that there is ultimately a negative effect on wages earned in those who

use marijuana consistently, comparing this to those who use cocaine, concluding that while marijuana has an effect, cocaine use does not (Van Ours, 2007). The reasons for these results are unclear, though Van Ours (2007) highlights the potential health effects and school drop outs could be of cause.

While Mitchell et. al., (2020) discover the increase in marijuana use proceeding legalization in the US, it is apparent that the age group susceptible to developing the habit are young adults. This could lead to lower levels of education attained, emphasized through the Van Ours & Williams (2014) research paper. This study finds that chronic marijuana use results in an increase of 1.5-2% chance of dropping out of school (Van Ours & Williams, pg 1003, 2014). The study also emphasizes that the earlier on in high school marijuana is abused, the higher the chance of future drop out (Van Ours & Williams, pg 1004, 2014). This could be due to the health effects previously stated, as well as the onset of amotivational syndrome, also known as the amotivational syndrome hypothesis (Creason & Goldman, 1981). This hypothesis assumes that marijuana use will ultimately decrease users' will to achieve and overall activity levels (Creason & Goldman, pg 447, 1981). The negative effects of adolescent marijuana use and lower education trajectories are further emphasized in similar papers studying university student outcomes, which consist of findings exhibiting poor academic performance and lower academic achievements for heavy users when compared to casual and non-users (Suerken et. al., 2016; Jones et. al., 2018; Allen & Holder, 2013; Thompson et. al., 2018; Bryant et. al., 2000). Though much of the previous literature on marijuana intake creates different levels of marijuana intake, the data in this study is unable to decipher between them. Therefore, this study is limited in assuming marijuana use as one index, assuming higher use in legal states.

The subgroups of marijuana users have been identified in different words across studies, but each follow the same guidelines, categorizing these subgroups range from no use to everyday dependency (Pacula, 2010; Mitchell et. al., 2020; Creason & Goldman, 1981). Throughout a multitude of these studies, the results are most similar. The findings show that heavy or moderate use of marijuana will have lasting, diminishing human capital (Ringel, et. al., 2006). While this may be true, the economic research surrounding the relationship between marijuana use and labor market outcomes is still contradicting. Most studies find that infrequent use of marijuana will not cause wage penalties nor impact labor supply (Van Ours & Williams, pg 1005, 2014). Though, in many cases, problematic use of marijuana is associated with negative wage effects (Van Ours & Williams, pg 1005, 2014). Overall, previous research heavily advocates that chronic use of marijuana will result in negative human capital outcomes. This ranges from developing behavioral disorders to low educational attainment, which in turn inevitably could lead to negative labor market outcomes. This is supported through the work of Pomykacz (2020) as he stresses that individuals with higher levels of education exhibit little to no use of drugs. It is to be noted that these outcomes only encompass a few of the socioeconomic effects from legalizing marijuana which are most important for this study, as there is most likely a multitude of others not studied due to the purpose of analyzing higher education decisions.

4 Data

The data compiled for this study was attained through multiple government and state university data files. Focused on the three universities; OSU, WSU, and BSU, data was found on individual sites. Regarding overall state factors, government state-by-state features were desired. The years 2002-2018 were isolated. Once each observation was consolidated, personal data sheets were organized in preparation for testing.

4.1 Source Material

The first datasets of use were from the OSU and WSU Common Data Sets (CDS). Each academic year was an individual file, with the Fall term as a focal point. The CDS were available online to the public via their university institutional research, a collaborative effort with the aim to provide accurate information on a student's transition into higher education. These CDS are updated yearly. In regards to BSU, the university's archive data files were applied. BSU's facts and figures reports were also utilized to attain certain variables. The state-by-state variables were gathered through government and university reports (Census 2021; Census 2021; Census 2023; U.S. BLS 2019; WSU, 2015; WSU, 2024; BSU, 2024; OSU, 2024).

There were a total of eight variables collected, two dependent variables and six independent variables. The two dependent variables consist of first-time first-year freshman applications and enrollments 2002-2018. The first four independent variables consist of first-time first-year freshman HS GPA, state-by-state median income in current US dollars, state-by-state population, and state-by-state unemployment rates. The next independent variable being the years 2002-2018. The final independent variable being the marijuana legal status, which was categorized by (0) illegal/medicinally legal, (1) recreationally legal.

Upon reviewing the available data from the latter mentioned sources, the specific variables were chosen due to relation to human capital and education attainment. In other words, the six dependent and independent were considered with regards to aspects which could have an influence on the state of mind and current conditions a young adult may be in when progressing from high school to university. The time span 2002-2018 was decided upon data availability, in relation to similar previous study time frames. The three categories of marijuana legalization allows for emphasis on the changing policies over the years in each state.

4.1.1 Source Criticism

These data sources were carefully selected, ensuring reliability, the sources all contain real-life number projections and rates. The authors of the different data sets are all university and government verified. The sources aim to further educate the public on education and living factors, therefore no personal bias or altered motives should be of issue. The sources are

up-to-date and open to revision if necessary. However, some of the data is aggregated at the state-level, meaning the universities specific county numbers could be masked. Additionally, the openness to revision could potentially create issues regarding inconsistencies. Overall, the data is trustworthy and gives an accurate depiction for the standing research question.

