

RESEARCH ARTICLE

Ceremonial ‘Plant Medicine’ use and its relationship to recreational drug use: an exploratory study

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ABSTRACT

Background: The ceremonial use of psychoactive/hallucinogenic plant based drugs, such as ayahuasca, psilocybin and others, is a growing trend in the United States (US) and globally. To date, there has been little research documenting how many people are using psychoactive substances in this context, who the users are, what benefits/risks exist in the use of these drugs and the relationship between ceremonial drug use and recreational drug use.

In this paper we describe a cohort of plant medicine facilitators in the US and explore how they differentiate plant medicine use from recreational drug use.

Methods: Using modified ethnography, individual interviews were conducted in 2016 with 15 participants who are currently facilitating plant medicine ceremonies in the US. Descriptive content analysis was performed to discover themes and to inform a larger mixed-method study.

Results: Ceremonial drug use was seen by participants as a natural healing and treatment modality used in the context of community and ritual. Three main themes were identified relating to participants’ differentiation between ceremonial plant medicine use and recreational drug use: (1) participants see a clear delineation between plant medicine use and recreational drug use; (2) plant medicine is seen as a potential treatment for addiction, but concerns exist regarding potential interference with recovery; and (3) plant medicine use may influence recreational use.

Conclusions: More research is needed on who is using plant medicine, motivators for use, perceived and real risks and benefits of plant medicine use and harm reduction techniques regarding safe ingestion.

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Introduction

An estimated 15.3% of individuals age 12 and older in the United States (US) have used a hallucinogenic drug in their lifetime (40.9M individuals) (Center for Behavioral Health Statistics and Quality 2016). Although the majority of use has most likely been recreational (i.e. used for psychoactive properties without medical justification; Merriam-Webster 2017), there is growing documentation of the use of hallucinogenic drugs with the goal of spiritual enlightenment, consciousness-raising and/or health improvement (Adamson and Metzner 1988; Krebs and Johansen 2013; Cohen 2014; Perry 2016; Worrall 2016). Interest in the use of hallucinogens for improved health is not a new phenomenon. Psychoactive plant-based hallucinogens have been used in ceremonies throughout the Americas, Europe, Asia and Africa, for centuries (Blackman 2004). Anthropological and historical literature describes the important role that ceremonial drug use play in societies, both individually and collectively, including why and how the preparations were made, how they were used and who had access to the rituals around their use (McKenna 1998). In fact, rather than being seen as a phenomenon of a subculture, research suggests

that some drugs, including cannabis and plant based hallucinogens, have played an important role in the development of the ‘moral and ethical belief system[s]’ (Blackman, p.132) and societal structure of a heterogeneous group of cultures across many millennia (Blackman 2004). As well, research documents the use of MDMA (commonly called Ecstasy) in ceremonial/ritual and therapeutic contexts (Saunders 1993).

During the 1950s and 1960s, there was great interest in the potential for psychedelics in the treatment of mental illness and substance use with over 1,000 scientific papers published (Strassman 1995). However, due to the complex political and social backlash against all drugs, psychedelic research was abruptly halted in the US in the 1970s and LSD and other hallucinogens were classified as Schedule I substances (high potential for abuse with no known therapeutic value) (Strassman 1995). However, in the past decade, there has been a resurgence of interest in psychedelics among medical researchers. Recent clinical trials have suggested that these plants may be effective treatments for smoking cessation (Johnson et al. 2016), anxiety, depression and post-traumatic stress disorder (PTSD) (Griffiths and Grob 2010; Grob et al. 2011; Carhart-Harris et al. 2016; Ross et al. 2016), addiction (Griffiths and Grob 2010;

Loizaga-Velder and Verres 2014; Bogenschutz et al. 2015; Morgan et al. 2017), obsessive-compulsive disorder (OCD) (Moreno et al. 2006) and cluster headaches (Sewell et al. 2006; Davenport 2016). MDMA was approved by the Federal Drug Administration (FDA) for Phase III clinical trials in 2016 and psilocybin is currently being considered for Phase III clinical trials.

At the same time as there has been renewed interest in the clinical use of hallucinogens, articles in the mainstream media have been describing self-formed groups holding ceremonies in which participants ingest ayahuasca (a combination of plants from the Amazon Basin that contains the potent hallucinogen DMT from sources such as *Psychotria viridis* or *Diplazium cabrerana*, and *Banisteriopsis caapi*, which contains MAO inhibiting harmala alkaloids), psilocybin, san pedro cactus, ibogaine or other 'plant based' drugs with the aid of a facilitator (Blackman 2004; LaVecchia 2013; Levy 2016; Perry 2016). Possibly due to the low risk profile of these hallucinogens, or perhaps due to changing societal norms, including drug normalization, and increased popularity of complementary and alternative medicine, reports indicate that that use of hallucinogenic plants in this context is expanding. In these groups, often called 'journeys', participants formulate an 'intention' (goal) that they may share with others during a short group lecture or interactive discussion (called 'induction') before the ceremony begins and the plants are consumed (LaVecchia 2013; Levy 2016; Perry 2016). During the journey, participants are encouraged to explore past trauma and its impact on current individual and relational functioning (Levy 2016; Perry 2016). People usually spend the night after ceremonies, and engage in group discussion regarding experiences during the journey and how lessons learned might be actualized in day-to-day life, a process called 'integration'.

