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An analysis of the Co-Use of Cannabis and Alcohol Amongst Spanish-Speaking Communities in Legalized vs. Non-Legalized States

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Abstract

While there are data on the effects of co-use of various drugs and alcohol, many studies do not have a wide demographic of participants such that results tend to be skewed towards majority groups. In order to have a better understanding of which populations are using the most cannabis, it is necessary to broaden research to non-majority groups to have a more accurate representation of the population. The present study used a survey on Prolific, conducted completely in Spanish, to ask members of the Latinx community about their drug and alcohol use. There were 203 total participants in the study, all 21 years or older, identifying as Latinx, and endorsing Spanish as a primary or fluent secondary language. Results suggest that, between the alcohol only group and the co-use group, there was a significant difference in age such that participants in the co-use group are older than participants in the alcohol only group (t = -2.35, p = 0.02). There were no differences between groups in regard to gender or level of education. Results also suggested that, within the co-use group, participants who started using cannabis at an older age use more cannabis than participants who started using cannabis earlier in life (F(203) = 50.4, p < .05). Furthermore, there was a significant relationship between legalization status and cannabis use frequency score such that co-use participants living in a state where cannabis is legal use cannabis more frequently than participants who live in a state where cannabis is illegal (F(104)=4.595, p=0.03). However, there were no significant results within the co-use group in regard to gender or level of education (p < .05 for all hypotheses). If creating an intervention for co-use, the intervention should be targeted towards Latinx co-users who started using cannabis at an older age and are living in a state where marijuana is legal.

Keywords: alcohol, cannabis, co-use, Latinx, marijuana

An Analysis of the Co-Use of Cannabis and Alcohol Amongst Spanish-Speaking Communities in Legalized vs. Non-legalized States

The use of cannabis has become increasingly legal across the United States, and though it is more easily obtained than before, there are little data to suggest which demographics are at higher risk for regular use, especially in conjunction with other substances such as alcohol. While some data suggest that cannabis has various positive effects on things such as chronic pain, anxiety, and stress (Webb & Webb, 2014), these data are predominately skewed toward whites and often exclude minority populations for reasons such as language barriers or cultural differences. A study by Al-Amer, Ramjan, Glew, Darwish & Salamonson (2014) found that it is challenging to incorporate a culturally diverse sample due to the lack of standardization in the translation and production of healthcare-based studies. Furthermore, there are very few Spanish papers in the U.S. literature. While there are data on the co-use of cannabis and alcohol, they are usually represented by majority groups; therefore, it is important to conduct co-use studies on understudied demographics in order to further contribute to the data.

Cannabis

Carliner et al. (2016) found that the prevalence of cannabis use has been increasing over time for both genders but is higher in men than in women. There are data to suggest that an earlier onset of drug use can cause problems with addiction, impulse control, and executive function (Ansell, Laws, Roche, & Sinha, 2015; Cohen & Weinstein, 2018; Grinspoon et al., 1997) . Cannabis users who start using earlier are more likely to smoke 3 times as much cannabis and twice as often as later onset groups (Gruber et al., 2012). The level of education a person has completed can also impact their drug use. For example, Galea, Ahern, Tracy, Rudenstine, & Vlahov (2007) found that, on average, cannabis use was higher in neighborhoods with a lower

mean level of education. Though there could be a number of socio-economic factors contributing to these results, the researchers in this study suggest that individuals who live in neighborhoods where attaining a higher education is less common might be more likely to use cannabis as compared to individuals who live in neighborhoods where it is more common to attain some type university education.

There are very few studies that analyze the usage of cannabis as predicted by views or attitudes; however, existing data suggest that there tends to be more negative views from individuals in the Latinx[1] community when compared to non-Hispanic whites (Roppolo, Brooks-Russel, Bull, Maffey & Levinson, 2017). Holding a negative view towards cannabis use may indicate a lower frequency of use; however, this is not always the case. Johnson et al. (2018) found that, using a 30-day trend measuring self-reported cannabis use at 0 and 30 days, Hispanic/Latinx youth were the only ethnicity group to show an increase in use of cannabis as compared to other ethnicity groups such as white or Asian. Therefore, because data suggest that younger generations in the Latinx community are starting to use cannabis more, it is important to gather research on the demographics most at risk for cannabis use to address the gap in the literature as younger generations age.