5 Methods

The methodology of this research is influenced by the latter mentioned theoretical approach, focusing on the priorities of individuals and their current lifestyle when establishing themselves as adults in society. University is an option, and not all take the option up, not all feel the need to, though the reasoning for this big decision is captivating to analyze when new policies could be having an effect. This is a comparative study, observing three individual universities with differing policies in the US, as well as considering various contextual factors within these states (Bryman, pg 147, 2021). The study uses a quasi-experimental design by comparing the data collected pre and post legalization, which is not randomized (Bryman, pg 121, 2021). The sampling process used a purposive sampling approach. This is a type of non-probability sampling, which selects the units as best fit (Bryman, pg 733, 2021). Within this type of non-probability sampling, the critical case sampling approach was implemented (Bryman, pg 734, 2008). Critical case sampling chooses variables as they "display features that are central to the phenomenon of interest" (Bryman, pg 734, 2021). Additionally, the study is both intertemporal and longitudinal, examining data across a range of years, and focusing on the same three universities over this time period (Wrigley, 1986).

5.1 The Model

The comparative and quasi-experimental design is applied through the use of a Difference-in-Differences (DiD) model. The DiD approach can estimate the causal impact of marijuana legalization by comparing the annual applications and the annual enrollments between the treatment (pre-legalization vs post-legalization) and the control groups (never legalized) at each university through the years 2002-2018. DiD is a well-known analysis method used by a multitude of economists, suitable for estimating the effects of policy interventions and changes (Lechner, 2010). Human capital theory guided the process of data collection and model creation through the assumptions that capital investment decisions are based in rational thinking, and marijuana influence has been noted (described throughout the theory section) to affect a person's state of mind and alter motivations, potentially changing what is deemed as 'rational' (Bryant, et. al, 2000). The theory was utilized when choosing the variables in this model as it assumes that investment in education will result in future earnings, creating more human capital, and the chosen variables all could show an impact on the initial decisions regarding education (Bryant, et. al, 2000). This allowed for focus on educational decisions (applications and enrollments), the differing policy statuses (illegal/medicinally legal and recreationally legal), and the current

environment of potential university students (median household income, population, and unemployment). Each of these factors encompass what could be considered a rational or irrational decision under differing circumstances. The program R was used to calculate said estimations, as well as later discussed correlations and regressions (R Core Team, 2024).

In rare cases, there were a few observations not accounted for in the data. This will be further discussed in the limitations sections. As a result, R will aid in imputing these missing values. Imputing is a process in which researchers can replace missing data with calculated imitation values (Templ, et. al, pg 2793, 2011). There are multiple types of imputation used in various programming languages. In this case, the algorithm called Iterative Robust-Model Imputation (IRMI) was applied (Templ, et. al, pg 2795, 2011). Once this is complete, running DiD and correlation tests is possible. Besides the DiD estimation, correlation tests will also be conducted. This is to further quantify the relation between the given variables. The Pearson correlation test for a more comprehensible analysis of results to answer the null and alternative hypotheses (Bakdash & Marusich, 2017). In addition to the Pearson correlation test, a point-biserial test, which is a special case of the Pearson correlation tests, where there is one binary variable and a continuous one, will be analyzed (Kornbrot, 2005). These two correlation tests will complement each other in the empirical analysis.

5.2 Limitations

The method explained does not assume flawlessness. Throughout the process, limitations were introduced. Limitations included factors regarding university data, different time periods for policy adjustments, desired variables unable to be collected, and a common limitation of causality.

The time period 2002 to 2018 was decided upon data availability. Each university had their own portal for data, therefore not every year was accounted for on each database. This meant that the time frame was unable to match across all three universities dating before 2002. If they had, the beginning year for the datasheet would likely go further back than 2002. Another limitation was that of the legalization year. Each state follows their individual laws, in this case, the specific law of marijuana use, sale, and possession were all different. That is the main focal point of this study, though when using the model, this created a smaller time frame of observation for Oregon. Washington fully legalized marijuana in 2012, while Oregon followed a few years later in 2015. Hence, when running the DiD and correlation tests, the years for observation would always be different for Washington and Oregon. Washington had 7 years post-legalization to discern while Oregon only had 4 years post-legalization in this study. This also highlights the limitation of the amount of universities, only encapsulating the changes in three states, which could limit the full impact of legalization across all US states.

Other limitations regarding data and human error are of course plausible. The data had 1% of missing values, therefore imputation was the chosen remedy. This undeniably may alter the results, though data manipulation is a common tactic in quantitative research. Human error is also always a possibility, depending on how the data was reported. It is also important to emphasize that none of the data relates to the different use levels of marijuana, only the legal status of the drug, therefore the status is the only change, not how much one may use given the legal status. Though this is depicted in the previous research section, this study is unable to conduct the difference.

Another limitation was that of independent variable choices. Guided by the human capital theory, variable categories were specifically chosen in relation to educational decisions and environments. There were a number of categories that could have been included to show further correlations which may affect the outcomes, though reliable data was undiscovered. Also, the limitation of causality is apparent due to the purposive sampling technique used. This is because the US states chosen could have underlying reasons for legalization, therefore these underlying reasons could be visible to students when making educational decisions, causing a shift unrecognizable in the data provided. Time lag effects are also considered in the limitations of this study, as the impact of legalization could potentially take years to integrate into society, though based on previous research the time lag is accounted for as marijuana use increase is viewed within a year.