Despite the explosion of literature in the mainstream press describing this emergent drug use trend, there has been little research documenting how many people are involved in this work, who the users are, if users have physical or mental health issues, what benefits/risks exist regarding the use of these drugs, and how ceremonial drug use may relate to decisions to engage in recreational drug use. The minimal research literature to date on the Western use of plant medicine has largely consisted of convenience samples that are majority white and well-educated (Kjellgren et al. 2009; Harris and Gurel 2012; Winkelman 2005). Findings suggest that the majority of Westerners using plant medicines are doing so for their perceived therapeutic value (Winkelman 2005). Minimal literature has looked at the potential benefits of these same substances outside of clinical trials, although a few studies have shown improvements in mental health (Barbosa et al. 2005; Halpern et al. 2008) and substance use (Grob et al. 1996; Halpern et al. 2008). The potential impact of plant medicines on physical health has been largely unexplored. Clinical trials to date have not made definitive conclusions on the potential mental, spiritual and physical benefits of plant medicine use, although studies of ayahuasca and psilocybin have shown promising results for depression, anxiety, PTSD, addiction, OCD, and headaches (Moreno et al. 2006; Griffiths and Grob 2010; Grob

et al. 2011; Loizaga-Velder and Verres 2014; Bogenschutz et al. 2015; Carhart-Harris et al. 2016; Davenport 2016; Johnson et al. 2016; Ross et al. 2016; Morgan et al. 2017). Significant gaps in the literature exist regarding the risks and possible benefits of these plants across the spectrum of health.

Safety of plant medicines is also an understudied area. There have been a few highly publicized deaths among plant medicine users traveling abroad, one involving a suspected homicide (Alexander 2015) and at least two others possibly related to ingestion of ayahuasca (Escobedo 2014; Macdonald 2017). However, clinical research has suggested that hallucinogens are non-addictive, present little risk of overdose (Fábregas et al. 2010; Loizaga-Velder and Verres 2014), and that adverse effects and overdose are less common among people who partake plant-based hallucinogens in ceremonial contexts as compared to those that take hallucinogens recreationally. Reasons for this include a markedly decreased purity of substances consumed in recreational settings as compared to ceremonial settings (Lanaro et al. 2015) and/or accidental or intentional poly-substance ingestion outside of structured ceremonies (Reynaud-Maurupt et al. 2009).

Methods

The purpose of this exploratory study was to investigate the emergent drug subculture of Western plant medicine users, specifically exploring how users differentiate ceremonial use of these plants from recreational drug use. The study used a modified focused ethnographic methodology including in-depth, semi structured interviews with participants currently both facilitating, and participating in, plant medicine ceremonies in the US. The ethnographic method used in this study is referred to as 'modified' as the majority of the in-depth interviews were conducted on the phone, rather than in-person as in traditional ethnography. After receiving [blinded] University Institutional Review Board (IRB) approval, a convenience sample of 15 participants was recruited using key informants and snowball sampling. Inclusion criteria included being aged 18 or older, English speaking, and currently overseeing and participating in ceremonies in the US. Participants with insider knowledge of plant medicine culture, community, protocol and controversies were selected (Cruz 2013). The 15 participants have collectively worked with many hundreds of plant medicine users.

An interview guide was developed including the following topics: mode of entrance into the community; previous western and non-western mental health treatment; language around ceremonial plant medicine use purpose and philosophy of plant medicine use; perceived benefits on physical, emotional and spiritual and relational health perceived limitations of use on physical, emotional, spiritual and relational health, perceived risks of use; previous drug and alcohol use; and similarities and differences between plant medicine use and recreational drug use.

Interviews lasted between 60–120 minutes and took place between January and June, 2016, and were recorded and

Table 1. Participant characteristics.

Participant	Age	Ethnicity	Sex	Education level	Religious affiliation	Profession
1	60s	Black	Female	College	Methodist/none	Medical
2	40s	White	Male	College	None	Arts
3	40s	Asian	Male	College	None	Arts
4	50s	White	Female	College	None	Medical/Academic
5	50s	White	Male	Doctorate	None	Legal
6	40s	White	Female	Master's	Catholic	Arts/Academic
7	60s	White	Female	Doctorate	None	Medical
8	30s	White	Female	College	None	Medical
9	50s	White	Female	Master's	Catholic	Arts
10	50s	White	Male	College	Jewish	Arts
11	70s	White	Female	Doctorate	Congregational	Medical
12	40s	White	Female	Master's	Catholic	Arts
13	40s	White	Female	Master's	None	Medical
14	40s	White/Black/Latino	Female	College	Catholic	Business
15	60s	White	Male	Doctorate	Jewish	Medical/Academic

transcribed by a professional transcriptionist. Per IRB request, informed consent for interviews was obtained verbally in order to ensure anonymity and basic demographic data were collected using categories rather than specific information (for example, decade of life was recorded rather than exact age). Audio-files and transcriptions were kept on a password-protected computer in a locked office, and contained no identifying information. Data saturation was achieved with 15 formal interviews.

