

“If You Need to Light Up ... You Gotta Do What You Gotta Do”: A Qualitative Study of Adolescent Attitudes Towards Cannabis Use and Comparison with Alcohol Attitudes

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ABSTRACT

Objective: Cannabis and alcohol are among the substances most frequently used by adolescents. Adolescents also frequently co-use these substances, with use of alcohol predicting subsequent initiation of cannabis use, and vice-versa. Minimal research has explored adolescents' attitudes towards cannabis use qualitatively, and how these attitudes may directly/indirectly relate to attitudes towards alcohol use and vice versa. **Method:** Forty U.S. adolescents ($M_{Age} = 16.68$, $SD = 0.86$) who had recently completed a study reporting their in-vivo exposure to substance use content in media completed follow-up interviews focused on substance depictions in media and attitudes towards substance use. Interviews were individual, semi-structured, and approximately one hour long. A priori codes were derived from the interview agenda. Interviews were transcribed and qualitatively coded by a team of three graduate students. Percent agreement across coders was 80%, suggesting substantial agreement. **Results:** Several themes emerged from analysis. Most adolescents reported that their approval/disapproval of cannabis use was contingent on several factors including legality, age, degree of use/problematic use, and purpose (i.e., medicinal/recreational). Participants more commonly endorsed cannabis use as more acceptable than alcohol. Common reasons for this comparative approval included perceived social and health impacts (e.g., alcohol poisoning, liver disease), perceived addictive potential, and different effects of intoxication. **Conclusions:** Results of the present study provide rich context to recent trends in adolescent cannabis and alcohol use and perceptions, as well as co-use and abstention. Understanding teens' attitudes towards substance use may be beneficial in developing appropriate substance prevention and intervention strategies (e.g., effectively communicating health risks of cannabis use).

Key words: = adolescent; cannabis; alcohol; qualitative research; attitudes

Adolescent Alcohol and Cannabis Use

Cannabis and alcohol are two of the most used substances by adolescents in the United States. Data from the 2023 Monitoring the Future Survey

showed that when asked about substance use in the past month, 24.3% of 12th graders and 13.7% of 10th graders reported drinking alcohol, while 18.4% and 10.3% of 12th and 10th graders respectively reported using cannabis in any form

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(Miech et al., 2024). While rates of adolescent use have decreased from 10 years prior for both substances (as has the rate of adolescent co-use of these substances; Keyes et al., 2022), current prevalence rates highlight adolescent substance use as a continuing public health concern. Countering aggregate trends, adolescents' use of vaporized cannabis and use of cannabis for medicinal purposes has increased since first reported seven years ago, showing shifts in how teens are using cannabis, in the context of decreasing use overall (Miech et al., 2018; 2024), which could indicate subtle shifts in adolescents' attitudes towards cannabis. There are numerous immediate and long-term risks of both alcohol and cannabis use, with earlier and heavier use in both cases predicting less favorable outcomes (Patton et al., 2007; Scholes-Balog et al., 2016; Yuen et al., 2020). Further, co-use of alcohol and cannabis is associated with increased long-term risk as well as increased risk related to acute intoxication. Considering these risks, gaining a deep understanding of factors contributing to adolescent use of cannabis and alcohol and identifying appropriate prevention and intervention efforts are worthy public health endeavors. The present study aims to contribute towards these endeavors through qualitative analysis of semi-structured interviews focused on adolescents' cannabis approval and cannabis-related attitudes in direct relation to attitudes towards alcohol.

Theoretical Framework – Substance Use Attitudes

Despite the rich quantitative data on trends of substance use adolescence, few qualitative studies address teens' perceptions of and attitudes about cannabis as it compares to other substances. Ajzen's Theory of Planned Behavior (TPB; 1991) posits that attitudes (including expected consequences and evaluative attitudes; Ajzen & Fishbein, 2000; Ajzen, 2001), are valuable predictors of future behaviors and behavioral intentions. Per Ajzen (2020), "Attitude toward [a] behavior is assumed to be a function of readily accessible beliefs regarding the behavior's likely consequences, termed behavioral beliefs." In the case of substance use, adolescents could develop a behavioral belief that cannabis use is useful for coping with stress, which would contribute

towards making the adolescent's aggregate attitude towards cannabis use more positive. Conversely, an adolescent could develop a behavioral belief that cannabis use is likely to bring about adverse health consequences or social harm, contributing to a more negative aggregate attitude towards this behavior. Positive attitudes are theorized as a causal factor in behavioral intentions. This theory is supported by a significant body of work across countries indicating that adolescents' attitudes regarding substance use can reflect current substance use behaviors and serve as a valuable predictor of future substance use initiation and progression (Bashirian et al., 2012; Cooke et al., 2016; Kam et al., 2009; Malmberg et al., 2012; Marcoux & Shope, 1997; Morell-Gomis et al., 2019). Further, perceived peer attitudes have been shown to impact adolescent substance use behaviors (Mason et al., 2014; Trucco, 2020). Attitudes and behavioral beliefs are also common mechanistic targets of substance use prevention and intervention efforts in adolescents and beyond (Bashirian et al., 2013; Derzon & Lipsey, 2001; Donaldson et al., 2021; Huang et al., 2017).

