Research Article

Emerging Adult Perspectives on Cannabis Use to Inform Brief Early Intervention: A Qualitative Study

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Kathryn S. Gex[1,2], Rachel L. Tomko[1,2], Kevin M. Gray[1,2], & Shannon Phillips[3]

[1]Department of Psychiatry and Behavioral Sciences, College of Medicine, Medical University of South Carolina
[2]Hollings Cancer Center, Medical University of South Carolina
[3]College of Nursing, Medical University of South Carolina

ABSTRACT

Objective: While cannabis brief interventions for emerging adults (age 18-25) are feasible, evidence for their efficacy is limited and mixed. The goal of the current study was to leverage qualitative research methods to inform novel content to improve the efficacy of cannabis brief interventions. **Method:** Twelve emerging adults (67% female, M_{age} = 21.1, 50% white) who frequently use cannabis (3+ times per week in the past month) participated in qualitative interviews focused on eliciting perceptions of: (1) personalized normative feedback (PNF), (2) severity of cannabis use consequences, (3) problematic cannabis use, and (4) the reasons emerging adults use cannabis.. **Results:** While participants were intrigued by PNF, they did not expect this type of approach to significantly impact their use unless they were already motivated to change. Participants believed that more common consequences associated with cannabis use were less severe, and participants' perceptions of problematic cannabis use were extreme, rather than considered on a continuum, but tended to minimize symptoms of physiological dependence. Finally, participants indicated that some reasons for use may be more acceptable than others and that using out of boredom could be problematic, especially if combined with highly convenient methods of use (e.g., pens/carts/vapes). **Conclusions:** Taken together, our results provide nuance to emerging adult cannabis use and may be useful in informing future cannabis brief intervention approaches for this population.

Key words: = emerging adults; cannabis; brief intervention; qualitative research methods

Cannabis is among the most commonly used substances in emerging adults (age 18-25), with approximately 25% having used in the past month and half in their lifetime (Center for Behavioral Health Statistics and Quality, 2024). Among those who used cannabis in the past month, 44% reported using it daily or almost daily (at least 20 days in the past month). High frequency or daily use during adolescence and emerging adulthood is consistently predictive of experiencing problems associated with use and increased risk of developing cannabis use disorder (CUD; Feingold et al., 2020; Kroon et al., 2020; Leung et al., 2020). Although emerging adults exhibit the highest prevalence rates of past year CUD (~15%) relative to other age groups (hovering around 5%), their treatment-seeking rates are disproportionately low (Center for Behavioral Health Statistics and Quality, 2024). Historically, low rates of treatment seeking have been due in part to a lack of perceived need for help, greater perceived social acceptability of cannabis use, and low perceived

Corresponding Author: Kathryn S. Gex, PhD, Medical University of South Carolina. 67 President St., MSC 864, Charleston, South Carolina 29425. Email: soltisk@musc.edu

risk (Center for Behavioral Health Statistics and Quality, 2024; Gates et al., 2012; Mennis et al., 2023). With more states legalizing cannabis and the potential for the federal government to reschedule cannabis under the Controlled Substances Act, use among emerging adults is expected to continue to increase, as are rates of CUD and the need for early interventions to prevent problematic cannabis use.

Brief interventions (BIs) are one of many approaches for early intervention of problematic cannabis use, specifically as an indicated prevention approach which is intended to target individuals who are showing early signs or symptoms of a problem (Youth National Research Council and Institute of Medicine Committee on the Prevention of Mental Disorders and Substance Abuse Among Children et al., 2009). Because these individuals are not expected to meet criteria for a diagnosis, full-length treatments may not be necessary. Brief interventions vary widely in number of sessions (e.g., one to four) and in session length (e.g., <5 minutes up to 90 minutes) depending on the clinical setting, which often dictates the time and personnel available to intervene. To date, cannabis brief interventions for emerging adults have been designed as indicated prevention interventions, targeting individuals with varying levels of use and/or related problems (see Gex et al., 2024). While these brief interventions have been shown to be feasible and generally acceptable, the evidence for their efficacy is mixed (Halladay et al., 2019). Although cannabis brief intervention mechanisms for behavior change are currently not well understood, the mixed evidence for efficacy suggests that they may not be targeting the most salient factors that motivate frequent use among emerging adults. For example, while personalized feedback on consequences and use frequency, including personalized normative feedback (PNF), is commonly used in cannabis brief interventions, it has been more frequently included in trials that reported no effect of the brief intervention on cannabis use outcomes (Gex et al., 2024). Alternatively, in 15 studies of cannabis brief interventions for emerging adults, only four included personalized feedback on motives for use (Halladay et al., 2019). Thus, more time could be spent trying to understand why emerging adults use cannabis and how to leverage this to motivate behavior change.

Social norms theory proposes that behavior is influenced in part by perceptions, usually incorrect, of how peers think and act (Berkowitz, 2003). Descriptive norms refer to what people actually do, and injunctive norms refer to attitudes or beliefs about what people do. One of the more robust mechanisms observed in alcohol brief interventions, for example, which have demonstrated small to moderate effects in reducing drinking among emerging adults, is the correction of descriptive norms misperceptions through the use of PNF (Mun et al., 2022; Reid & Carey, 2015). Many cannabis brief interventions also use PNF; however, some research suggests that little correction in norms misperceptions may occur because emerging adults who use cannabis at a higher frequency are already aware that their use exceeds the norms for their age group (Loverock et al., 2021). Indeed, a large survey study of college students with and without lifetime cannabis use observed a significant difference in their descriptive norms for a "typical use week" but saw no significant difference in descriptive norms reported for a "heavy use week" (Pearson et al., 2017), suggesting there is some awareness of normative use across emerging adults. However, PNF that utilizes a more specific reference group, one that emerging adults more strongly identify with, seems to overcome this hurdle and is more successful in correcting norms misperceptions (Buckner, 2013; Duckworth et al., 2025). Given the mixed nature of findings related to PNF and cannabis use, it is pertinent to better understand the perceptions of PNF from emerging adults who would receive this type of feedback.

