

Successful Self-Medication of a Major Depressive Episode with Repeated Administration of LSD: A Case Report

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Abstract:

This report describes the successful treatment of Major Depression by self-medicating with LSD. The subject of this case was a young, Caucasian, unmarried man who matches the demographic characteristics of people most likely to self-medicate and those most likely to use psychedelic drugs. Details of the participant's experience are helpful in understanding many aspects of psychedelic self-administration. They may also apply to other cases, such as psychosocial factors that contributed to developing depressive symptoms; history and symptoms of the disorder; prior substance abuse history; rationale for self-medication; choice of drug and strategy; psychological mechanisms for symptom alleviation; possible adverse effects; other psychosocial consequences; and follow-up experiences and reflections since self-medication.

KEYWORDS: LSD, Major Depression, self-medication, case study

INTRODUCTION

The psychedelic research community is currently engaged in a debate regarding the rate of mental health problems in psychedelic drug users. Some researchers claim the rate is low ^[1], while others suggest that conclusion is mistaken ^[2]. Either way, there are certainly some cases of psychedelic drug users who experience mental health problems. The current study investigated this issue by documenting a non-clinical case unique to the literature on self-medication of psychiatric conditions with psychedelic drugs. This case is important because it illuminates an intersection between two strains of research that address mental health issues among psychedelic drug users from divergent points of view.

The first strain began in the 1960s and 1970s with early attempts to use psychedelic drugs to facilitate psychotherapeutic change ^[3-5]. After the Controlled Substances Act of 1970 made it illegal to use psychedelic drugs in research, exploration of the therapeutic utility of psychedelic drugs was put on hold. Recently, researchers have begun once again to investigate using these drugs to treat

psychiatric symptoms, such as alcoholism ^[6, 7], nicotine addiction ^[8], obsessive-compulsive disorder ^[9], and Post-Traumatic Stress Disorder ^[10]. Most relevant to the present study, Rucker et al. ^[11] recently reviewed clinical treatment studies using psychedelics in patients with mood disorders and found that 79.2% of patients in 19 studies showed improvement after treatment. Carhart-Harris et al. ^[12] have demonstrated success with treatment-resistant depression specifically. Finally, depression and anxiety related to terminal diagnoses have also been impacted by treatment with psychedelic drugs ^[13, 14]. Thus, current findings based on clinical trials suggest psychedelics may be useful for treating a wide range of psychiatric disorders.

The second strain of research has investigated the phenomenon of self-medication of psychiatric disorders with various substances. For example, Turner et al. ^[15] recently found that the prevalence of self-medication with alcohol or drugs among people with mood or anxiety disorders ranges from 21.9% to 24.1%, with young, Caucasian, unmarried males being especially likely to endorse self-medication. In addition, data from

multiple sources has shown that psychiatric symptoms often precede substance abuse among those who self-medicate [15, 16]. Research has thus confirmed that some people with mental health problems turn to self-medication to treat them. In some circumstances, such uncontrolled treatment may exacerbate the problem or result in new symptoms such as addiction.

Case reports are essential when ethical or legal issues constrain experimentation with psychedelic substances. A review of case reports related to psychedelic drug use reveals mostly negative outcomes such as genital self-mutilation [17], exacerbation of schizophrenic symptoms [18], induced mania [19], and substance dependence [20]. However, a smaller group of case reports suggests psychedelics may be successfully used to treat symptoms of Obsessive-Compulsive Disorder, Bipolar I Disorder, Anorexia Nervosa, and Major Depression [21-23]. However, Wilcox's [24] report of an individual who successfully treated his own OCD with psilocybin most closely parallels the case reported here. Although the symptoms and choice of drug differ, in the present case and the one reported by Wilcox, both individuals turned to an illicit substance to treat psychiatric symptoms out of desperation and were apparently successful.

