Integrating Music Making Practices into Psychedelic Assisted Therapy for Substance Use Disorders

Amy Duckett

School of Health and Social Sciences, City University of Seattle

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Alethea Heudes, PhD, R. Psych

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Abstract

Interest in the use of psychedelic assisted therapy in the treatment of substance use disorders has existed since the 1950s, and results of contemporary studies with more rigorous methodologies suggest preliminary support for the efficacy of the treatment. The use of music has become part of the standardized protocol for psychedelic assisted therapy, though the role of music appears to be limited to music listening rather than music making in these contexts. However, in traditional Indigenous settings where psychedelics have been used in healing ceremonies, reports of music making are common. This capstone collects research on the above-mentioned topics, research on the effect of music making on various aspects of wellbeing, and research on the efficacy of music therapy in the treatment of substance use disorders. In doing so, suggestions for integrating music making into the preparation, dosing, and integration phases of psychedelic assisted therapy are presented. Examples of such suggestions include singing and drumming to address dysregulation in the preparation and dosing phases. In the integration phase, suggestions for music making activities include group music making to address feelings of isolation, and songwriting to assist in meaning making processes. These findings provide preliminary support for the integration of music making interventions into psychedelic assisted therapy and could inspire further research on how to do so safely and ethically, whilst respecting and collaborating with Indigenous peoples who hold ancestral knowledge of these practices.

Keywords psychedelic assisted therapy; substance use disorder; music therapy; music making, singing, drumming, songwriting

Introduction

Current research on the use of psychedelic substances in the treatment of psychiatric conditions has shown promising results for treatment resistant depression (TRD) (Carhart-Harris et al., 2021) and substance use disorders (SUD) (Bogenschutz, Forcehimes, et al., 2015; Bogenschutz, Ross et al., 2022; Sessa et al., 2021; Krebs & Johansen, 2012). Psychedelic substances represented in the literature include psilocybin (Bogenschutz et al., 2022), lysergic acid diethylamide (LSD) (Krebs & Johansen, 2012), 3,4-methylenedioxymethamphetamine (MDMA) (Sessa et al., 2021) ayahuasca (Graham et al., 2022; Sherwin et al., 2025) and ketamine (Grabski et al., 2022; Krupitsky et al., 1992; Mollaahmetoglu et al., 2021).

Various therapeutic modalities have been used in combination with the administration of psychedelics, including psychodynamic and cognitive behavioral modalities (Wolff et al., 2020; Yaden et al., 2022). Regardless of the modality being used, adjunct music listening during the psychedelic dosing session has become standardized in psychedelic assisted therapy (Johnson et al., 2008; Kaelen et al., 2018).

The importance of music in traditional healing ceremonies involving psychedelics has long been recognized (Nettl, 1956; Katz & Dobkin de Rios, 1971; Dobkin de Rios & Katz, 1975), and investigations regarding the role of music in psychedelic assisted therapy began as early as the late 1950s (Bonny & Pahnke, 1972; Eisner & Cohen, 1958; Gaston & Eagle, 1970). Additionally, music has been used in the treatment of substance use disorders in a variety of forms, including music listening, songwriting, and recreational music therapy (Chen et al., 2024; Short & Dingle, 2016; Silverman, 2022).

Research Purpose

The aim of this literature review is to better understand the role of music in psychedelic assisted therapy for substance use disorders. More specifically, my research question is: What are the potential benefits, risks, and limitations of implementing music making interventions (such as singing, composing, and instrument playing) into psychedelic assisted therapy for substance use disorders?

As psychedelic assisted therapy becomes more widely utilized, it is of importance to public health policy to find evidence-based ways to increase positive outcomes of this emerging therapeutic modality (Kaelen et al., 2018). Research in this area has the potential to influence public policy regarding the creation of guidelines for practitioners in the field to ultimately decrease risk of harm. While the findings of this literature review may be of particular interest to music therapists, it will likely also be valuable to any health professional working in the field of psychedelic assisted therapy (referred to as PAT in the following review) including counsellors, expressive arts therapists, psychologists, and psychiatrists.

Introductory Summary of the Literature Review

Psychedelic Assisted Therapy and Substance Use Disorder

Ceremonial use of psychedelic substances has been reported in many cultures as part of healing rituals for those struggling with addiction (Barbosa et al., 2018; Perkins et al., 2022; Rodrigues et al., 2022). Western clinical interest in the potential efficacy of psychedelics in treating substance use disorders began with LSD in the 1950s. This research continued into the 1970s (Dyck, 2008; Krebs & Johansson, 2012), primarily in the treatment of alcohol use disorder (AUD). While results of many studies conducted at that time appeared to be promising, Krebs and Johanson (2012) stated that methodological standards were less rigorous than they are today, and therefore the results of these early studies must be interpreted cautiously and critically.

Additionally, research on the therapeutic effects of psychedelics was restricted in the 1970s due to a myriad of factors, including growing politicalized demonization of psychedelic substances (George et al., 2022). Currently, the scientific community is experiencing what has become colloquially known as the psychedelic renaissance, and renewed interest and ability to study the therapeutic potential of these substances is present.

An example of recent studies being conducted in the field of PAT in the treatment of SUD can be found in the work of Bogenschutz et al. (2022). Their randomized controlled trial compared psilocybin with diphenhydramine for AUD and included 93 participants. The primary outcome was participant's subjective reports of heavy drinking days (defined as more than five drinks per day for men and more than four drinks per day for women). Participants in the psilocybin group had an average of 9.71% heavy drinking days, while participants in the diphenhydramine group had an average more than two times that of the psilocybin group at 23.57%. Additionally, participants in the diphenhydramine group were less likely to achieve a two-level reduction in their drinking risk as defined by the World Health Organization, further supporting the treatment effects of psilocybin in this sample. Though 78.9% of participants identified as non-Hispanic white, Bogenschutz et al. (2022) acknowledged this as a limitation of their study and emphasized the need for further research to include more racially diverse samples.

Role of Music in Psychedelic Healing Practices

Music accompanying psychedelic ceremonies in traditional settings has been described as providing a helpful structure to the psychedelic experience (Dobkin de Rios & Katz, 1975; Maas & Stuebelt, 2005). Recent studies have also found that participants of ayahuasca ceremonies commonly describe this effect (Graham et al., 2022; Sherwin et al., 2025). Varied examples of

music making in these settings exist, from reports of engaging in communal singing in the Santo Daime religion (Daschke, 2023) to playing hand-made percussion instruments, accounts of which have stemmed from Africa and South America (Maas & Stuebelt, 2005; Shannon, 2011).

In contrast, the protocol for music use during a psychedelic dosing session involves directing the participant to recline in a comfortable position while wearing headphones and eye coverings (Johnson et al., 2008; Kaelen et al., 2018). This design encourages introspection and helps limit external distractions that may have a variety of unexpected effects on the participant. Descriptions of types of music used in studies and clinical use varies greatly. The music playlist may be preselected and standardized amongst participants as in studies by Kaelen et al. (2018) and Strickland et al. (2021). Or, the music may be preselected by, and unique to, each participant (Hauser et al., 2024). Additionally, the music may be chosen and changed to best support the client in the moment by an experienced facilitator (Barrett et al., 2017).

A qualitative investigation by Kaelen et al. (2018) produced valuable insights into patient's experiences of listening to music in psychedelic therapy for TRD. Though they were cognizant of Bonny and Pahnke's (1972) recommendations to tailor the music to the individual, Kaelen et al. (2018) devised a standardized playlist for all participants to listen to during two dosing sessions to create a controlled condition. Kalen et al. (2018) included ambient, neoclassical, and ethnic music on their playlist, as they were mindful of the history of this practice to primarily use western classical music with Christian connotations (Lett & Dyck, 2023). While responses to the music were both positive and negative, all 19 participants reported appreciating at least some of the music. Additionally, liking the music, being open to its effects, and finding it congruent with their personal experience of psilocybin predicted a larger reduction in participant's depression scores one week after the last dosing session. This finding presents

the possibility that music has the potential to influence therapeutic outcomes both positively and negatively, and reflects the importance of understanding the role of music in various forms when used in PAT.

Music Interventions in the Treatment of Substance Use Disorder

Music has been utilized in various ways in the treatment of substance use disorders; two main categories that these musical practices fall under are music listening and music making (Bruscia, 2012). Researchers in this field have studied the effects of music listening (Chen et al., 2024; Lozon & Bensimon, 2025; Short & Dingle, 2016; Silverman, 2011, 2016, 2022, 2023), music listening compared to music making (Silverman, 2019a; 2019b; 2025) and various types of music making (Baker et al., 2011; Dickerson et al., 2012, 2014, 2021; Liebowitz et al., 2015). A particularly salient topic in this area of research is the influence of music on increasing and decreasing substance cravings (Lozon & Bensimon, 2025; Short & Dingle, 2016; Silverman, 2011, 2016, 2022, 2023).

Silverman (2022) raised important considerations regarding the use of music in addiction treatment using a randomized cluster study comparing the ability of two different music interventions to reduce craving and withdrawal in a detoxification facility. Silverman used the example of a person hearing a song that reminded them of past substance use acting as a stimulus that could induce cravings in that person, which Short and Dingle (2016) confirmed. However, Short and Dingle also found an opposite function of music, in which participant rantings of levels of craving were reduced after listening to certain music. Silverman's (2022) music interventions included a group of motivational educational songwriting in which Silverman, as the music therapist, collaborated with a group of participants undergoing medical detoxification to write a song that detailed motivations for stopping substance use, alternative coping

mechanisms, and hopes for recovery. Silverman discussed that the participants would not be as likely to associate the resulting novel song with past substance use.

In the recreational music therapy intervention, rock-and-roll bingo was delivered to the participants, providing a source of distraction and socialization (Silverman, 2022). While no significant differences between groups were found, significant differences were found within groups, further supporting the use of music in detoxification settings. However, a major limitation of this study is that Silverman served as the researcher and the clinician providing the interventions, which he acknowledged. As such, to minimize the potential confounding effects of researcher bias, it is necessary to analyze studies where this has not been the case to gather less biased evidence that indicates a benefit to music interventions in the treatment of substance use disorders.

Methodology

Theoretical Framework

The dynamic conceptualization of this topic, the search for literature, and the synthesis of the gathered information were guided by the underlying theoretical framework of harm reduction. One of the primary principles of harm reduction regarding substance use is the acknowledgement of human use of psychoactive substances for time immemorial (Riley et al., 2012). This acceptance is accompanied by respect for a person's autonomy to determine their own goals regarding their substance use, whether those goals include abstinence or not.

In psychotherapeutic settings practicing harm reduction, strategies are explored in a collaborative relationship between therapist and client to reduce the potential harms associated with substance use, which may be physical, mental, or relational among others (Denning & Little, 2011). While various strategies for promoting safer use of substances used via intravenous

injection may come to mind for many as an example of a harm reduction intervention, ritualistic use of psychoactive substances, including psychedelics, for ceremonial purposes has also been conceptualized as representing a harm reduction strategy (Fielding, 2012; Riley et al., 2012). In this setting, substance use is bound by social support, culturally meaningful use, and time constraints that can help safeguard against some of the risks of unregulated substance use. This underscores the importance of studying psychedelic use in traditional healing capacities to better understand how to act in the spirit of harm reduction when psychedelics are used in clinical healing capacities. The supportive use of music in these ceremonies is well known (Jerotic et al., 2023; O'Callaghan et al., 2022) as such, music can be conceptualized as a harm reduction intervention in both psychedelic assisted therapy and in substance use disorder treatment.

Approach

Given that a traditional narrative review allowed for the synthesis of material from diverse sources and areas of study (Efron & Ravid, 2019), this seemed best suited to a topic incorporating research from the fields of ethnomusicology, music therapy, substance use disorder treatment, psychedelics, and psychedelic assisted therapy. Taking a narrative approach also allowed for a broad date range spanning multiple decades in order to temporally trace the narrative of the various fields whilst including researcher and clinician perspectives, reviews, qualitative, quantitative, and mixed methods studies.

While the systemic review approach was not fully employed, attempts were made to locate the majority of the relevant literature in the areas of music and traditional psychedelic use, music and psychedelic assisted therapy, music therapy and substance use disorders, and substance use disorders and psychedelic assisted therapy. This was achieved through searching the City University library database as well as google scholar. Articles were drawn from search

results in the following categories: psychedelic assisted therapy + substance use disorders, psychedelics + music, psychedelic assisted therapy + music/ music therapy/ music intervention, substance use disorders + music/music therapy/music intervention. Additional specifiers were added and modified throughout the search. The reference sections of selected articles were manually searched for additional appropriate sources.

Exclusion criteria varied between sections of the review. For example, while the specific treatment area under investigation was PAT for substance use disorders, literature regarding PAT for other disorders, such as TRD was included in the music and PAT section in order to better represent the scope of literature regarding PAT and music. For both PAT and substance use disorder treatment, works were excluded if the sole intervention used was not music based.

Analysis

The selected works were analyzed on various criteria including but not limited to the following. For experiments, the representativeness of diverse cultural groups in their sample, as well as the effectiveness of the intervention will be evaluated. The presence or absence of a rigorous study design including methods and measures used will also be evaluated, as will the feasibility of the intervention in multiple treatment settings. Safety and adverse effects will also be noted.

By subjecting works from the areas of music and psychedelics, music and substance use disorders, and psychedelic assisted therapy and substance use disorders to this analysis, the considerations needed to expand the current standard of music listening in PAT to music making in PAT are presented.

Positionality Statement

Bourke (2014) explained researcher positionality as striving for a balance between objectivity whilst simultaneously recognizing and presenting the aspects of the researcher's identity that may affect various aspects of the research process. Lund et al., (2025) described three aspects of an author's identity that are commonly disclosed in positionality statements. These include privileged and marginalized identities held by the author, as well as the author's personal experiences relevant to the topic of their research. Therefore, in my positionality statement, in addition to general demographic information, I will disclose details of my experiences with cannabis use disorder, my musical experience and education, and my experiences with psychedelic use.