Emerging adults are also less likely to perceive a need for intervention and tend to view cannabis as the least risky drug. Rates of perceived risk from regular use have steadily declined over the past three decades (Schulenberg et al., 2021; Substance Abuse and Mental Health Services Administration, 2021; Terry-McElrath et al., 2025). Although there are recognized therapeutic benefits of cannabis for certain medical conditions (Solmi et al., 2023), there is still a risk for problematic use and dependence with daily or near daily use. Discussion of cannabis consequences is another commonly used motivational strategy in cannabis brief

interventions, yet it may not necessarily be salient for emerging adults given the low perceived risk of using cannabis (see Gex et al., 2024). Discussion of cannabis consequences is typically derived from measures completed by participants. Notably, some measures of cannabis consequences only assess how often consequences occur and not how severe participants perceive the consequences to be (e.g., the Rutgers Marijuana Problems Inventory, RMPI, Johnson & White, 1989; Knapp et al., 2018). In addition, several measures that assess cannabis-related consequences have been adapted from alcohol-related consequences measures (see Pearson [2019] for examples). Thus, these measures may not adequately capture the experience of using cannabis or what a severe consequence associated with cannabis looks like. Understanding emerging adults' experiences of cannabis use-related consequences and perceptions of problematic use could inform both the development of more accurate assessments of cannabis consequences in this population and more credible and salient motivational intervention strategies.

Finally, motives, or reasons, for using cannabis are robust proximal predictors of cannabis use and consequences (Bresin & Mekawi, 2019; Halter & Abar, 2023). The motivational model asserts that motives for substance use serve internal or external needs in either a positive or negative valence: enhancing positive mood (positive and internal), alleviating negative mood (negative and internal), for socializing (positive and external), and to avoid peer rejection (i.e., conformity; negative and external; Cooper, 1994; Cox & Klinger, 1988). In addition to the above motives that are common across substances, there are several cannabis-specific motives including use for sleep, because it is available, out of boredom, to experiment, to expand world view, because they had been drinking alcohol, and for various reported medical and health reasons (Berey et al., 2023; Chabrol et al., 2020; Lee et al., 2009; Simons et al., 1998). While some specific reasons for use tend to be associated with greater cannabis-related problems or consequences, research indicates that simply having more reasons to use is associated with more use and problems (Bresin & Mekawi, 2019; Espinosa et al., 2022). Because there has been minimal explicit incorporation of personalized feedback on motives for use in cannabis brief interventions, understanding how emerging adults perceive different motives for use may inform salient approaches to motivating behavior change.

The Current Study

Cannabis brief interventions for motivating behavior change and preventing potentially problematic cannabis use in emerging adults demonstrate mixed evidence for efficacy. With more states legalizing cannabis, efficacious brief interventions to prevent problematic cannabis use are urgently needed. Qualitative research methods are critical to informing interventions as these methods involve seeking out and incorporating the voices of those who will ultimately receive the intervention. These methods also demonstrate the researcher's willingness to more deeply understand the lived experiences of individuals who are often unheard.

Prior research on the efficacy of brief interventions for cannabis use in emerging adults points to a few potentially important areas of focus for improvement, specifically the use of PNF on cannabis use frequency and personalized feedback on cannabis use consequences versus motives for use. The goal of this qualitative study was relatively narrow in its focus on trying to understand emerging adult perceptions of these feedback components of brief intervention. We were most interested in (a) their reactions to PNF on cannabis use, (b) how they perceive the severity of consequences of cannabis use as presented in commonly used problems measures, (c) what they view as problematic cannabis use, and (d) their perceptions of different motives for using cannabis.

METHODS

Design

Using Rosen and colleagues' qualitative steps for intervention adaptation as a guide (Rosen et al., 2017), we used a qualitative descriptive design. This approach is generally low-inference, typically resulting in consensus more easily among researchers because the goal is to provide a comprehensive summary of an event in "everyday

terms" by the people experiencing those events (Sandelowski, 2000). Interviews were conducted between September and December 2023. Participants were recruited from the community primarily through social media (e.g., Instagram, Facebook) and print (e.g., flyers) advertising. All study procedures were approved by the MUSC Institutional Review Board. Study processes and reporting follow the Consolidated criteria for Reporting Qualitative research (COREQ) guidelines (Tong et al., 2007).

Participants and Recruitment

Individuals were eligible to participate if they: (1) were between age 18 and 25, (2) reported regular and/or frequent cannabis use (at least 3x per week in the past month), and (3) submitted a positive urine cannabinoid test confirming recent use. Participants were excluded if they: (1) were currently engaged in substance use treatment for any type of substance use, (2) had any substance use disorder requiring a higher level of care, (3) reported significant or acutely unstable medical or psychiatric problems that would contraindicate research procedures, interfere with safety or compromise data integrity, or (4) reported/demonstrated significant risk of suicide or homicide. A purposive sampling strategy with maximum variation was applied to identify participants with a range of sociodemographic characteristics (e.g., age, sex, race/ethnicity, cannabis use frequency).

All participants were screened through a centralized recruitment and screening center for individuals interested in participating in a substance use research study ("Entryway" described in Davis et al., 2024). Recruitment took place in South Carolina where cannabis in all forms is considered illegal; however, smoke and vape shops and liquor stores sell hemp-derived products (e.g., pre-rolls, gummies, seltzers containing delta-8, delta-9, and/or CBD). Interested individuals contacted Entryway and were scheduled for their intake visit, which consists of self-report surveys and a providing urine sample. Results of the intake are used to confirm study eligibility. Entryway then facilitated scheduling of key informant interviews with author KSG. Prior to the start of the interview, study-specific informed consent was obtained from all participants.

Data Collection

KSG developed the interview guide, which was reviewed by author SP. Questions were guided by literature review and the focus of the study on understanding emerging adult cannabis use and perceptions of common components of brief intervention to inform novel intervention content creation. For example, we included questions such as, "Why do you think you decided to try it [cannabis]?" and, "Why do you think people use [cannabis]?" To elicit their perceptions of PNF, we created a fake person, "Doug," with hypothetical cannabis use levels and percentile rank. The PNF was printed on paper, and the interviewer oriented the participant to "Doug's" PNF report to ensure they understood the information. Pre-written and impromptu prompts were used as needed. See supplemental material for the full interview guide.