Data analysis was an iterative, inductive process and included multiple readings of transcripts and discussion among the research team members in order to elucidate patterns and themes. Analysis was completed with the assistance of Dedoose[®] software to organize and manage qualitative data. The primary investigator coded interview transcripts according to a codebook developed with an experienced ethnographer (Cresswell 2013). Codes were then condensed as themes regarding the relationship between ceremonial plant medicine use and recreational drug use emerged. A second investigator coded 25% of transcripts to establish inter-coder reliability. Participant quotations are presented throughout the results section of this paper to illustrate participants' thoughts and experiences in their own words. For increased clarity, quotations have been edited for verbal hesitations without changing the meaning or significance of the quotes.

Results

Participants

The majority of the sample identified as white, middle-aged, 'not religious', and reported working in professional fields (Table 1). Participants were highly educated, with a minimum of a Bachelor's degree (four reported having Doctoral degrees). Residence and work locations were geographically diverse, including all major areas of the US (the Northeast, Midwest, South, Southwest, West and Northwest). Participants had been involved in plant medicine ceremonies for a minimum of three years to a maximum of 30+ years.

Main themes

Plant medicine use was consistently described by participants in this study as a self-care, healing strategy. Three main themes were identified regarding participants' differentiation between ceremonial plant medicine use and recreational drug use: (1) a clear conceptual differentiation between plant medicine use and recreational drug use; (2) potential use as a treatment for drug and alcohol addiction; and (3) possible demystification and encouragement of recreational use.

Theme 1: Conceptual differentiation of plant medicine use and recreational drug use

Participants in this study verbalized clear beliefs that plant medicine use is different from recreational drug use, and framed this differentiation in multiple ways including type of substance used, the overall philosophy of use, the ritual around plant medicine use and the existence and impact of a supportive plant medicine community.

Participants in this study used a vocabulary specific to plant medicine use that differentiated it from recreational drug use. Participants referred to plant medicine use as 'the work', reflecting the perception that their use is an on-going, at times difficult process, expected to lead to measurable results in relationships, life experience and improved mental and physical health. Common drug terminology, such as the word 'drug' itself, was not used when referring to the plant medicines, which were instead described as 'supplements', 'sacraments' or 'medicine'. Plants were seen as sentient beings coming from nature, the earth or 'spirit' rather than as chemicals or illegal drugs. In contrast, common recreational drugs, such as marijuana, cocaine and MDMA, were referred to as 'drugs', their purpose described as 'fun' and their use primarily for 'checking out' or 'numbing the pain' (as opposed to self-care).

Participants also noted that the ritual nature of plant medicine use differentiated it from recreational drug use, and that it was based in an overall philosophy of practice which focused on making meaning in life and healing past trauma, rather than escape or enjoyment. This philosophy was operationalized both by verbalizing the overall purpose of the work and by making goals ('intentions') for each ceremony. One participant summarized this by saying:

'So the difference is that when people take drugs ... it's to check out. The idea is to get away from yourself, get away from your problems, get away from whatever it is that's driving you crazy. And this work is about checking in, it's about really connecting with yourself and seeing what's going on. If you're going into a ceremony to run away from your problems, good luck, because that ain't gonna' happen.'

Another participant confirmed this, commenting:

'... My intention as, you know, an unconscious young girl was to escape my pain, and my discomfort being in my own skin ... This time around [with plant medicine] ... my intention was to go ... into the trauma, go in and resolve whatever I could ...'

Still another summarized this difference in intent and philosophy as being an overall focus on spirituality, saying:

'The spiritual aspect of the work is where it becomes really, really important, because without that you're just chasing a high.'

A few participants expressed anger at the insinuation that plant medicine use was similar to recreational drug use because they saw their role as ceremony facilitators as a way of giving back to the world and as an expression of gratitude, and felt that to suggest otherwise perpetuates stigma regarding the work, denigrating its importance and seriousness.

Participants also commented on ritual around plant medicines that served to differentiate it from recreational drug use, including the special diet (fasting, vegan, low salt, few spices) often used before ceremonies; music used during ceremonies to create a healing environment and guide participants; a 'container' around ceremonies, described by participants as the creation of a safe and sacred environment; and the presence of a facilitator to help navigate the experience and integration afterwards (integration refers to processing the experience with plants, both directly after the experience as a group, and on-going). One participant described integration as '... how I put into practice the gifts that were shown on a journey, what that looks like in my day-to-day operation'.