Joint exploration of cannabis and alcohol use is supported by the frequent co-use of these substances among adolescents (Keyes et al., 2022; Patrick et al., 2018; Yurasek et al., 2017) as well as their common co-occurrence in media (Corcoran et al., 2024). Further, initiation of cannabis use is shown to predict later use of alcohol, and problematic use of cannabis predicts problematic use of alcohol (Hasin et al., 2016; Keyes et al., 2019). The inverse relationships are also shown to be true (Linakis et al., 2022). While these associations are well supported, it should be noted that there is still significant debate as to whether these relationships are best explained by directional associations, e.g., a "gateway" model, as opposed to a model of common vulnerability to substance use (Van Leeuwen et al., 2011; Vanyukov et al., 2012). Although both substances are commonly used, adolescent co-use of these substances has shown a slow decline over the past 15 years, while sole use of cannabis has increased (Keyes et al., 2022), which could indicate subtle shifts in adolescents' attitudes towards each substance. Substance use prevention efforts targeting adolescents also frequently target substance use *generally*, as opposed to developing content specific to individual substances

(Tremblay et al., 2020). It is possible that programming structured in this generalist manner could be ineffective if adolescents hold opposing attitudes towards different substances targeted in prevention efforts, especially if these opposing attitudes are functionally related to each other. For example, an adolescent could hold a belief that use of alcohol is quite dangerous and decide to use cannabis instead, as a perceived safer alternative behavior. Therefore, understanding how adolescents conceptualize different substances and their relation to each other could inform future public health and prevention programming.

Current Gaps in Research on Adolescent Cannabis Attitudes

Understanding how adolescents' attitudes towards alcohol and cannabis relate to each other may provide additional, unique information that may not be ascertained through studying each substance in a vacuum. Adolescents' views on this topic are likely quite nuanced and may not be fully captured through solely quantitative data collection methods, indicating that qualitative inquiry into these attitudes could provide valuable context to recent trends. Qualitative data could also provide greater understanding of adolescents' attitudes and behavioral beliefs nested within the social context and lived experiences of the individual. Several studies have utilized interviews with teens and other qualitative methods to investigate factors contributing to adolescent substance use (e.g., Alhyas et al., 2015; Janssen et al., 2014; Karashiali et al., 2022; Moradi et al., 2019). However, much prior work is limited by small sample size, has been conducted in non-U.S. samples, or has not interviewed adolescents directly. Further, past work has often leaned on focus groups rather than individual interviews which may shade how adolescents talk about risk behaviors (see Colonna et al., 2023). Additionally, while past qualitative work with adolescents *has* queried adolescents about multiple substances (e.g., Friese, 2017; Price Wolf et al., 2019), to our knowledge, no past work has queried adolescents *directly* about how their attitudes towards cannabis and alcohol may be interrelated, beyond their differential contribution to dating violence perpetration (Rothman et al., 2016).

The Current Study

The present study aims to expand upon this existing body of qualitative work by conducting individual interviews with adolescent participants who had recently completed an ecological momentary assessment study of in-vivo exposure to substance use content in digital media (R01-AA027968; PI: Jackson, see Jackson et al., 2025 for full parent study methodology). Importantly, the parent study was not interventional in nature; rather aiming to understand the frequency, characteristics, and interpretation of these exposures. However, through completion of the parent study, participants may have had their awareness and salience of attitudes towards these two substances raised through recalling and appraising media imagery of each product. Analysis of these interviews offers insight into adolescent attitudes on cannabis and alcohol and the interrelation of these attitudes among adolescents both with and without engagement in substance use. Findings are valuable both for understanding recent trends in adolescent substance use and for informing public health campaigns and other prevention and intervention efforts targeting adolescent substance use behaviors. Additionally, novel themes that emerge could serve to inform future quantitative or mixed-methods investigation.

METHODS

Participants

Participants included a subset of 302 adolescents ($n = 40$) enrolled in a parent study on exposure to alcohol content in the media who agreed to participate in an additional interview focused on cannabis/vaping in the media upon completion of the primary study. Interview participants were 80% female, with a mean age of 16.68 years ($SD = 0.86$ years). Fifteen percent of participants identified as male and two participants (5%) identified as non-binary. About half of the participants identified as White (45.5%), followed by 27.5% Black/African American, and 27.5% Asian. Twenty five percent identified as Hispanic. Most participants received free or reduced-price lunch (75%). Forty percent reported past use of cannabis and 62.5% reported past use

of alcohol (not including as part of a religious ceremony). Lifetime prevalence rates in the present sample for both cannabis and alcohol use closely align with national rates for 12th graders (Miech et al., 2024). Full participant demographics can be seen in Table 1.

Recruitment and Study Procedures

Participants were recruited to the parent study through paid advertisements distributed nationally on Facebook and Instagram. Eligibility criteria included smartphone ownership, being between 15 and 18 years old, and endorsing that either they or a close peer used alcohol (to ensure adequate recruitment of youth across a range of risk behaviors; NIAAA, 2011; Tubman et al., 2021). Upon confirming eligibility, study staff obtained informed consent via Zoom (Zoom Communications, Inc., San Jose, CA) call from 18-year-old participants and from parents of 15- to 17-year-old participants and secured assent from 15- to 17-year-old participants. Enrolled participants participated in a study orientation session via Zoom and completed an approximately 40-minute-long baseline survey including questions on demographic characteristics (e.g., age, grade, state of residence, race, ethnicity, sex, gender, and receipt of lunch subsidy), substance use, and technology use, among other measures. Participants were compensated \$30 for completion of the orientation and baseline measures. See Jackson et al., 2025 for full procedures of the parent study. All parent study participants were contacted via email with information (e.g., procedures and compensation) about the qualitative interview follow-up study. Interested participants completed another brief eligibility survey on Qualtrics (Qualtrics, LLC, Provo, UT). Parents of eligible and interested participants aged 15-17 received an email with study information and a digital informed consent form. Upon confirming completion of the parental informed consent form, participants under 18 completed a digital assent form. Participants aged 18 directly received the study information and digital informed consent form.