In addition, case reports add important information to the conclusions drawn on the basis of large-scale controlled trials because of the varied set and settings of their subjects. A vast literature documents the impact of set and setting on subjective drug experiences [25], and case studies are positioned to provide unique insights into the ecological validity of psychedelic drug treatments established by experimental methods. Although psychedelic treatments for psychiatric conditions may become more common in the future, these drugs will no doubt continue to be available without a prescription, so exploring their use by individuals who choose to self-medicate provides

valuable information about this subgroup of psychedelic drug users. Given the paucity of research in this area, this case study provides a valuable groundwork for future investigations related to the self-medication of major depression with LSD.

METHOD

Participant

The participant, Ken (not his real name), was a 25-year old, unmarried, Caucasian male who self-identified as someone who suffered from Major Depression and was nearly suicidal when he began medicating with LSD in college. He was identified through a student in an undergraduate class that discussed psychedelic drugs and their potential therapeutic utility. Ken volunteered to participate in this project because he felt his experience was very successful, and he wanted to contribute to current research efforts seeking to promote research investigating the use of LSD for depression.

Design and Procedure

The researchers interviewed Ken for approximately ninety minutes on two separate occasions. The conversation followed a semi-structured format designed to cover basic aspects of his biopsychosocial history and drug-related experiences while allowing for follow-up in other areas as needed. The conversation was recorded and then transcribed. Relevant themes were identified along with specific quotes characterizing those themes.

RESULTS

Family History

Ken grew up in an upper-middle-class suburb of a major metropolitan community in the West. His father worked outside the home,

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and his mother was a stay-at-home mom during his childhood. Both parents had graduated from college. He had a brother two years younger than him. He characterized his childhood as “normal.” He was interested in visual art as a child and excelled at school. Ken’s family was not religious. Ken could not identify any specific aspects of his family life that he felt contributed to his later mood problems.

Mental and Physical Health History

Ken was born with a specific medical problem that impaired his self-concept, especially concerning romantic relationships, but caused no physical symptoms. He reported first realizing he was very depressed as a high school senior. At that time, he reported he had no sense of meaning and increasingly felt alienated from society. He reported that his depression did not seem related to his social life since early in high school, he had few friends and did not feel depressed, but later, he had a strong friend group and felt much more depressed. Ken could not identify any specific psychosocial factors that he felt contributed to his depression beyond existential concerns he related to growing up in modern, suburban America. Specifically, he began to feel that life was flat and meaningless, that he was following a predetermined professional path, and that there was nothing interesting left to be learned.

Ken’s mood problems became progressively worse throughout high school and increasingly prevalent in college. In retrospect, Ken reported he experienced all the symptoms of major depression during this time, including passive suicidality. However, he did not consider traditional treatments for depression. He had a mistrust of SSRIs, saying the kids he knew in high school who were prescribed them were “zombies,” and he did not want psychotherapy because he wanted to handle his problem on his own. Ken did not

tell anyone in his family how he felt. Some of his high school friends knew how unhappy he was, and they were concerned but did not know how to help him.

Ken started smoking cannabis during his sophomore year of high school. He reported smoking once or twice per month during his sophomore and junior years and weekly by the time he was a senior. He reported never liking alcohol but used cannabis recreationally throughout high school. His first experience with psychedelics occurred during his senior year of high school when he went to a national park with a friend and used LSD in conjunction with cannabis. He reported this combination produced vivid visual hallucinations, the most meaningful of which was the clouds over the mountains merging into a dragon that gave him a spinning diamond, which the dragon told him represented knowledge. Ken was impressed by the profundity of this experience, and it later contributed to his hope that LSD might help him manage his depressive symptoms.

College Experience

After graduating from high school, Ken attended a state university and majored in architecture. During this time, he became increasingly depressed. He was smoking marijuana regularly and becoming increasingly concerned about his mental health. Looking back on that time, Ken says he was experiencing every symptom of major depression. He also used other drugs, such as MDMA, MDA, and occasional alcohol during this time. However, he lost interest in alcohol because he noticed it made him feel worse instead of better. He felt the MDMA and MDA were helpful with his social anxiety in some circumstances, but neither made a substantial difference in his depression. “What I needed was more than social connection.”