I am a Caucasian cisgender woman who holds, and has always held, an upper middle-class socioeconomic status. My interest in psychoactive substances began with my personal exploration of cannabis during my undergraduate degree starting in 2016. I became a regular cannabis user from 2018-2025. Though I have a prescription for medical use to treat chronic lower back pain, I have been intentionally working on reducing my usage for the last 3 to 4 years, as I have realized through attending therapy and self-reflection that I do have what would be classified as cannabis use disorder (American Psychiatric Association, 2022).

I have been a musician since I was a child; I have played multiple instruments at various points during my life, including the recorder, piano, and oboe. I began studying classical voice at the age of 12, and I continued my vocal studies in my undergraduate degree, where I received an Honour's Bachelor of Music. I have experiential knowledge of music making and am passionate about the therapeutic benefits of music. Due to my educational background, I understand music terminology and am familiar with many characteristics of the western art music genre, including melody, harmony, timbre and rhythm. While I enjoy a diverse range of musical genres, my

experience has endowed me with a love for western art music. Currently, I am not engaging very much in music making, primarily due to the time constraints of completing this program. I also acknowledge that difficult emotional experiences that I had during my undergraduate degree likely play a role in my decrease in and avoidance of music making. Additionally, I wonder about the potential effect that my cannabis usage has had on this decrease, as losing interest and engaging less in previously enjoyed activities is part of the diagnostic criteria of cannabis use disorder (American Psychiatric Association, 2022).

My own stance on substance use treatment is one of harm reduction and respect for the individual's preferences; I would never push someone towards complete abstinence unless it was something that they desired. Regarding psychedelics, I have used psilocybin recreationally a handful of times. The largest dose that I took was 0.5g of psilocybin containing mushrooms, and this experience led to a feeling of deep insight regarding how much I missed singing, which likely served as inspiration for this topic.

Commitment to Reflexivity and the Mitigation of Bias

Positionality and reflexivity are important practices to undertake when striving to be a responsible researcher (Zilber & Meyer, 2022; Victor et al., 2022). Reflexivity has been compared to the process of countertransference in therapy (Smith & Luke, 2021) and engagement in these processes to manage biases as both a clinician and a researcher is consistent with descriptions of best practices for psychologists (Canadian Psychological Association, 2017). However, researchers holding marginalized identities and lived experience of mental health conditions may experience discomfort and even fear when faced with the need to make positionality statements (Lund et al., 2025, Victor et al., 2022). Reasons for this fear include losing respect from colleagues and the potential for ensuing job loss (Victor et al., 2022). Though

the field of substance abuse counselling has traditionally been more open to clinicians who have personal experience with substance use disorders (Culbreth, 2000), stigma still exists surrounding clinicians who have lived experience of psychiatric conditions (Lund et al., 2025; Victor et al., 2022).

I feel trepidatious being so vulnerable in my positionality statement, however I am also aware that having firsthand experience of substance use disorder provides me with an insider identity in relation to this topic. Insider/outsider identities describe the extent to which the researcher shares identities with members in the group under study (Bourke 2014; Johansson et al., 2022) and the researcher may hold multiple insider and outsider identities. Therefore, while I share the insider identity of having a substance use disorder, I become an outsider if the specified substance is not cannabis. In the practice of reflexivity, it is important to keep in mind that both insider and outside positions can lead to biases (Victor et al., 2022) and sharing an insider identity with members of a group does not erase differences between members. This concept of insider/outsider identities is crucial to the design of my reflexivity practice, which will include the following:

- Selecting and listening to various music used in the reviewed studies on PAT and music, and subsequently journalling about various aspects of the music. This will include what I liked and disliked, as well as any free associations that arise during my listening. My journal entries will also include answers to the following questions: What aspects of my past experiences could have contributed to my experience of listening to this music? How could other listeners' backgrounds influence their experiences of this music?

- Journalling about any experiences of craving cannabis that I may have while engaging in this research, as I have chosen to undertake a period of abstinence.
- Engaging in music making (if possible, particularly while experiencing cannabis cravings). This will consist of singing and/or playing piano and recording any personal insights gained about the therapeutic potential of music making in the treatment of substance use disorders.

Arts based research methods are becoming increasingly used in researcher's reflexivity practices (McCaffrey & Edwards, 2015; Skukauskaite et al., 2022; Smith & Luke, 2021). Examples of arts activities that can be used in reflexivity practices include engaging in visual art making (Skukauskaite et al., 2022), and songwriting (McCaffrey & Edwards, 2015). As music is a significant topic in this paper, I felt that it was fitting to include music listening and music making in my reflexivity practice. Additionally, dos Santos (2024) discussed the importance of self-care while engaging in the practice of reflexivity and framed personal music making as a self-care practice for music therapists. While I do not currently have the training to be a music therapist, I see my identity as a musician as integral to my well-being. Furthermore, ensuring that I find and utilize self-care practices is vital to my future role as a counsellor (Canadian Psychological Association, 2017).

Literature Review

Substance Use Disorder and Psychedelic Assisted Therapy

According to the United Nations Office of Drug Use and Crime (2025), global substance use is increasing. Substance use disorders may develop in some users, and high rates of relapse and dropout from treatment are notorious in this population (Lappan et al., 2020). Therefore,

interest is growing in the treatment potential of psychedelics for this disorder (Bernett & Weleff, 2023; Nutt et al., 2024; Koslowski et al., 2022; van der Meer et al., 2023).

Research in this area varies in terms of types of psychedelic substance used for treatment, type of therapy accompanied by dosing, and the substance use disorder being addressed. Generally, early research during the last century focused on using LSD for AUD (Krebs & Johanson, 2012) though Krupitsky et al. (1992). et al. conducted research using ketamine in combination with aversion therapy for AUD.

Currently, AUD is still largely represented, and studies have been performed exploring the utility of psilocybin (Bogenschutz et al., 2022), MDMA (Sessa et al., 2021), and ketamine (Grabski et al., 2022) in the treatment of it. Other substance use disorders are also being investigated. These include opioid use disorder, for which ibogaine has been utilized (Noller et al., 2018), treatment for tobacco use disorder with psilocybin (Johnson et al., 2014), as well as ketamine for cannabis use disorder (Azhari et al., 2021) and cocaine use disorder (Dakwar et al., 2017). Regarding ayahuasca, while there appears to be less studies on its utility in the treatment of specific substance use disorders, it's use in traditional healing contexts has long been recognized (Barbosa et al., 2018; Perkins et al., 2022; Rodrigues et al., 2022) Observational studies have provided some support for its benefits, including reductions in problematic substance use (Barbosa et al., 2018; Perkins et al., 2022).

Lysergic acid diethylamide (LSD)

LSD belongs to the category of serotonergic psychedelics, and its effects are largely due to agonism of 5HT2A and 5HT1A serotonin receptors (De Gregorio et al., 2016). Clinical studies on LSD in the treatment of substance use disorders began in the 1950s (Krebs & Johanson, 2012; Nutt et al., 2024). The founder of Alcoholics Anonymous expressed support for

studying LSD after reporting a reduction in his own drinking following an LSD experience (Nutt et al., 2024).

Krebs and Johanson (2012) performed a metanalysis on six randomized controlled trials on this subject that occurred between 1966 and 1970. The combined trials comprised a total of 536 adults, and participants in the experimental condition received between 210-800mcg of LSD, considerably higher than the LSD dosages reported in contemporary clinical trials (see Kaelen et al. 2015 for an example). Krebs and Johanson (2012) reported that the effects of LSD in the combined trials yielded a treatment effect with an odds ratio of 1.96, which provides considerable support for the efficacy of the experimental condition compared to the control. However, the treatment effect of LSD was no longer statistically significant at 12 months post treatment, and risks of bias in the studies included problems with blinding, incomplete outcome data, selective outcome reporting, and significant differences between baseline measures provided by the control and experimental groups.

Psilocybin

Psilocybin has been examined in more recent studies on alcohol use disorder (Bogenschutz, Forcehimes, et al., 2015; Bogenschutz, Ross, et al., 2022) and tobacco use disorder (Johnson, Garcia-Romeu, Cosimano, & Griffiths, 2014; Johnson, Garcia-Romeu, & Griffiths, 2017). Psilocybin, a metabolite of psilocin, is naturally found in certain species of mushrooms. Psilocybin is an agonist of multiple serotonin receptors but shows affinity for the 5HT2A receptor (Mckenna et al., 1990) similarly to LSD. This 5HT2A receptor agonism was cited by Johnson et al. (2014) as a mechanism of action shared by LSD and psilocybin that may be involved in positive outcomes obtained in earlier studies on LSD in the treatment of substance use disorders. An open label pilot study on psilocybin for smoking cessation by Johnson et al.

included four weeks of preparatory sessions, a total of three potential dosing sessions, and 19 integration sessions for each of the 15 participants. All participants were aware that they were receiving psilocybin, and the study was designed to provide evidence encouraging the conduction of larger studies with more rigorous designs. The four weeks of preparatory sessions included cognitive behavioral therapy for smoking cessation, after which participants were encouraged to commit to a target quit date, which coincided with the first psilocybin dose. Results of the study included significant reductions in self-reported daily tobacco smoking, with 80% of participants reporting abstinence 6 months after study commencement. This subjective data was biologically corroborated with significant reductions in exhaled carbon monoxide and urinary cotinine levels, two biomarkers that are elevated when an individual has been smoking tobacco. In a long term follow up of this study (Johnson et al., 2017) 10 participants were biologically confirmed to be abstinent from smoking one year after the original study. At a second follow up point that varied between 16 and 57 months after the original study, the number of abstinent participants dropped by one. Notably, stronger ratings of mystical experiences at the end of each dosing session were associated with lower urine cotinine levels.

Noorani et al. (2018) enriched these findings by collecting qualitative data from 12 of the 15 participant's experiences. The two themes most reported by participants were insights into their identity as a non-smoker, and reduced withdrawal symptoms and cravings. Notably, seven participants reported no nicotine cravings or withdrawal symptoms at all.

Clinical trials involving psilocybin for the treatment of alcohol use disorder have also occurred (Bogenschutz, Forcehimes et al., 2015; Bogenschutz, Ross et al., 2022). In a proof-of-concept study by Bogenschutz et al. (2015) significant decreases in drinking were associated with occurrences of mystical experiences during the dosing session, providing another example

of the phenomenon also supported by the Johnson et al. (2014) study discussed above. The lack of a control group in the Bogenschutz et al. (2015) study precluded conclusions on whether the psychotherapy given during the preparation session, the psilocybin dose, or a combination of both was responsible for the decreases in reported alcohol consumption. However, data from self-report measures taken regularly throughout the study exhibited more noticeable reductions after the dosing session in comparison to after the preparatory psychotherapy sessions. To increase credibility of subsequent findings, a randomized controlled trial by Bogenschutz et al., (2022) included a control condition in which participants ingested diphenhydramine, a type of antihistamine that produces sedation, and psilocybin in the active condition. While participants in both groups saw reductions in drinking, the psilocybin group achieved a substantially larger reduction compared to the diphenhydramine group.

Pagni et al., (2024) further extended the scope of the Bogenschutz et al. (2022) parent study by scanning the brains of 5 participants in the psilocybin condition and 6 in the control group. When exposing both groups to visual cues containing positive, neutral, negative, and alcohol associated stimuli, brain scans of participants in the psilocybin group showed both increases and decreases in activity of various brain regions that differed from the scans of the control group. Due to the similarity in neural circuitry activation between all types of visual stimuli, Pagni et al., (2024) cautiously hypothesized that psilocybin ingestion may have had an overarching effect on increasing participant's emotional self-regulation ability.

Accordingly, an interpretive phenomenological study by Agin-Liebes (2023) of 13 participants from the Bogenschutz et al. (2022) parent study found that participants did indeed report changes in their perceived ability to regulate their emotions. Specifically, some participants reported that they had more patience, tolerance and understanding of their negative

emotions. This included altered perceptions of space and time during emotional processing, wherein participants felt able to approach their emotional dysregulation with curiosity rather than with alcohol use and avoidance. Additional themes reported by participants included decreased feelings of shame, increases in both self-compassion and compassion for others, as well as an improved ability to advocate for their own needs and seek support. In another study building from the findings of the Bogenschutz et al., (2022) parent study, Pagni et al. (2025) reported that changes in personality traits had also occurred in the psilocybin group. Namely, extraversion and openness increased significantly, and neuroticism decreased significantly.

In the studies discussed above, psilocybin was generally well tolerated (Bogenschutz, Forcehimes et al., 2015; Bogenschutz, Ross, et al., 2022; Johnson et al., 2014). When adverse psychological effects occurred, study therapists were able to provide adequate support to the participant, such that their distress resolved before the end of the dosing session. The most frequently reported physical effects were headaches and nausea, which were treated by some participants with over-the-counter pain medication (Johnson et al., 2014).

While the effects of psilocybin appear promising in these studies, it is worth noting that a lack of racial diversity was present in the demographics, with most participants identifying as Caucasian (Bogenschutz, Forcehimes, et al., 2015; Bogenschutz, Ross et al., 2022; Johson et al., 2014). Unfortunately, this is a common limitation in studies on psychedelic assisted therapy (George et al., 2019) and one that needs to be eliminated moving forward.

3,4-Methylenedioxymethamphetamine (MDMA)

The mechanism of action of MDMA is complex (Mustafa et al., 2020) though it is generally understood to inhibit the reuptake of serotonin and to a lesser extent, dopamine (Iravani et al., 2000). An important consideration in the use of MDMA in PAT is that this excess

of neurotransmitters has been associated with neurotoxicity and substance abuse (Kalant, 2001; Mustafa et al., 2020).

Nonetheless, Sessa et al. (2021) stated that some patients seeking psychedelic assisted therapy may desire a less intense experience than is typical of the classic psychedelic. Given this, Sessa et al. completed the first open label proof-of-concept trial of MDMA for alcohol use disorder. The open label design of this study meant that all participants were aware they would be receiving MDMA, and no control group was used. Fourteen participants engaged in a two-month therapy program involving various cognitive behavioral therapies, and two MDMA sessions. Strikingly, at the nine-month follow-up, mean weekly alcohol use had decreased by 111.9 units, from over 130 to less than 20. Sessa et al. (2021) also monitored changes in the participant's mood in the week after MDMA sessions, as recreational MDMA users commonly report a sharp decrease in mood after use. Notably, this experience was not recorded in the study. Participants also did not report any cravings to use MDMA again, potentially indicating lower addiction potential in this structured setting. However, reports of lack of craving were based on self-report data and are thus vulnerable to desirability bias.