A semi-structured interview agenda included topics broadly related to alcohol, cannabis, and vaping, as well as exposure and reaction to substance use content in the media. The semi-structured format of the interviews allowed for

flexibility in modifying or adapting the interview agenda and codes based on participant reports and novel information. Interviews were conducted by trained clinical psychology doctoral students (EC, AC, MR) and an undergraduate research assistant (NW), with most interviews lasting approximately 60 minutes. Once scheduled, participants were provided with a link to a secure Zoom videoconference. While in the waiting room, participant names were changed to their Subject ID for deidentification. Interviewers provided a brief introduction where participants were informed of how their information will be kept private, affirmed that they were in a private location where they felt comfortable sharing openly, and agreed to the session recording. Sessions were then recorded and saved to a secure institutional cloud storage system along with an automatically generated session transcript before being transferred to secure folders within a university shared drive. The session transcript was reviewed alongside interview audio and edited to create a verbatim transcript. Each transcript was subsequently reviewed for accuracy by another undergraduate or graduate research assistant. Participants were compensated an additional \$30 for completion of the interview. All methods were approved by the Brown University and University of Florida Institutional Review Boards.

Analytic Plan

Data were analyzed utilizing a hybrid deductive, template-style to inductive analytical approach (Crabtree & Miller, 1992; 1999; King, 2014; Proudfoot, 2023). An initial hierarchical codebook was developed comprised of a priori codes derived from the agenda of the semi-structured interview (Brooks et al., 2015). After transcripts were finalized, they were subsequently qualitatively coded in Lumivero Nvivo 14 (2023; NVivo, Version 14, www.lumivero.com) Participant quotes and responses were coded across 49 a priori codes derived from the semi-structured interview agenda encompassing six broad thematic content areas: (1) feedback on the parent study, (2) cannabis knowledge and attitudes, (3) media portrayals of cannabis and other substances, (4) cannabis advertising, (5) impacts of cannabis use, and (6) other feedback. Of note, results from the present study are derived largely from the

cannabis knowledge and attitudes content areas. Each transcript was double coded by two graduate research assistants (AC, EC, MR). All coders initially coded two full interviews, with initial agreement ranging from 76-83%. Coders then met to resolve discrepancies, identify and review exemplars of coding categories, and clarify code definitions. Each coder subsequently coded 26 to 28 transcripts. Percent agreement across all coders and transcripts averaged at 80%, indicating substantial agreement between coders (McHugh, 2012).

Content identified as belonging to each code was compiled across participants and reviewed by at least two coders to identify emergent themes and exemplar quotes. Video recordings of interviews were destroyed upon completion of coding and analyses. Past work on theme saturation in qualitative research has indicated that a sample of 20-30 interviews provides sufficient power for meaning saturation, such that additional interviews beyond this are likely to result in redundant information and few

unique/novel issues (Dworkin, 2012; Marshall et al., 2013). As such, the sample size for the present study was sufficient for this purpose. Neither the transcripts nor demographic data were manipulated in any way, nor were any participants' transcripts excluded from qualitative analysis.

Participant quotes below are accompanied by participant number, as well as the participant's race, self-identified gender identity (female [F], male [M], non-binary [NB]), grade at time of interview, past and/or current cannabis and alcohol use (cannabis +/cannabis - , alcohol +/alcohol -), and the legal status of cannabis in their state at the time of their interview (legal, illegal, mixed-status). Mixed legality status was generally characterized by medicinal use being legal, while recreational use was illegal. While meaningful group comparison is not feasible due to sample size of the present study, this information may be beneficial in providing additional context to individual participant quotes.

Table 1. *Sample Descriptives*

	<i>n</i>	(%)
Participants	40	100
Age (<i>M/SD</i>)	<i>16.68</i>	<i>0.86</i>
15	2	5.0
16	17	42.5
17	13	32.5
18	8	20.0
Grade	--	--
9	1	2.5
10	2	5.0
11	16	40.0
12	21	52.5
Gender Identity	--	--
Male	6	15.0
Female	32	80.0
Non-Binary	2	5.0
Race/Ethnicity	--	--
White or Caucasian	18	45.0
Hispanic/Latino	10	25.0
Black or AA	11	27.5
American Indian or Alaskan Native	1	2.5
Asian	11	27.5
Other	2	5.0
Native Hawaiian or Other Pacific Islander	0	0
Ever Cannabis Use	--	--
Yes	16	40
No	24	60
Ever Alcohol Use	--	--
Yes	25	62.5

No	15	37.5
State Cannabis Legal Status	--	--
Legal	23	57.5
Mixed	9	22.5
Not Legal	8	20.0
Receipt of Free/Reduced Lunch	--	--
Free Lunch	29	72.5
Reduced-Price Lunch	1	2.5
Neither	10	25.0

RESULTS

Representative quotes for two major thematic areas are discussed below: (1) adolescent attitudes towards cannabis and (2) how adolescents' attitudes towards alcohol and cannabis compare to each other. Emergent subthemes related to each theme are further discussed in the corresponding sections below.

Cannabis Attitudes

When asked about cannabis attitudes independent of alcohol attitudes, three broad thematic clusters emerged: (1) youth who primarily or unconditionally disapproved of cannabis use, (2) youth who primarily/unconditionally approved of or accepted cannabis use, and most commonly, (3) youth who conditioned their approval of cannabis use upon certain factors like age, legality, medicinal versus recreational use, and degree of use (e.g., if use was interfering with daily life). Generally, conditional approval of cannabis was common, while both unconditional approval and disapproval were infrequently described by participants. Additionally, outside of attitudes towards cannabis broadly, adolescent participants shared feedback on how their perceptions of and attitudes towards cannabis varied by route of administration (e.g., ingestible, combustible, vaporized).

General approval or acceptance. Some participants expressed primarily approval or acceptance of cannabis use that was not conditioned on any factors related to its use. One participant, for example, noted their acceptance of peers' cannabis use behaviors, and further expressed that they perceived engaging in risky and prohibited/taboo behavior as normative and even enticing or desirable for young people.