6 Empirical Analysis

Using DiD estimation and the correlations depicted above in the program R, the study proceeds to the analysis stage. Using the knowledge from previous research, the perspective of the theoretical framework, and accounting for limitations and delimitations in the methodology, a thorough investigation will be done. Results will be exhibited through tables and figures, then further examined.

6.1 Results

The proceeding tables will exhibit the results from the DiD model and the complementing correlation models. The figures will exhibit the independent variables' individual relationship regarding applications and enrollments for each university through scatter plots and Ordinary Least Squares (OLS) regression lines.

Table 1: DiD results for the model OSU, WSU, against BSU applications.

Coefficients	Applications	
	OSU (p-value)	WSU (p-value)
Intercept	0.043851 *	0.00243 **
Treated	0.000780 ***	0.0000162 ***
Time	0.530117	0.64517
DiD	0.724673	0.06314 .
Income	0.104289	0.07418 .
Population	0.000742 ***	0.00000822 ***
Unemployment	0.781213	0.06855 .
GPA	0.347164	0.00762 **
Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1		

Table 2: DiD results for the model OSU, WSU, against BSU enrollments.

Coefficients	Enrollment	
	P-value (OSU)	P-value (WSU)
Intercept	0.33409	0.0403 *
Treated	0.00805 **	0.0968 .
Time	0.25405	0.5458
DiD	0.11748	0.6333
Income	0.30101	0.1621
Population	0.00187 **	0.0395 *
Unemployment	0.8579	0.7858
GPA	0.2893	0.0420 *
Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1		

Table 3: Point-biserial correlation and p-values for OSU and WSU against BSU applications.

University	Legal-status	
	Correlation	P-value
Oregon (OSU)	0.6317	0.006539
Washington (WSU)	0.8631	0.000008148

Table 4: Point-biserial correlation and p-values for OSU and WSU against BSU enrollments.

University	Legal-status	
	Correlation	P-value
Oregon (OSU)	0.5429	0.02433
Washington (WSU)	0.8244	0.00004610

Table 5: Pearson correlation test results for independent variables (excluding legal status) for OSU applications and enrollments.

OSU/Oregon		Correlation	P-value
applications	population	0.898166494914983	9.86392121760105e-07
applications	income	0.785551793959158	0.000186190800401498
applications	unemployment	-0.177234008045027	0.496180472825351
applications	GPA	0.87073977931254	5.43280418474623e-06
applications	years	0.917946021068376	2.07110979255631e-07
enrollment	income	0.731015542909194	0.000856607993553915
enrollment	population	0.874414045247219	4.42506608333559e-06
enrollment	unemployment	-0.0487610722565504	0.852568000865153
enrollment	GPA	0.795743144408319	0.000133420735114687
enrollment	years	0.88665240656755	2.12798866305874e-06

Table 6: Pearson correlation test results for independent variables (excluding legal status) for WSU applications and enrollments.

WSU/Washington		Correlation	P_Value
applications	income	0.906180418052799	5.46339711249288e-07
applications	population	0.957666613186153	1.62677715742632e-09
applications	unemployment	-0.332140782004679	0.192748066807031
applications	GPA	-0.508266371632307	0.0372333537091114
applications	years	0.950988341907418	4.7860431173774e-09
enrollment	income	0.881038220050605	3.00674351283448e-06
enrollment	population	0.937289421893535	2.9196491890815e-08
enrollment	unemployment	-0.180303041221826	0.48862842607662
enrollment	GPA	-0.675474731209786	0.00292227349386964
enrollment	years	0.939901118512199	2.13849520314113e-08

Table 7: Pearson correlation test results for independent variables (excluding legal status) for BSU applications and enrollments.

BSU/Idaho		Correlation	P_Value
applications	income	0.858182165284553	1.04827115445794e-05
applications	population	0.90992727997108	4.06965876331711e-07
applications	unemployment	-0.193433605082571	0.456956601458088
applications	GPA	0.905030009948575	5.96581591238987e-07
applications	years	0.94164285759644	1.72400322906441e-08
enrollment	income	0.810950481446005	7.83035782250252e-05
enrollment	population	0.7188324765168	0.00114820217710809
enrollment	unemployment	-0.403848515209008	0.107916380645519
enrollment	GPA	0.647954283667831	0.00491184237676512
enrollment	years	0.705760424944492	0.00154754486951125

Overall, the results show that marijuana legalization has little to no impact on application and enrollment patterns when other outside factors are included in observing the p-values and correlation numbers through the Pearson correlation test and DiD estimation. Though, when isolated, the point-biserial test shows that legalization may alter these patterns to an extent. The p-values highlight the factors' statistical significance for the given data. This means that if the p-value is less than 0.05, it rejects the null hypothesis, which suggests that there is no relationship and impact between the factor and the outcome. In this case, the factors are the

independent variables used, including legal status, and the outcome being applications and enrollments. These p-values are not to be taken as the complete truth, as the limitations of a small sample size is its own factor. The more data points, the more accurate the estimations. There are only 4 points after Oregon legalized marijuana to evaluate and only 7 points after Washington legalized marijuana to evaluate, restricting the DiD model as well as the correlation test evaluations. There are also the outliers and imputed data points, discussed in the limitations and delimitations, to consider when reviewing the model results.