Legalized vs. Non-legalized States

Full legalization of cannabis began in 2012 when Colorado voted to approve a constitutional amendment that allowed for the retail sale of cannabis and cannabis-related products (CO. Const. amend. 64). With this newfound legalization, many studies have found the frequency of use of cannabis to have gone up. For example, Epstein, Bailey, Kosterman, Furlong

[1] "Latinx" will be used throughout this paper to represent any person of Latin-American descent, and encompasses all genders (including nonbinary).

& Hill (2020) found that there has been an increase in both pro-cannabis norms as well as frequency of use in cannabis in both legal and non-legal states, with the legal states showing a greater increase than non-legal states. This study also mentions that there was no difference in use or norms across gender, ethnicity, or education. After the legalization of cannabis, there was an increased risk for cannabis use disorders among both adolescents and adults (Cerdá et al., 2019). Thus, it is important to take legalization into account when analyzing data concerning cannabis use as well as including underrepresented groups in a more equitable way.

Alcohol

Alcohol use tends to be more common than cannabis use and has been legal in the United States for a much longer period of time. A study from the National Survey in Drug Use and Health found that there were 139.8 million current alcohol users above the age of 11 in the United States, while there were 43.5 million cannabis users above the age of 11 in 2018. Keyes, Grant, & Hasin (2008) found that men born between the years of 1913 and 1932 were 5.07 times more likely to have alcohol dependence than women, and men born between the years of 1968 and 1984 were 1.97 times more likely to have alcohol dependence than women.

Although the gender gap is decreasing, evidence still supports men having a higher dependence of alcohol than women overall. Pitkänen, Lyyra, & Pulkkinen (2005) found that both men and women were at the highest risk of heavy drinking if they began consuming alcohol before the age of 16. Early age of onset in regard to alcohol can predict lifelong habits of using and can cause many problems throughout a persons' life. Other studies have made similar conclusions (Hingson, Heeren, & Winter, 2006; Moure-Rodriguez & Caamano-Isorna, 2020).

Similar to cannabis use, the level of education a person has completed can correlate with how much alcohol they use. Individuals who dropped out of high school are 6.34 times more

likely to develop alcohol abuse/dependence than those who did not drop out (Crum, Helzer, & Anthony, 1993). Data suggest alcohol use amongst the Latinx community is relatively common. Hispanics have the second highest prevalence of use of alcohol at 60.3% frequency, slightly behind whites who report at 63.5% frequency (Delker, Brown, and Hasin 2016). While frequency data are more abundant, there is still a lack of detailed alcohol use data representing the Latinx community.

Co-use of Alcohol and Cannabis

There are two competing hypotheses about co-use: substitution and complementarity (Subbaraman 2016). The substitution hypothesis states that cannabis and alcohol can be used in the place of one another to get similar effects (Schuster et al., 2021), while the complementarity hypothesis states that alcohol and cannabis can be used together to enhance the effects of both (Risso, Boniface, Subbaraman, & Englund, 2020). The data are mixed on these two perspectives, and there is again not an accurate representation of all demographics in these studies. For example, Subbaraman and Kerr (2015) found that participants who use both cannabis and alcohol are more likely to use them simultaneously and more frequently than those who do not co-use, which increase the odds of unfavorable social behaviors such as drunk driving. Unique among most studies, Black and Hispanic Americans were oversampled in this study which aimed to analyze simultaneous versus separate users of cannabis and alcohol. While the study is useful to provide data that would be otherwise unavailable, it still is not a true representation of the desired population.

Barriers to Research

As previously mentioned, there is a gap in the literature regarding cannabis use, co-use, and ethnicity which are largely due to societal and political barriers. Language barriers exist for

certain ethnic groups, which often means they will be less likely to participate in important studies. McDonald, Merwin, Merwin, Morris, and Brannen (2011) found that, of the 30 county governments with the highest proportions of Spanish-speakers, only 6% of county websites included Spanish translations in pages other than the entry page. The findings suggest that although various places across the United States are home to non-English-speaking populations, there are very few local governments giving a sufficient amount of accessibility. A similar problem occurs in research. Many studies do not translate information in different languages to encompass a wider demographic. There are also many inconsistencies in methodologies among the studies that do translate (Larkin Dierckx de Casterlé, & Schotsman, 2007).