"I mean, personally for me...if you're comfortable with doing that, that's fine. Like, I

personally don't partake in smoking. But, like, I—the friends I do have that smoke weed it's, like, okay, like, 'You do you.' ...at the end of the day, people like doing what's, like, prohibited, if you know what I mean. Like, people are attracted to doing what they know they can't do." - SID 166 (Black, F, 12th grade, legal, cannabis -, alcohol -)

For other participants, their approval of cannabis appeared to be related to a behavioral belief that it was not harmful or dangerous.

"I don't really think weed's that bad. I could ... I could probably see myself ... if I didn't have this [medical disorder precluding use of cannabis], using weed more frequently." - SID 186 (White, F, 11th grade, mixed legality, cannabis +, alcohol +)

This perception of minimal risk may also be a function of teens' risk appraisal of cannabis in relation to other substances.

"I don't actually have too many opinions about people my age using cannabis because I'm not sure it's as bad as nicotine. [Vaping] nicotine could have side effects 20 years in the future and no one would know because it hasn't been around for that long. Cannabis, however, if you use it ... well then I guess you're better off that way even though it is still smoking." - SID 293 (White, F, 12th grade, legal, cannabis +, alcohol +)

Conversely, a different participant stated their approval despite acknowledging possible negative effects. They noted cannabis use could provide a means of coping with difficult contemporary events and news.

"It definitely affects your brain, but I also think everything affects your brain, and the world is really scary right now. So, if you need to light up every once in a while, or if you need to light up consistently to get through it, like, you gotta do what you gotta do." - SID 111 (White, F, 12th grade, legal, cannabis +, alcohol +)

Conditional Approval. The most commonly held perspective among the participants interviewed was that their approval or acceptance

of cannabis use was not unconditional, but rather depended on who was using cannabis, how, and where. For example, a number of participants noted that they approved of cannabis if it was used for medicinal management of mental or physical health concerns.

"I think that it could be used really, really good for really good ways. I've seen, like, people on chemo using it for, like, nausea, and stuff like that, or other people using it for other medical reasons." - SID 153 (White, F, 12th grade, legal, cannabis -, alcohol -)

Some expanded that their approval of medicinal cannabis use was contingent on the medical need for cannabis being "legitimate," as opposed to individuals leveraging a feigned or actual medical condition to obtain a prescription for cannabis that is not truly medically necessary.

"I think that [medical use is] fine, but, like, there's obviously not any way to really control this, but I think that it needs to be legit ... I know there's also people that- where here it's not legal, where people are using that as an excuse to get it. Like, there's a, there is a medicinal marijuana shop, doctor's office type thing that is close to my house ... and anytime I go around there, there's always a huge line, like people literally out the door into the parking lot, and you look and it's all young people, like, probably in their twenties." - SID 108 (White, F, 12th grade, mixed legality, cannabis -, alcohol -)

Participants commonly noted that their approval of others using cannabis was conditional upon the frequency/degree of use and the level of impairment to daily activities resulting from that use. As such participants expressed that cannabis use was less acceptable for those who use cannabis excessively, were dependent on cannabis, or were otherwise impaired in some way by their cannabis use (e.g., grades, school, social relationships). For example,

"Me, personally, I don't really have a problem with it as long as it's not like affecting your, like, day-to-day life. Like, ... I have a few friends who like started using it as, like, fun. And then it turned into now it's affecting how they are in school and their grades and everything." - SID 104 (Mixed-race, F, 12th grade, legal, cannabis +, alcohol -)

Beyond dependence or degree of impairment to daily life caused by cannabis use, frequency of use was described as an important factor in

approval of substance use generally, such that "sporadic" use of either was acceptable, while "over-indulging" was not.

"Responsible use is a big thing, too. Like, I don't approve of over drinking or over-indulging in smoking and all, but if it's used sporadically, then I approve more of it." - SID 268 (Asian, F, 12th grade, mixed legality, cannabis -, alcohol +)

Participants generally varied in how they characterized problematic use (e.g., frequency, impairment, reasons for use). For example, it was noted that, even in the context of perceived low risk for addiction to cannabis, use of cannabis as a coping mechanism may result in negative outcomes.

"I think, like, what mainly matters for me is how often people use it and why, because I know it's not, like, as addictive as other substances they could be using, but, like, if they're using it often when they're alone to, like, get through hard times, then I think it could be pretty bad for them." - SID 247 (White, F, 11th grade, legal, cannabis +, alcohol -)

It was somewhat rare that participants conditioned their approval of cannabis use upon whether or not it was legal for the individual to use it based on their age and geographic location.

"I think the only thing is, like, if- if you're legally allowed to do it, then I don't really care if you do it or not." - SID 164 (Asian, M, 12th grade, legal, cannabis -, alcohol +)

Another participant who conditioned their approval based on legality further clarified that they found it acceptable to travel to a different jurisdiction to use cannabis legally, even if it is not currently legal where an individual is currently living.

"If it's legal for you to use it, go ahead. If it's illegal, that's not a 'that you're using it' problem that's a, 'you're using it illegally' problem ... I know, my friend's sister, before it was legalized in New Jersey, because that was only a few years ago, would just travel to Canada with her friends because it was legal there ... So, like, that's perfectly fine, even if it's illegal in your area, you're not doing it in your area." - SID 154 (White, F, 11th grade, legal, cannabis -, alcohol +)

Unconditional disapproval. Comparatively fewer participants reported unconditional disapproval of cannabis use. Participants mentioned several reasons for their disapproval including impact on health, the smell of smoke,

impact on decision-making, and belief that it can impair one's ability to engage in important activities (e.g., academics, studying). For example, one Asian participant described the importance of academic success in their family's cultural value system, and how engaging in substance use was not congruent with these values.