All participants completed the interview independently. All interviews were completed by KSG, a female Ph.D.-prepared clinical psychologist. KSG and SP have training in qualitative data collection and analysis, and KSG has expertise in delivering and evaluating brief motivational interventions for reducing problematic substance use in emerging adults. All interviews were completed in person, in private interview rooms housed in the Addiction Sciences Division at the Medical University of South Carolina (MUSC). Participants did not have an established relationship with the interviewer but were provided with information about the study's purpose and the interviewer's credentials. Interview duration ranged from 60 to 77 minutes, with an average of about 69 minutes. Interviews were audio recorded and transcribed by an outside, HIPAA-compliant agency. As the sole interviewer, KSG recorded field notes during and after interviews, which were discussed with SP following each interview. No repeat interviews were conducted, transcripts were not returned to participants for review, and no participant feedback was solicited on findings. Per review of field notes and discussion between KSG and SP, data saturation and information power1 were

determined to be reached at the 12th participant (Malterud et al., 2016).

Measures

All quantitative data presented were collected during the center's screening assessment.

Demographic information and substance use history. Participants were asked to share information about their age, sex, racial and ethnic identity, education level, and employment status, as well as their history of cannabis and other substance use.

Past month cannabis and other substance use. Center staff administered a modified version of the Timeline Followback (TLFB), the gold standard approach for assessing current and recent substance use (Sobell & Sobell, 1992). To characterize cannabis use, participants were asked about the different products (e.g., leaf/bud material, wax/concentrates/oils, edibles/drinks/tinctures) and methods (e.g., joints, blunts, bongs, pens, cartridges) they have used in the past 30 days.

Cannabis use disorder (CUD). Center staff, supervised by doctoral- or master's-level clinicians, also administered the Mini International Neuropsychiatric Interview (MINI), a semi-structured interview assessing DSM-5 psychiatric disorders (Sheehan et al., 1998). The cannabis use disorder module consists of 12 "yes/no" items examining the 11 DSM criteria (2 items assess withdrawal experiences). CUD severity is based on the number of items endorsed: 0-1, no use disorder; 2-3, mild; 4-5, moderate; and 6+, severe.

Data Analysis

Qualitative data analysis was conducted primarily by KSG and began following the first interview. Data analysis was completed in summer 2025. We used directed content analysis with the motivational model of substance use and DSM-5 conceptualization of substance use disorder as the initial coding framework and a deductive-inductive approach (American Psychiatric Association, 2013; Cooper, 1994; Cox & Klinger, 1988; Hsieh & Shannon, 2005). These models/frameworks were used to guide development of both the interview guide and the analysis and codebook development. KSG developed and tested the codebook with the redacted transcripts from the first 3 interviews. Once the final codebook was determined, KSG coded the remaining transcripts using NVivo Qualitative Analysis software (Lumivero, Version 14.0). SP is a recognized expert in qualitative data analysis and serves as KSG's mentor in qualitative research methods. As such, SP coded behind KSG on the first 3 interviews, and then a random sample of ~20% of the remaining interviews to ensure consistency in coding.

RESULTS

Characteristics of Emerging Adult Participants

Emerging adult participants ($N = 12$) were a mean age of 21.1 (1.99), ranging from 18 to 24. Our sample was modestly diverse in terms of age, sex at birth, and race (see Table 1). Ten of the 12 emerging adult participants reported using cannabis on 20 or more days in the past month with 8 reporting daily use. On average, participants reported using on 27 of the past 30 days and using at least one method or route of administration (see Table 2 & Figure 1). Although not part of our eligibility criteria, all 12 participants met criteria for CUD in the past year. Average age of first ever cannabis use was about 16, and history of regular cannabis use ranged widely from around nine months to just over nine years with an average of about 3.5 years (see Table 2). Most participants ($n = 11$) reported using both alcohol and cannabis on the same day at least once in the past month (i.e., co-use), whereas only four participants reported co-using tobacco/nicotine and cannabis. Interestingly, three individuals who reported cannabis and tobacco/nicotine co-use reported co-use every day or nearly every day.

Follow along in Tables 3-6 for themes and examples.

[1]*Information power*, as conceptualized by Malterud et al. (2016), is proposed to mean that the more information a sample of participants can provide that is relevant for the current study, fewer participants are needed. Information power is based off of five elements of information: (a) the breadth of the study aim(s) with narrow aims indicating fewer participants and broad aims indicate more; (b) the specificity of the sample in terms of experiences, knowledge, or characteristics, with more dense samples indicating fewer participants and sparse samples indicating the need for more participants; (c) the level of theoretical background that exists, with application of established theory requiring fewer participants and no established theory necessitating more participants; (d) the quality of interview dialogue, with strong interviewer skills in communication and background knowledge on the topic indicative of fewer participants needed; and (e) the analysis strategy, with within-case in-depth analysis indicating the need for fewer participants and cross-case comparison indicating the need for more participants.

Table 1. *Participant Demographic Characteristics (N = 12)*

Variable	Mean (SD) or N (%)
Age (years)	21.1 (1.99)
Sex-assigned-at-birth	
Female	8 (67%)
Male	4 (33%)
Race	
Black/African American	4 (33%)
White	6 (50%)
Multiracial	2 (17%)
Ethnicity	
Hispanic/Latino/a/e	1 (8%)
Not Hispanic/Latino/a/e	11 (92%)
Education	
9th grade	1 (8%)
High school graduate	3 (25%)
Some college, no degree	5 (42%)
Bachelor's Degree	3 (25%)
Employment	
Working now	3 (25%)
Looking, unemployed	3 (25%)
Student	5 (42%)
'Other' (student & working)	1 (8%)