However, some participants questioned the clear distinction between ceremonial use and recreational use, specifically expressing concern about their ability to differentiate between participants' motivations for healing versus recreational use. As one participant said:

'... I screen out people who just ... wanna' party ... And there can be a fine line between "I'm really curious and I think this could help me" and "I'm curious, I went to Burning Man and raved and (laughs)" ... I mean I don't pretend I can always tell the difference, but I hope I can.'

Such concerns suggests that *participation* in ceremonial use and recreational use may not be completely separate entities but rather may exist on a continuum, while the substances used, philosophy and intention behind their use, and the rituals designed to help potentiate the experience and ensure safety, are different.

Theme 2: Plant medicine can be potentially helpful in treating addiction; concerns regarding interference with recovery

Participants in this study overwhelmingly verbalized their belief that plant medicine has the potential to be a helpful

tool in the treatment of addiction, including tobacco, alcohol and illicit drugs. Some recounted stories of the positive impact that plant medicine use has had on unhealthy substance use and addictive behaviors. However, concerns were also expressed about plant medicines possibly interfering with recovery, with working with people with addictions, and with the ability of less experienced facilitators to make decisions about inclusion and safety. Per one participant:

'[This work] has cured me. Even after 7 years of sobriety ... I would have a bender every once in a while. And I had no intention of quitting that because I didn't feel like I was hurting anybody ... All of a sudden, I think about my second year into [this work], I just noticed I was like "oh, my urge to do that is gone, I have no desire to check out anymore" ... I think my whole life, I've always felt a little pit, like an empty hole in my heart ... But [due to this work] that hole got filled up.'

However, some participants, especially those with personal or family addiction histories, spoke about the need to reflect on whether or not plant medicine use was in fact drug use, and spent significant time gathering data before participating to decide whether using plant medicine was physically and emotionally safe for them. For example, one participant with a history of addiction and recovery via a twelve-step program expressed a related concern—whether participation in a journey would be breaking the twelve-step tenet of abstinence:

'I had actually been sober ... in 12-step programs for like 21 years when I came to the work and had left those programs quite a long time ago because I felt that I kind of maxed out there ... So when I found out about [the work], I interviewed the facilitator for like an hour and a half before I did it to make sure like "this is not gonna' compromise my sobriety, right?"'

Others spoke about the responsibility of working with people with addictions and expressed that, despite their belief that plant medicine could be helpful in treating addiction, they were unsure about their qualifications to work with issues of addiction:

'I don't feel qualified to work with [addicts]. I know there are many who have actually used ceremony to get over drug and alcohol addiction. And there's fascinating literature about this. I don't feel I'm ready to work with those kinds of people yet, but I do know that the shaman and some very qualified facilitators have worked with them ... I think plant medicine can be way into helping people gently untangle the trauma that promotes that kind of addiction'

Theme 3: Plant medicine use may influence recreational drug use

Participants in this study reported varying past histories of alcohol, tobacco and illicit drug use from negligible exposure to a history of multiple addictions. As previously described, many participants in this study saw a place for this work in the treatment of alcohol and drug addiction and/or stated that they experienced a decrease desire to use other substances after starting this work. Past drug use experience, or the lack thereof, influenced participants' desire to work with plant medicine in various ways. Some participants felt that a history of past recreational drug use and treatment facilitated

their entry into the plant medicine community in that they were already familiar with drug use culture and community:

'I was in AA, and did a little time in NA. I had done like outpatient rehab stuff, in-patient rehab, so I was used to the basic shape of [drug use]. And I had ... experimented with a lot of drugs so to have a bunch of people over at my house, taking mind-body-spirit-heart-altering substances wasn't anything new to me.'

Conversely, other participants stated that previous drug use made them hesitant to enter into this community, either due to societal stigma around drug use, or previous negative drug experiences. For example, one participant said: "A lot of people do associate [plant medicine] with recreational drug use that they did in college and they're afraid of it."

Four participants in this study explained that they had no previous experience with drug use and that this was a consideration in deciding whether or not to participate in the work, for example:

'For a year [my friend] was trying to get me to do the work, and I was like "you're crazy, that's drugs." I mean I grew up type A, straight-A's, perfectionist, three [academic] degrees by age 24 ... I was petrified of putting any substance into my body, thinking I would be altered and I wouldn't know what my new reality is. Looking back now, that's crazy—I embrace that now (laugh)—but then, it just felt scary.'

Lastly, some participants spoke about the possibility of substituting journeys for recreational use:

'I've had journeys where my heart is open, and I feel so alive and so present, and I hear ex-cocaine addicts saying that was a similar feeling ... So I get the crossover, and I get the draw, and I also get how some people start chasing journeys. And if they have money, they do it, and that's you know, it's not regulated in any way, they'll just go journey-hopping, you know what I mean, to get their fix.'