"I don't think it is a wise decision, especially if they're underage, or if they're in school. I think just growing up in the Asian household, I think the most important thing to do is study. Study hard to get good grades. So, I would say vaping, doing drugs, does get in the way of your studies for sure." - SID 260 (Asian, F, 12th grade, mixed legality, cannabis -, alcohol -)

Interestingly, another participant reported social impacts secondary to their disapproval of cannabis use. They noted that they initially try to discourage friends from using cannabis, and if they persist or progress in their cannabis use, they will attempt to socially distance from that friend.

"No, I don't support it. And most of the times when, like, I become friends with someone, and I notice that they engaged themselves with that, I first encourage them to, like, step away from that and I realized if they don't want to, they want to make that, like, a part of their daily lives, then slowly I, like, gradually take myself away from that person." - SID 251 (Black, F, 11th grade, legal, cannabis -, alcohol -)

Variable attitudes by route of administration. Participants also broadly shared that their perceptions of risk and approval of cannabis also varied as a function of the route of cannabis administration. Participants remarked on route of administration in the context of societal bias, dependent use, and ease of use. While there was no unified belief as one route as most acceptable or unacceptable, several participants did acknowledge combustible forms of cannabis as harmful due to effects of smoke inhalation.

"I've seen people, like ... if they have an edible they will usually ingest those instead, because they're like, 'Oh, I don't want to burn my lungs, or anything,' so, like, the way they would take cannabis is to ingest it instead in edibles." - SID 143 (Asian, F, 12th grade, mixed legality, cannabis -, alcohol -)

Another participant specifically spoke to potential socialization effects related to smoking when noting a perception of edible forms of cannabis as less acceptable.

"I would say [peers] would like edibles better than smoking, just because I feel like—like it's always for trade, like in the media, or, like, our parents, that like smoking is bad for you, like, don't smoke. But, like, an edible [is] just like eating a gummy bear. So, they don't really think of it as wrong." - SID 136 (Asian, 12th grade, legal, cannabis +, alcohol +)

Another participant shared the belief of smoke inhalation as a harmful element of combustible cannabis use, while also expanding on perceived ease of use across these routes of administration.

"I don't know that there's any, like, science behind this, but I do think, like, I view smoking weed like a lot more harmful than, like, taking an edible, but I think it's just, like, that smoking aspect that I think makes it more harmful. And I think most people my age like opt to take edibles instead of like smoking it or any other way of ingesting it. Just because it's, like, easier." - SID 121 (Black, F, 11th grade, legal, cannabis -, alcohol +)

Others, while not remarking specifically on risk, also noted similar differences in ease of use and concealment between combustible cannabis versus ingested or vaporized as being factors contributing to choices in route of administration among adolescents who use cannabis.

"I think for kids my age, vaping is just easier. It's more like accessible. And it's easier to hide, I guess, so they probably look at them, a little bit differently in that perspective." - SID 153 (White, 12th grade, legal, cannabis -, alcohol -)

Also of note, participants shared that adolescents may hold stereotyped perception of individuals who use cannabis that vary based on their preferred route of administration of cannabis. One participant specifically noted an association between combustible cannabis and being a "stoner."

"I think a lot of people view smoking marijuana as, like, the 'stonery' kind of classic, 'Yeah, they smoke weed. They're like that,' kind of thing. I think people mainly think of smoking weed and the stereotypes that go with it." - SID 111 (White, F, 12th grade, legal, cannabis +, alcohol +)

Another participant remarked that use of ingestible cannabis was less stigmatized than combustible cannabis, partially as a function of risk perception.

"Yeah, I feel like there's, like, less stigma around like taking edibles than actually smoking it ... I feel like taking edibles—I see that people view it as more safe, in a way." – SID 281 (Black, F, 10th grade, legal, cannabis +, alcohol +)

Similarly, another participant remarked on the association between route of administration and perceptions of dependence on cannabis, noting that vaporized cannabis was perceived as more associated with dependent use.

"I think that the general association with the people who would vape that sort of thing is that they are more dependent on it, they are more addicted to it. You know the people who smoke or the people who do it you know more casually. You know they still do it all the time, but that's something that they do. You know, when they're at a party, after school, when they're at their house." – SID 179 (Mixed-race, M, 12th grade, legal, cannabis -, alcohol -)

Comparing Adolescent Attitudes on Cannabis Use Versus Alcohol Use

Participants were later asked if they had differing attitudes about alcohol compared to cannabis. Four thematic clusters of participants emerged: (1) attitudes related to both substances are similar and primarily negative, (2) attitudes related to both substances are similar and primarily positive, (3) attitudes of both substances are different, with the participant expressing more positive views of alcohol use, and most commonly, (4) attitudes of both substances are different, with the participant expressing more positive views of cannabis use.

Mostly equivalent. Most adolescents in the study expressed a view that they approved of use of one substance more than the other. However, some participants expressed that their views on alcohol and cannabis are approximately equivalent. For some, these views were neutral to positive towards both substances. One participant specifically reported that they shifted towards approving more of substance use as they had aged.

"I think cannabis and alcohol are probably about the same level of approval ... I think I became more okay with that sort of stuff as I got older, but it also just depends on the environment a person grows up in." – SID 117 (White, F, 11th grade, illegal, cannabis -, alcohol +):

For other participants, degree of use and impairment from use were again important, such that use of both cannabis and alcohol is equally acceptable so long as it is not excessive or interrupting daily activities.

"I care about, like, how present people are when I'm spending time with them, but like ... about their own use of cannabis and alcohol ... it's not really my place—but if they are close to me, and they are using [cannabis] or, like, drinking, really, really, often. Then, like, I will worry about like, why they're doing it so frequently." – SID 234 (Asian, F, 12th grade, legal, cannabis -, alcohol -)

One participant was keenly aware of differing degrees of social acceptability of both substances, but expressed that they personally held similar views, so long as use is not harming the individual using the substance or others around them.