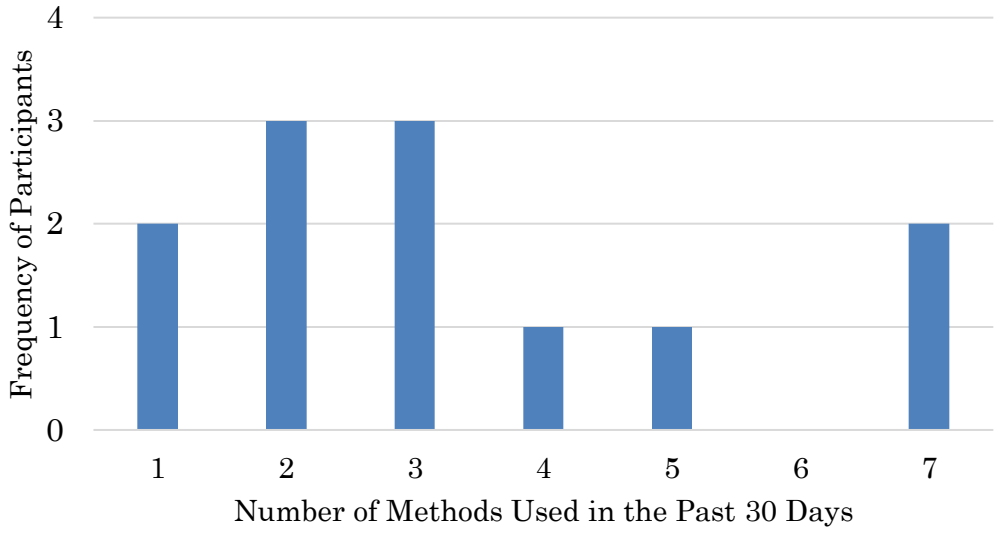
Note. Education = the highest grade or level of education completed at the time of assessment.

Table 2. *Participant Reported Cannabis Use Characteristics*

Variable	Mean (SD) or N (%)
Cannabis use primary (or only) method	
Leaf/bud material (e.g., joint, blunt, bong, bowl)	8 (67%)
Wax/dabs/concentrates/oils	3 (25%)
Edibles/drink/tinctures	1 (8%)
Past month cannabis use frequency (days)	26.8 (5.88)
Age of first cannabis use	15.54 (2.69)
Years of regular cannabis use	3.44 (2.38)
DSM-5 CUD Severity	
No CUD (0-1 symptom)	0 (0%)
Mild (2-3 symptoms)	3 (25%)
Moderate (4-5 symptoms)	4 (33%)
Severe (6+ symptoms)	5 (42%)
Other Past Month Substance Use Frequency (days)	
Alcohol use	5.25 (6.00)
Binge drinking episodes	1.83 (2.12)
Tobacco/nicotine use	8.50 (13.41)
Past Month Co-Use	
Alcohol & cannabis frequency (days)	5.08 (5.98)
Alcohol & cannabis co-users	11 (91.7%)
Tobacco/nicotine & cannabis frequency (days)	8.42 (13.26)
Tobacco/nicotine & cannabis co-users	4 (33.3%)

Note. DSM-5 is the Diagnostic and Statistical Manual of Mental Disorders, 5th Edition. CUD = Cannabis Use Disorder. Binge drinking episodes = 4/5+ standard drinks for women/men respectively. Co-users = at least 1 day of reporting use of both substances.

Figure 1. *Frequency of Participants Using Multiple Methods of Cannabis Consumption*



Note. Methods most commonly included leaf material (joints, blunts, bongs, bowls), pens/vapes/carts, and edibles, and typically were delta-9 tetrahydrocannabinol (THC) predominant, with two participants also reporting delta-8 THC predominant pen/cart use.

Personalized Normative Feedback

Participants were intrigued by the idea of personalized normative feedback (PNF); however, they described being mostly aware of their own use relative to their peers. Specifically, a higher percentile rank would not surprise them because they were aware that a lot of people their age do not use cannabis at all. In relation to how emerging adults would respond to a PNF report, participants' perceptions of emerging adults who use cannabis generally fell into one of two groups: (1) "I don't care how much I use" / "I've made peace with my use" or (2) "I need to change how I use." Identity as someone who uses cannabis seemed to play a role in regards to which group they fall into and how responsive someone might be to PNF, with people who strongly identify as a "stoner" (per participant 8) far less likely to care about PNF. In general, participants did not seem to think that PNF could change how much someone uses cannabis, and, while PNF could prompt consideration of changing their use, the consideration would be unlikely to last long. Additionally, two participants reported that the PNF exercise could make someone more defensive or feel judged.

Perceived Severity of Cannabis Consequences

Broadly, participants perceptions of the severity of consequences from cannabis use depended, in part, on their understanding of the commonality of the consequence. Consequences such as low productivity, hangovers, and tolerance were perceived as quite common, even expected, and, ultimately, less severe. Participants believed that tolerance and dependence on cannabis were also common consequences that happen but that something like tolerance is manageable on their own (e.g., using tolerance breaks or T-breaks).

Alternatively, less common consequences such as aggression, blackouts, and passing out/fainting, were occasionally perceived as more severe because of their infrequency in association with cannabis use. In fact, a few participants associated these consequences more with alcohol use. Specific to cannabis, a few participants believed that medical problems and psychosis were consequences of cannabis use that would be severe and warrant cutting down or stopping, but still perceived to be relatively uncommon.

Withdrawal was less frequently perceived to be a negative consequence of cannabis use. Participants either seemed to be unaware of what cannabis withdrawal symptoms were, believed them to be low enough in severity that they were

not perceived as significant, and/or attributed cannabis withdrawal symptoms to another psychiatric or medical experience, especially symptoms they may have had prior to their cannabis use that they were using cannabis to manage.

Participants believed that while a consequence may not be severe, it may still prompt a reduction in cannabis use. Consistent with this sentiment, the severity of any given consequence will depend on the person. That is, low productivity may be viewed as inconsequential to one person, but highly severe to another depending on what they value or find directly important or relevant.

Perceptions of Problematic Use

Participants generally agreed that problematic use of cannabis could be identified by high frequency or quantity of use, use that is socially isolating or interferes with or impairs everyday life, and/or dependence or "overreliance" on cannabis use. Notably, participants described high frequency use as "everyday, multiple times a day" and "every hour on the hour." One participant explicitly connected high frequency of use to impairment and interference in everyday functioning, wondering "…if you're using every hour on the hour, how are you doing anything productive…?" (see Table 5 for the full quote). However, another participant indicated that the high frequency of use could be disregarded if any level of use caused impairment or led to an "overreliance," or dependence, on cannabis. There was some agreement in beliefs that using large quantities of cannabis in a short period of time (e.g., 1-2 ounces in a week or less) was indicative of a problem. Finally, although more related to the concept of tolerance, one participant stated, "the more you do it the less fun it gets."