Furthermore, there are large barriers due to cultural stigmas and the current political climate within the Latinx community. Escobedo, Allem, Baezconde-Garbanati, Unger (2017) reported that participants who felt an obligation to care for and honor their parents were associated with less binge drinking, cannabis use, and other hard drug use. In the Latinx community some feel that their family is one of the biggest sources of their anxiety (Chavez-Palacios, Blanco, & Graf, 2021), which could be a contributing factor to the lack of data within Latinx communities. Participants may be less likely to report accurate use of cannabis or alcohol. Furthermore, many people in the Latinx community feel increasing pressure in regard to immigration statuses or government policies. Hatzenbuehler et. al (2017) found in a population-based study of Latino participants that Latinos living in a state with more exclusionary political polices had 1.14 times worse mental health as compared to Latinos living in a state where the political climate was less exclusionary. This data suggest that participants might not feel comfortable using drugs or reporting drug use honestly.

The purpose of this study is to address the gaps in the literature on substance use in the Latinx community through the development and implementation of a nationwide Spanish language survey on substance use patterns and attitudes. Specific research questions include examining gender, level of education, age of onset, and legalization status of cannabis use among the Latinx community worldwide. The present study hypothesizes that, within the co-use group, men will use cannabis more frequently than women, participants with a lower level of education will use cannabis more frequently than participants with a higher level of education (i.e., any completed education after high school), and participants within the co-use group who report using cannabis at an earlier age will use cannabis more frequently than participants who report starting to use cannabis later in life. An additional hypothesis is that cannabis use for co-users will be more frequent in states where cannabis is fully legal in comparison to cannabis use for co-users in states where cannabis is partially or completely illegalized.

Methods

Design and Procedure

The survey used in this study was translated from a previously written English version conducted by the CUChange Lab at the University of Colorado at Boulder. The original version of the study aimed to collect information about cannabis use patterns and attitudes as well as the risks and benefits of using cannabis products to alleviate various ailments. The Spanish version of the survey was completely anonymous and was offered through Prolific (https://www.prolific.co), an online survey and data collection software. Upon the creation of a Prolific account, potential survey respondents answered demographic-related questions to determine whether or they qualify for any given study. If a particular user was eligible, they were required to complete an informed consent form (also offered through Prolific) which contained

information about the survey. Participants that qualified for participation in the survey did so voluntarily. The survey was completely anonymous and took about 15 minutes to complete in its entirety. However, participants were not required to respond to questions they did not feel comfortable answering. While this study is only concerned with participants currently residing in the United States, participants all around the world were free to take the survey. Data was collected from May 2020 until August 2020. Participants were asked demographic related questions as well as questions related to cannabis use, alcohol use, and other drug use.

Participants

Participants had to be 21 years of age or older to complete the survey, had to endorse Spanish (any dialect) as a native language and must currently reside in the United States. Participants must have also had access to a computer or internet service in order to complete the survey. Due to the current political climate (Hatzenbuehler et. al, 2017) the present study allowed participants to skip any questions on the survey they did not feel comfortable answering, such as their zip code or state of residency. Furthermore, the survey included a wide variety of genders for the participants to choose from, including a text box in which they could specify their identified gender. If a participant chose not to respond to a question that was imperative to the present study, they were not included in the data analysis.

Measures

Demographics, Cannabis Use History and State Legality Status

When selecting a gender identity, participants had many different options, including a text box to ensure all genders could be represented. Since one of the focuses of the study is cannabis legality status, participants were asked to report their zip code or current state of residency (but were not required to respond). If a participant reported living in a state where the

recreational use of cannabis has been legalized, the participant was considered to be in a legal state. If a participant reported living in a state where cannabis was only partially legalized (i.e., medicinal use only) or if they reported living in a state where cannabis was completely illegal, that person was considered to be in an illegal state. Furthermore, the age of onset variable was determined by reporting the age of participant's first use of cannabis. Breakdown of the states included in the study, legalization status, percentage of the population identifying as Latinx, and number of participants from each state can be found in **Table 1**.