The DiD estimation was used to utilize the chosen control group being BSU, due to the legal status being illegal, and the treatment groups being WSU and OSU, as these two states have fully legalized marijuana. Given the contents of tables 1-2, the findings are constrained, yet acceptable. Table 1 finds that the treated groups experienced a p-value of 0.72 for OSU and a p-value of 0.06 for WSU. This means that the statistical significance for both treatment groups is above 0.05, concluding that there is no meaningful impact between legalizing marijuana and number of applications. This test was run twice, to find the impact on both applications and enrollments. Through the DiD estimation regarding enrollments, the treated groups experienced a p-value of 0.12 for OSU and a p-value of 0.63 for WSU. These findings also exhibit that there is no impact on enrollments given legalization of marijuana in these given US states. Both of these results are consistent with the null hypothesis, while also rejecting the two initial hypotheses being that applications and enrollments would decrease following the legalization of recreational marijuana in these states. The individual coefficients, when run through a DiD estimation, show a positive correlation for population size (and the p-value is significantly less than 0.05), in both Oregon and Washington, having an impact on application numbers for the universities throughout the treatment. GPA also shows a positive correlation though in Washington only, meaning that the GPA of first-time first year freshmans influence the decision to apply to WSU throughout the treatment. Regarding enrollment patterns, the latter explanation also applies. Income and unemployment show no statistically significant impact on applications nor enrollments for OSU and WSU throughout the treatment. Regarding the intercept and treated coefficients listed within the DiD estimation, their p-values represent the pre-treatment numbers, which in the case of this study are irrelevant as the aim is to show the reaction on application and enrollment numbers given change in marijuana legislation and will not be further discussed. This also applies to the time coefficient as this p-value only exhibits the overall effect of the passage of time on the outcome variable for all groups.

For tables 3-7, the p-values and correlations have been calculated separately to distinguish the individual relationships. Categorical factors, such as legal status of legalized and illegal, were calculated with a point-biserial correlation test while the other independent, yet continuous variables, were calculated with the Pearson correlation test. These tests allow for a thorough analysis of the relationships within legalizing marijuana.

The first point-biserial test (refer to table 3) shows OSU and WSU applications against the applications in the control group, BSU, emphasizing that the legal status in the given state has a high statistically significant impact on application patterns when isolating the categorical variable. The second point-biserial test (refer to table 4) shows OSU and WSU enrollments against the enrollments in the control group, BSU, showing similar results to that of table 3. This means that when taking the other socioeconomic factors chosen into account, the results may differ and legal status may not be as significant.

The Pearson correlation tests (refer to tables 5,6, and 7) do the opposite as the point-biserial test. This test looks for statistical significance through the independent variables, or the socioeconomic factors chosen, disregarding legal status. Through the Pearson correlation, it is clear that highly significant factors are population, income, and GPA when looking at both application and enrollment patterns over the years for both OSU and WSU. These findings are concurrent with the initial DiD estimations, though the DiD model did not find income significant for either OSU or WSU, nor GPA for OSU.

These findings can be further assumed when analyzing the scatter plot graphs, see appendix A, figures 1 and 4, which shows that applications and enrollments both have a linear relationship with the socioeconomic factors population and income for OSU. The scatter plots for WSU, see appendix A, figures 2 and 5, show a linear relationship for socioeconomic factors population and income as well. The scatter plots show a more inconsistent relationship regarding GPA for both BSU and WSU, which could be due to a multitude of factors ranging from university budget constraints to individual preferences. The scatter plots for BSU, see appendix A, figures 3 and 6, also show a somewhat linear relationship between applications and population, income, and GPA. The same stands for BSU enrollments respectively.

6.2 Discussion

Overall, it is clear through the results of the DiD estimations and correlation tests that marijuana legalization is unlikely a leading factor in application and enrollment patterns in OR, WA, and ID. Through the isolation of using the point-biserial correlation, it is apparent that legalizing marijuana may have an effect on the number of university applicants and enrolled students, though when integrating other socioeconomic factors such as population size, household incomes, HS GPAs, and unemployment rates, the legal status effectiveness is lesser than. These results then reject the two initial hypotheses that application rates and enrollment rates would decrease following marijuana legalization, and answers the research question. There has been a clear change in student application and enrollment patterns for university students between US states; they have generally been increasing since 2002, though the specific patterns within this steady increase has little to do with the legalization of marijuana.

The leading factors which show a high impact on university applications and enrollments are the state's population size, household median incomes, and the GPAs of enrolled students. These determinants are logical, as with a growing population, there will be more students entering the higher education realm, searching for the next step in life. Household incomes are also a reasonable influence, since education in the US is far from free, and tuition is a large economic burden. Therefore, students must value higher education greatly for it to be worthwhile. It could be possible that the point-biserial found legal status of high statistical significance in this case, as heavy marijuana use has been previously associated with amotivational syndrome and behavioral disorders, which could ultimately affect a person's view on life goals, altering priorities (Creason & Goldman, 1981). University could also simply not be an option given certain incomes, therefore having a large impact on applications and enrollments. The HS GPA of enrolled students is also comprehensible. The higher the HS GPA of enrolled students, the perceived likelihood of acceptance is fitted, meaning if a student's HS GPA is much lower than the average enrolled student, there may be a less chance of getting accepted. Therefore, this could easily lower the application rates. Regarding enrollment patterns, those with higher HS GPAs could likely have applied to a large number of universities, thus having more options, and could choose a range of universities outside of OSU, WSU, or BSU. The inverse relationship between HS GPA and WA applications and enrollments is seen through the negative slope of the OLS. This could be due to a multitude of reasons, one being that students in WA commonly choose to go out-of-state for college. The choice to go out-of-state for university could be due to a variety of reasons.