Ketamine

While the pharmacology of ketamine is complex and not fully understood in the treatment of mental health disorders (Lavender et al., 2020), it is well known among neuroscientists that it acts as an antagonist at N-methyl-D-aspartate receptors, blocking glutamate at these sites (Lavender et al., 2020; Mion & Villevielle, 2013). At higher doses, ketamine has long been utilized as an anesthetic (Lavender et al., 2020; Mion & Villevieille, 2013) but has exhibited subjective psychedelic effects at lower dosages (Mollaahmetoglu et al., 2021).

Ketamine's propensity for treating alcohol use disorder was first observed by Krupitsky et al. (1992). In this early study, a high dose of ketamine was administered in conjunction with two other drugs to counteract the high dose ketamine's anesthetic effects (Grabski et al., 2022) which was concurrently delivered with aversion therapy. Unlike the classic psychedelics, ketamine administration is more likely to result in dissociation rather than mystical experiences, though these have still been reported to occur (Hauser et al., 2024; Mollaahmetoglu et al., 2021). The effects of ketamine have also been described as resembling psychosis, particularly after long term repeated use (Morgan et al. 2004) and accordingly can be quite frightening for some (Hauser et al., 2024; Krupitsky et al., 1992; Mollaahmetoglu et al., 2021) In the study by Krupitsky et al (1992) however, this effect was desired so that the participant's exposure to alcohol during the ketamine dose could be associated with this distressing state. Notably, nearly 70% of participants who received ketamine reported full abstinence from alcohol at one year follow-up. The control group received traditional aversion therapy, which is designed to create an association between alcohol and feelings of nausea (Elkins et al., 2017). Only 24. % of this group achieved alcohol abstinence at one year follow up (Krupitsky et al., 1992). However, statistical analyses were not conducted, and therefore the statistical significance, or lack thereof, of the results was not reported.

Grabski et al. (2022) conducted a phase two clinical trial of ketamine assisted therapy for alcohol use disorder and compared four different treatment conditions: ketamine and mindfulness-based relapse prevention therapy, ketamine and alcohol psychoeducation, saline and mindfulness-based relapse prevention therapy, and saline and alcohol psychoeducation. This design allowed conclusions to be drawn not only about ketamine's treatment potential but also about the enhanced treatment potential of combining it with a therapeutic modality. Participants

in the ketamine and mindfulness-based relapse prevention therapy condition reported the highest percentage of days abstaining from alcohol use, whereas participants in the saline and psychoeducation condition reported the lowest percentage of days abstaining from alcohol. Additionally, participants in the ketamine groups showed more robust improvements in liver function than the saline groups.

Regarding other types of substance use disorders, ketamine administration without added psychotherapy has been found to reduce cocaine self-administration (Dakwar et al., 2017). Azhari et al. (2021) have also completed a clinical trial on ketamine assisted therapy for cannabis use disorder. At baseline, eight participants reported an average of 5.1 days of cannabis usage per week. During the week after ketamine administration, this average dropped to less than one day of cannabis usage per week. While this reduction is encouraging, it is important to note that two participants did not achieve abstinence from cannabis after the treatment.

Ibogaine

It is of great importance to find effective treatment options for opioid use disorder, as deaths involving the use of opioids have been increasing since the late 1990s (Center for Disease Control and Prevention, 2024). In Canada alone, the average number of deaths related to opioids is 20 a day (Government of Canada, 2025). Ibgoaine has been recognized as a potential treatment for opioid use disorder since the 1980s and is even legal for this purpose in New Zealand (Noller et al., 2018). Ibogaine is derived from bark of the Iboga tree native to the African country Gabon and is used ritualistically by the Bwiti people (Maas & Stubelt, 2005). It is an agonist for two different types of opioid receptors, as well as a weak agonist of 5HT2A receptors (Barnett & Weleff, 2022).

In an observational study of 15 participants dependent on opioids receiving ibogaine treatment, Noller et al. (2018) found significant reductions in scores on the Addiction Severity Index Lite between baseline and 12 months, though urine samples were not collected consistently to support this self-report measure with objective biological data. Notably, 14 participants also reported significant reductions as measured by the Subjective Opioid Withdrawal scale after acute ibogaine administration, but crucially, one participant died during treatment. This death was ruled as resulting from failure to provide duty of care and was likely instigated by an ibogaine induced arrythmia. Accordingly, there are two major medical considerations involved in ibogaine treatment; ibogaine has been found to prolong the cardiac QT interval, potentially leading to arrythmias (Koenig et al., 2014) and up to 10% of Caucasian people lack the ability to produce an enzyme that is needed to properly metabolize ibogaine (Glue et al., 2015). The latter is an example of why including participants of diverse ethnicities is crucial in healthcare research (Call et al., 2023), as genetic differences may exist in specific demographics.

Ayahuasca

Ayahuasca is a concoction made by brewing bark from the *Banisteriposis caapi* vine and *Psychotria* leaves (Barbosa et al., 2018) into a tea. The two active ingredients in this mixture are N,N-dimethyltryptamine (DMT), from the *Psychotria* leaves, which is an agonist at multiple 5HT receptors, and multiple monoamine-oxidase inhibitor containing alkaloids contained in *Banisteriposis caapi,* which allows the DMT to exert its effects before full metabolization (Smith et al., 1998; Yritia et al., 2002).

While no randomized controlled trials have been conducted on ayahuasca and substance use disorder, use of ayahuasca in recreational and religious settings has shown some associations

with lower rates of substance use disorders and decreases in substance use (Barbosa et al., 2018; Perkins et al., 2022; Rodrigues et al., 2022). Additionally, the Takiwasi addiction treatment center in Peru has been in operation since the early 1990s (Graham et al., 2022; Mendive et al., 2023) and ayahuasca assisted therapy has been delivered to Indigenous community members struggling with substance use in coastal British Columbia (Argento et al., 2019). Qualitative reports from participants in the study by Argento et al. included feeling more connected to themselves, nature, and others, and eight out of 11 total participants reported subsequent abstinence 6 months after the ayahuasca treatment.

Music and Psychedelics in Healing Practices

Traditional Settings

Music has long been recognized as a component of the traditional ceremonial use of psychedelics (Efthimiou et al., 2024; Nettl, 1956; O'Callaghan et al., 2020; Jerotic et al., 2024), and has been described as occupying a guiding and structuring role in this context (Dobkin de Rios & Katz, 1975; Graham et al., 2022; Katz & Dobkin de Rios 1971; Labate et al., 2017; Maas & Stubelt, 2005; Sherwin et al., 2025) In contrast to clinical settings where participants and patients primarily listen to music, descriptions of music making, either by guides, ceremony participants, or both in traditional settings are far more common (Daschke, 2023; Dobkin de Rios & Katz, 1975; Graham et al., 2022; Katz & Dobkin de Rios 1971; Labate et al., 2017; Maas & Stubelt, 2005; Shannon, 2011; Sherwin et al., 2025)

Maas and Stubelt (2005) described musical aspects of iboga ceremonies that they observed in Gabon. Instrumentation varied for male and female ceremonies, with mouth bows being used primarily in ceremonies for males, and harps being used primarily for ceremonies for females. Maas and Stubelt reported that polyrhythms were integral aspects of ritual music and

were created through the simultaneous playing of various rhythms on different instruments. Additionally, instrumentation varied based on where initiates were during the course of the ceremony; instruments were played to represent the journey to the spiritual realm, and singing was subsequently used to welcome initiates back to the earthly realm. This description of music being used as a sort of time keeping device was echoed by Shannon (2011) in the context of the use of music in ayahuasca rituals.

A form of music used in many ayahuasca healing rituals are songs called *Icaros.* These songs are often described as a gift given directly from the spirits of plants and animals in the natural world (Graham et al., 2022; Sherwin et al., 2025) and can be passed down from master healers to initiates. *Icaros* are usually described as monophonic chants possessing a single line of melody, though sometimes multiple healers join in the singing, and accompaniment with rattles has been documented (Graham et al., 2022; Shannon, 2011; Sherwin et al., 2025). Qualitative reports or participant experiences of listening to Icaros at Takiwasi center include perceptions that the *Icaros* evoked somatic sensations of healing energy moving throughout the body and releasing, unblocking, and cleansing emotions (Graham et al., 2022; Sherwin et al., 2025) Other perspectives common to these two studies were that the *Icaros* provided feelings of connection to nature and produced supernatural and/or spiritual experiences, often entailing synesthesia of visual and auditory senses.

In contrast to experiences at Takiwasi where participants of ayahuasca rituals are discouraged from singing (Graham et al., 2022), practices during ayahuasca ceremonies of the Santo Daime religion include singing and music making by musicians, congregants, and spiritual leaders (Daschke, 2023; Labate et al., 2017; Shannon, 2011). Singing is an important form of music making in this setting as well, but maracas and acoustic guitars are also commonly used.

The songs in Santo Daime ceremonies can be sung in unison, or in a call and response style (Hartogsohn, 2021) and Daschke (2023) emphasized that by simultaneously singing and being sung to, the sacred power of the songs is received both internally and externally.

Shannon (2011) reported that in various religions that use ayahuasca, music making occurs during the harvesting and preparation of the ayahuasca brew as well as during ingestion of the brew and takes the form of beating the bark in a percussive manner. Additionally, Shannon described that during some of his own experiences of taking ayahuasca, he sang spontaneously with a heightened ability and altered vocal qualities. Furthermore, he asserted that singing helped him tolerate some of the unpleasant physical effects of ayahuasca, such as nausea, and provided him with the ability to take some sort of action during feelings of overwhelm. For this reason, he emphasized the benefit of having songs well known to participants included in the ritual, providing something easy to sing to help create a sense of anchoring.

Classic Studies

The importance of using music in psychedelic assisted therapy sessions has been recognized since the first wave of clinical psychedelic research between the 1950s and 1970s (Bonny & Pahnke, 1972; Eisner & Cohen, 1958; Gaston & Eagle, 1970). In an early experiment on the subject, Gaston and Eagle (1970) studied the experience of 59 participants who had ingested 500mcg of LSD while listening to music. This is notably higher than dosages described in contemporary clinical trials, for example 75mcg of LSD used by Kaelen et al., (2016) and 100mcg of LSD used by Preller et al. (2017).

Gaston and Eagle (1970) included five conditions, consisting of no music played in the room, miscellaneous music played, familiar music played, unfamiliar music played, and familiar music played through headphones. Gaston and Eagle developed the LSD music preference

questionnaire for participants to rate their familiarity of nine musical genres, including religious hymns, rock and roll, country, jazz, folk, march, light classical, heavy classical, and love ballads. Gaston and Eagle made no mention of specific examples of pieces that would be categorized into each genre, leaving the difference between light classical and heavy classical unclear.

After the LSD dosing session, many participants reported liking the music and experiencing synesthesia-like effects while listening under the effects of LSD. Notably, every participant in a music listening conditioned reported that they believed music should be used in an LSD dosing session, and many described that the music provided a sense of grounding as the psychedelic trip progressed. Gaston and Eagle (1970) concluded that out of the four music listening conditions, participants found familiar music preferable to unfamiliar music.

The Work of Helen Bonny. Bonny and Pahnke (1972) based their findings on the importance of music use in PAT in the context of their experience observing and facilitating upwards of 600 LSD assisted therapy sessions. Bonny's Guided Imagery and Music Technique, a music therapy modality currently used in the treatment of various psychological complaints, including substance use disorders (Chen et al., 2024) was developed during this time (Clarke, 2019).

Set and Setting. Bonny and Pahnke (1972) emphasized the importance of set and setting, two now well-known factors of the psychedelic experience (Carhart-Harris et al., 2018; Devenot et al., 2022; Hartogsohn, 2017; Mollaahmetoglu et al., 2021; Noorani, 2021). Set refers to factors existing within the individual, including their personal preferences, histories, and personalities, while setting consists of factors existing outside of the individual, such as the room that the patient is in when the psychedelic is administered, the presenting mood of the therapists involved, and the type of music played. Bonny and Pahnke (1972) detailed numerous ways in

which music assisted the patient during the dosing session. These included helping the patient relinquish control and release emotions, providing a sense of continuity, direction, and structure; and evoking and facilitating peak experiences in the patient. Bonny and Pahnke discussed that peak experiences include feelings of unity, transcendence, joy, and awe; additionally, they are often ineffable and provide a sense of meaning that is likely the result of psychological insights. Bonny and Pahnke asserted that music alone can facilitate peak experiences in listeners, but that the effects are greater when combined with psychedelic substances.

Recommendations Based on Phases of the Psychedelic Experience. From their observations and experience, Bonny and Pahnke made the first recommendations for which types of music to play during six identified phases of the LSD experience. These phases included: (a) pre-onset, (b) onset, (c) building toward peak intensity, (d) peak intensity, (e) re-entry and (f) return to normal consciousness. The entire LSD therapy experience lasted from seven to 12 hours, and the time courses of the various phases differed between participants. In the pre-onset, re-entry, and return to normal consciousness phases, popular music of the patient's choice was acceptable to be played, and notably music with lyrics comprehensible to the patient could be included, a recommendation that is absent from the rest of the phases. During the onset phase, Bonny and Pahnke recommended music with a good melody, though they did not provide a description of what a good melody entailed. Omissions like this are an example of why Barret et al. (2017) described many of Bonny and Pahnke's recommendations as vague.

An additional musical characteristic that Bonny and Pahnke (1972) deemed appropriate for the onset phase was regular rhythm, and appropriate examples included Brahm's symphonies. In the third phase, Bonny and Pahnke emphasized the need for music to provide a sense of stability and reassurance, which they said could be achieved through the use of instrumental

music and vocal music respectively. However, they stated that English words needed to be avoided in the vocal music used so as not to invite the patients to make sense out of their experience through the words provided. Though Bonny and Pahnke did not detail any demographic characteristics of the patients that they based their observations and recommendations on, it can be inferred from statements like this that English was the language most familiar to the patients.