Average Cannabis Use per Day

For the purpose of this study a construct called "average cannabis use per day" (ACPD) was created to measure co-use status. In the survey participants were asked how frequently they currently used cannabis or cannabis related products, such as flower, hash, wax, topicals, and edibles. The frequency of use of all cannabis products for a participant was averaged and they received a score for the ACPD variable. This variable was used in two ways. First, it was used to define cannabis use status. For example, if a participant scored a zero on the ACPD variable (did not endorse use of any of the cannabis products), they would not be considered a user of cannabis because they did not report any cannabis product use. Anyone scoring greater than zero on the ACPD variable would be considered a co-user. Second, ACPD was also used in the models examining frequency of use as a continuous variable.

Co-Use Definition

In this study, "co-use" is defined as any participant who scored anything above a zero in the ACPD variable, and who had also reported alcohol use at some point in their life. Because there are not many effective ways to measure potency in regard to cannabis use (a participant might use edibles once a week and another might use hash once a week, and the two cannot be

exactly compared) the present study assigned a score to participants that was an average use of all cannabis products in a day. While participants were asked how often they use different cannabis products with possible responses ranging from never having used cannabis before to daily, the ACPD variable was averaged by daily use. Questions listed in **Table 2** were used to determine co-use status. If a participant reported using alcohol and reported having never used any cannabis product in their life, that participant was placed in the alcohol only (AO) group. If a participant reported using alcohol and a cannabis product at some point in their life (ACPD > 0), they were put into the co-use group (AMJ).

Translation, Cultural Equivalency, and Ethics

The Spanish version of the study was put through professional translators and a focus groups in order to create a survey accessible to all different types of Spanish speakers from different regions. Participants were not required to disclose any information they did not feel comfortable sharing with researchers. This study followed the recommendations of the University of Colorado Boulder's Institutional Review Board. Informed consent was given by all participants in accordance with the Declaration of Helsinki. Both the English and Spanish version of the study were approved by the University of Colorado Boulder's Institutional Review Board.

Statistical Analysis

First, t-test and chi squared analyses were used to compare AMJ and AO groups on age, education level, and gender. Next, three single degree of freedom F tests were used to examine if gender, age of onset, and level of education were related to cannabis use frequency scores. Finally, a single degree of freedom F test was applied to a subset of participants who reported

state of residency to examine the relationship between cannabis use frequency and legal status of their state of residence.

All statistical analyses were calculated using RStudio Team (2018). RStudio: Integrated Development for R. RStudio, Inc., Boston, MA URL http://www.rstudio.com/.

Results

Study Demographics

There were 480 total responses to the survey. However, 275 participants were removed from the study due to any of 3 reasons: they reported an international zip code, they reported an age under 21 years old, or they did not endorse using either alcohol or cannabis. Furthermore, an additional 2 participants were removed because their age was higher than two standard deviations above the mean. After these exclusions, there were a total of 203 participants included in the primary analysis, and 104 of the 203 participants were included in the secondary analysis (96 participants were excluded from the secondary analysis due to missing state data). There were 38 participants that reported living in a state where cannabis is legal, and 68 participants living in a state where cannabis is partially or fully illegal.

Within the total 203 participants, there were men (N=91) and women (N=112). While participants were given a wide variety of gender options from which to choose, the only genders identified in the data set were men and women. Of the participants that chose to identify their race (N=188), 0 (0%) participants reported Indigenous Native American or Alaskan Native, 4 (2.12%) participants reported being Asian, 3 (1.60%) participants reported being Black/African American, 0 (0%) participants reported being Hawaiian, 73 (38.83%) of participants reported being White, 89 (47.34%) of participants reported being Hispanic or Latino, and 19 (10.10%) of participants reported identifying with 2 or more races.

Demographic Differences among Groups

See **Table 3** for demographic differences across groups. Specifically, there were 108 participants in the alcohol and cannabis group (AMJ), ranging in age from 21 to 53 years old (M=27.21, SD=9.46). The alcohol only group (AO) had 95 participants, ranging in age from 21 to 50 years old (M=23.7, SD=11.79). Notably, the t-test demonstrated significant differences in age between the AMJ and AO groups, such that participants in the AMJ group on average were slightly older than participants in the AO group (t=2.345, p=0.02). No other demographic variables had significant differences between groups.