No one method of cannabis use was viewed as inherently problematic, although dab/wax pens and blunts were mentioned most often, albeit for different reasons. While there could be less risk of social or legal consequences, participants perceived that developing an overreliance on cannabis was a greater risk with these methods. Specifically, participants believed that dab/wax pens were associated with potentially more problematic use because of their ease of use. Participants mentioned they can be used discreetly (no smell or smoke); therefore, people may end up using cannabis more frequently and in more places (e.g., where it is socially acceptable to use cigarettes or nicotine vapes, where it is otherwise illegal to use cannabis).

Reasons for Cannabis Use

Finally, participants described college specifically and emerging adulthood more generally as an especially stressful time, and the most commonly perceived reason emerging adults use cannabis is to "relax," "chill," or "unwind" in response to this everyday stress. This seems to serve as an "umbrella" for many other potential reasons. For example, a handful of participants (n = 5) reported that the main reason they perceive emerging adults use cannabis is because of the fun or enjoyable effects; however, a couple of participants reported that the enjoyable effects for them are the relaxation or alleviation of anxiety/worry. Additionally, half of our participants described that they use cannabis to celebrate or reward themselves after completing or accomplishing a task, or once the need for productivity was done for the day/week. Another commonly mentioned reason for using cannabis was out of boredom, i.e., they have nothing else to do, so "why not." Interestingly, a couple of participants indicated that they perceive use out of boredom could turn in to use out of habit. Although use out of habit was less commonly mentioned, participants acknowledged that they believe it could happen in emerging adults. In fact, a couple of participants seemed to express concern about their own use of cannabis out of boredom.

"As long as it's marijuana…" Participants did not believe that any one method is typically used among emerging adults for a particular reason (e.g., joints when celebrating). Rather, the primary reason they believed any method may be used is out of convenience, which often seemed to be dictated by access to or preference for a particular method to achieve their desired level of high and/or the context in which they are. From the participants' perspectives, convenience seemed to mean the ability to use discreetly, requiring less effort to access and use it, or requiring less effort for a greater high.

Alternatively, a few participants described more specific, but varied, reasons for deciding between edibles and other routes of administration.

DISCUSSION

Cannabis brief interventions have generally yielded mixed results in terms of their efficacy in reducing frequent or problematic use (Gex et al., 2024; Halladay et al., 2019), raising questions about the saliency of common intervention components. For example, they have rarely included discussion of reasons for use, primarily focusing on personalized feedback on use norms and the consequences of use. The goal of this qualitative study was to better understand emerging adult perceptions of PNF on cannabis use frequency, cannabis use consequences, and reasons for use to inform brief intervention content aimed at reducing potentially problematic use among emerging adults. We focused specifically on gathering in-depth information about their reactions to a hypothetical PNF report, eliciting their ratings of severity for a variety of cannabis consequences, understanding their conceptualization of problematic cannabis use, and better understanding their beliefs about reasons for use. While research on cannabis brief intervention mechanisms of behavior change has been lacking, studies on treatments for CUD indicate that cannabis use reduction is an important mechanism for reducing functional impairment (Boumparis et al., 2019), making this an important target for cannabis brief interventions. However, for non-treatment-seeking emerging adults, the question remains on how to effectively motivate reductions in high-frequency use.

In line with prior research on cannabis PNF, emerging adult reactions to the hypothetical PNF report suggested that they may already have a clear understanding of their own cannabis use relative to their same-age peers (Loverock et al., 2021), thus requiring little correction, which is the intention of PNF. Some participants expressed confusion about the PNF report. While this may have been due in part to the report's hypothetical nature, the fact that participants raised questions suggests that an adequate explanation by a counselor/clinician may be important to elicit a response. Regardless, participants' perceptions of how they might respond to their own PNF report align with prior cannabis brief intervention research that shows greater readiness to change was a significant moderator of intervention effect (see Lee et al., 2010; Palfai et al., 2016; Stein et al., 2011). Specifically, participants indicated that their response would depend on their goals at the time they received the information. Relatedly, participants also indicated that they expected cannabis self-concept would influence emerging adults' responsiveness to the PNF, which is in line with research showing that greater cannabis self-concept is associated with higher rates of use and less motivation to reduce their use (Blevins et al., 2018). Our participants reported a wide range of cannabis use history which could impact this perception. For example, a longer history of use could mean greater cannabis self-concept, and thus less motivation to change in response to PNF. Finally, a couple of participants described PNF as confrontational. It is possible that intervention content order matters and that PNF could be more impactful if less confrontational discussions aimed at motivating cannabis use reductions happen first.

To date, there has been relatively minimal research on how emerging adults perceive the severity of specific cannabis use consequences. Broadly, results from our interviews align with the overarching perception that even regular cannabis use is low risk (Center for Behavioral Health Statistics and Quality, 2024). However, our results provide a more nuanced understanding of emerging adults' perceptions of consequences, which better informs brief intervention content. For example, a large survey study of youth and young adults in Canada observed a wide range of physical, psychological, and social concerns associated with cannabis use that were deemed to be the "most important" negative health effects (Leos-Toro et al., 2020). From our interviews, this wide range of consequences considered significant is related to the highly individualized nature of cannabis consequences (e.g., how well their use fits within their specific environment). That is, negative health effects considered most important are dependent on the individual. This has important implications for cannabis brief interventions given that these approaches often use Motivational Interviewing (MI) which leverages

personalized values-based approaches to behavior change (DiClemente et al., 2017; Miller & Rollnick, 2013). Additionally, our results provide preliminary support for the improvement of cannabis consequences measures in two ways: (1) incorporation of consequence severity ratings, and (2) re-evaluation of consequences that have more apparent associations with alcohol use (see Pearson, 2019).