"[My views are] similar, but yet not so much because alcohol is, like, just a social thing, and to my understanding, cannabis is like—it's not so socially acceptable, you won't go to a restaurant and get cannabis with your dinner. ... Whereas you will go to a restaurant, get a glass of wine with your dinner. It's ... they're different. Alcohol is more socially acceptable. But they are kind of similar in the way that if it's harmless and you're not hurting anyone, you're not hurting yourself, go ahead." – SID 154 (White, F, 11th grade, legal, cannabis -, alcohol +)

Adolescent participants rarely expressed an equivalent disapproval of both substances. One participant noted that use of either by teens was unacceptable, but that they would be more accepting of use in adults.

"Neither of them are particularly, like, awesome if you're a teenager, but I mean, if you're an adult. And you know, again, I—I feel like it's just a matter of age and maturity." – SID 177 (White, M, 11th grade, mixed legality, cannabis -, alcohol +).

More positive views towards alcohol. Some participants expressed generally more negative valence and less approval towards cannabis use as compared to drinking alcohol. For some this was driven by perceptions of normality or acceptability of use. Ubiquitous presence of alcohol in American society seems to be a contributing factor of these views. After expressing their comparative approval of alcohol, one participant noted specifically that in their culture, cannabis use was communicated as being bad, while drinking was

modeled as being acceptable through parental use.

"I think it's like ... like it comes back to like my own experiences that, like ... my culture, I guess, it's just weed, cannabis, that's all viewed as, like, 'Don't do it. It's really bad.' Smoking is bad. Whereas, like, drinking is okay. Because, like, parents drink, right?" - SID 164 (Asian, M, 12th grade, legal, cannabis -, alcohol +)

Another participant noted that they approved of alcohol use in certain settings (e.g., religious ceremonies), but did not approve of cannabis use in any setting. Consequently, they expressed that alcohol use was comparatively more acceptable.

"You know there are occasions in which I think that alcohol is acceptable, and there are not occasions where I think that cannabis is acceptable. So, I suppose that's the difference. You know. I- I think that it's fine, for you know, a Catholic person to drink wine when they're ... if they think that it's the blood of Jesus, or something along those lines." - SID 179 (Mixed-race, M, 12th grade, legal, cannabis -, alcohol -)

For another adolescent, their views were mixed. Similar to previous participants, they expressed that alcohol use was more acceptable due to likelihood of encountering its use at celebrations. However, they also noted that they perceived cannabis use as being less detrimental to health, despite being socialized to believe that cannabis use was bad.

"I would say that drinking is a little bit better ... You're not going to go to a wedding and everyone's going to be, like, smoking weed, you know. So even if it's not, you know, medically, and everything like that, like if maybe weed is less, you know, detrimental to your body than drinking. But just in regards to what's more, like, advertised as being not as bad, I would say, drinking alcohol." - SID 108 (White, F, 12th grade, mixed legality, cannabis -, alcohol -)

More positive views towards cannabis. Participants much more commonly expressed that they approved of cannabis use more so than use of alcohol. Some of the reasons included perceived social and health impacts (e.g., risk of alcoholism, alcohol poisoning, vomiting, liver damage, death), perceived addictive potential, and the perceived level of bodily control with each substance. For example, one participant described witnessing others experience detrimental alcohol-related

outcomes, which impacted their comparative approval of cannabis use.

"And I think [cannabis is] way, way, way, way better for you than alcohol is. I think alcohol can maybe...I've seen it destroy people, so I know I would prefer people to look to—to [do] weed than to—to [drink] alcohol." - SID 111 (White, F, 12th grade, legal, cannabis +, alcohol +)

Another participant described cannabis as "healthier," in part because it is a plant and from a natural source. In contrast they described alcohol as poisonous to the body as it is consumed.

"I probably approve of cannabis more, just because it's healthier for you, and alcohol is literally poisoning you as you drink it. And just cannabis is from like a natural plant source." - SID 153 (White, F, 12th grade, legal, cannabis -, alcohol -)

Participants occasionally compared their personal observations of individuals under the influence of both alcohol and cannabis, with one participant describing those under the influence of the former as "unsettling."

"I feel like I'm somewhat more approving of [cannabis] because, like, the people, like people that I've been around who have, like, been under the influence of cannabis, like they, like their behavior wasn't like necessarily alarming, but people that I've been around who are like drunk obviously like the behavior was kind of unsettling." - SID 241 (Black, F, 12th grade, legal, cannabis +, alcohol +)

Another participant made their decision based on the perceived addictive potential of each substance. Notably, they also indicated that peers commonly hold the belief that alcohol is addictive.

"I approve of cannabis more than alcohol ... because alcohol is- it affects your liver fast and it's very ... it's addictive. Because most of the people just like my age who are drinking, they're drinking, and then they like ... they're drinking every day. They're not, like, just taking one sip and going about their day. They're drinking it every day. That's why [there's] not a lot of people drinking alcohol because they know how addictive it is." - SID 305 (Black, F, 12th grade, illegal, cannabis +, alcohol +)

DISCUSSION

The present study utilized a qualitative approach to capture a rich and descriptive account

of adolescents' attitudes towards cannabis use as well as how these attitudes directly relate to their attitudes related to alcohol. This study is one of few to directly prompt adolescents about their attitudes towards cannabis use (e.g., Karashiali et al., 2022) and to our knowledge, is the first to qualitatively describe how youth conceptualize attitudes towards alcohol and cannabis in relation to each other. Youth reported a range of attitudes towards cannabis and alcohol use that can serve to explain recent trends related to adolescent substance use, inform clinical care, and serve as the basis for future quantitative and qualitative inquiry into adolescent substance use beliefs and attitudes. Interpreting these behavioral beliefs and attitudes within the framework of the Theory of Planned Behavior (TPB) provides insight into adolescents' subsequent behavioral intentions and behaviors, as well as possible mechanisms for prevention and intervention.