By his sophomore year, Ken reported that he was suicidal. He had seen the movie

“DMT: The Spirit Molecule,” based on Rick Strassman’s work with DMT [26], which includes a discussion of the therapeutic effects of psychedelic drugs in general and DMT in particular. DMT is one of the active ingredients of ayahuasca, a potent hallucinogenic concoction used for healing purposes in the Amazon. Ken decided to travel to Ecuador to participate in an ayahuasca ceremony “out of mental desperation.” However, he was unable to participate in the ceremony due to legal issues related to the volunteer group with whom he was traveling and became so distraught that he tied a bedsheet into a noose, but he stopped short of following through with the planned suicide.

Therapeutic Phase

When Ken returned to college, he began systematically using LSD to treat his depression. He recalled the sense of meaning he felt during his experience at the national park and suspected that LSD could help his depression. Initially, Ken took it sporadically as he experimented with different ways to use it and explored the quality of the drug he received from various sources. Following this period, however, he maintained a regimen of using between 150 mcg and 250 mcg of LSD one day per weekend for approximately six months, during which time his mood noticeably improved. He made sure to take the doses early in the morning on Saturday or Sunday so they did not disrupt his sleep schedule. He then spent the day with three to five familiar people, who were also using LSD, and exploring nature.

Ken says he was rigid about planning for safety and health during this period, which indicated he was beginning to care more about his own survival. His goal was to take a dose strong enough to induce a mystical experience but not so strong that he was overwhelmed or disoriented. During his experimentation, Ken tried micro-dosing but did

not continue because it made his stomach upset and confused him. He settled on a relatively high dose of LSD because he felt he needed dramatic effects beyond the typical recreational experience: “I was pretty desperate, to be honest.”

Ken did not believe he developed a tolerance to LSD since he intentionally spaced out his doses to avoid that problem while maintaining a maximum therapeutic effect. He also did not believe he experienced withdrawal symptoms since “I felt better the next day, not worse.” He also cut back on his cannabis use as LSD began to make him feel better.

After the six-month period, Ken tapered off his use. “I kind of just started feeling better and felt like I didn’t need to take it anymore.” After approximately two months of not using LSD, his friend returned to campus, and they celebrated by taking LSD together late at night. This violation of his own rules resulted in an unpleasant trip that he knew signified the end of his LSD use. “Like I didn’t see a scary clown or pink elephants or something, I just knew it was wrong. The whole time I knew it was wrong. I knew that I was done.... I’m done with my acid phase.” The entire therapeutic phase of Ken’s LSD use lasted approximately seven months.

During this time, Ken reported that his ability to manage the psychedelic experience improved. “There’s not enough emphasis on using it like a tool, like a microscope. I had to learn how to use it over repeated sessions. It’s not like I was immediately an excellent user of the LSD mind state. I had to acquire skill in reshaping my own perception.” Specifically, he described the skill he acquired as an “acceptance of impermanent phenomena” combined with an ability to manage the experience of unconstrained cognition and unfiltered sensory input without becoming disoriented and confused. “I had to navigate a landscape of perpetual kaleidoscopic events and patterns, perpetually shifting motion. It’s

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disorienting. I had to learn to have my wits about me.... [T]he power of learning that was to learn to control my own mind. That is exactly what it taught me. That is part of the unbelievably powerful therapeutic aspect.”

Ken was not using any other treatment during the time he was treating himself with LSD, although he did begin meditating. “I started meditating because it helped elicit that ego dissolution experience.... I started setting aside time out of the hike to sit down, close my eyes, and meditate, which I had never done before and I never did while I was on acid for a long time....” During this time, he also did not use any other drugs in comparable amounts, frequency, or regularity as he did LSD, which he specifically viewed as a medicine for his condition. In Ken’s view, the successful treatment of his depression was solely due to LSD since those were the experiences that had direct, positive effects on his mood, including aftereffects.

Therapeutic Effects

In broad terms, Ken reported that the fundamental way LSD helped him was to facilitate his ability to appreciate the complexity of nature and feel directly connected to it. He simultaneously felt it enhanced his interest in the intricate patterns of nature and unified him with them: “I’m part of this.”