During the peak phase of the LSD session, Bonny and Pahnke emphasized the importance of the therapist's attunement to the patient's state of mind in determining appropriate musical selections. They recommended music of a driving nature if the patient was experiencing resistance to facing inner therapeutic content but also cautioned against using anything too dissonant to prevent inducing additional unease and discontent. Overall, Bonny and Pahnke asserted that music acted as a nonverbal guide to assist patients in expressing and processing intense emotions that arose during the psychedelic experience.

Contemporary Studies

Contemporary clinical studies have expanded on Bonny and Pahnke's (1972) research on music listening combined with psychedelic assisted therapy using LSD. LSD administration and concurrent music listening have been found to result in different neural activity than LSD administration without music listening (Kaelen, Roseman et al., 2016; Kaelen, Lorenz et al., 2017; Preller et al., 2017). Additionally, numerous researchers have applied Bonny and Pahnke's recommendations for matching musical qualities to phases of the psychedelic experience using psilocybin rather than LSD (Barrett et al., 2017; Kaelen et al., 2018; Messell et al., 2022). While ketamine is not a classic serotonergic psychedelic and therefore the phases described by Bonny and Pahnke do not match the ketamine dosing experience, adjunct music listening during

ketamine administration has garnered numerous positive results that differ from ketamine administration alone (Hauser et al., 2024).

LSD and Music Listening. Kaelen et al. (2015) furthered research on the concurrent effects of LSD and music listening in a small single blind study. After administration of LSD, 10 participants rated the music that they listened to as significantly more emotionally affecting than after being administered a placebo. Kaelen et al. used the Geneva Emotional Music Scale 9 designed by Zentner et al. (2008) as a secondary measure, a questionnaire that is intended to quantify how listening to music makes a person feel. This scale presents nine emotions, and participants are asked to rate how much they felt each specific emotion while listening to the music on a Likert type scale. All ratings of felt emotions were higher in the LSD condition versus the placebo. Notably, wonder, transcendence, power and tenderness were significantly higher. The authors speculated that significant increases in ratings of wonder and transcendence could be related to the concept of the mystical experience that some people undergo as part of the effects of psychedelic substances, which is reminiscent of the peak experiences described by Bonny & Pahnke (1972).

Findings from the Field of Neuroscience. The current understanding of the effects of LSD and music has been augmented by contemporary studies in the field of neuroscience (Adamska & Fink, 2023; Kaelen, Roseman, et al., 2016, Kaelen, Lorenz, et al., 2017; Preller et al., 2017). LSD administration when accompanied by music listening has been shown to correspond with changes in blood oxygenation level dependent (BOLD) responses in, and functional connectivity between, various brain regions (Kaelen, Roseman, et al., 2016; Kaelen, Lorenz, et al., 2017; Preller et al., 2017). For example, in a study by Preller et al., (2017), participants were asked to rate music as meaningful or meaningless while undergoing fMRI

scanning. BOLD responses in various brain regions when listening to meaningful music without the influence of LSD resulted in similar responses when listening to previously rated meaningless music while under the influence of LSD. From these findings, Preller et al. hypothesized that this may indicate LSD ingestion can produce changes in personal meaning making processes. Interestingly, when administering keterasin, a 5HT2A antagonist, the effects of LSD were no longer felt by participants. From this aspect of the study, Preller et al. asserted that LSD's agonism of 5HT2A receptors is an integral aspect of the meaning making processes that participants have reported after taking LSD.

Kaelen et al. (2016) found that adjunct music listening during LSD administration was correlated with increases in reports of complex visual imagery compared to LSD administration without the addition of music listening. Additionally, this increase was accompanied by increased connectivity between the parahippocampal gyrus and the visual cortex. Crucially, some participants reported that the imagery contained content from their lives and personal experiences. Kaelen et al. (2016) suggested that this intensification of the visual effects of LSD, particularly if the content of the visual imagery was self-referential in character, may have therapeutic value.

Kaelen, Lorenz, et al. (2017) replicated the findings of Kaelen, Barret, et al. (2015) regarding increases in GEMS 9 ratings of wonder and transcendence while listening to music in an LSD treatment condition compared to the placebo condition. In addition to this replication, Kaelen et al. (2017) also found that acoustic features of the music were correlated with BOLD imaging changes in multiple brain regions. Notably, BOLD activation associated with the acoustic feature timbral complexity was positively correlated with the increased ratings of feelings of wonder as collected by the GEMS 9. This finding may have implications for sonic

qualities to look for when selecting music that is more likely to encourage feelings of wonder and transcendence during a psychedelic dosing session.

Content of Music Playlists. Multiple music playlists have been compiled and used to accompany psychedelic assisted therapy with psilocybin (Barrett et al., 2017; Kaelen et al., 2018; Messell et al., 2022; Strickland et al., 2021). In the Copenhagen music program, Messell et al. (2022) compiled a playlist with Bonny and Pahnke's (1972) framework in mind and chose music with characteristics thought to correspond with the phases of the expected psychedelic experience of psilocybin. Messell et al. (2022) set out three additional criteria for music selection which included music representative of various cultures, styles, and genres: avoidance of vocal music with familiar languages, and an absence of direct religious connotations. Despite this last criterion, pieces such as Poulenc's (1950/2014) *Stabat Mater Dolorso* are included, a piece about Mary's suffering during Jesus's crucifixion. This is reminiscent of the conflict between music deemed as religious and music deemed as spiritual that Lett and Dyck (2023) identified in the first wave of research around psychedelic assisted therapy and accompanying music listening. As early as the 1970s, Helen Bonny was aware of the negative associations that people may have regarding organized Christian religion, and for this reason often recommended absolute symphonic works instead.

Another area of contention regarding music listening recommendations exists between the genres of western classical and non-western classical music. This can likely be traced back to music recommendations including Bach, Chopin, Beethoven, Brahms, and Mozart made by Bonny, Eisner and Huxley in the 1960s and 1970s (Lett & Dyck, 2023) Recently, preferences for western classical and non-western music were investigated by Strickland et al. (2021). Strickland et al. analyzed participants responses to two playlists to provide empirical data regarding

participant preferences of music genres. One playlist was comprised of western classical music, and the other was comprised of overtone-based music that featured instruments such as gongs, digeridoos, and sitars. Strickland et al. found that scores on the mystical experience questionnaire were higher for those who had listened to the overtone-based playlist. Though this difference was not significant, it implies that western classical music is not superior to non-western classical music in supporting the occurrence of mystical experiences.

Practitioner's Musical Recommendations for Psilocybin Experiences. Barrett et al., (2017) provided another perspective and examined practitioner's music listening recommendations to support the occurrence of mystical experiences under the influence of psilocybin. The survey was anonymous, encouraging therapists who were practicing illegally in their jurisdiction to be eligible for the study. While this allowed for a larger number of responses, this is a limitation, as the lack of demographic information makes it impossible to infer how these characteristics could have impacted the participant's musical recommendations.

Barrett et al. (2017) collected both qualitative and quantitative data about the recommended music for two phases of typical serotonergic psychedelic experiences, pre- peak and peak as initially described by Bonny and Pahnke (1972). Barret et al. (2017) analyzed the quantitative properties using music information retrieval, a program which runs audio through a computational system to organize characteristics of the audio such as brightness, activity, and fullness on a binary spectrum. Qualitative properties including tempo, meter, dynamics and orchestration were also assessed.

Barret et al. (2017) described music used during the peak phase as steady and constant in features such as melody, harmony, instrumentation and meter. Music for this phase was often predominantly in a major key. The authors interpreted this constancy to be important for

communicating a sense of ease during the peak phase and stated that music with unpredictable qualities may induce anxiety at this point. Barret et al. (2017) reported that many of the pieces featured an ensemble, and that if a single instrument was featured, it was often one that was not commonly used in western art music, such as a Native American flute in *Whippoorwill* by R. Carlos Nakai (1987). Quantitative properties associated with music recommended for the peak phase, included less higher frequencies than in music used for the pre-peak phase. Notably, two songs were recommended for both the pre-peak and peak phases, indicating that music supportive of optimal experiencing of the two phases may not be completely distinct.

Experience of Music Listening and Correlation with Treatment Outcomes. Kaelen et al. (2018) conducted a study on participant's experiences of music used during the dosing sessions of psilocybin assisted therapy, as well as the relationship between these experiences and treatment outcomes for TRD. During the dosing sessions, patients could listen to a music playlist using headphones or a standing stereo speaker. Kaelen et al. clarified that ensuring that the therapist is listening to the same music along with the participant is essential; this way, the therapist can account for what is happening in the music and is more equipped to provide appropriate support to the participant. For the sake of standardization across participants, a single playlist was used in this study that contained music classified into the following genres: classical, neoclassical, contemporary, ambient, and traditional/ethnic. Based on the participants qualitative data, numerous welcome influences of the music were reported. The various welcome influences were divided into the four clusters of intensification, guidance, calming, and openness. However, some participants described the music as an unwelcome influence, and notably, decreases in ratings of depression were only associated with positive reactions to music.

Ketamine and Music Listening. Hauser et al. (2024) demonstrated that adjunct music listening during ketamine administration appeared to produce an anxiolytic effect. Hauser et al. did not use a predetermined playlist in their study; therefore, no inferences can be made about the genre or type of music that was most supportive to participants during ketamine administration. Multiple genres were represented in playlists curated by the participants that included instrumental, classical, rock, pop and Indian music. Hauser et al. reported that much of the music did not include vocals and classified it as mostly relaxing. However, they did not report on any musical characteristics commonly associated with relaxation and instead made a subjective interpretation, leaving the actual characteristics of the music unclear. While this study only had 37 patients, Hauser et al. analyzed hundreds of sessions for a total of 234 sessions that included music listening and 216 that did not. Interestingly, music listening was associated with physiological effects including significantly lower systolic blood pressure. Additionally, participants who listened to music tolerated a significantly higher dose of ketamine.

Implications for Counselling

Music is often referred to as a universal language, given its prevalence in many cultures, though its many iterations vary significantly across time and place (Levithan, 2024). The first flutes, which were carved out of bone by prehistoric humans as long as 43,000 years ago, are an example of humanity's long relationship with music making (Jerotic et al., 2024). Music making has been documented to confer a wide range of physical, emotional, and social benefits that can increase overall wellbeing (Vickhoff et al., 2013; Fancourt et al., 2016; Hendry et al., 2022; Williamson & Bonshor, 2019). The enduring presence of music throughout various cultures, combined with the benefits that music making provides suggests it has a propensity for promoting holistic health. The various benefits of music making have been identified in multiple

groups, from the general population (Hendry et al., 2022; Williamson & Bonshor, 2019) to clinical populations, including those with substance use disorders (Baker et al., 2011; Dickerson et al., 2021; Silverman, 2025).

Physical and Biological Benefits of Music Making

Musical engagement, which includes a wide variety of receptive and active tasks, activates multiple neurological structures and is facilitated by bilateral processing between these structures (Leviathan, 2024). Music making specifically is associated with physical changes in brain structures, as well as improvements in memory, learning, attention, and sensorimotor capabilities (Kraus, 2024; Levithan, 2024; Sherman & Plies, 2023).

A significant amount of research regarding the effect of music making on wellbeing focuses on group interventions, especially choral singing, and particularly in aging demographics (Clements-Cortés, 2015; Johnson, 2024; Willamson & Bonshor, 2019). Accordingly, singing has been associated with changes in breathing, including production of a slower respiration rate (Vickhoff et al., 2013). A slower respiration rate in turn has been associated with short- and long-term benefits regarding cardiovascular health. There is also some support that singing can help facilitate the improvement of cardiovascular health in populations with pre-existing cardiovascular conditions, producing benefits that are similar to those begotten by physical activity but with a less strenuous intervention (Kulinsky, 2024). Interestingly, the bodily structures needed for a person to engage in singing are all moderated by the vagus nerve (Grooten, 2023). The vagus nerve is the tenth nerve descending from the cranium, and plays an integral role in regulating heat rate and respiration (Porges, 2007). Singing often results in a slower exhalation of breath (Grooten, 2023); this change in respiration can help evoke a state of regulation referred to as the ventral vagal state (Grooten, 2023; Porges, 2007). In polyvagal

theory, it is theorized that when people are in this state, biological, emotional, and social functions can occur more easily and effectively.

Biological changes in the endocrine and immune systems have also been noted in conjunction with music making (Beck et al., 2000; Grape et al., 2003; Kuhn, 2002; Kreutz et al., 2004; Fancourt et al., 2016). For example, increases in antibody production have been demonstrated in conjunction with choral singing (Kuhn, 2002; Kreutz et al., 2004) as well as decreases in cortisol (Beck et al., 2000) and increases in oxytocin (Grape et al., 2003). Even an activity as seemingly simple as humming can have profound biological effects, including decreases in blood pressure and heart rate (Goldman & Goldman, 2017; Kuppusamy et al., 2018, 2020; Trivedi et al., 2023) as well as increases in nitric oxide, a vasodilator that has been associated with increased blood flow among other biological functions (Goldman & Goldman, 2017; Maniscalco et al., 2007). Drumming is another form of music making in which biological changes have been detected. Fancourt et al. (2016) took salivary samples from mental health service users who were participating in a 10-week drum circle. From these samples, Fancourt et al. found a significant increase in an anti-inflammatory protein. Based on this, Fancourt et al. emphasized that the importance of such a finding lays in the capability of music to provide a potential anti-inflammatory effect through nonpharmacological means.

Psychological and Emotional Benefits of Music Making

Various types of music making seem to yield similar qualitative reports of the psychological and emotional effects produced by engagement in the activity. Group music making is associated with the experience of a flow state, which involves intense concentration, beneficial distraction from stressors, enjoyment, and feelings of unity between group members (Ascenso et al., 2018; Tay et al., 2021; Von Lob et al., 2010; Williamson & Bonshor, 2019).

Decreases in anxiety, stress, and depression are also commonly perceived benefits of group music making (Bailey & Davidson, 2005; Clements-Cortés, 2015; Fancourt et al., 2016; Hendry et al. 2022; Williamson & Bonshor, 2019), as well as accounts of an overall uplifting effect on mood that often manifested as joyful anticipation regarding weekly participation in music making and persistent positive affect in the days following (Ascenso et al., 2018; Hendry et al., 2022; Williamson & Bonshor, 2019).