Adolescents' Nuanced Approval of Cannabis

Results from the present study seem to indicate that adolescents are nuanced in their degree of approval of cannabis use and provided a range of reasons for both their approval and disapproval. For those who approved of cannabis use, they described a lack of care or, alternatively, a desire to not police the behavior of their peers. Interestingly, participants captured within this theme included both cannabis-naïve participants and participants who had endorsed past cannabis use. Most youth did not hold black-and-white opinions in their approval of cannabis use, rather conditioned their approval upon *who* is using cannabis, *how* they are using it, or *why* they are using it. For example, participants reported approving of use by those who were older and could use cannabis legally in their jurisdiction, while others noted that medicinal use and recreational use that does not cause significant impairment in activities of daily life is acceptable.

Some of these factors are well documented in the literature, while others are more novel. Past work has consistently demonstrated that adolescents disapprove of regular use of cannabis at somewhat high rates, and that early adolescents are especially disapproving of heavy use (Miech et al., 2024). Notably, the present study expands upon prior qualitative insight into adolescents' approval of medicinal cannabis use.

Over time, medicinal use of medicinal cannabis by adolescents has increased (Miech et al., 2024). Teens in the present study reported mixed views of use in this manner, in that genuinely "needed" use of medicinal cannabis was acceptable, while use of cannabis to cope, or alternatively, feigning medical need to obtain cannabis, was less acceptable. Budney (2021) captures this dilemma and notes that there is some lack of clarity in past work (e.g., Wardell et al., 2021) in the definition and operationalization of medicinal cannabis use. This conceptual ambiguity must also be considered in concert with the known differences in efficacy of medicinal cannabis in managing various mental and physical health symptoms (Hill, 2015; Wilkinson et al., 2016). As such, further work that qualitatively and quantitatively captures adolescent attitudes towards each of the interpretations of "medicinal" use listed above is likely needed.

Furthermore, past work has demonstrated that legality of cannabis does not necessarily increase risk of adolescent cannabis initiation, and that other related mechanisms (e.g., increased access) have more causal influence on adolescent cannabis use (Coley et al., 2019; Harper et al., 2012). Relatedly, several participants in the present study noted that their approval of cannabis was at least in part related to its legality. Although not explicitly stated by these participants, conditioning approval based on legality would necessarily imply that underaged use by similarly aged peers would not be acceptable. However, it is unclear if participants expressing this belief are fully aware of age restrictions within jurisdictions that have legalized recreational and/or medicinal use. This finding might suggest that adolescent cannabis attitudes can be shaded by legality, such that adolescents may be more likely to endorse cannabis use as acceptable while within states that have legalized its use. This is a finding demonstrated in past qualitative work based in California (which had legalized medicinal use at the time of the study) in which participants seem to have evaluative attitudes shaped at least in part by the legal status of cannabis (Friese, 2017). For example, one participant in this study remarked "if it was all that bad of a drug, they wouldn't be trying to legalize it. It's not like they're trying to legalize crack or anything like that" (Friese, 2017). As such, cannabis attitudes

could serve as an additional factor mediating the relationship between legalization of cannabis and rates of adolescent cannabis use. Further, it is imperative that prevention messaging highlight the limited empirically-supported therapeutic benefits of medicinal use of cannabis (see Bilbao & Spanagel, 2022; Pratt et al., 2019).

Contrasting Attitudes Towards Cannabis and Alcohol

Despite more adolescent participants in the study reporting having used alcohol in the past (62.5%) than cannabis (40%), this pattern of use was not necessarily reflected in self-reported attitudes related to cannabis and alcohol use. In fact, participants were much more likely to express having more positive attitudes towards cannabis use than alcohol use. Participants who viewed cannabis more positively perceived alcohol as a more addictive substance with greater potential for both short-term consequences (e.g., alcohol poisoning, impaired bodily control) and long-term consequences (e.g., liver damage and early death), which parallels prior qualitative work with a sample largely consisting of adolescents with current or prior cannabis use (Friese, 2017). Those endorsing alcohol as more acceptable indicated the opposite, that cannabis was more addictive and detrimental to health, while also noting that their view was shaped by how alcohol use is culturally normalized and viewed as more socially acceptable. Levy and colleagues (2018) demonstrated that the proportion of youth endorsing that cannabis use is a “low-risk” behavior has more than doubled in the last two decades. This trend is also seen in data from Monitoring the Future, which shows that perceived risk of harm from experimental, occasional, and regular cannabis use has seen significant decrease over time among 8th, 10th, and 12th graders (Miech et al., 2024). Similar stark changes in perceived risk of both experimental and heavy use of alcohol were not seen in 10th and 12th graders, who now perceive binge drinking at least once weekly as more harmful than regular use of cannabis (Miech et al., 2024). Adolescents holding these contrasting behavioral beliefs simultaneously are likely to hold more positive attitudes towards cannabis than alcohol, and thus are more likely to have intentions to use cannabis.

Broadly, the results of the present study seem to indicate that adolescent attitudes towards cannabis and alcohol could be interrelated. Further, findings from the present study may be of particular interest to substance use prevention and intervention scientists and clinicians. A number of substance use interventions for young people delivered in both traditional and digital settings target alcohol and cannabis simultaneously (e.g., Coughlin et al., 2021; Newton et al., 2010), or alternatively, target substance use generally (e.g., Hecht et al., 2003; Schwinn et al., 2018, 2019). While this polysubstance approach may be beneficial for some youth, others may benefit from separate and tailored intervention for each substance to ensure the appropriate potential mechanisms of change are being addressed adequately. Preventive interventions could additionally be tailored to youth based on where they fall on the spectrum of approval and disapproval of cannabis, as well as the reasons for and types of use they find to be acceptable. Public health programming development may also benefit from a youth participatory action framework, in which youth are engaged as active stakeholders in creating intervention content. For example, a campaign targeting substance use injunctive norms in youth and adolescents may be more effective if modeled in such a way that youth are receiving messaging created by similarly aged peers. While past interventions have utilized youth-created messaging (e.g., the Truth Campaign; Farrelly et al., 2009; Zucker et al., 2000), having youth additionally contribute to presenting the information (e.g., featuring youth in videos or ads) could contribute to additional program efficacy.