Age of Onset, Gender, Education Level, and Cannabis Use Frequency in Co-Users

Within the co-use group, there was a significant relationship between cannabis use frequency and age of first ever cannabis use such that the average frequency of cannabis use was higher for individuals that had a higher age of first use (F(203)=50.4, p<0.001). Results can be found in **Figure 1** below.

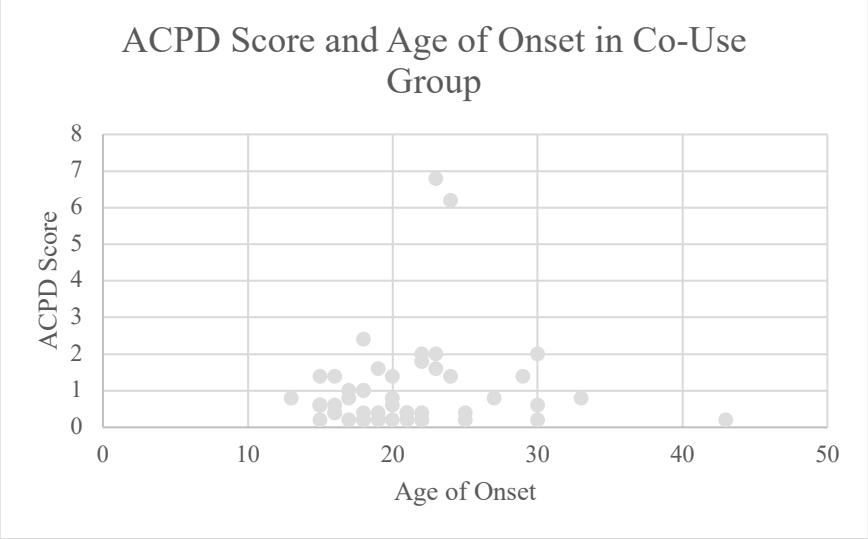

Figure 1. ACPD Score and Age of Onset in the Co-Use Group. The reported age at which participants started using cannabis regularly for the first time, and the current ACPD score.

Statistical analyses suggested that there is no significant relationship between gender and cannabis use frequency among co-users, $F(201)=0.1741$, $p=0.677$.

Level of education was also not significantly related to cannabis use frequency score ($F(201)=1.951$, $p=0.164$).

State Legal Status and Cannabis Use Frequency in Co-Users

For this analysis, a subsample of participants who reported state of residency was used (N=104). There was a significant relationship between legalization status and cannabis use frequency score such that co-use participants living in a state where cannabis is legal use cannabis more frequently than participants who live in a state where cannabis is illegal ($F(104)=4.595$, $p=0.03$). Results of this statistical analysis can be found in **Figure** 2 below, and **Table 4** summarizes the results of all statistical analyses preformed.