Unemployment rates not having an apparent impact on applications nor enrollments is interesting as one could assume it relates to choices of entering the labor market or taking the time to complete higher education first, as well as having an effect on the household incomes. Though, none of the tests showed a correlation and the scatter plots presented a non-linear relationship. Therefore, unemployment rates could possibly encompass other underlying factors, such as varying regional economic conditions, the availability of alternative education or training opportunities, or differing perceptions of job market stability, that may not be directly captured through simple linear analysis. These complexities suggest that further investigation of how unemployment interacts with educational decisions is warranted.

Although previous research exhibits that marijuana use, especially in high quantities over a long period of time, will have an effect on human capital accumulation, the results of this case study show that the treatment of legalizing marijuana is improbable to have a large enough significance to alter student progression into higher education. While marijuana legalization might introduce certain social and behavioral shifts, these findings imply that its impact on educational outcomes, such as college applications and enrollment rates, remains minimal. This suggests that other factors, such as socioeconomic conditions, academic preparedness, and institutional support, play a more crucial role in shaping students' educational trajectories than the legal status of marijuana.

Though, it is also important to continue to stress the fact that a smaller sample size definitely has an effect on the results.

The long-term effects of continuous marijuana use may not show large changes in the data only 4 or 7 years after legalization, however marijuana legalization is quite a new law in US states, and with the impact of COVID-19, it may be hard to define the exact impact. These small sample size limitations and delimitations have been discussed in the given sections, allowing for understanding as to why this particular case study may be limited in findings. It is also important to be aware that the population, household income, and unemployment rates each were gathered from a state overview. Hence, the levels of these independent variables were not collected in the specific region which each university exists in. This could potentially shift the results, though it is also essential to form a holistic point of view of these factors as many students move throughout the given state to arrive at university.

Taking everything into account, the outcomes of this research can begin to conclude that marijuana legalization in US states may likely have a small lasting effect on future education for the entire US population. Everyone at least considers continuing education post-upper secondary schooling, and there are a range of factors which could possibly influence the final decision. This study aimed to combat some of these alternate factors surrounding legalization by including multiple socioeconomic effects, though the findings still emphasized that these socioeconomic factors play a much bigger role in education decision making. The discoveries, despite historic research, are that in this case, marijuana legalization has little to insignificant impressions on young adults in the US.

7 Conclusion

Marijuana legalization has been a growing global phenomenon, with special focus on the US. The US has become the forefront for research regarding what future impacts could entail following changes in marijuana legislation, and what this means for society. As more than half of the country lifts prohibition on this Schedule I drug, a plethora of new studies have been developed with the aim to understand the drug's possible outcomes, and how communities can learn to adjust to these newly enacted policies.

This surge in research encompasses a wide range of topics, including public health implications, economic effects, shifts in crime rates, and changes in social attitudes towards marijuana use (Ryan, 2010; Neeley & Richardson, 2020; Hammond et. al., 2020; Hall, 2014; French et. a., 2022). Researchers are investigating how legalization affects everything from substance abuse patterns and mental health outcomes to the financial benefits from taxation and the impact on law enforcement practices (French et. al., 2022). Additionally, studies are examining the implications for education and workplace environments (Van Ours, 2007).

These earlier investigations have assisted this current studies' comprehension on the potential repercussions of MMLs and RMLs. Through this holistic view, and the implementation of the human capital theory, it is apparent that while evolving marijuana laws may have lasting negative effects on a society, entering higher education students have not been driven by them. As university applications and enrollments in OR, WA, and ID have been gradually increasing over the years 2002-2018, the internal patterns in this increase are far-fetched due to legal marijuana. The initial hypotheses that applications and enrollments could be seen to decline following MMLs and RMLs are now rejected, and this does not apply.

7.1 Research Aims

As states and communities navigate the complexities of legalization, it is crucial for ongoing research to inform policy making and public understanding. This growing body of evidence could help policymakers develop more effective regulations, support services, and educational programs to address the evolving field of legal marijuana use. Ultimately, past research has aimed to provide a comprehensive understanding of how legalization shapes societal structures and guide the development of balanced approaches, and this current study does the same with special focus on higher education. The aim of this study has been to evaluate the trends in university applications and enrollments in three states, and whether these trends are due to legal availability of marijuana and increased public use.

7.2 Research Objectives

The research objectives of this study coincide with the research aims, by evaluating the trends in the progression into university in the US. However, the objectives are specific in reviewing the different socioeconomic factors which could also play a role in differing dynamics. The research encompasses a range of alternate variables shaping higher education decisions, while incorporating the legal status of each given state. Determinants such as unemployment, income, population, and high school achievements have been observed alongside legal status to provide a complete view of reasons as to why one may choose immediate workforce entry or further education. The specific universities chosen across three US states were carefully decided upon through similar characteristics regarding tuition, size of institution, college ranking, and so on. The years for the given study were determined through availability of university data, while consistent with marijuana legislation development. These thorough investigative tactics allowed for a detailed and effective analysis on young adult drug use, which could initiate future ideas on how to combat potential consequences of permitting state use of the plant Cannabis sativa.