Ken described his experience of depression as “repetitive negative thought loops” related to a fundamentally negative self-image and alienation from society in general. He saw LSD as a “catalyst” that facilitated his ability to experience a different perspective on his maladaptive thoughts. “There’s a way in which it put me above the thought loops – literally like physically above – and said watch your brain do repetitive things and then, now in the unconstrained cognition style that it allows you to access, you can – honestly, you can purposely reprogram your brain.” “The whole thing was all in the

head.... It was caused by my own thought loops, and that’s why psychedelics were so perfect to treat it. Just break your thought loops. Perfect. Cool. We have a drug that does that.”

Ken felt stuck and limited by his architecture program, then LSD expanded his perspective, and everything got more interesting and complex. Part of his depression came from feeling like he understood everything, but his LSD experiences showed him he did not and gave him another frontier to explore. “It’s not just that it became more complex, it became *infinitely* complex. No matter how long I studied it would still be interesting.” The world was a flat and boring place before, then everything became incredibly interesting, but it did so gradually. “Underlying all seemingly mundane objects is a level of complexity of pattern which I could apprehend – I could manage to extract the exquisite fractal veins out of this leaf that I thought was just a leaf before.”

Slowly, Ken reported he began to care about himself and the world. “Everything is the same thing. I was everything. That’s why it’s so interesting – like oh, I’m this tree, I’m this building.... It made reality seem as though I had a place in it – like I could make real change to reality.... I was the flowing of the ever-present energy of the universe. That’s the thing.” Ken began to feel noticeably less alienated from his environment and less isolated in his distinct sense of self, even during periods between using LSD.

Risks and Negative Experiences

When asked about the risks involved in choosing this type of intervention for himself, Ken acknowledged that “nothing is completely harmless.” He was aware of the potential of precipitating a psychotic break, but also knew the incidence of such experiences was equivalent among psychedelic and non-psychedelic populations [27]. He knew

hiking alone could be dangerous, so he had a rule to always go with friends. At the same time, he also had the rule to set aside a time when he could sit by himself because “[i]n the end the trip was between me and me. The trip was between me and the eternal divine. I had to spend time with that.”

However, Ken acknowledged that some aspects of the experience were uncomfortable. “But to some extent that’s exactly what I was looking for.” Ken explained that a natural environment was the setting he chose for his interventions because the complexity of nature experienced on LSD broke through his ordinary mode of experiencing the world. “It broke my mind. It literally . . . split my mind apart.” Specifically, Ken reported that the dissociation and ego dissolution he experienced was uncomfortable, useful, and perhaps uniquely tolerable, given that he had recently been suicidal. “[W]hen you’re depressed... you’re not really worried about whether you dissolve into nothing.”

Ken reported that he felt the primary curative aspects of his LSD experiences were ego dissolution and increased interest in the world around him, which he experienced as related to each other. A seemingly fundamental aspect of Ken’s mood problem was his sense of separation from the world around him, but LSD dissolved the rigid boundaries around his sense of self, restoring his ability to appreciate aspects of the world that previously appeared static and dull. “I look at this tree and all of a sudden it’s the most interesting thing I’ve ever looked at in my whole life, and then when I’m sober it’s *still* the most interesting thing I’ve ever looked at, and then I kind of restructured the way I thought about the world and said, oh, actually everything is really interesting and imbued with some sort of significance and meaning.” In this way, Ken’s sense of emptiness and meaninglessness was undermined by his unmediated connection to the complexity of nature.

Aftereffects

While Ken was using LSD therapeutically, he started to feel increasingly creative, efficient and re-energized in his academic life. He began to see connections between what he was learning in school and his life experience. “At first, it was about the drug because I had the drug, and then I took it, but as soon as I was on the drug, it ceased to become about the drug... It’s just a molecule. What’s really powerful is the brain. That’s the point. . . It’s not about the drug. It’s just a grain of sand. It’s about the beach.... At first, I thought that the drug itself was sacred, but then I slowly started to realize the drug is just a molecule – it’s just a crystal. What’s really sacred is life itself – the brain and life itself.” He also became interested in Buddhism and read books like *The Electric Kool Aid Acid Test* [28]. Ken reported that there were no negative consequences to his use of LSD, and he believed his friends and family would say there were only permanent, positive changes to his personality and behavior.