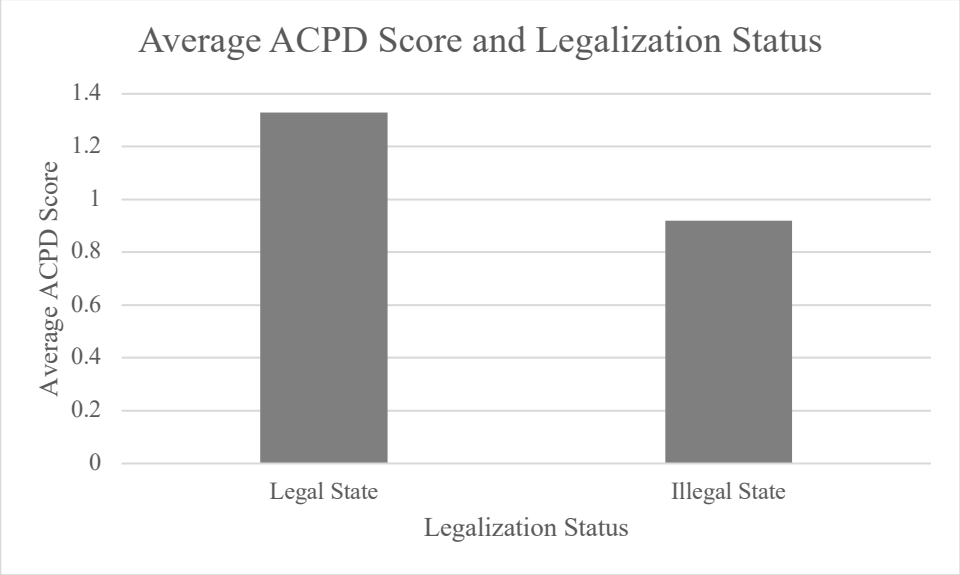

Figure 2. This figure shows the relationship between the average ACPD score for all participants living in a state where cannabis is legal in comparison to the average ACPD score for all participants living in a state where cannabis is illegal for recreational use.

Discussion

The goal of this study was to examine the relationship among key demographic characteristics within Latinx communities across the United States impact on co-use cannabis and alcohol. The present study included 4 different hypotheses. It was predicted that, within the AMJ group, men use more cannabis than women, participants with a lower level of education use more cannabis than participants with a higher level of education, and participants who report using cannabis at an earlier age use more cannabis than participants who report starting to use cannabis later in life. Finally, it was also hypothesized that participants in the co-use group would use cannabis more frequently when living in a state where cannabis use is legal compared to participants living in a state where cannabis use is illegal. In regard to group differences, participants in the co-use group were older than participants in the alcohol only group. Results are consistent with 2 of the 4 hypotheses: participants living in a state where cannabis is legal use more cannabis than participants that live in a state where cannabis is illegal ($p < 0.05$). Interestingly, our study found that participants with an older age of onset use cannabis more frequently than participants with a younger age of onset ($p < 0.005$), which was the opposite direction of what we hypothesized. However, the AMJ group was significantly older than the AO group ($p<.05$).

In addition, when comparing individuals who used both cannabis and alcohol (AMJ) vs. those who use only alcohol (AO), there were no significant group differences in gender or education level($p > 0.05$ for all hypotheses), indicating that men do not co-use cannabis and alcohol more than women and participants who reported a lower level of education do not co-use cannabis and alcohol more than participants who reported a higher level of education.

The present study found that Latinx men were not more likely to co-use cannabis and alcohol than women. Results were not consistent with previous findings. Carliner et al. (2016)

found that males were more likely to use cannabis than females, and Keyes, Grant, & Hasin (2008) found that men were more likely to develop alcohol use disorders than women. Furthermore, a study on co-use and gender also found that men were more likely to co-use cannabis, alcohol, and cigarettes than women (Purcell et al., 2020). A possible explanation for the differences in data could be that there were more men than women in the study, or that previous literature does not specify co-use patterns within the Latinx community in the United States.

While previous data suggest level of education is correlated with drug and alcohol use, the results in this study suggested that the two did not correlate. This result is inconsistent with previous results from Crum, Helzer, & Anthony (1993) on age of onset and alcohol and from Gruber et al. (2012) on age of onset and cannabis use. It is possible that there are many other factors contributing to a participant's education level, such as cultural or religious beliefs. A study done by Castro et al. (2009) found that there are cultural protective factors, such as conservative beliefs, in Latinx families that can reduce youth problem behaviors such as drug use. Although a participant might not have had the ability or desire to receive a higher-level education, it is possible that other culturally unique factors such as familial values prevented a co-use status.

Results suggested that participants who started using cannabis later than other participants currently use cannabis more frequently than participants who started using cannabis earlier in life. These results are not hypothesis consistent or consistent with previous literature, such as Gruber et al. (2012), which found that cannabis users who reported an earlier age of onset were more likely to smoke more frequently and in greater quantities than those who reported an older age of onset, and Pitkänen & Pulkkinen (2005) which found that participants

who started using alcohol age 16 or lower had a much higher risk of developing alcohol-related addictions than those who reported starting to drink alcohol later in life. Furthermore, it is important to note that the age of onset in the Gruber et. al (2012) study participants had a slightly younger age of onset of cannabis use than in the present study, with participants as young as 11 years old reporting a first use of cannabis, whereas in this study the youngest age of first use was 13 years old. An explanation for this finding could be that participants starting cannabis later in life could be doing so because it is more easily accessible in legal states, it might be helpful for medical ailments occurring in older age, or that stigmas against cannabis use have reduced since legalization.