However, most participants did not see much potential risk of substituting journeys for recreational use both because of the many ways that plant medicine use is different than recreational use (see section above), because of the significant possible side effects of plants like ayahuasca such as vomiting (purging) and because of the system of checks and balances set up by the community of people who hold each other accountable. The following participant specifically spoke of the responsibility of being a group facilitator and how s/he feels that it is a responsibility to assure appropriate use:

'I have seen in my clients that they're chasing, they're taking something, and I believe that's up to the facilitator to monitor. I mean I told people no, they can't come back, they have to go and sit this one out, and then come back.'

Discussion

Although recent clinical studies suggest that there may be a therapeutic use for plant medicine in the treatment of mental health and substance use issues, little is known about the non-medical use of plant based psychoactive/hallucinogenic substances including ayahuasca, psilocybin, and others. As part of a larger study on the emerging subculture of plant medicine users, this preliminary qualitative study explored

how plant medicine users perceive the relationship between ceremonial plant medicine use and recreational drug use.

Participants in this study saw a clear delineation between ceremonial plant medicine use and recreational drug use, based on the goals of use, substances ingested, ritual around use and integration of the experience into the everyday life of participants. Whereas "recreational" use was defined by participants as a desire to enjoy the psychoactive properties of substances, ceremonial use in this study was defined by a "higher purpose" such as the healing of childhood traumas or on-going mental health issues. This finding is supported by the minimal literature that exists on plant medicine use. Similar to participants in this study, participants in previous studies were predominantly middle-aged, white and highly educated with a stated purpose of seeking higher consciousness or emotional healing (Winkelman 2005).

The demographics and motives for use among plant medicine users in these studies stand in contrast to some national studies of recreational drug use which suggest that people who use illegal drugs in the US are more likely to be in their teens and 20s, racial/ethnic minorities, have lower educational attainment than non-drug users (SAMHSA 2013). Likewise, drug use is generally hypothesized to be motivated by the desire for euphoria/mood alteration, enhanced sexuality and physical performance, social facilitation, social conformity/peer pressure, boredom, habit, and self-insight (Solowij et al. 1992; Nicholson et al. 2002; Ter Bogt and Engels 2005; Riley and Blackman 2008; Dash and Anderson 2015). Ray and Ksir summarized the main motivators for illegal drug use as pain reduction and pleasure enhancement (Ray and Ksir 1993), a finding not supported by this study. However, more recent research on drug trends in the US, including the opioid epidemic, have largely challenged the myth that drug use is more common among people of color than non-Hispanic whites (Rudd 2016). Thus, the findings of this study may represent a true change in US drug use demographics, or be a reflection of historical bias in drug use research and reporting. It is important to note that participants in this study clearly differentiated ceremonial drug use and recreational drug use, but did not as carefully differentiate between ceremonial and recreational users, suggesting that these communities may not be distinct communities.

In this study, ritual was seen as an essential factor in differentiating plant medicine use from recreational drug use. Previous research supports the role of ritual on safety and experience of drug use, including proper set and setting (Dalgarno and Shewan 2005; Harris and Gurel 2012; Loizaga-Velder and Verres 2014); proper preparation including diet (Harris and Gurel 2012), a stated intention for the experience (Harris and Gurel 2012); support of community (Harris and Gurel 2012), presence of a facilitator/guide (Harris and Gurel 2012) and integration of the experience into everyday life (Harris and Gurel 2012). Trust in the authenticity/purity of substance ingested was mentioned by a minority of the participants in this study as an important element in creating a safe environment.

Results of this study also suggest that plant medicine may be an effective tool to treat addictive behaviors among some users. This finding is supported by early medical literature that has shown potential therapeutic value in the use of Psilocybin, MDMA and Ibogaine in the treatment of depression, anxiety and PTSD (Carhart-Harris et al. 2016; Grob et al. 2011; Ross et al. 2016), smoking cessation (Johnson et al. 2016), alcohol overuse (Bogenschutz et al. 2015) and drug use (Alper et al. 1999). As well, early observational studies suggest that ayahuasca may also be effective in the treatment of depression ((Sanches et al. 2016) and addiction. Participants in this study reflected on plant medicine's multiple pathways for healing addictive behaviors including decreased cravings, increased community support and the healing of traumas that fueled addiction. Similarly, a recent study by Loizaga-Velder and Verres (2014) suggests that ayahuasca has multiple therapeutic mechanisms for persons with addictions, including psychological, neurobiological and spiritual pathways and may be a helpful tool for substance use treatment when used in proper settings.

However, based on the findings of this study, questions still remain on whether plant medicine use may encourage recreational drug use in some participants or be used as "substitute therapy" for some. The majority of participants in this study had (1) a history of previous illegal drug use and were hesitant to join this work based on previous experience with drugs and/or because of family or personal histories of addiction or (2) a history of problematic drug and/or alcohol use found that addictive patterns in their lives, and subsequently their use of alcohol and/or recreational drugs decreased after using plant medicine and/or (3) did not feel that plant medicine use demystified or encouraged recreational drug use. In this study, a small minority of participants had no previous exposure to recreational drug use before entry into this community and felt that their experiences with plant medicine demystified drug use for them (especially cannabis). More research is needed to understand this phenomenon. There is certainly evidence to suggest that use of these substances may change participants' general perspective on the world, leading to more open-mindedness regarding new experiences (MacLean et al. 2011). Whether this translates to an increased openness to, or use of, recreational drugs is unknown.