Lower perceived severity of cannabis consequences may also be related to our participants' perceptions of what problematic cannabis use is. That is, emerging adults in this study conceptualized problematic use to be quite extreme, rather than a continuum, and consisting of three interrelated components: high frequency/quantity use, impairment/interference in daily life functioning, and dependence on cannabis to function as normal. This aligns with a large experimental vignette study conducted with emerging adults in Canada who were asked to rate harms associated with cannabis use (McMahon et al., 2023). McMahon and colleagues (2023) found that there is a greater perceived risk of harm associated with frequent consumption. Interestingly, among our participants, dependence on cannabis tended to be more about the psychological aspect, rather than physiological (i.e., tolerance, withdrawal), which seems to deviate somewhat from observations in another large survey study of Canadian youth where addiction was the most important negative physical health concern for 16% of respondents (see Leos-Toro et al., 2020). Participants perceived tolerance to be an extremely common experience among those who use cannabis; however, participants either were not aware of what cannabis withdrawal symptoms were, believed the symptoms to be minor, or attributed the symptoms to a health issue that they reported having prior to using cannabis (e.g., poor sleep, anxiety). Given that cannabis withdrawal symptoms are a significant contributor to continued use or returning to use following a quit attempt (Zvolensky et al., 2018), our results provide support for more comprehensive psychoeducation about tolerance and withdrawal, as well as the continuum of problematic use, in cannabis brief interventions.

While there is a robust understanding of what the different reasons are that emerging adults use cannabis, our study focused on their perceptions of these different reasons. In line with considerable prior research, enjoyment (i.e., relaxation, celebration/reward) was among the most common reasons our participants perceived that this age group uses cannabis (Bresin & Mekawi, 2019; Espinosa et al., 2022; Patrick et al., 2016). Although using for enjoyment has been associated with relatively frequent use, when it is the primary or sole reason for use, it tends to be associated with comparatively fewer problems (Espinosa et al., 2022). However, our participants also described boredom as a common reason for use, which was perceived less positively compared to use out of enjoyment or relaxation. Of particular concern was the connection a participant made between boredom and grabbing their cannabis pen, given that our participants perceived this type of method to be highly convenient and that these products often contain extremely high concentrations of THC (Chandra et al., 2019; ElSohly et al., 2016). Indeed, prior research shows young adults were more likely to use cannabis to relieve boredom and that trait boredom is a significant factor in regular cannabis use (Doering et al., 2023; Haug et al., 2017). Importantly, frequent use of high-potency THC-dominant products is associated with CUD (Petrilli et al., 2022). Further, although participants did not associate specific methods with specific reasons for use, convenience seems to play a significant role. Future research should explore whether and how this affects the number of methods used and the number of different reasons to use cannabis. Cannabis brief interventions may also benefit from providing more personalized discussion of why and how emerging adults use cannabis, given that so few interventions include it (see Gex et al., 2024; Halladay et al., 2019).

Limitations and Future Directions

There are limitations to this research. Participants were sampled from South Carolina where cannabis is not legal for medicinal or general adult use. However, some participants were out-of-state students attending a local university and therefore had experience with differing state laws. While we used a purposive sampling approach with maximum variation,

male participants were still underrepresented overall. Our sample could have benefited from a slightly more diverse group, particularly in terms of race and income level; however, our assessment of information power suggests that more participants likely would not have yielded notably more impactful data. Additionally, the interviews asked about various experiences related to and beliefs about cannabis use, not about desired components of early interventions or other topics specific to intervention development. Future research should involve emerging adults in the co-design process, asking about their perspectives more explicitly regarding what they would find most interesting, acceptable, and effective in reducing cannabis use. Future research should also seek to understand how and where emerging adults would prefer to access these types of interventions to maximize engagement with the intervention content and facilitate dissemination and implementation.

Conclusions

It is critical to the success of behavioral interventions that target populations are involved in the development process. The current study uncovered new insights into how emerging adults think about and approach cannabis use, opening the door for new strategies to help address a continuously growing public health concern. While the current study focused on topics specific to the development of brief intervention content to reduce cannabis use and related harms, the insights uncovered are also highly relevant to improving our understanding and ability to measure various cannabis related phenomena, as well as inform policies related to the legalization of and public health messaging surrounding cannabis.

Table 3. *Emergent Themes & Examples: Personalized Normative Feedback (Descriptive Norms Correction)*

Existing Awareness of Use Norms May or May Not Contribute to Surprise in Presentation of PNF	I guess it depends on how proud they are of their own use. I feel like there's definitely some people who are like, "Yeah, I smoke so much. I'm not ashamed of it at all." But I think most people would be surprised if they heard that. … Or at least even if they're not proud of it, if they're aware of it then they're not going to be surprised. You know, they're going to be like, "Yeah, I use way more than most people. I know that and I'm fine with that." – **Participant 1** It wouldn't be too – like it would shock them at first but then be like when they start counting the amount of times that they smoke be like shoot. That number does check out. – **Participant 10**
Perceived Responsiveness to PNF	I think there'd be a little shock, but not care. … well, shocked but in about, I don't know, 20 minutes, I could leave this building and then forget that we ever had this conversation. Not 'cause I'm – not 'cause I smoke weed, but because just, you know things go to the back of your head. – **Participant 7** I don't know if I would change it or not. It would definitely like, I wouldn't like it, hearing that. And it depends on how much it impacted me, I guess. Like I think I would want to definitely change, but I don't know how long that would last, is what I'm trying to say. So I would like forget and stop caring or something like that. – **Participant 6** I think it depends on what their goal is. Like if I received something like this at this point, I would be just grateful to know, I guess. And I'd like to have more information. – **Participant 3** I think they'd be more mindful. They would definitely look to reduce because, like I said, 96 percent is really high. But I would – if that was me, I would take it and I would apply that to my use, but I wouldn't take it and be like "Okay, I need to stop altogether." … I don't see cannabis being that big of a deal in a way, if that makes sense. If it was alcohol and someone said that, then I'd be alarmed. But cannabis? If I'm just more chill than 96 percent of the population, then okay, cool. – **Participant 4**

Table 4. *Emergent Themes & Examples: Perceived Severity of Cannabis Consequences*