Finally, data suggested that there was a relationship between frequency of cannabis use in co-users living in states where cannabis is legal. There was a significant difference in frequency of cannabis use in co-users between states where cannabis is legal and states where cannabis is only partially legal or completely illegal. This result is consistent with previous studies such as Epstein, Bailey, Kosterman, Furlong & Hill (2020) that found that the legalization of cannabis has caused an increase in pro-cannabis attitudes as well as overall cannabis use, and Cerdá et al. (2019), which found that following the legalization of cannabis there was an increased risk of substance use disorders in adults. These results could be partially explained due to more liberal cannabis norms in states where cannabis use is legal, therefore explaining why cannabis use is higher for participants living in a legal state.

The present study is unique in that it utilizes language to include non-majority populations that are generally underrepresented in many areas of the scientific community. Since there has been a large increase in immigrants living in the United States in recent years (Budiman, Tamir, Mora, & Noe-Bustamante, 2020) it is imperative the government as well as

public health officials understand the demographic trends in drug use. Thus, the results of the present study might be useful in representing non-majority communities and establishing a foundation for other cultural-based scientific studies to be conducted. It is important to reflect that some of the relationships among demographic characteristics co-use and frequency of cannabis use look different in our specific study population from the prior literature and it will be important for future research to examine these patterns in larger representative studies.

Limitations and Future Directions

As stated the topics in this survey can be seen as taboo subjects and might affect a participant's willingness to participate. Self-report methods can be can inaccurate due to a social desirability bias or cultural/religious differences. The sample was relatively small and due to COVID-19 restrictions, the survey instrument was moved online. In future studies it would be better to conduct the survey using community outreach methods and doing so on larger scales in order to increase sample sizes. Furthermore, creating a longitudinal study might improve the guidelines to determine who is considered a "co-user", as this study had a broad criterion matrix. Because cannabis laws have been changing throughout different states across the U.S., it is likely that responses to the survey could warrant a different outcome due to changes in attitudes or perceptions of cannabis use.

Implications

Results suggest that the demographic most likely to frequently use cannabis in Latinx communities across the United States are participants who reported an older age of onset and participants living in states where recreational use of cannabis is legal. Results did not find a significant relationship between co-users and gender, or co-users and level of education. In the event of an intervention for the co-use of cannabis and alcohol, results suggest that targeting

members of the Latinx community that started using cannabis at an older age living in state where cannabis use is legal would yield the most successful results.

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Tables

Table 1

Legalization Status and Population Breakdown by State

State	Legalization Status	Percentage of Latinx Population	Number of participants in study
Arizona	Partial (medicinal use only)	29.6%	6
Arkansas	Partial (medicinal use only)	6.4%	1
California	Legal	37.6%	26
Colorado	Legal	20.7%	2
Florida	Partial (medicinal use only)	22.5%	15
Georgia	Partial (CBD oil use only)	8.8%	1
Illinois	Legal	15.8%	3
Iowa	Partial (CBD oil use only)	5.0%	1
Kansas	Illegal	10.5%	1
Maine	Legal	1.3%	1
Maryland	Partial (medicinal use only)	8.2%	2
Massachusetts	Legal	9.6%	1
Missouri	Partial (medicinal use only)	3.5%	1
Minnesota	Partial (medicinal use only)	4.7%	1
Montana	Partial (medicinal use only)	2.9%	1
North Carolina	Illegal	8.4%	2
Nevada	Legal	26.5%	1
New Jersey	Partial (medicinal use only)	17.7%	3
New Mexico	Partial (medicinal use only)	46.3%	1
New York	Partial (medicinal use only)	17.6%	8
Ohio	Partial (medicinal use only)	3.1%	3
Oregon	Legal	11.7%	2
Pennsylvania	Partial (medicinal use only)	5.7%	3
South Carolina	Illegal	5.1%	1

Tennessee	Illegal	4.6%	1
Texas	Partial (CBD oil use only)	37.6%	13
Virginia	Partial (CBD oil use only)	7.9%	2
Washington	Legal	11.2%	2
Wisconsin	Illegal	5.9%	1

Note. This table is a breakdown of all the states from this study. Not all 50 states were represented in the data. The percentage of the population from any given state that identifies as Latinx can be found here, as well as the number of participants in the study from each state. Legalization status is from the year 2019, and all Latinx population percentages are from the U.S. 2010 Census data.