7.3 Practical Implications

The main findings of this study is that legalizing marijuana, while this could increase overall use and become problematic, is not adversely affecting university applications and enrollment

patterns. Thus, policies should be actively evolving to combat the potential problems of addiction, dependence, and amotivational syndrome, so that in the future spillover effects into educational attainment are limited. This could be done through drug awareness policies and drug dependence support, as legal marijuana is seemingly becoming more and more common in the US. This research and analysis highlights that while other socioeconomic factors have a much larger impact on educational decisions, easy access to this drug could also likely be correlated. The long-term outcomes are limited in this study, thus it should be emphasized that the aforementioned consequences of heavy use are still probable and should be mitigated through policy interventions. This case study further highlights the complicated relationship between drug use and human capital accumulation, which stresses the need for additional understanding of when consumption becomes problematic and visible in lifetime earnings and status.

7.4 Future Research

While this focus has been on the shift from upper secondary school to university, future research should build on the effects of using marijuana in high school, as studies have shown marijuana use could be correlated with school drop outs, inevitably affecting the ability to apply to universities (Bray et. al., 2000). Future research on adolescent marijuana use, the frequency of this and the potential consequences should be further analyzed. Young adults are at the forefront of drug mistreatment, and are extremely vulnerable to changes in their environment (Pacula & Chaloupka, 1998). Expanded analysis of why this is true could enhance literature on exposure risk and provide deeper insights into the mechanisms underlying adolescent vulnerability, thereby informing more effective intervention strategies and risk management practices.

Future research could also focus on an solely economic perspective, analyzing the state monetary accumulation following MMLs and RMLs. These findings could result in a more holistic view on educational attainment, as it would rely on the US state markets for evidence. This could show that people are still applying and enrolling in universities, with new labor market opportunities on the horizon, given the emerging marijuana industry. Relying on the data from the new industry could accentuate that although there are potential consequences of using marijuana, if not abused, it could create new revenue and a fresh income. The requirements for working in this industry could be different from regular sectors, hence people may not even need a university degree to work in this field. Though, this is unknown as far as this research is concerned, so future research in this area is essential to create a different outlook on legal marijuana. While student dropouts are on the rise, correlated with financial reasons to this, future research on the economic outcomes of working in the marijuana industry and how this is seen in fiscal and individual revenue could be of importance (UPCEA, 2021).

7.5 Concluding Remarks

Ultimately, marijuana has addictive potential and therefore should be carefully monitored (Arria et. al., 2015). As more US states move toward legalizing marijuana both medicinally and recreationally, it becomes an intriguing yet critical case to study in both socioeconomic approaches and political approaches. In the context of this study, a socioeconomic approach with the basis of the human capital theory was adopted. Through this methodology, conclusions were able to be made regarding higher education choices. This study found that legal marijuana has minimal effect on these choices alongside major socioeconomic factors. However, this impact could change as long-term effects become more apparent in developing data, and this outcome should be closely observed. In conclusion, MMLs and RMLs are definitely changing US societies, though in regards to higher education, the impact appears to be modest so far.

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Appendix A

Figure 1: Independent variables relation to application patterns for OSU.

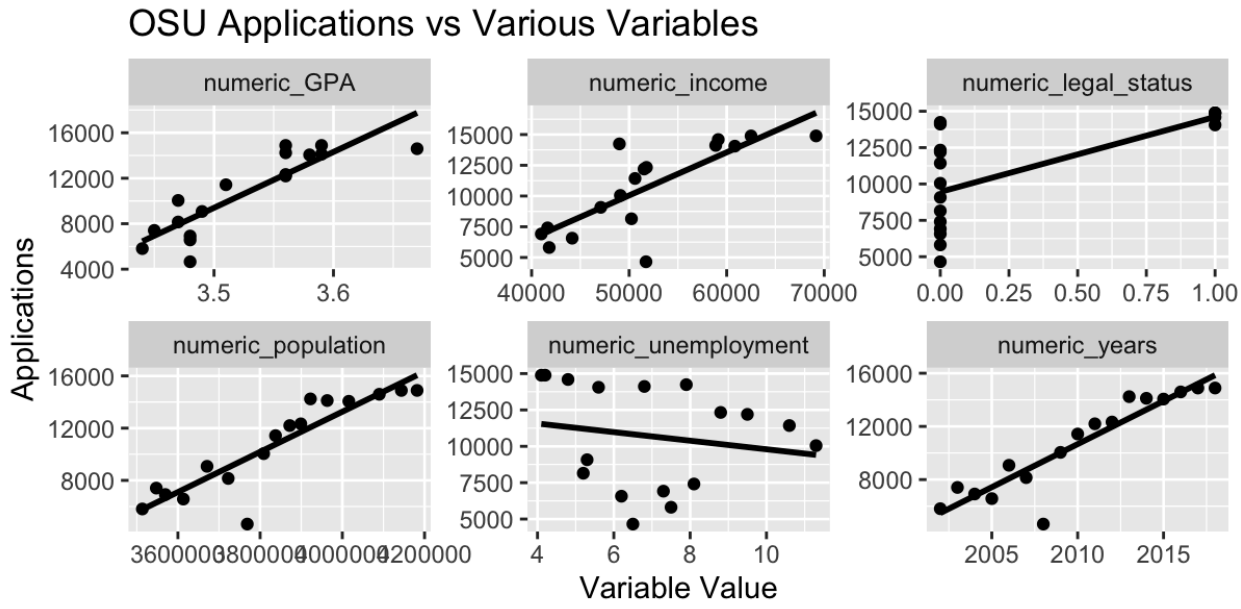

Figure 2: Independent variables relation to application patterns for WSU.