Participants’ qualitative feedback from the present study indicates that a greater depth of understanding could be gained through directly querying teens about attitudes towards one substance as they relate to attitudes towards a separate substance. Insight in this regard could help explain transitions in primary or sole-use patterns (e.g., substitution) versus complementary use or total abstinence (Subbaraman, 2016; Weinberger et al., 2021). Asking open-ended questions (e.g., “What do you know about the risks of substance use/using cannabis or alcohol?”) in clinical settings (e.g., primary care) may also be beneficial in identifying adolescents who may benefit from brief counseling

on risk of other non-preferred substances. Importantly, within TPB, objective truth regarding the risks of behavior are not meaningful in predicting behavioral intentions, as individuals are believed to act in concordance with subjective held beliefs (Ajzen, 2020). Sole-substance prevention programming could feasibly foster behavioral beliefs that a non-discussed substance is safer in comparison, as the individual has not had their belief confronted that use of the alternative substance is safe, or safer in comparison. In this regard, providing corrective feedback to youth regarding risks of both cannabis use and alcohol use simultaneously could foster subjective behavioral beliefs regarding the risk of both substances. As such, general substance use prevention programming may have particular utility in communicating health risks, as opposed to targeting specific, and possibly varying, mechanisms of substance refusal and abstinence.

Findings of the present study are also meaningful in the context of the broader substance use prevention literature and the parent study's focus on the impact of adolescents' exposure to alcohol content in the media. Adolescents' attitudes towards substances are socially constructed both within built world and online social networks (Fujimoto & Valente, 2012; Strowger et al., 2023). As such, understanding what attitudes adolescents have internalized through social influence (e.g., Frey & Friemel, 2023) and may be transmitting to others in different digital and physical social contexts (e.g., direct digital communication, social media posting, in-person conversation) is essential. Future longitudinal and mixed-methods approaches could be beneficial in investigating the spread of specific substance-related attitudes within adolescent social networks. This approach would be especially beneficial in understanding development of attitudes or norms within smaller (e.g., close friend groups) and larger (e.g., schools) social networks that contrast or vary from national level trends. Further, this granular understanding could serve the effective application of targeted, social network-informed prevention and intervention strategies.

Study Strengths and Limitations

This study has some notable strengths. First, the sample size was relatively large for individual

interview-based qualitative research with adolescents, allowing for thematic saturation. Second, the sample was relatively racially and ethnically diverse and also included a significant proportion of substance-naïve teens and teens who have used cannabis and alcohol (closely aligned with national rates). Additionally, the present study utilized individual interviews, rather than focus groups. This can reduce pressure to agree with peers within the group and allows participants to share openly and honestly without fear of negative peer evaluation. It also reduces privacy concerns that can arise in group settings.

Some limitations should also be noted. First are those inherent to qualitative inquiry: its comparatively small sample size limits its representativeness and does not allow for objective statements of prevalence rates, relatedness, or causality. Sample size was not sufficient among study subgroups (e.g., males, smokers, etc.) to reach subgroup saturation, precluding cross-group comparison. As some participants in the present study noted that their attitudes and approval of substance use was related to cultural identity and upbringing, future studies are needed to understand unique and nuanced viewpoints that could be held by different groups. The study also had an overrepresentation of female participants and did not have a significant number of 9th and 10th grade participants. As such, generalizability of the results to males and students in earlier grades is limited. Finally, to ensure adequate representation of youth in the parent study across a range of risk with regards to exposure to alcohol content, our sampling approach included having endorsed having used alcohol at least once, or having at least one close friend who drinks. This strategy was aligned identified as necessary by the research team to counter known difficulties of recruiting and consenting youth with higher engagement in risk behaviors into research, especially research targeting risk behaviors they are engaging with (e.g., Kekkonen et al., 2015; Tigges, 2003). While rates of substance use engagement in full parent study and this subsample approximate those found in large, nationally representative samples (e.g., Monitoring the Future), results of the present study must still be considered in the context of these limitations.

Conclusions

The present study is a valuable step in developing a rich understanding of adolescent attitudes towards and approval of cannabis use. Findings suggest that these beliefs are quite nuanced, such that approval/disapproval is generally conditioned on several factors, with most youth expressing that they approve of cannabis use in at least limited circumstances (e.g., for medicinal use, if used moderately, etc.). Further, the present study seems to indicate that degree of approval of one substance may be related to approval or disapproval of other substances. For example, youth who perceive alcohol as being highly risky, harmful to health, or addictive may in turn be more likely to express a belief that cannabis use is not risky or harmful. This information could be valuable in understanding recent trends in substance use behavior among youth and adolescents, including decreases in poly-use of cannabis and alcohol, and increased sole use of cannabis in this population (Keyes et al., 2022). Finally, qualitative data described through the present study may be beneficial in developing prevention and intervention programs and for making decisions in allocation of public health resources.

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Clement: Conceptualization, Data curation, Formal analysis, Investigation, Writing – original draft, Writing – review & editing. **Erin Corcoran:** Conceptualization, Data curation, Formal analysis, Methodology, Investigation,

Writing – original draft, Writing – review & editing. **Joy Gabrielli:** Supervision, Writing – review & editing. **Kristina M. Jackson:** Supervision, Writing – review & editing, Funding Acquisition.

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