Another cluster of benefits regarding perceived increases in autonomy, agency, self-efficacy and confidence appears to exist in the literature (Ascenso et al., 2018; Hendry et al., 2022; Williamson & Bonshor, 2019) Remarkably, participants often reported that these qualities were transferrable to non-musical pursuits and activities, including applying for new jobs and meeting new people. General feelings of pride, satisfaction and achievement are also commonly reported across qualitative studies on group music making (Hendry et al., 2022: Williamson & Bonshor, 2019).

Social Benefits of Music Making

Social benefits are particularly represented in the reports of participants from qualitative studies that revolve around group music making. Decreased feelings of loneliness and isolation (Clements-Cortés, 2015; Dingle et al., 2013) and increases in participant's sense of community, belonging, and group identity are commonly reported across music making disciplines (Ascenso et al., 2018; Hendry et al., 2022; Von Lob et al., 2010; Willimason & Bonshor, 2019). Notably, choral participants and brass band participants both reported that they enjoyed the opportunity to meet people from diverse backgrounds that they likely would not have encountered otherwise (Hendry et al., 2022; Williamson & Bonshor, 2019). One explanation for music's capacity to facilitate social bonding has been attributed to its ability release endorphins (Tarr et al., 2014).

Crucially, group music making may be particularly beneficial to people experiencing adverse events in their lives, with group singing providing stability, purpose, and meaning that many participants identified as lacking in their personal lives (Von Lob et al., 2010).

Spiritual Benefits of Music Making

While not as widely represented in the literature, qualitative reports of group music making have also included accounts of increased spirituality (Camlin et al., 2020: Williamson & Bonshor, 2019). Camlin et al. (2020) detailed accounts of feelings of transcendence from ordinary life, while Willimason & Bonshor (2019) gathered accounts of participants feeling closer to God.

Negative Effects and Experiences of Music Making

While the above literature provides support for a variety of benefits that music making can have on a person's wellbeing, it is important to acknowledge the presence of negative experiences in the endeavor of music making. For example, in Williamson and Bonshor's (2019) qualitative study on membership in community brass bands, reports of a culture of drinking within the band were present. This may represent a particularly relevant challenge to people struggling with SUD who are seeking to engage in music making as part of their recovery. Additionally, some members discussed the unpleasant pressure of competition creating stressful dynamics both between the leader of the band and band members, and amongst band members themselves. Similarly, in a choral setting, participants in a study by Hendry et al. (2022) described experiences of exclusion based on the presence of a clique within the choir.

Music Therapy in the Treatment of Substance Use Disorders

In music therapy, music is seen as a supportive entity that has the potential to affect positive change and support a person's holistic wellbeing (Bruscia, 2012). Both the relationship

between the client and the music, as well as the relationship between the client and therapist are viewed as integral to positive therapeutic outcomes. Music therapy uses receptive methods such as music listening, and active methods including songwriting, improvisation, playing instruments, and singing.

Studies have indicated that the use of music therapy in the treatment of substance use disorders increases treatment motivation and engagement (Bednarz & Nikkel 1992; Gallagher & Steele, 2002; Silverman, 2012), decreases negative affective states, including anxiety and depression (Albornoz, 2011; Cevasco et al., 2005; Fritz et al., 2015; Gallagher & Steele, 2002; Gardstrom & Diestelkamp, 2013), facilitates feelings of self-efficacy (Fritz et al., 2015) awareness, understanding, and emotional catharsis, (Gardstrom et al., 2017) and increases cohesion between members in group settings (Bednarz & Nikkel, 1992; Bourdaghs & Silverman, 2023; Cevasco et al., 2005; Garstrom & Diestelkamp). In a systematic review, Ghetti et al., (2022) found that music therapy has been empirically examined in short term detoxification units, residential treatment facilities, and in and outpatient treatment settings.

Participants in multiple studies by Silverman (2009, 2011, 2012, 2015, 2016a, 2016b, 2019a, 2019b, 2020, 2022, 2023, 2025) often attended multiple music therapy sessions, however, as the sessions did not build off of each other, they were classified as single sessions, and participants were cluster randomized to various experimental or control groups to ascertain the potential effects of a single music therapy intervention. Silverman has often cited the transient nature of detoxification settings to be a primary barrier in implementing music therapy programming consisting of multiple sessions. An additional barrier on detoxification units is the medical nature of experiencing withdrawals from certain substances, necessitating a multidisciplinary approach that often consists of pharmacological interventions.

While Michael J. Silverman has contributed extensively to the literature base in this field of study, Silverman's dual role as both the clinician delivering the intervention and the researcher constitute a risk for bias (Ghetti et al., 2022; Hohmann et al., 2017) The dominance of studies by Silverman has been cited as a reason for not conducting meta-analyses of the available literature on the topic. Other important limitations of Silverman's studies identified by Ghetti et al. (2022) are that over 80% of participants in Silverman's studies were Caucasian, and many of the results were based on self-report measures.

Music and Craving

It is well known that music has the potential to induce cravings for substance use (Baker et al., 2011; Horesh, 2005; Lozon & Bensimon, 2025; Pasqualitto et al., 2023; Short & Dingle, 2016; Silverman, 2011, 2016, 2022, 2023, Silverman et al., 2023) Pasqualitto et al. (2023) proposed that this could be due to an overlap of neural pathways involved in both autobiographical memory processing and craving processes. For this reason, using music in cue exposure treatment has been proposed (Short & Dingle, 2016; Silverman, 2011, 2016, 2022, 2023; Silverman et al., 2023).

Cue exposure treatment is similar to other types of exposure therapy in that it involves a hierarchical approach in the presentation of triggering stimuli and an ensuing prevention of the targeted behavior (Marissen et al., 2007; Mellentin et al., 2017). In the treatment of substance use disorders, the goal would be experiencing reduced or nonexistent cravings, and an ability to refrain from substance use when presented with stimuli associated with past substance use, such as drug paraphernalia, places, people, and music for example. While the efficacy of cue exposure therapy is unclear and instances have been noted where exposure to music associated with past substance use has induced relapses in individuals in substance use disorder treatment (Lozon &

Bensimon, 2025), the importance of building distress tolerance to triggering music has been noted (Horesh, 2005; Lozon & Bensimon, 2025; Short & Dingle, 2016).

In a study exemplifying music's effect on craving, Short and Dingle (2016) asked participants to pick a song associated with their past substance use, and a song that they associated with sobriety. Mean craving scores were heightened after listening to the song associated with substance use and were consequently reduced after listening to the chosen song associated with sobriety.

Lozon and Bensimon (2025) provided qualitative data of individual's experiences with music in substance use treatment facilities In Israel. Out of the 23 participants, six were at a facility that provided music therapy interventions, four were at a center that did not allow music consumption of any kind, and 13 were at a center that had no regulations around music consumption. Thematic analysis of the music therapy participant's responses pointed to a process in which participants first gained awareness of music that triggered cravings, secondly avoided triggering music, thirdly explored other genres not associated with past substance use, and eventually developed tolerance to previously triggering music. In contrast, some of the participants in the facility that did not allow any music consumption reported that they had not progressed past the second stage of this process and instead avoided listening to music altogether for fear of it triggering a relapse.

Music Making Interventions

It is unclear whether receptive or active music therapy interventions are more effective in treating substance use disorders (Ghetti et al., 2022; Vega, 2017). However, Silverman (2019a) found that when comparing group songwriting to recreational music therapy and a control condition, participants in the songwriting condition reported significantly lower cravings on the

expectancy subscale of the Alcohol Craving Questionnaire. Additionally, participants in group songwriting interventions have reported feeling significantly more pride (Silverman, 2019b) and hope for recovery (Silverman, 2025) than recreational music therapy participants. Furthermore, participants in a songwriting group reported feeling inclined to participate in the intervention and expressed enjoying peer collaboration along with recognition of the commonality of their experiences (Silverman, 2023). For all songwriting interventions, Silverman (2012, 2019a, 2019b, 2020, 2022, 2023, 2025) described playing a 12-bar blues progression on his guitar while helping participants compose lyrics comprised of reasons for wanting to recover from substance use disorder, and ways to engage in the recovery process. Baker et al. (2011) discussed using rap for the same purposes as songwriting, eliminating the need for elements such as melody writing that may be challenging for some participants.

Drumming is another music making intervention that has garnered favourable results in the treatment of substance use disorders in various populations (Dickerson, Robichaud, et al., 2012; Dickerson, Venner, et al., 2014; Dickerson, D'Amico, et al., 2021; Harrison, 2009; Hill et al., 2017; Stuebing et al., 2020). For example, average ratings of meaningfulness were highest for the drumming intervention compared to other expressive arts interventions in a study on a program that integrates expressive arts interventions with the 12-step model of recovery (Stuebing et al., 2020). Additionally, participants in multiple studies of Drum Assisted Recovery Therapy for Native Americans, or DARTNA for short (Dickerson, Robichaud, et al., 2012; Dickerson, Venner, et al., 2014; Dickerson, D'Amico, et al., 2021) reported that the intervention provided them with a valuable opportunity to engage with their culture. More recently, in a feasibility randomized controlled trial (Dickerson et al., 2021) DARTNA participants had lower scores on measures of cognitive impairment and physical ailments than the control group.

Notably, on a satisfaction survey that was completed by 68% of DARTNA participants in this study, 100% of that subgroup reported that they were satisfied with the intervention, that they felt respected by the group leader, and that they viewed lessons learned during the intervention as helpful and applicable to their daily lives.

Singing has been discussed as occurring spontaneously in the context of lyric analysis interventions (Silverman, 2009, 2015, 2016a, 2016b) and some literature exists on the effects of implementing purposeful singing in the treatment of substance use disorders. Liebowitz et al., (2015) examined the experience of participating in a choir on veterans with substance use disorders at a residential treatment facility. Half of the participants expressed that they enjoyed singing in the choir, and multiple participants described singing as both calming and energizing, as well as having a positive effect on their overall mood. Furthermore, most of the participants reported that singing in the choir provided them with a reprieve from focusing on their addiction in the supportive context of belonging to a group with a shared goal. Gardstrom et al. (2017) also discussed female participant perspectives of singing that included enjoyment and stress relief.

Ethical Considerations

Numerous ethical considerations have been identified in the field of PAT. One area for consideration involves the potential risks of psychedelics, which include acute risks during the dosing session, as well as long term risks following the dosing session, such as the potential for the development of various psychiatric disorders (Johson et al., 2008). While not a psychiatric disorder but still deeply serious, individuals who undergo PAT may experience ontological shock, wherein their worldview is drastically changed, potentially affecting various aspects of their lives (Argyri et al., 2025; Harrison, 2023; Katzman & Shwartz, 2024). Additionally, the unpredictable nature of the psychedelic experience, the potential for feelings of fear and panic, as

well as the use of therapeutic touch to provide reassurance if such feelings arise during the dosing session are unique aspects of the treatment that need to be thoroughly discussed in order to obtain informed consent before proceeding (College of Alberta Psychologists, 2025; Harrison, 2023; Johnson et al., 2008; Knighton, 2024; Multidisciplinary Association for Psychedelic Studies, 2021; Smith & Sisti, 2021; Villiger, 2024). On a societal scale, the importance of respect and reciprocity regarding Indigenous involvement in the field must be considered in both research and clinical aspects. Actions to take in this area involve working to uplift Indigenous knowledge, leaders, and communities, as well as preventing appropriation of sacred practices (Celidwen et al., 2023; Spriggs et al., 2023).

Acute Risks of Psychedelic Substances During the Dosing Session

In addition to changes in perceptions and potential hallucinations during the dosing session, psychedelic substances used in PAT including psilocybin, LSD, MDMA, ketamine, and ayahuasca have the potential to cause unpleasant psychological events including fear and anxiety (Breeksema et al., 2022; Colcott et al., 2024; Graham et al., 2022; Johnson et al., 2008; Kaminski & Reinhart, 2024; Sherwin et al., 2025; Van Amsterdam & Van Den Brink, 2022) These effects are usually transient in nature, and often commence once the acute drug effects have worn off. Interestingly, many participants retrospectively report that any psychological and emotional challenges were therapeutically relevant and necessary (Johnson et al., 2008).

Regarding potential physical reactions to be aware of, the administration of ayahuasca, ketamine, MDMA, psilocybin, and LSD has been associated with increases in blood pressure and heart rate, as well as headaches and nausea (Breeksema et al., 2022; Colcott et al., 2024; Graham et al., 2022; Johnson et al., 2008; Kaminski & Reinhart, 2024; Sherwin et al., 2025; Van Amsterdam & Van Den Brink, 2022). Two substances, ayahuasca and ibogaine, warrant

additional caution due to unique effects. Because one of the plants used to make the ayahuasca brew contains a monoamine oxidase inhibitor, those already on selective serotonin reuptake inhibitors or monoamine oxidase inhibitors are at risk of developing serotonin sickness, and should refrain from taking it while on these medications (College of Alberta Psychologists, 2025; Johnson et al., 2008; Simonsson, et al., 2025). In the case of ibogaine, according to a review by Ona et al. (2022), QTc prolongation was a common adverse cardiac event. Notably, in some cases this persisted for up to seven days after administration. In addition to cardiac events, neurological events were also reported, including loss of muscle control and coordination, seizures, loss of consciousness and an anoxic brain injury which resulted in death. This is especially noteworthy, as ibogaine appears to be the only psychedelic substance under study that has resulted in death as a direct result of administration. Additionally, as previously mentioned, approximately 10% of Caucasian people are unable to properly metabolize ibogaine (Glue et al., 2015). Therefore, along with pre-existing cardiac conditions, liver function is another area that needs to be involved in the screening process when considering treatment with ibogaine.

Long Term Risks

When looking at the risks of PAT, the dosing session is only one component of the treatment that needs to be considered (Palitsky et al., 2024). Equally important to consider is the potential for lasting negative effects. Long-lasting negative effects include the potential for psychedelic use to precipitate various psychiatric disorders. These include hallucinogen persisting perception disorder (HPPD), hallucinogen use disorder (HUD), as well as various psychosis spectrum and affective disorders (American Psychiatric Association, 2022; Johnson et al., 2008; Yiridim et al., 2024).