Application to theory

Results of this study are best considered in the context of existing theories of substance use, health promotion and harm reduction. Participants in this study did not see plant medicine as drug use, but rather as a part of self-care and spiritual growth practices. Thus, existing theories of substance use do not fully explain the growing phenomenon of plant medicine use, nor how participants differentiate plant medicine use from recreational drug use as discussed in this study. For example, Blackman discusses the increase in use of cannabis and club drugs in the context of drug normalization and subculture membership that considers drug use as both as a pleasure seeking activity and a form of resistance to authority. Certainly, subculture/community membership

explains some of the use of plant medicines but findings of this study clearly suggest that plant medicine use is not motivated by pleasure seeking (it can be quite an unpleasant experience producing, for example, scary hallucinations or significant vomiting) but rather by the belief that, despite hardships possibly associated by plant medicine ingestion, use over time will help heal emotional and physical trauma. Similarly, one could examine the use of plant medicine in the context of the Reasoned Action Approach, a social cognitive theory that links health behaviors to intention, social norms, attitudes, and behavioral control (Fishbein and Ajzen 2011). Participants in this study verbalized the intention of plant medicine use to help heal trauma and change unhealthy behavior patterns. However, participants came to plant medicine use with varying attitudes towards substance use and varying thoughts on the social acceptability of plant medicine use. Formation of a tight-knit community of plant medicine users certainly impacted social norms regarding plant medicine for participants in this study. Perhaps the most helpful theoretical framework to explore in regards to plant medicine use would be harm reduction theory that strives to move substance use away from moral and disease paradigms towards an understanding that high-risk activities, such as drug use, are maladaptive coping mechanisms, and that treatment that reduces risk of harm is preferable to no treatment at all (Marlatt 1996). Many participants in this study attributed decreased use of drugs, alcohol and tobacco, as well as promotion of other healthy behaviors, including increased physical activity and adoption of healthier eating patterns, to their use of plant medicines.

Limitations

The results of this exploratory study are not generalizable, but rather may serve to inform the content and methodology of further studies on plant medicine use within the US. The data were obtained from interviews with a small convenience sample of facilitators of plant medicine ceremonies within the US and thus may not represent the larger population of plant medicine users. As well, due to concerns regarding the legality of most plant medicines in the US, participants may have self-censored certain practices, thoughts or comments and may have also downplayed illicit drug use or other practices due to social desirability. Lastly, the minority of participants in the study for whom plant medicine demystified recreational drug use, were not asked specifically about which drugs they started using after working with the plants. As significant differences risks exist between the use of varied substances, this is an area that should be explored further. Regardless of these limitations, it is hoped that the results of this study illustrate the need for further research in this area and shed preliminary light on the differentiation between plant medicine use and recreational drug use.

Conclusion

The use of psychoactive/hallucinogenic plant based drugs in a ceremonial context is a growing trend worldwide. Based

on the findings of this preliminary, qualitative study, ceremonial drug use is defined as the use of psychoactive plants as a natural healing and treatment modality used in the context of community and ritual. Results suggest that Western plant medicine users are a tight community of people with strong beliefs and attitudes towards plant medicine use and that ceremonial plant medicine use is seen by participants in stark contrast to recreational drug use. This differentiation is based on multiple factors including plants ingested, ritual around use, purpose of ingestion, existence of a supportive and like-minded community and impact of plant medicine use on participants' mental, spiritual, physical and relational health. However, questions based on the findings of this study remain. Extensive further research on this topic is needed, including larger quantitative studies that might be able to more fully address who is using plant medicine, motivators for use, perceived and real risks and benefits of plant medicine use and potential interventions to facilitate safe ingestion. Clinical trials of Psilocybin, MDMA and Ayahuasca, and theory driven research, will help facilitate this knowledge. However, research is also needed on the use of plant medicines outside of controlled clinical environments, ideally using a harm reduction lens to evaluate potential risks and benefits.