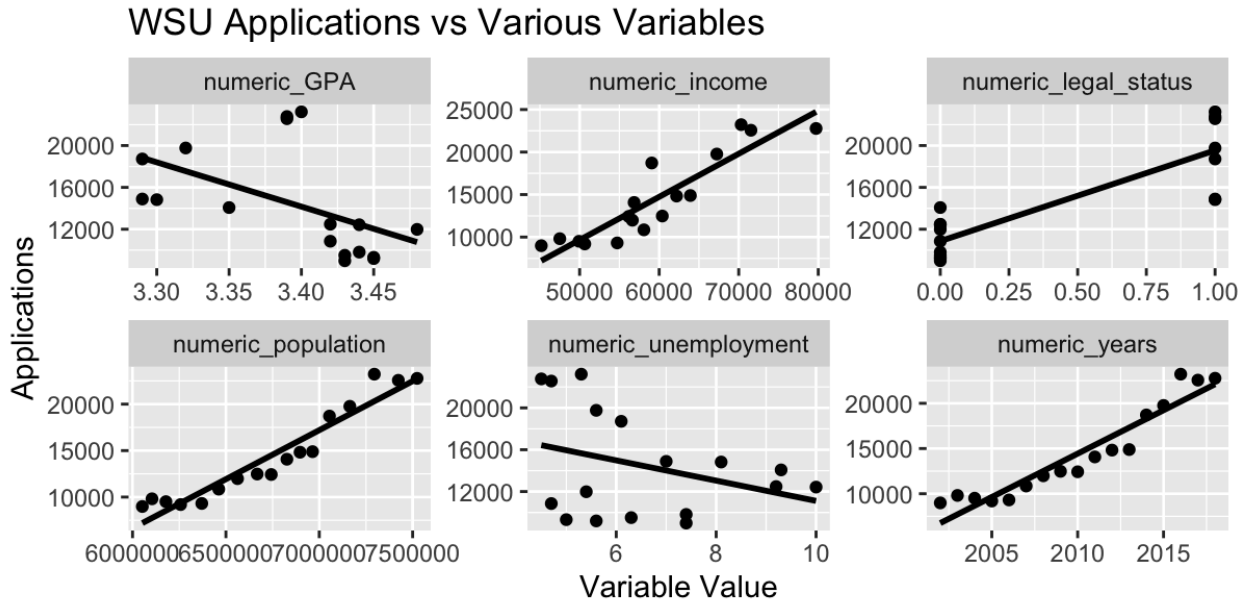

Figure 3: Independent variables relation to application patterns for BSU.

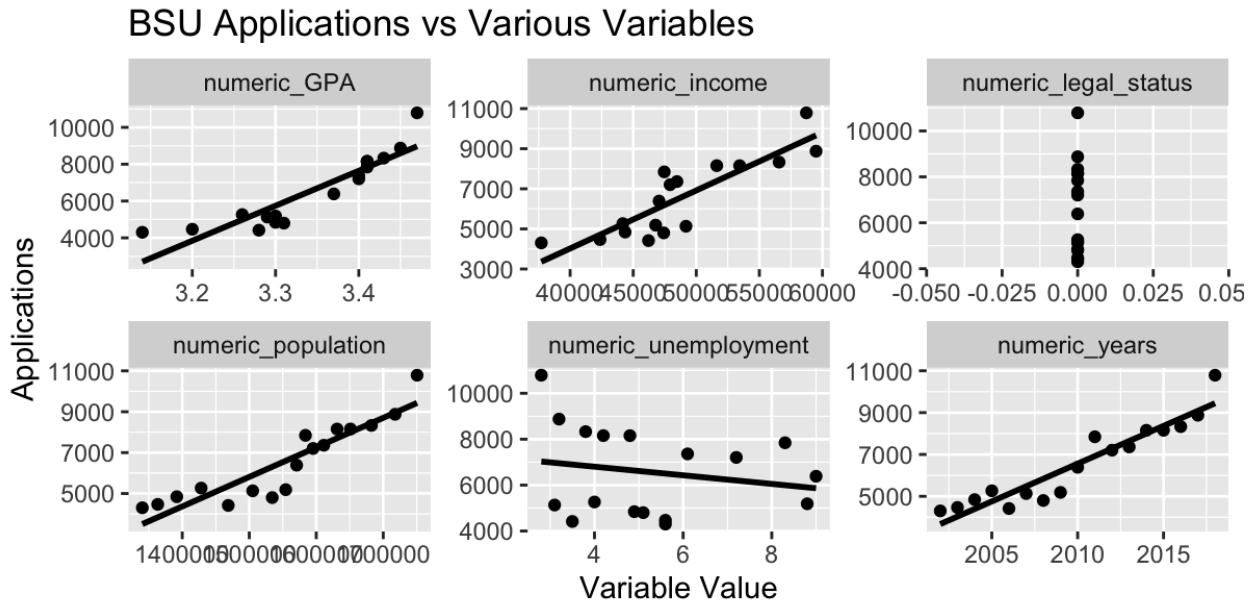

Figure 4: Independent variables relation to enrollment patterns for OSU.