Hallucinogen Persisting Perception Disorder (HPPD)

Hallucinogen Persisting Perception Disorder (HPPD) involves perceptual disturbances resembling those experienced during a previous psychedelic experience (American Psychiatric Association, 2022; Ford et al., 2022; Martinotti et al., 2018). Visual disturbances are widely reported, including visual snow, a condition in which vision is distorted to appear granular. HPPD can be precipitated by usage of various psychedelics across classes, though there is some evidence that it may develop more often in users of LSD (Baggott et al., 2022; Orsolini et al., 2017*).* Diagnostic criteria in the DSM V-TR maintains that any perceptual disturbances must be accompanied by clinically relevant distress (American Psychiatric Association, 2022; Johnson et al., 2008). However, reports of symptoms consistent with HPPD excluding distress exist. For this reason, Lerner et al. (2014) proposed that HPPD could be divided into two types, with only HPPD Type II requiring the presence of distress. Despite the fact that only some users report accompanying distress with their HPPD symptoms, (Lerner et al., 2014; Zhou et al., 2025) this distress may have tragic consequences. For example, in their review, Ford et al. (2022) reported that two people diagnosed with HPPD died by suicide. While it cannot be confirmed that HPPD was the cause of these deaths, it also cannot be eliminated as a precipitating factor.

Hallucinogen Use Disorder

In the DSM V-TR, HUD is specified into two categories; the first category, called phencyclidine use disorder, includes substances such as phencyclidine and ketamine, whereas the second category involves any hallucinogen other than those in the phencyclidine class (American Psychiatric Association, 2022). In both categories, the disorder is characterized by spending copious amounts of time using, thinking about using, and obtaining the substance, as well as difficulties when attempting to decrease use, emergent problems in various areas of life, development of tolerance, and craving for the substance. Unlike other types of substance use

disorders, withdrawal is not a criterion for the diagnosis; though withdrawal syndromes have been reported to occur with long term hallucinogen usage, they are not reliably seen in the use of these substances (American Psychiatric Association, 2022; Johnson et al., 2008). It is worth noting that MDMA users seem to have a higher risk of developing HUD than other hallucinogen users (American Psychiatric Association, 2022; Wu et al., 2008). This finding concerns recreational usage and may be less of a risk in a structured clinical setting. However, it is still important to keep in mind when determining what substance may be most appropriate for a prospective client, particularly if they are already struggling with a substance use disorder.

Both HPPD and HUD are considered rare disorders, with incidence and prevalence rates of less than 1% reported by the American Psychiatric Association (2022). However, of critical importance to those with substance use disorders, there is some evidence that both disorders are more likely to occur in this population. (American Psychiatric Association, 2022; Zhou et al., 2025). Additionally, populations of people with other mental health disorders may also have a higher risk of developing these disorders. These are important considerations for clinicians to keep in mind when screening prospective clients who wish to undergo PAT. Sharing this information with prospective clients who belong to these populations is an integral aspect of providing sufficient information so that appropriate informed consent can be given by clients (Johnson et al., 2008).

Other Psychiatric Disorders

The development or worsening of schizophrenia and other psychotic spectrum disorders has long been a concern regarding the potential long-term effects of the use of various psychoactive substances (Johnson et al., 2008; Yilidirim et al., 2024). Yildirim et al. (2024) systematically reviewed research on adverse psychiatric side effects of PAT that occurred

between 1960-2022. Within this literature, Yilidirm et al. found 39 case reports of psychiatric disorders, including 17 reports of schizophrenia spectrum disorders. Reports of the precipitation of affective disorders were equally prevalent in the systematic review. Over half of both types of disorders were precipitated by LSD administration, and in five cases, symptoms of a schizophrenia spectrum disorder developed after only a single dosage. While eleven of these participants were reported to have recovered, three did not, and crucially, one of these three died by suicide.

Ontological Shock and Traumatic Experiences

Ontological shock involves serious effects on a person's beliefs about themselves, the universe, and the nature of existence (Argyri et al., 2025; Katzman & Shwartz, 2024). The ensuing long term personality changes that may occur as a result of ontological shock can be so extreme that they disrupt important aspects of a person's life, such as relationships and their career (Harrison, 2023). Ontological shock may manifest in a variety of people, including both those who have no prior spiritual belief system and those who are deeply religious (Argyri et al., 2025).

For example, in a qualitative study of recreational psychedelic users, Argyri and colleagues (2025) presented reports of both an atheist becoming a Buddhist nun after an experience with psychedelics, and a person who had formally described themselves as spiritual, but experienced deep disappointment in God after an experience with psychedelics. Other accounts from the study by Argyri et al. included lasting feelings of grief over loss of identity, distressing experiences of paranoia and rumination, and difficulty with social interaction. Argyri et al. noted that many descriptions provided by participants were consistent with post-traumatic stress disorder. The potential for traumatization to occur during psychedelic assisted therapy is

recognized (Johson et al., 2008; Katzman & Schwartz, 2024; College of Alberta Psychologists, 2025; Multidisciplinary Association for Psychedelic Studies, 2021; Psychedelic Association of Canada, 2022) whether from a resurgence in suppressed memories of trauma, a difficult dosing experience, or ontological shock regarding the content of the dosing session. Because of this, many codes of ethics and practice guidelines emphasize the importance of providing integration sessions to support clients during this time of heightened vulnerability (America Psychedelic Practitioners Association & BrainFutures, 2023; Johnson et al., 2008; College of Alberta Psychologists, 2025; Multidisciplinary Association for Psychedelic Studies, 2021; Psychedelic Association of Canada, 2022).

Therapeutic Touch

While therapeutic touch is controversial in many forms of psychotherapy (Dvir & Hull, 2024; Luoma et al., 2023), it is an important form of providing support and ensuring safety in psychedelic assisted therapy (America Psychedelic Practitioners Association & BrainFutures, 2023; Johnson et al., 2008; College of Alberta Psychologists, 2025; Multidisciplinary Association for Psychedelic Studies, 2021; Psychedelic Association of Canada, 2022). In fact, the Multidisciplinary Association for Psychedelic studies MDMD assisted therapy treatment manual goes so far as to say that withholding touch when the client is experiencing distress in an altered state of consciousness may even be considered neglectful (Luoma et al., 2023). More research is needed in this area (Harrison, 2023; Luoma et al., 2023), and qualitative research gathering client's perception of touch could help inform guidelines for best practice. Additionally, more research and emphasis are needed regarding clinician's comfort levels with providing and receiving touch (Dvir & Hull, 2024; Harrison, 2023; Luoma et al., 2023).

As people undergoing a psychedelic experience may have difficulty verbally communicating, Dvir & Hall (2024) discussed the importance of looking to nonverbal cues to confirm or dispute previously given verbal and written consent, including the presence of tension in the body indicated by a person's posture. They also emphasized the importance of considering past trauma, especially if it was physical or sexual in nature, when collaborating with clients on decisions about therapeutic touch. Lastly, they asserted that there was a need for the therapist to have significant training on the use of touch, which is consistent with recommendations from guidelines and codes of ethics for therapists to stay within their scope of practice in this area. (America Psychedelic Practitioners Association & BrainFutures, 2023; College of Alberta Psychologists, 2025; Multidisciplinary Association for Psychedelic Studies, 2021; Psychedelic Association of Canada, 2022).

Informed Consent

Obtaining informed consent from a potential client to engage in the process of any type of psychotherapy is of the utmost importance in local, national, and international jurisdictions (American Psychological Association, 2017; Canadian Psychological Association, 2017; College of Alberta Psychologists, 2023). Many have questioned whether or not it is truly possible for a person to provide informed consent to participate in psychedelic assisted therapy, given the potential for a deeply transformative experience that is difficult to describe and varies significantly between individuals (Harrison, 2023; College of Alberta Psychologists, 2025; Knighton, 2024; Smith & Sisti, 2021; Villiger, 2024).

Villiger (2024) compared and contrasted talk therapy with psychedelic assisted therapy and asserted that while both have the potential to provide transformative experiences, the gradual nature of talk therapy is more conducive to engaging in the dynamic process of obtaining

informed consent, as clients have more time to reflect and decide what they truly want. In contrast, the dosing session of psychedelic assisted therapy often takes place over the course of mere hours, and clients may be experiencing profoundly altered states of consciousness that add nuance to dynamically obtaining informed consent. Nevertheless, Villiger suggested that as long as prospective clients can engage in a risk benefit analysis where they understand there is a potential for this treatment to result in decreased quality of life, they are able to provide informed consent.

To address some of the challenges regarding obtaining informed consent for psychedelic assisted therapy, Knighton (2024) proposed that practitioners assist clients in developing embodied awareness of both enthusiastic consent and enthusiastic refusal. The process proposed by Knighton involves inviting clients to recall memories of times that they experienced wanting and not wanting to do something. Alongside the recall of these memories, Knighton recommended inviting clients to attend to any physical sensations that arose to determine how each experience feels somatically. Additionally, clients are encouraged to vocalize saying yes or no when attending to their somatic sensations. Knighton recommended repetitive practice of this strategy to assist clients in developing embodiment. Knight's suggestions appear to align with a recommendation by the Psychedelic Association of Canada (2022) which describes helping clients practice both choice and voice to freely give informed consent.

Respect for Indigenous Knowledge and Practices

Indigenous peoples around the world have suffered repeated mistreatment by many colonial systems, including the practice of psychology (Celidwen et al., 2023; Efthimiou et al., 2024; Herrera, 2024; Spriggs et al., 2023). The mistreatment of Indigenous peoples has unfortunately been present in psychedelic research since the first wave in the 1960s when

American researchers travelled to South America and appropriated psilocybin containing fungi and sacred ritual teachings from Maria Sabina, a respected healer and leader in her community (Spiers et al., 2024). Her village was soon overtaken by tourism due to increased public interest in psychedelics, and many members of her community turned against her for sharing their knowledge with outsiders who did not handle it responsibly.

Unfortunately, this type of incident is not confined to the past; psychedelic tourism in the form of mass ayahuasca retreats when not conducted respectfully still threaten Indigenous practices and land (Celidwen et al., 2023; Herrera, 2024). Even synthetic psychedelics such as MDMA, which one may not immediately consider to be associated with Indigenous practices has deep connections and impacts on Indigenous communities. The raw material used to synthesize it is often sourced from the amazon rainforest, contributing to deforestation and the breakdown of communities due to drug trafficking activity (Celidwen et al., 2023). Treatment of natural resources as a commodity that simply exists for human consumption is directly against Indigenous knowledge systems that view humans as intricately connected with the natural world, with reciprocity between the two necessary to keep all things in right relationship (Celidwen et al., 2023; Spriggs et al., 2023).

This reverence for nature is part of the ethical guidelines formulated by Celidwen et al. (2023), a multidisciplinary Indigenous led committee with members from communities around the world. Celidwen et al. proposed eight pillars of reverence, respect, responsibility, relevance, regulation, reparation, restoration, and reconciliation, which fall under the broader categories of acknowledgement, knowledge translation and education, intellectual property, and belonging. A common theme running throughout all these recommendations, as well as recommendations from other authors, is the inclusion of Indigenous leaders and communities in the development,

practice, and review of psychedelic assisted therapies (Celidwen et al., 2023; Herrera, 2024; Spriggs et al., 2023; Prioleau & Panjwani, 2025). A crucial part of this is giving power back to Indigenous communities and allowing them to determine what they share and allow western practitioners to use. This includes what Celidwen et al. (2023) referred to as both tangible and intangible aspects of Indigenous knowledge. Practices that fit into the intangible category that have often been appropriated by western practitioners include intention setting, prayer, cleansing rituals and the use of music (Efthimiou, et al., 2024; Herrera, 2024). Crucially, Efthimiou et al. (2024) asserted that in some cases, giving power back to Indigenous communities may mean relinquishing curiosity regarding Indigenous musical practices connected with ceremonial psychedelic use.

Additionally, multiple authors have discussed the need for those working in the PAT field to be advocates for expanding access to PAT (Herrera, 2024; Prioleau & Panjwani, 2025; Spriggs et al., 2023). Advocating for expanded access not only includes fighting for insurance coverage and government policy changes, but also providing psychoeducation to challenge the stigma that black, indigenous, people of color (BIPOC) communities have faced regarding substance use (Herrera, 2024: Prioleau & Panjwani, 2025). The impact of this stigma is evident in the disproportionate substance related imprisonment of BIPOC peoples.

Recommendations for Practice

Research regarding the clinical use of music in psychedelic assisted therapy has focused on the effects of listening to music. Despite this, Macleod et al. (2025) demonstrated that there is interest in further studying music making in this setting. Macleod et al. provided participants with a hypothetical description of a PAT session and asked participants numerous questions about how they thought active music making would contribute to the therapy session. Themes

that arose in participant's answers included that offering PAT clients the opportunity to play instruments during the dosing session could provide them with a sense of agency, an alternate outlet for emotional expression, and the opportunity for a deepened collaborative relationship between client and therapist. An increased sense of agency, emotional expression, and strengthened social bonds are consistent themes found in qualitative research on the benefits of group music making (Ascenso et al., 2018; Hendry et al., 2022; Williamson & Bonshor, 2019). Given this connection, as well as the integral role that music making plays in the traditional use of psychedelics, it seems possible that music making could be integrated into psychedelic assisted therapy. Synthesizing research from the areas of music and PAT, as well as music therapy in the treatment of substance use disorders can illustrate suggestions for how to incorporate music making into the various phases of PAT in the treatment of substance use disorders specifically.

Suggestions for Music Making During the Preparation Phase

During the preparation phase, common therapeutic aims include building rapport between the client and therapists, gathering client histories, providing psychoeducation on what to expect during the dosing session, and teaching, then practicing coping strategies for the client to utilize (College of Alberta Psychologists, 2025; Yaden et al., 2022). Discussing any potential uses of music therefore is an important part of the preparation phase (O'Callaghan et al., 2020). When working with people who struggle with substance use, it is important to determine if they have any associations between music and substance use, as music can act as a trigger for substance cravings (Baker et al., 2011; Horesh, 2005; Lozon & Bensimon, 2025; Pasqualitto et al., 2023; Short & Dingle, 2016; Silverman, 2011, 2016, 2022, 2023, Silverman et al., 2023). A lyric analysis intervention of any identified vocal music as described by Silverman (2009, 2015,

2016a, 2016b) could be used in this context to encourage a deeper exploration of the client's emotional experience of this music in connection with their substance use. As spontaneous singing has been reported in the context of lyric analysis interventions provided by Silverman (2009; 2015; 2016a. 2016b) this could be a straightforward way to incorporate music making into the preparation phase. Conversely, clients could also identify music not associated with substance use to listen and/or sing along to during any of the three phases of PAT, as Short and Dingle (2016) found that doing so can result in reduced substance craving. This may also be a powerful way of setting an intention for the dosing session.