3. Perceived Severity of Cannabis Consequences	
3.1 Depends on the person and what is important or salient to them	Definitely think that some of these really depend on the person, and it depends on the people around you. Because I mean, I grew up in a family where marijuana is not an issue but some people like relatives avoided you or had a bad time, could be from relatives or people around you. I feel like that, had a fight or argument with a friend or your parents or something, I feel like that depends on your relationships and how they perceive you doing weed. … just depends on the person, how much you're taking, if you know your limits, the environment, in my opinion it depends on everything. – **Participant 8** It depends on the person. It depends on if they see a life outside of the weed. – **Participant 10** But it's within yourself. I feel like it depends on how much it means if whatever of these happens. I know for me, I get mad at myself if I smoke before school, because I care about school. – **Participant 3**
3.2 Consequences that are common or expected are perceived as less severe	"They look like side effects." – **Participant 12** [in reference to the list of consequences] I think most of the consequences I think of with smoking weed is like related to productivity and not doing things, or just chilling too much or something like that, which I just don't think of as severe. I think it definitely poses a problem, but just not severe. – **Participant 6** I feel like the feeling in a fog, sluggish, tired, or dazed is like a 1, or maybe even a 2. But just like that's kind of – it just doesn't feel as severe, and most people are kind of like, "Oh yeah, it's just what happens." – **Participant 1**
3.2.1 Less common experiences could go either way	**Participant 7**: Felt like you were going crazy is 100 percent a zero for me. *Interviewer*: Mm-hmm, for you because you haven't experienced it, or? **Participant 7**: Yeah, maybe that. Or if you're getting in fights. But I've never seen that, so. Or fainting and medical problems. Those are also in the eight, like, nine to 10 range. – **Participant 2**
3.2.2 Relevant to alcohol, not cannabis	And then "pass out or faint suddenly," that's definitely happened to me on alcohol. … Definitely never weed. – **Participant 11** And the blackouts. I mean, I understand the concept of a weed coma, which is basically when you get high and then there's a period where you don't – it's kind of foggy and then you fall asleep and you wake up the next day, like "What just happened?" But a blackout? No. That's more like a drinking thing as opposed to [cannabis] – **Participant 4**
3.2.2 Medical/Physical Health Problems	And then let's see. I've never had medical problems with, but I guess certain things start, things – you never know…. I would say if it gave me COPD I wouldn't be worried about it, but I would cut down. I definitely would slow down. – **Participant 11** I wouldn't count medical problems, but I never went to the doctor for none of those. – **Participant 12**
3.3 Tolerance	A while back, not long, like two months ago, I realized I was like oh, I'm using a little bit too much and I went on a T-break. I know people who do that too and they get back on it and they're like oh, it's a little bit better. I feel like T-breaks are super helpful, especially if you notice them before you're way too dependent or something like that. – **Participant 8** All right. Feeling that you need more to get the same effect. I know that definitely happened to me and it's happened to some of my friends… Oh. 'Cause I think that would definitely be a reason to reduce, but I wouldn't call it like severe sort of thing. – **Participant 6**

3.4 Withdrawal	Basically cutting down or stopping.…I would say "feel anxious, irritable, lost my appetite, or had stomach pains." I've had that all the time. But it doesn't really affect me, 'cause as soon as I start smoking my stomach stops hurting. **– Participant 11** See, I don't know too much about how much like withdrawal symptoms with like stopping. 'Cause I've seen people have – like possibly have problems with that. But I feel like it's kind of hard to tell. I don't know if that's like because it's not severe enough or something, but it feels very like it could be attributed to other things. Like there's a lot of things happening, but I don't know. **– Participant 6** I guess it's made me be more anxious. I felt when I started, I was going to smoke to stop being anxious, but I think now, it's just led to me being anxious even more. But yeah, I would say that was probably just the worst. But that also could be like I was anxious before, so I can just say probably it didn't do anything. Also, if I stop, I just lose my appetite. And that affects me a lot. **– Participant 3**

Table 5. *Emergent Themes & Examples: Perceptions of Problematic Use*

2. Perceptions of Problematic Use	
2.1 Extreme high frequency/quantity	I would say if they smoke two ounces a week or less. … 'cause that's a lot of weed. But there's been people that do it worse. Like there's certain people they can smoke two ounces in a day. You know, if I had the money I would do it, but I don't think it would be fun. 'Cause the more you do it the less fun it gets. **– Participant 11** I would say that if you're using it all day, every day, but some people can concentrate on that stuff and makes them almost a better person, so I think it depends. **– Participant 8** If you can smoke – ok, so you know the different measurements. You got a half, an eight ball or an eighth of weed. It depends on the gram. If you can go through a zip of weed or like I don't know how much that but a zip is like a really big bag of weed. If you can get through that in under a week you have a problem. **– Participant 10**
2.2 Impairment/interference in daily life functioning (usually related to high frequency/quantity)	That is very problematic, because it's like if you're using every hour on the hour, how are you doing anything productive, like what are you doing day after day? Do you work, like do you go to school? **– Participant 5** When it gets in the way of everyday life…. Not going to work, or not taking responsibility. **– Participant 12** I would say if you speak to someone, you get to know them, and you ask them what their, maybe, personal goals are, or maybe work goals, relationship goals, whatever they have, and it's just nah, nah, nah, nah. Kinda going through the motions, you know? … I think that we all need to have some sorta goals and purpose. And when if I see that, and I see someone who smokes every day and just is constantly just, "I go to work and I get high." As a friend, that would worry me, 'cause it's just, you know, you don't wanna see someone go down that route, 'cause then it gets worse. … But, again, not how much you smoke. More so of what is your life looking like outside of weed. **– Participant 7**
2.3 Dependence on cannabis	If you feel like you can't go to a social event without smoking, or, you know, basically if you can't function without it. If you can't function socially without it, if you can't get through your day without it, I think that's when most people would say it's out of hand. **– Participant 1**