After his treatment with LSD, Ken reported that none of the depressive symptoms that he had previously reported remained. He had no trouble sleeping. His appetite returned, he regained interest in things he had previously enjoyed, no longer felt guilty or worthless, experienced improved concentration and memory, and was no longer suicidal. In particular, he reported that his suicidality resolved early on because he became hopeful that his treatment strategy would be successful. At the time of the interview, Ken described his current mood this way: “I very infrequently feel even a teeny bit of depressed, and it’s not the same kind of depressed. It’s like the regular person ‘I feel like shit today’ kind of depressed, not the ‘I hate everything, and I want to die’ kind of depressed.”

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Individual Differences

Ken attributes his ability to devise and carry out using LSD in a therapeutic way to his conscientious nature. He reports being very serious about safety throughout the entire experience. He was very careful about obtaining the LSD from trustworthy sources and taking precautions against the dangers potentially present in nature. He was aware of the need to create a positive set and setting for each experience, knowing that those elements are equally as important as the drug type and dose. In addition, Ken saw his intention to use LSD therapeutically as crucial to its effectiveness, and potentially a distinguishing characteristic separating the way he used it from the recreational way it is often used.

DISCUSSION

Whereas psychedelics have been found to be useful in treating depression in high doses in clinical settings^[29] and micro-doses in natural settings^[30-32], this case indicates that a series of high doses of LSD may help treat depression in natural settings for some people. Ken's experience comports well with Carhart-Harris et al.'s^[33] findings that the mechanism by which LSD facilitates lasting mood improvement is by increasing cognitive flexibility based on Ken's explanation of how it helped was to allow him to access a different perspective on his "negative thought loops." Similarly, Ken's description of his experience corresponds well with findings that micro-dosing psychedelics increase convergent and divergent thinking and suggest that psychedelics might affect cognitive metacontrol policies^[34]. Not only did Ken find himself simultaneously more interested in things (convergent) and better able to get beyond his habitual negatively focused cognitions (divergent), but he described LSD as allowing him to "purposely reprogram" his brain. This

description fits with findings from Lebedev et al.^[35] that psychedelics facilitate ego-dissolution by disrupting the ordinary functioning of the Default Mode Network.

In some respects, Ken's recovery from depression using LSD is unremarkable given his description that the symptoms he experienced were primarily cognitive and his realization that he needed to break the cycle of his negative thought patterns. However, whereas traditional cognitive therapy attempts to accomplish this same end through conversation with a therapist who helps the client recognize and combat the cognitive habits, the unconstrained cognition facilitated by LSD appears to have accomplished the same goal. Thus, although Ken was unwilling to seek therapeutic help, wishing to handle his problems independently, the altered state of consciousness he achieved with LSD served the same purpose as traditional cognitive therapy. This case suggests there may be other individuals, especially those who value their autonomy or are reticent to seek professional help for other reasons, which may achieve the same goals as cognitive therapy using a psychedelically-assisted state of mind.

Ken's experience aligns with findings by^[36] that psychedelic drug use is associated with lower levels of psychological distress and suicidality, but it also implies a causal connection. Ken's experience supports findings that psychedelics can reduce symptoms of depression in the short term^[37]. It also suggests these gains can persist years beyond the last dose and supports the generalizability of laboratory-based findings to more naturalistic settings.

Ken's case is also different from other users of psychedelics in many ways. He had a specific resolution to use LSD therapeutically on himself, whereas many users' intentions are purely recreational. Ken made a point to educate himself on the multiple factors that influence a user's experience and manipulate dose, set, and setting in ways that facilitated

his purpose. In these ways, Ken's case may be unique, and others severely depressed may be unable to access the cognitive or emotional resources necessary to plan and carry out a complex strategy that requires advanced planning and self-discipline over an extended duration.