An additional aim of the preparation phase is to teach coping strategies to employ if needed during the psychedelic dosing session (Yaden et al., 2022) Music based coping strategies could include humming and singing to encourage relaxation by way of slowing respiration, and decreasing heart rate and blood pressure (Goldman & Goldman, 2017; Kuppusamy et al., 2018, 2020; Trivedi et al., 2023; Vickhoff et al., 2013). Identifying any songs that the client would find comforting during difficult moments in the dosing session is also recommended during the preparatory phase (O'Callaghan et al., 2020). The comforting effects of these songs could be augmented by singing along to them, given the aforementioned physiological effects of singing.

Suggestions for Music Making During the Dosing Phase

In the dosing phase of PAT, the substance is administered to the client, and the role of the clinicians is to provide support, encouragement, and reassurance when necessary (College of Alberta Psychologists 2025; Yaden et al., 2022). During psychedelic dosing sessions in traditional settings, music making often occurs in groups, and descriptions of singing and playing percussion instruments are common (Daschke, 2023; Dobkin de Rios & Katz, 1975; Graham et al., 2022; Katz & Dobkin de Rios 1971; Labate et al., 2017; Maas & Stubelt, 2005; Shannon,

2011; Sherwin et al., 2025) Variations in music making, such as switching to singing rather than playing instruments (Maas & Stubelt, 2005), can help signal the occurrence of different phases of the psychedelic journey, and act as a sort of time keeping device. The role of music to provide structure and impetus to a psychedelic experience is well documented in clinical research as well (Barrett et al., 2017; Bonny & Pahnke, 1972; Kaelen et al., 2018). Based on these connections, it is possible to use knowledge from Indigenous traditions along with Bonny and Pahnke's (1972) recommendations to inform suggestions for music making during the dosing session of PAT.

During the pre-onset phase, Bonny and Pahnke (1972) recommended that familiar music with words could be used. Similarly to the suggestions described above, this could be an opportunity to play and sing along to any music identified by the client. During the onset phase, one of Bonny & Pahnke's recommendations was that the music should have a regular rhythm. The use of drumming, either between an individual client and therapist, or in a group setting reminiscent of more traditional settings could help provide this regular rhythm.

Since Bonny & Pahnke (1972) recommended that if vocal music is used during the phase where the psychedelic experience builds towards peak intensity it should not contain recognizable words, humming or other vocalizations could be utilized here. Alternatively, Shannon (2011) described that singing familiar songs could be grounding for participants of ayahuasca rituals.

Driving music is recommended for the psychedelic peak (Bonny & Pahnke, 1972) which could be achieved through drumming with a fast tempo. As Barrett et al. (2017) found that there are similarities between music used for both the pre-peak and peak phases of the psychedelic experience, any of these suggestions could likely be used interchangeably.

In both the re-entry and return to normal consciousness phases, Bonny and Pahnke (1972) stated that familiar music with words could be played. Again, this could be an opportunity to play and sing along with music chosen during the preparation phase that is not associated with substance use to accompany one's journey back to an ordinary state of consciousness.

Regarding substance use specifically, there may be value in engaging with novel music through the process of music making during a PAT session, as unfamiliar music is less likely to be associated with past experiences (O'Callaghan et al., 2020; Silverman et al., 2023) Though music making has been documented to result in cravings in a few cases (Horesh, 2005: Lozon & Bensimon, 2025) it seems to be less likely, and can simultaneously facilitate new experiences with music apart from substance abuse (Silverman, 2019b, 2022).

Finally, increased heart rate and blood pressure are well documented physiological effects of many psychedelic substances (Breeksema et al., 2022: Johnson et al., 2008). As singing and humming have been found to reduce heart rate and blood pressure (Goldman & Goldman, 2017; Kuppusamy et al., 2018, 2020; Trivedi et al., 2023; Vickhoff et al., 2013), implementing these interventions may be supportive in counteracting this adverse event. While this should not replace medical monitoring and the presence of medical professionals, music making could act as a supportive nonpharmacological intervention.

Suggestions for Music Making During the Integration Phase

Integration involves returning to an environment that oftentimes may have contributed to the perpetuation of the problem, and clients can be particularly vulnerable to relapsing to past behaviors during this time (Katzman & Schwartz, 2024). Katzman & Schwartz identified five layers of experience to address during integration, including cognitive behavioral, emotional, personal identity, interpersonal, and unconscious layers. They additionally presented suggestions

for activities to engage in to support successful integration, which included various forms of artistic expression, mindfulness practices, an engagement in new hobbies. Again, group music making may be particularly suited to address the challenges of this phase, as qualitative reports of choral singing, group brass playing, and drumming demonstrate that these activities can support emotional expression, develop one's identity, and provide interpersonal support during challenging life events (Hendry et al., 2022: Von Lob et al., 2010; Williamson & Bonshor, 2019).

Guided songwriting, as described by Silverman (2012, 2019a, 2019b, 2020, 2022, 2023, 2025), could be an additional music making activity to promote during the integration phase. In addition to writing lyrics that explore reasons for, and ways to recover from substance use disorder as suggested by Silverman, songwriting could act as a form of journalling, a recommended activity for this time for the purpose of reflecting on and making meaning out of one's psychedelic dosing experience (Katzman & Schwartz, 2024).

Music making may also be supportive in addressing some of the potential long-term risks of PAT. While the development of both HUD and HPPD is considered rare, if these conditions do develop as a result of undergoing PAT, they may cause considerable distress and impair daily functioning (Johnson et al., 2008). When considering the benefits of music making regarding stress, anxiety relief and positive effects on mood, (Ascenso et al., 2018; Hendry et al., 2022; Williamson & Bonshor, 2019) music making could be an important aspect of treatment if it appeals to the client. Finally, since damaged spirituality is a documented aspect of ontological shock (Argyri et al., 2025; Katzman & Schwartz, 2024) if reclaiming spirituality is an important goal, music making may offer an avenue for this endeavor, as qualitative reports of the benefits

of music making include descriptions of strengthened spirituality (Calmin et al., 2020; Williamson & Bonshor, 2019).

Further Information Regarding Practitioner Training, Credentials, and Role

Practicing ethically in this area requires numerous competencies, notably, adequate training in psychedelic assisted therapy and music therapy. Locally, the College of Alberta Psychologists (2025) states that a psychologist must be fully registered for five years and have experience treating stress and mood disorders before practicing PAT. Secondly, the psychologist must be able to demonstrate adequate knowledge in the area of PAT through a combination of supervision and training. In addition to this, the College of Alberta Psychologists stresses the importance of maintaining and expanding competency in the psychologist's chosen therapeutic modalities that they are delivering in the preparation and integration phases of PAT, as the dosing phase should be primarily non-directive. While the suggested interventions above could be performed by a music therapist, counselling psychologists who are experienced enough to provide PAT could seek additional training in the field of expressive arts therapy, as expressive arts therapists regularly practice music interventions as well as dance, visual arts, and literary arts interventions (Estrella, 2023; International Expressive Arts Therapy Association, 2025; Ontario Expressive Arts Therapy Association, 2025). Lastly, PAT should be practiced within a multidisciplinary team that must be conducted under the oversight of a psychiatrist (College of Alberta Psychologists, 2025).

Fundamental Next Steps for Research

There are many different aspects to consider when recommending future research on this topic, such as ethical and methodological challenges in research on PAT in general, as well as multiple combinations of interventions and subjects to explore. These combinations include

further research on PAT in the treatment of SUD to expand the literature base, further research on music therapy for SUD, research on music making in PAT, and research on music making in PAT for SUD specifically.

Ethical and Methodological Challenges in Psychedelic Assisted Therapy Research

While many studies regarding the efficacy of PAT in the treatment of multiple psychiatric conditions have provided encouraging results, there are several critical considerations to account for alongside the excitement that these results may garner.

In general, there is an extreme lack of diversity in PAT research; much of the research takes place in western Europe or North America (O'Callaghan et al., 2020) with the vast majority of participants identifying as Caucasian (George et al., 2019; Morales et al., 2022). Additionally, many authors have called for greater inclusion of people of color occupying both researcher and clinician roles, as this increase in representation may in turn lead to increased interest from prospective participants of color (Celidwen et al., 2022; Morales et al., 2022; Prioleau & Panjwani, 2025). These inclusions, ideally in larger sample sizes in general, are critical to ensure the efficacy of this treatment in more diverse populations (Bogenschutz et al., 2022; Johnson et al., 2016; Noller et al., 2018).

Another group that is under-represented in the literature is those with certain psychiatric disorders; those with psychosis spectrum disorders and bipolar disorders are usually excluded from research (Bradbeery et al., 2022; Bogenschutz et al., 2022; Johnson et al., 2008; Sabé, et al., 2025). While some have questioned the need for this strict exclusion criteria (Sabé, et al., 2025) others assert that the relatively low incidence of adverse effects in research on PAT is due to adhering to this exclusion criteria and protecting this at-risk population (Johnson et al., 2008; Villiger, 2024). However, it is also worthwhile noting that many studies do not report on adverse

events at all, making it ambiguous whether any occurred or not (Breeksema et al., 2022). Other studies rely on spontaneous reports from participants rather than any sort of systematic assessment (Palitsky et al., 2024). Accordingly, more standardized rules on adverse event reporting are needed in future research.

Additional randomized controlled trials have also been called for (Azhari et al., 2021), though even in studies that utilize this design, blinding is difficult to maintain in research on psychedelics (Azhari et al., 2021; Bogenschutz et al., 2022). For example, in the Bogenschutz et al. (2022) study on PAT with psilocybin for AUD, the use of the antihistamine diphenhydramine was not effective in all of the sample, as many participants correctly identified that they were in the placebo condition. Blinding is particularly difficult if participants have prior experience with psychedelics, especially the specific psychedelic under investigation (Grabski et al., 2022).

Researcher bias and expectations are another aspect to consider; there is some concern that the objectivity of researchers may be limited if they themselves have had a psychedelic experience with the substance under investigation (Kious et al., 2023). However, many practice guidelines and codes of ethics call for clinicians to at least be familiar with the psychedelic substance, or in some cases to have had a dosing experience themselves (Psychedelic Association of Canada, 2022). Therefore, it may be helpful to enhance researcher and clinician reflexivity by including positionality statements, as well as ensuring that research teams include psychedelic naïve members to create a balanced environment that encourages critical evaluation of study results (Kious et al., 2023).

Another challenge to continue addressing in future research includes differentiating between the effects of the substance itself, the combination of the substance and psychotherapy, or the provision of psychotherapy alone (Azhari et al., 2021; Bogenschutz et al., 2022).

Additionally, many studies also lack follow up lasting longer than two years (Bogenschutz et al., 2022), and more research is also needed to determine optimum dosages (Krebs & Johannson, Azhari et al., 2021; Grabski et al., 2022) as well we if one substance is more effective than another (Krebs & Johanson, 2012).

Music Making and Psychedelic Assisted Therapy

Participant/Client Experiences

Qualitative research could be a helpful first step in exploring whether participants enjoy making music during PAT, whether they find it helpful, and what potential challenges exist in implementing this intervention. High doses of psychedelic substances may be one of these barriers. Based on reports of various physical effects including gastrointestinal symptoms and headaches as well as psychological disorientation (Breeksema et al., 2022; Colcott et al., 2024; Johnson et al., 2008; Kaminski & Reinhart, 2024), playing a musical instrument or singing might feel like a difficult task to undertake. Lower dosages of psychedelics, such as in psycholytic therapy or microdosing may provide a solution to this challenge. Psycholytic therapy can still result in an altered state of consciousness but allows people to maintain more control over their experience (Dvir & Hull, 2024). In microdosing, while some effects may still be felt, an altered state of consciousness does not commonly occur (Polito & Stevenson, 2019). While more research is needed on the benefits of microdosing, general increases in wellbeing as well as creativity have been reported. Therefore, exploring the implementation of music making interventions at lower doses of psychedelic substances could be an interesting avenue of research to pursue.

Therapist's Experiences

Alongside the experiences of participants and clients, it would also be helpful to understand how therapist's experience providing music making interventions in PAT. Are therapists collaborating in music making, or are they simply teaching and facilitating? Can music therapists teach techniques that non music therapists can ethically provide, or do all music making interventions need to be performed by registered music therapists? O'Callaghan et al. (2020) also stressed that the music therapist's background can influence music listening choices; how would this manifest in the provision of music making interventions?

As this field progresses, a study similar to the one by Barret et al. (2017) on which music psilocybin facilitators recommended for different phases of the psychedelic experience would be helpful to conduct, this time with music making rather than music listening.

Music Making Interventions in PAT for SUD Specifically

Finally, the above recommendations on implementing music making interventions in PAT for SUD specifically would need to be empirically investigated. Some questions that come to mind regarding this include "What is the role of music in eliciting and decreasing cravings in those with SUD undergoing PAT treatment?" and "Based on the ability of music making to provide a novel experience with fewer associations than listening to familiar music, is music making more effective than music listening at decreasing cravings?". These are simply a few examples of questions that may arise in this field of study.

Finally, the influence that traditional practices have on these recommendations is vast. To work in a spirit of respect and reciprocity as recommended by Celidwen et al. (2023), it would be essential to collaborate with Indigenous researchers, clinicians, and communities on how to implement these practices without engaging in cultural appropriation.

Insights from Reflexivity Practices

Reflections from Listening to Music Used in PAT

The musical selections that I chose to listen to and reflect on were *183 times* and *Azure* from the album *Digressions* by Greg Haines (2013) both used in the study by Kaelen et al. (2015). In general, it was clear that even when listening to instrumental music that I had never heard before, memories of my education in classical music were easily evoked. Though neither piece strictly fit into the category of classical music, my background clearly influenced my perception of the music. When listening to *Azure* specifically, I found myself feeling anxious as the dynamics and timbral complexity increased; it was difficult to stay in the present moment without wanting to turn the volume down. When listening to 183 times, the solo violin reminded me of music composed by Dario Marianelli (2011) for the film *Jane Eyre*. As a result, I associated this music with sorrow and yearning. Even though I had never heard these particular songs before, my perception of them was greatly influenced by past associations of various art forms that I had been previously exposed to. I reflected that even with novel music, associations informed by one's background are likely unavoidable.