	Because at the point to where, like, you're doing it when you wake up, middle of the day, before you go to bed… like, at that point, then you have, like, some type of, like, mental, like – trying to think of the word – like, attachment to it, I guess in a way. Like, you're, like, mentally addicted to it. – **Participant 2**
2.3.1 Problematic reasons to use cannabis	To relieve boredom. I think that would be a problem. That could be problematic. … Because I feel like you can become bored very frequently, so yeah, if you're doing that, then it's very problematic because you're probably smoking every time you're bored. – **Participant 5** A problematic reason for, what is a problematic reason for using weed? I'm thinking. There's a lot. When you use it because you have nothing else to do. If that – weed is usually like for me. I use it as like a little bit of sparkle for whatever else I'm doing. If I'm writing I'm like ok. And then it generates something. But if you're just like you're waking up because what else can I do, that's the problematic justification. – **Participant 10** I feel like it just – as far as it becoming an issue, I feel like if that's your only means to cope, then that's where the dependency comes. You're overly dependent on marijuana to fix your mood and everything. – **Participant 4**

Table 6. *Emergent Themes & Examples: Reasons for Cannabis Use*

1. Reasons for Cannabis Use	
1.1 Relax, Chill, or Unwind	Because a lot of people are stressed out, and the weed, when you smoke, you just become carefree at that moment, so I feel like that's why, especially in this age, you're trying to figure out what to do with your life and how to get your bearings. Yeah, it's a lot going on around this age, I feel like. – **Participant 5**
1.1.1 Enjoyable effects are the relaxation/alleviation of anxiety/worry	Kind of like – just, like, trying to think, like, just sit there and just enjoy your time, but not think about anything else. – **Participant 2**
1.2 Celebration or reward after completing or accomplishing a task	And then, the other one is maybe just to maybe my case, your little nightcap, kinda your reward, if you wanna see it that way. – **Participant 7** We definitely would use it to celebrate. Like it's midterm week this week so we're all like, okay, we're all going to lock ourselves in the library for like five hours, and then we can all go home and smoke together. – **Participant 3**
1.3 Boredom	To relieve boredom, I don't hear straight out, but feel like it definitely happens. That's definitely something that plays a factor in this, but I don't hear people like say, "Oh, yeah, I'm going to go smoke weed because I'm bored," I feel like people just do that. It's not really said so I don't really hear it, but it's probably common. – **Participant 8** To relieve boredom. Yeah, I guess. We always say, like Sundays, we need to lock our stuff in a box. Because if we're not doing anything, it's just boring Sunday. If we're hungover especially, we'll just smoke all day. – **Participant 3**
1.3.1 Concerns related to use out of boredom	Other friends are more similar to me, of just like, you know, I'll just smoke at home and relax, and, you know, really boredom… And that's what I have started to get a little bit more concerned about it, because I always was a little hesitant about like, "Okay, well what does it mean if I'm using it individually, and not in a social context?" You know, and what does it mean if I feel like I can't – if I'm a little scared to go a night without it? You know, like am I going to have like really intrusive thoughts? Am I going to not sleep very well? You know, am I just going to die of boredom? I mean, none of these things are like major things, but those are the kinds of little things that I'm kind of like, "Oh, well, why not just like take a few hits, and then I'm not going to be bored anymore." You know, the movie I'm watching will be a whole lot more interesting, which I don't know, or stuff like that. So yeah. – **Participant 1**

	Because you had nothing better to do is one that I myself focus on trying not to do. Because I had noticed that I was just grabbing my pen when there was nothing else to do. And it's like, well, I don't need to do that. I wouldn't just grab a shot of alcohol. – **Participant 9**
1.4 Methods for convenient use	
1.4.1 Pens, carts, and vapes are the most discrete	[There's] sort of effort to get all the pieces in a bag and then take the weed and then grind it, all that kind of stuff. But also, and like carts, I feel like that's like the most convenient way, people are going to have carts, they want to hit it out on the street where it's not legal or smoke it in your bedroom, so you don't have to worry about smell. – **Participant 8** And, also, like, you don't want to get – like, if you smoke inside, you're not going to get your room gross. But, mostly smell, yeah. People will do, like, pens or wax or stuff like that just because it's not going to stink as much. – **Participant 2**
1.4.1.1 Other discrete methods based on context	I feel like joints are pretty popular, it's more convenient I feel like if you're walking around, you're not going to carry around a bong while you're on the street or at a party. – **Participant 8** Delta-8, because it's in gummy form whenever I have it, and it's like an edible, I think I use it more whenever there's something I'm about to be in for a long time. Like if we were going to the movies or something. obviously you can't smoke during, I would take an edible and then I'd enjoy the entire experience, 'cause it lasts longer. – **Participant 6** *(also related to 1.4.2 low effort high)*
1.4.2 Low effort high	[P]eople tend to use edibles more for a stronger, longer-lasting high, and more of a full body thing. – **Participant 9** I feel like, yeah, it depends on what your intention is. If you just want to have fun, you could either have just a bowl, just a joint, or in a group setting you get a blunt. But I know if you're stressed or trying to get a different perspective on life or anything like that, you'd probably use more than what you typically need in order to get high, if that makes sense. Like, you might smoke a blunt because there's more in the blunt, so you'll – essentially you'll get higher. Or if you just want to get high, you might hit a bong because you can get really high off of two, three hits of a bong, stuff like that. – **Participant 4**
1.4.3 Low effort access	I would say the bowl is just easier. It's a lot more easier to travel with, not that I drive with it or take it anywhere, 'cause you run the risk of getting caught or whatever. But, I would say the only time it would ever change is if it I'm at a friend's house and they have a joint…. Most of the time, they have a joint, and I'm the one with the bowl. So, that's where it would really change, but there's no reasoning behind it. I would say it's just the occasion, if you go to their house and they have it. So, no reason. – **Participant 7** Like, carts, for the most part, are just, like, I think, for most people, are just when they're, like, alone or, like inside, obviously, stuff like that where they just want something to be quick and easy. – **Participant 2**
1.5 Reasons to not use a particular method	But I will say I guess the edibles that I have right now have – like they're like 25 milligrams of CBD and 5 milligrams of THC, so it's a lot of CBD. So I find that I'm kind of groggy like the day afterwards. So I try not to do that like if I have work the next day or if I have to be up early in the morning or something. But it's not a hard and fast rule. – **Participant 1** Like if people had asthma, and still enjoy getting high, they will use edibles as a way to … So it's like more you're taking a pill comparatively to like inhaling it. – **Participant 9** I didn't want to continue eating edibles 'cause I was gaining weight. – **Participant 10**

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