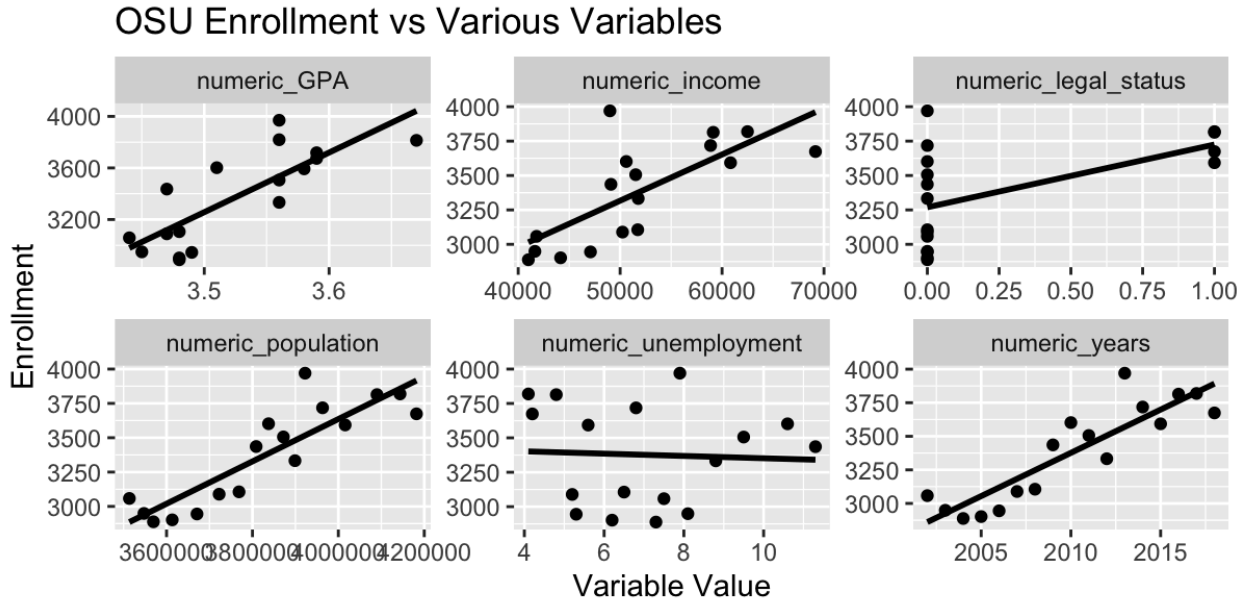

Figure 5: Independent variables relation to enrollment patterns for WSU.

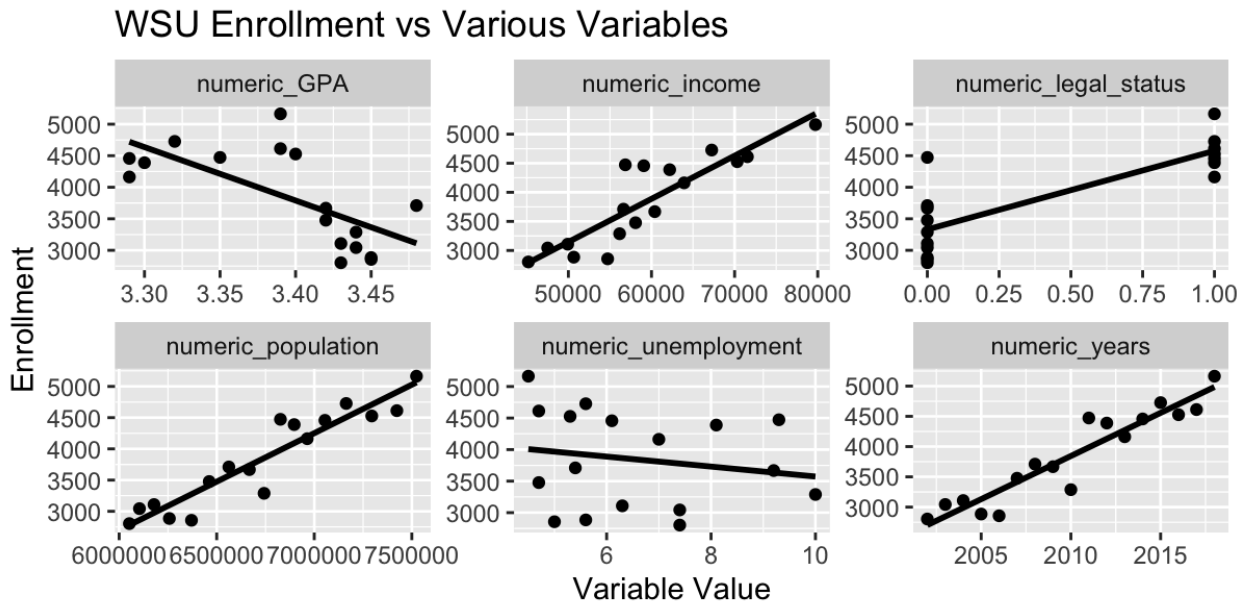

Figure 6: Independent variables relation to enrollment patterns for BSU.