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References

- Adamson S, Metzner R. 1988. The nature of the MDMA experience and its role in healing, psychotherapy, and spiritual practice. *Revision*. 10:59–72.
- Alexander H. 2015. Briton killed in Peru ayahuasca ceremony texted girlfriend about “bad experience” in Amazon. *Telegraph* 12/21/2015. <http://www.telegraph.co.uk/news/worldnews/southamerica/peru/12062526/Briton-killed-in-Peru-ayahuasca-ceremony-text-girlfriend-about-bad-experience-in-Amazon.html>
- Alper KR, Lotsof HS, Frenken G, Luciano DJ, Bastiaans J. 1999. Treatment of acute opioid withdrawal with ibogaine. *Am J Addict*. 8:234–242.
- Barbosa PCR, Giglio JS, Dalgalarondo P. 2005. Altered states of consciousness and short-term psychological after-effects induced by the first time ritual use of ayahuasca in an urban context in Brazil. *J Psychoactive Drugs*. 37:193–201.
- Blackman S. 2004. “Chilling Out”: the cultural politics of substance consumption, youth and drug policy. Maidenhead/New York: McGraw Hill-Open University Press.
- Bogenschutz MP, Forcehimes AA, Pommy JA, Wilcox CE, Barbosa PCR, Strassman RJ. 2015. Psilocybin-assisted treatment for alcohol dependence: a proof-of-concept study. *J Psychopharmacol*. 29:289–299.
- Carhart-Harris RL, Bolstridge M, Rucker J, Day CM, Erritzoe D, Kaelen M, Bloomfield M, Rickard JA, Forbes B, Feilding A, et al. 2016. Psilocybin with psychological support for treatment-resistant depression: an open-label feasibility study. *Lancet Psychiatry*. 3:619–627.
- Cohen A. 2014. My journey with a life altering drug: Ayahuasca. *Elle Magazine*, April 21. <http://www.elle.com/beauty/health-fitness/advice/a14193/Ayahuasca-drug/>
- Cresswell JW. 2013. *Research Design: qualitative, quantitative and mixed methods approaches*. 4th ed. Thousand Oaks (CA): Sage Publications, Inc.
- Cruz EV. 2013. The use of focused ethnography in nursing research. *Nurse Res*. 20:36.
- Dalgarno P, Shewan D. 2005. Reducing the risks of drug use: the case for set and setting. *Addict Res Theory*. 13:259–265.
- Dash GF, Anderson KG. 2015. Marijuana use, motives, and change intentions in adolescents. *J Psychoactive Drugs*. 47:100–106.
- Davenport WJ. 2016. Psychedelic and nonpsychedelic LSD and Psilocybin for cluster headache. *CMAJ.Journal* 188:217.
- Escobedo T. 2014. Teen’s quest for Amazon “medicine” ends in tragedy. *CNN*, October 27. <http://www.cnn.com/2014/10/24/justice/ayahuasca-death-kyle-nolan-mother/index.html>
- Fábregas JM, González D, Fondevila S, Cutchet M, Fernández X, Barbosa PCR, Alcázar-Córcoles MÁ, Barbanj MJ, Riba J, Bouso JC. 2010. Assessment of addiction severity among ritual users of Ayahuasca. *Drug Alcohol Depend*. 111:257–261.
- Fishbein M, Ajzen I. 2011. *Predicting and changing behavior: the reasoned action approach*. New York: Taylor & Francis.
- Grob CS, Danforth AL, Chopra GS, Hagerty M, McKay CR, Halberstadt AL, Greer GR. 2011. Pilot study of Psilocybin treatment for anxiety in patients with advanced-stage cancer. *Arch Gen Psychiatry*. 68:71–78.
- Grob CS, McKenna DJ, Callaway JC, Brito GS, Neves ES, Oberlaender G, Saide OL, Labigalini E, Tacla C, Miranda CT, et al. 1996. Human psychopharmacology of hoasca, a plant hallucinogen used in ritual context in Brazil. *J Nerv Ment Dis*. 184:86–94.
- Griffiths RR, Grob CS. 2010. Hallucinogens as medicine. *Sci Am*. 303:76–79.
- Halpern JH, Sherwood AR, Passie T, Blackwell KC, Ruttenber AJ. 2008. Evidence of health and safety in American members of a religion who use a hallucinogenic sacrament. *Med Sci Monit*. 14:SR15–SR22.
- Harris R, Gurel L. 2012. A study of Ayahuasca use in North America. *J Psychoactive Drugs*. 44:209–215.
- Johnson MW, Garcia-Romeu A, Griffiths RR. 2016. Long-term follow-up of Psilocybin-facilitated smoking cessation. *Am J Drug Alcohol Abuse*. 43:55–60.
- Kjellgren A, Eriksson A, Norlander T. 2009. Experiences of encounters with ayahuasca the vine of the soul. *J Psychoactive Drugs*. 41:309–315.
- Krebs TS, Johansen PØ. 2013. Psychedelics and mental health: a population study. *PLoS One*. 8:e63972.
- Lanaro R, Calemi DBDA, Togni LR, Costa JL, Yonamine M, Cazenave SDOS, Linardi A. 2015. Ritualistic use of ayahuasca versus street use of similar substances seized by the police: a key factor involved in the potential for intoxications and overdose? *J Psychoactive Drugs*. 47:132–139.
- LaVecchia O. 2013. Ayahuasca can change your life: as long as you’re willing to puke your guts out. *LA Weekly*, November 21. <http://www.laweekly.com/news/Ayahuasca-can-change-your-life-as-long-as-youre-willing-to-puke-your-guts-out-4137305>
- Levy A. 2016. The drug of choice for the age of kale. *The New Yorker*, September 12. <http://www.newyorker.com/magazine/2016/09/12/the-Ayahuasca-boom-in-the-u-s>
- Loizaga-Velder A, Verres R. 2014. Therapeutic effects of ritual Ayahuasca use in the treatment of substance dependence: qualitative results. *J Psychoactive Drugs*. 46:63–72.
- Macdonald H. 2017. How an ayahuasca retreat claimed the life of a 24 yo Kiwi tourist in the Amazon. *ABC news*, March 14. <http://www.abc.net.au/triplej/programs/hack/how-ayahuasca-retreat-claimed-the-life-of-a-24yo-kiwi-tourist/8350338>