Cannabis Cravings

One of the reasons why I picked this topic was because I did not think it would personally affect me as much as some other topics that I had in mind; I had been processing and coming to terms with my own substance use disorder for years, and therefore I was not expecting it to be as challenging to research this topic as it ended up being. Many times, I found myself not wanting to read about addiction anymore because of how easy it was to see myself in the accounts of the participants that I was reading. I found myself feeling ashamed and frustrated at myself that I was still experiencing such intense cravings even though it had been months since I had had any THC. I experienced feelings of sadness and irritability that was significantly out of

character, and at times I felt an intense aversion to writing because I did not want to experience an increase in cravings. During these moments, sometimes I turned to music making as I will describe more below, but sometimes my feelings felt too intense, and the only thing I could do was step outside for some fresh air and focus on my breathing. Because of the emotional energy that writing this capstone took, I had to take significant breaks from it, particularly while still completing my practicum. I was cognizant of the need to prioritize my own rest and wellbeing in order to provide competent, ethical care to my clients (Canadian Psychological Association, 2017).

At times I questioned whether I was too close to the topic, and if my interest in treating addiction with PAT came from a desire to still engage with psychoactive substances in some way. To address this bias and present a balanced review on the topic, I spent a considerable amount of time researching the potential risks of various psychedelics in order to highlight that psychedelics are not a miracle cure that can be taken without risks.

Personal Music Making

Despite my love of music making, I found it quite difficult at times to engage in my reflexivity practice of music making. This in itself was a helpful experience, as it helped me consider that if a musician such as myself struggled to employ music making as a coping strategy, it may be even more difficult for a non-musician. However, when I did begin to regularly sing, I noticed an uplifting effect on my mood and ability to focus on this capstone, which really showed me the personal importance of having a regular, musical self-care practice, consistent with dos Santos' (2024) recommendation. Though I was not expecting to, I even engaged in some song writing regarding my own experience of addiction. In my personal life, having a consistent music practice provided me with another reason to stay sober from cannabis.

Though this could be true for others struggling with SUD as well, it is important for me to keep in mind that different people may have different activities that they may find more effective in maintaining sobriety, or whatever their substance use-related goals are. Just because music making is beneficial for my wellbeing does not mean that it is the answer for everyone.

View on Psychedelic Assisted Therapy and Substance Use in General

After writing this capstone, I find myself more cautious about PAT. I think that recovering from cannabis addiction has significantly influenced this, as I find myself feeling more cautious about all psychoactive substances. While I need more time to reflect and know exactly what my beliefs regarding PAT are, I am confident that my stance on substance use as a therapist is informed by a belief in upholding the client's autonomy. This viewpoint is consistent with the Canadian Psychological Association's (2017) assertation that a client's autonomy should be given the highest weight when practicing ethically as a psychologist. When that autonomy involves taking substances, my role as a therapist may be to provide strategies and psychoeducation regarding harm reduction. When that autonomy involves abstinence, my role may involve providing support and strategies to assist the client in avoiding relapse and cultivating hope for recovery.

Conclusion

Music and psychedelics have long been intertwined, from music making during ceremonial psychedelic use in traditional settings to supportive music listening during PAT in clinical settings (Bonny & Pahnke, 1972; Efthimiou et al., 2024; Gaston & Eagle, 1970; Nettl, 1956; O'Callaghan et al., 2020; Jerotic et al., 2024; Kaelen et al., 2018). In both settings, the role of music has been described as offering structure and guidance to the psychedelic experience (Dobkin de Rios & Katz, 1975; Kaelen et al., 2018; Maas & Stuebelt, 2005).

Music making rather than music listening may be particularly appropriate in PAT for SUD, as participating in a novel musical experience can induce a sense of agency, and may be less likely to induce craving (Silverman, 2019b, 2022). Music making could support the preparation, dosing and integration phases of PAT for SUD by providing opportunities to sing along to meaningful songs, novel songs, or to simply hum. This in turn may encourage relaxation and facilitate a decrease in heart rate. Drumming in various tempos during the dosing session may serve similar enhancing functions that listening to music of various tempos while the dosing session progresses serve. Engaging in song writing and group music making could provide opportunities for reflection, meaning making, and social connection that may address challenges faced in the integration phase. When conceptualized as a harm reduction intervention, these music making suggestions could provide multidisciplinary clinicians working in the field of PAT an option to mitigate the potential acute physiological risks such as increase in heart rate during the dosing session, as well as long term risks such ontological shock.

While contemporary research in PAT has provided emerging evidence for its efficacy in treating SUD (Azhari et al., 2021; Bogenschutz et al., 2022; Grabski et al., 2022; Johnson et al., 2014; Noller et al., 2018; Sessa et al., 2021), continued attention needs to be paid to the potential risks of PAT. In the research domain, expanding sample sizes as well as participant diversity are crucial actions to take (Bogenschutz et al., 2022; George et al., 2019; Johnson et al., 2016; Morales et al., 2022; Noller et al., 2018). Careful screening for pre-existing psychiatric and physiological medical conditions can help ensure participant safety in PAT (Johnson et al., 2008; Villiger, 2024). In any future explorations on this topic, collaboration with Indigenous communities is essential in order to decenter western colonial frameworks and disrupt the legacy

of appropriation that such frameworks have supported (Celidwen et al., 2023; Spriggs et al., 2023).

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Appendix

Methodological Analysis of Selected Studies

Study	Study Component					
	Research Paradigm	Role of Researchers	Participants	Data Collection	Data Analysis	Findings
Graham et al., (2022)	Qualitative: Interpretive Phenomenological Analysis	Developing questionnaires, analyzing and interpreting the responses	12 total participants receiving treatment at Takiwasi addiction center, 100% of whom were male, provided 180 responses. Most participants hailed from various South American countries and the rest from Western European countries.	Two survey questions were administered by center staff the following day after participants attended an ayahuasca ceremony. The questions involved whether participants found the *Icaros* (traditional music) to be a helpful aspect of their ceremony, and they were then asked to provide a description of	Coding of themes found in participant's responses to the survey questions	Participant's responses about their experience of listening to the *Icaros* were coded into nine themes: 1. Effect on emotional and psychological state 2. General healing experience 3. Healing experience including "unblocking, movement, removal of something, cleansing" 4. Experienced as a guide; provided visual and cognitive effects 5. Provided a sense of protection 6. Provided a sense of connection 7. Provided learning and understanding 8. No/few effects 9. Supernatural/paranormal experiences

Study	Study Component					
	Research Paradigm	Role of Researchers	Participants	Data Collection	Data Analysis	Findings
				their experience of listening to the *Icaros* during the ayahuasca ceremony.		Notably, all 12 participants described experiences in theme one and theme three. A major limitation of this study is that only men were included, however this was due to the specific program at Takiwasi center. Graham et al. recommended further research in Indigenous settings as well as collaboration with traditional healers to learn how to best use music to support those undergoing PAT.
Gaston & Eagle, (1970)	Quantitative; Experimental conditions (not randomized)	Developing LSD Music Preference Questionnaire, analyzing and interpreting data. Gaston & Eagle discuss other study personal (but they are not listed as authors)	59 total participants, receiving LSD treatment for SUD; no mention of gender or ethnicity. Participants were divided into the following five groups; no music, miscellaneous music, familiar music, familiar	Pre-session music preferences measured by the LSD Music Preference Questionnaire including rating nine categories of music from most to least familiar to the participant. Following the	• Correlation coefficients calculated to determine interrater reliability for LSD experience levels. • Rank difference correlation tests conducted to determine changes in	Listening to familiar music during LSD dosing was preferrable to listening to unfamiliar music. Additionally, participants in this condition demonstrated a change in music preference as measured by the LSD Music Preference Questionnaire before and after the LSD dose. Participants were more likely to favour love ballads and religious music after the LSD session. Participants in the headphones conditions were most likely to change musical preferences.

Study	Study Component					
	Research Paradigm	Role of Researchers	Participants	Data Collection	Data Analysis	Findings
			music with headphones, and unfamiliar music.	LSD session, the LSD Session Survey and the Objective Check List for LSD Experience were administered. Researchers also rated what LSD experience level they perceived participants to have reached.	music preferences after treatment. • Fisher 2 coefficient calculated for comparisons between conditions. • Wilcoxin matched-pairs signed-ranks test used to determine significance of changes in musical preference ranking	Every participant who was in a condition that included music agreed that music should be part of the LSD dosing session. Gaston & Eagle recommended further empirical research regarding which music to use during PAT, and they stressed the importance of the participant's preferences. A major limitations of this study is the lack of information regarding gender and ethnicity.
Kaelen et al., (2018)	Mixed Methods: Interpretative Phenomenological Analysis and Quantitative analysis	Designing music playlist for PAT sessions; one researcher conducted semi-structured	19 total participants receiving PAT with psilocybin for TRD; demographics not listed in this paper, as	Semi-structured interview which questioned whether the music influenced the	Thematic Coding and various statistical analysis. Pearson correlation tests conducted between: a) researcher ratings of the	Themes found through coding of participant responses included: 1. Welcome influences (intensification, guidance, calming, openness)

Study	Study Component					
	Research Paradigm	Role of Researchers	Participants	Data Collection	Data Analysis	Findings
		interviews with participants; at least two researchers conducted the coding analysis; four blinded researchers analyzed the coded transcripts and rated to what extent participants liked the music, how much it seemed to resonate with them, and how open they were to the music's influence (referred to as music experience variables)	participants were part of a larger study regarding psilocybin for TRD.	experience, what ways it did so, what music was preferred, and positive and/or negative influences of the music. Quantitative measures of depression severity with Quick Inventory of Depressive Symptoms (QIDS) and subjective aspects of the psilocybin experience measured by the11-dimensional Altered States of Consciousness	three music experience variables and participants responses to the 11D-ASC; b) reductions in QIDS scores and ratings of the three music experience variables c) ratings of drug intensity and reductions in QIDS scores d) drug intensity and music experience variables e) music experience variable ratings of each researcher	2. Unwelcome influences (intensification, resistance, misguidance) 3. Appreciation of music styles/playlist 4. Dislike of music styles/playlist Key findings through statistical analysis included existence of a positive relationship between reduced symptoms of depression and high ratings of the music experience variables; high ratings of the music experience variables combined with drug intensity also correlated with mystical experiences as described by the 11D-ASC. Limitations of the study include lack of easily obtainable demographic information and lack of a placebo group. Given that positive experiences of the music were correlated with better treatment outcomes, Kaelen et al. recommended that studies are undertaken to ascertain how best to select

Study	Study Component					
	Research Paradigm	Role of Researchers	Participants	Data Collection	Data Analysis	Findings
				Scale (11D-ASC)		music to increase the possibility of optimal therapeutic results. This may include measuring personality traits and personal music preferences before music selection.
Bogenschutz et al., (2022)	Quantitative: Randomized Controlled Trial	All researchers who authored the publication were blind to the randomization; various authors contributed to the overall design of the study, the analysis of the data, and the writing of the paper.	93 total participants, 49 of whom were administered psilocybin. The remainder were administered diphenhydramine as an active control. All participants met criteria for AUD based on DSM IV criteria. Majority of participants were non-Hispanic white (78.9%). However, Indigenous, Asian, Black, and Hispanic groups were	Data was collected via the primary measure of percentage of heavy drinking days (>5 drinks/day for men; >4 drinks/day for women) which was assessed four times throughout the study. Additional data collection including measuring continuous outcomes such as percentage of	Various statistical analyses were conducted including • 3-dimensional multivariate repeated measures analysis of variances, • fixed baseline covariates. • X2 statistics and odds ratios used with dichotomous outcomes • Hedges g (between and within group differences	Greater reductions in drinking were reported in the psilocybin group than in the placebo condition; participants in the placebo condition had more than two times as many heavy drinking days than those in the experimental condition. Limitations reported include ineffective study blinding, hair/fingernail samples only obtained approximately half of the sample, sparse representation of gender and ethnic diversity; inability to generalize to populations with more severe AUD, (as the study sample had only moderate levels of AUD) no information regarding the interaction between psychedelic substance and psychotherapy provided; and no follow up past 32 weeks.

Study	Study Component					
	Research Paradigm	Role of Researchers	Participants	Data Collection	Data Analysis	Findings
			sparsely represented.	drinking days, and drinks per day. Dichotomous outcomes were also measured, including reports of abstinence, lack of heavy drinking days, and reduction in World Health Organization risk level. Additionally, to confirm self-reports of abstinence, hair or fingernail samples were collected	for continuous outcomes)	
Sessa et al., (2021)	Quantitative: Open-label safety and tolerability proof of concept study	Collecting data, analyzing and interpreting the data,	14 participants diagnosed with AUD receiving PAT with MDMA; 6	Data collected included the number of participants who	The gathered data was inputted into MS excel and plotted onto a graph	Findings of the study included a blank reduction in units of alcohol consumed at the nine-month follow-up. Limitations of the study include lack of a

Study	Study Component					
	Research Paradigm	Role of Researchers	Participants	Data Collection	Data Analysis	Findings
		writing the paper; two researchers (Ben Sessa and Laurie Higbed) acted as clinicians and delivered the psychotherapy sessions to participants	participants were females and 8 were males; all identified as Caucasian and British.	completed the therapy regime, the number of participants who completed the second MDMA session, and the number of adverse events that occurred throughout the course of the study. Numerous secondary measures collected information regarding the participant's changes in drinking, mental wellbeing, psychosocial functioning, quality of life,		control group; however this was expected as this was the first to access this intervention within this population. From these results it is possible that PAT using MDMA may be effective in treating AUD similarly to PAT using psilocybin as demonstrated in the Bogenshutz et al. (2022) study. Future RCTs using MDMA for PAT would allow a more direct comparison between the two studies.

Study	Study Component					
	Research Paradigm	Role of Researchers	Participants	Data Collection	Data Analysis	Findings
				and additional drug usage.		