Table 2

Co-Use Criterion Matrix

Question	English Translation	Possible Responses
¿Alrededor de qué tan seguido vapea o fuma flor de marihuana?	Around how often do you vape or smoke cannabis?	1 = nunca fumo ni vapeo cannabis (I have never smoked or vaped cannabis) … 4 = una vez al mes (once a month) … 13 = todos los días (everyday) 14 = prefiero no contestar
En promedio ¿qué tan seguido consume comestibles hechos con marihuana? Esta pregunta se refiere a cualquier producto que consuma oralmente como capsulas, comida o bebidas (por ejemplo productos horneados, golosinas, bebidas, aceite de cáñamo, aceite de marihuana, aceite de Rick Simpson, tinturas, etc.)	On average, how often do you consume food made with cannabis? This question refers to any product you use orally as capsules, food, or beverages (e.g. baked goods, candy, beverages, hemp oil, cannabis oil, Rick Simpson oil, dyes, etc.)	1 = nunca consumo comestibles (I have never used edibles) … 4 = una vez al mes (once a month) … 13 = todos los días (everyday) 14 = prefiero no contestar
¿En promedio con qué frecuencia usa productos tópicos (por ejemplo lociones, parches, etc.)?	On average, how frequently do you use topical products? (for example, lotions, patches, etc.)?	1 = nunca uso productos tópicos (I have never used topical products) … 4 = una vez al mes (once a month) … 13 = todos los días (everyday) 14 = prefiero no contestar

¿En promedio qué tan seguido usa productos concentrados de marihuana (por ejemplo aceite de hachís, aceite butane, cera, cartuchos)?	On average how often do you use concentrated cannabis products (e.g. hash oil, butane oil, wax, cartridges)?	1 = nunca uso productos concentrados (I have never used concentrated products) … 4 = dos días al mes (twice a month) … 12 = todos los días (everyday) 13 = prefiero no contestar
¿Bebe alcohol?	Do you drink alcohol?	1 = sí (yes) 2 = no 3 = prefiero no contester (I prefer not to answer)

Note. This table was used to determine co-use status. The left column represents the original question in Spanish, the middle column represents the English translation of the given question, and the rightmost column represents the possible answers to each question. If a participant answered 1 to any of the cannabis-related questions and 1 to the alcohol question, they were put into the AO group. If a participant answered 2-13 to any of the cannabis-related questions and 1 to the alcohol question, they were put in the AMJ group.

Table 3

Demographic Group Differences

Characteristic	**Frequency M(SD) or N(%)**	**p-Value**
Age, Co-use Group	27.21 (9.46)	0.02*
Age, Alcohol Only Group	23.7 (11.79)	
Gender, Co-Use Group	Men, 42 (38.8%) Women, 66 (61.2%)	0.6499
Gender, Alcohol Only Group	Men, 49 (51.5%) Women, 46 (48.5%)	
Education Level, Co-Use Group	15.05 (2.49)	0.2195
Education Level, Alcohol Only Group	14.40 (4.65)	
Ethnicity, Full Sample		
Indigenous Native American or Alaskan Native	0 (0%)	
Asian	4 (2.12%)	
Black/African American	3 (1.60%)	
Hawaiian	0 (0%)	

White	73 (38.83%)	
Hispanic/ Latinx	89 (47.34%)	
Multi-ethnic	19 (10.10%)	

Note. This table analyzes demographic group differences between the co-using group and the alcohol only group and provides an ethnicity breakdown of the full sample. Any result marked with * is significant according to the Alpha cutoff of 0.05.

Table 4

Results Summary

Hypothesis	**F statistic**	**p-value**
Co-use and Gender	0.174	0.677
Co-use and Age of Onset	50.4	2.11E-11*
Co-use and Education Level	1.95	0.164
Co-use and Legal Status	4.60	0.034*

Note. This table shows all the results from the statistical analyses performed. Any p-value with an asterisk is considered significant using a standard Alpha cutoff of 0.05.