- MacLean KA, Johnson MW, Griffiths RR. 2011. Mystical experiences occasioned by the hallucinogen Psilocybin lead to increases in the personality domain of openness. *J Psychopharmacol*. 25:1453–1461.
- Marlatt GA. 1996. Harm reduction: Come as you are. *Addict Behav*. 21:779–788.
- McKenna DJ. 1998. Ayahuasca: an ethnopharmacologic history. In: Metzner R, editor. *Ayahuasca: hallucinogens, consciousness, and the spirit of nature*. New York: Thunder's Mouth Press; p. 187–213.
- Moreno FA, Wiegand CB, Taitano EK, Delgado PL. 2006. Safety, tolerability and efficacy of Psilocybin in 9 patients with obsessive-compulsive disorder. *J Clin Psychiatry*. 67:1735–1740.
- Morgan C, McAndrew A, Stevens T, Nutt D, Lawn W. 2017. Tripping up addiction: the use of psychedelic drugs in the treatment of problematic drug and alcohol use. *Curr Opin Behav Sci*. 13:71–76.
- Nicholson T, Duncan DF, White JB. 2002. Is recreational drug use normal? *J Subst Use*. 7:116–123.
- Perry E. 2016. LSD: my life-saving drug. *GQ Magazine*, February 1. <http://www.gq.com/story/lsd-life-saving-drug>
- Merriam-Webster. 2017. Recreational drug use. In Merriam-Webster.com. <https://www.merriam-webster.com/dictionary/recreational.drug.use>
- Reynaud-Maurupt C, Cadet-Taïrou A, Zoll A. 2009. The contemporary uses of hallucinogenic plants and mushrooms: a qualitative exploratory study carried out in France. *Subst Use Misuse*. 44:1519–1552.
- Riley SC, Blackman G. 2008. Between prohibitions: Patterns and meanings of magic mushroom use in the UK. *Subst Use Misuse*. 43:55–71.
- Ross S, Bossis A, Guss J, Agin-Liebes G, Malone T, Cohen B, Mennenga SE, Belser A, Kalliontzi K, Babb J, et al. 2016. Rapid and sustained symptom reduction following Psilocybin treatment for anxiety and depression in patients with life-threatening cancer: a randomized controlled trial. *J Psychopharmacol (Oxf, Engl)*. 30:1165.
- SAMHSA. 2013. <https://www.samhsa.gov/data/sites/default/files/NSDUHresultsPDFWHTML2013/Web/NSDUHresults2013.htm#3.1.2>
- Rudd RA. 2016. Increases in drug and opioid-involved overdose deaths: United States, 2010–2015. *Mmwr Morb Mortal Wkly Rep*. 65:1445–1452.
- Sanches RF, de Lima Osório F, Dos Santos RG, Macedo LR, Maia-de-Oliveira JP, Wichert-Ana L, de Araujo DB, Riba J, Crippa JA, Hallak JE. 2016. Antidepressant effects of a single dose of Ayahuasca in patients with recurrent depression: a SPECT study. *J Clin Psychopharmacol*. 36:77–81.
- Saunders N. 1993. E is for Ecstasy. 14 Neal's Yard, London, WC2H 9DP, UK. https://erowid.org/library/books_online/e_for_ecstasy
- Sewell RA, Halpern JH, Pope HG. Jr. 2006. Response of cluster headache to Psilocybin and LSD. *Neurology*. 66:1920–1922.
- Solowij N, Hall W, Lee N. 1992. Recreational MDMA use in Sydney: a profile of 'ecstasy' users and their experiences with the drug. *Br J Addict*. 87:1161–1172.
- Ray O, Ksir C. 1993. *Drugs, society and human behavior*. Washington (DC): Times Mirror/Mosby.
- Strassman RJ. 1995. Hallucinogenic drugs in psychiatric research and treatment perspectives and prospects. *J Nerv Ment Dis*. 183:127–138.
- Ter Bogt TF, Engels RC. 2005. "Partying" hard: party style, motives for and effects of MDMA use at rave parties. *Substance Use & misuse*. 40:1479–1502.
- Winkelman M. 2005. Drug tourism or spiritual healing? Ayahuasca seekers in Amazonia. *J Psychoactive Drugs*. 37:209–218.
- Worrall S. 2016. What a comedian learned by traveling to the end of the earth. *National geographic*. August 14. <http://news.nationalgeographic.com/2016/08/comedian-writer-travel-office-steve-hely-wonder-trail/>