Ken's method of treating his depression is not without its drawbacks. Chief among those is that possessing and using LSD is illegal in the United States, according to federal law. Ken was certainly aware of this fact and, having weighed his options, chose to pursue this course of treating his depression despite the risk of criminal liability. As a young man, Ken may be more willing to take risks than other populations and more likely to use psychedelic drugs. For these reasons, young, unmarried, Caucasian males may be uniquely prone to choose this type of treatment from among other, more socially or legally acceptable choices.

Ken also chose to use LSD to treat his depression, whereas recent research has focused more on the effects of psilocybin [37]. His experience was consistent with outcomes reported from early studies on psycholytic psychotherapy in which patients were able to overcome constrained, negative thought patterns and sometimes experienced benefits that persisted over the long term [38]. However, Ken's case is also unique in that he was able to achieve the benefits of psycholytic psychotherapy without the guidance of a therapist.

The causes of Ken's depression also remain unclear. It is possible this type of intervention is uniquely effective for a specific type of depression that is existentially focused as opposed to one that is more organically based or related to trauma. Alternatively, although Ken was unable to identify any specific triggers, his cannabis use during high school may have contributed to the onset of his depression. If so, his reduction in cannabis use during the LSD regimen may have

directly contributed to the reduction of his depressive symptoms. Future research should seek to characterize more clearly the particular types of major depression that are most amenable to psychedelic intervention.

Finally, this case naturally suffers from the threats to validity inherent in a self-report occurring approximately three years after the experience. Certainly, Ken's memories cannot be trusted as entirely accurate. On the other hand, Ken's current estimation of the most important aspects of the experience is the best he can offer and perhaps the most relevant. According to his timeline, Ken was becoming increasingly depressed over the course of approximately three years to the point of suicidality and then recovered fairly quickly over the course of seven months using LSD. Perhaps the specifics of his experience are less important than the implication that the accomplishment is possible at all under entirely uncontrolled circumstances.

CONCLUSION

Ken's case suggests that some individuals with sufficient understanding of how to use psychedelics constructively may be able to manage their recovery from severe depression independent of the medical system. Ken's case may also help translate recent laboratory-based research to more naturalistic settings since protocols intended to treat major depressive disorder with psychedelic drugs could be enhanced by understanding the specific therapeutic elements of successful individual cases.

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REFERENCES

1. Johansen, P. Krebs, T. S. (2015). Psychedelics not linked to mental health problems or suicidal behavior: A population study. *Journal of Psychopharmacology* 29(3):270-279.
2. Nesvag, R. Bramness, J. G. Ystrom, E. (2015). The link between user of psychedelic drugs and mental health problems. *Journal of Psychopharmacology*, 29(9):1035-1040.
3. Pahnke, W. N. Kurland, A. A. Unger, S. Savage, C. Grof. S. (1970). The experimental use of psychedelic (LSD) psychotherapy. *Journal of the American Medical Association*, 212(11):1856-1863.
4. Richards, W.A. Berendes M. (1977). LSD-assisted psychotherapy and dynamics of creativity: A case report. *Journal of Altered States of Consciousness*, 3(2):131-146.
5. Soskin, R. A. (1973). Short-term psychotherapy with LSD: A case study. *Journal of Religion and Health*, 12(1):41-62.
6. Bogenschutz, M. P. Forchimes, A. A. Pommy, J. A. Wilcox, C. E. Barbosa, P. C. R Strassman, R. J. (2015). Psilocybin-assisted treatment for alcohol dependence: A proof-of-concept study. *Journal of Psychopharmacology*, 29(3):289-299.
7. Mangini, M. (1998). Treatment of alcoholism using psychedelic drugs: A review of the program of research. *Journal of Psychoactive Drugs*, 30(4):381-418.
8. Johnson, M. W. Garcia-Romeu, A. Johnson, P. S. Griffiths, R. R. (2017). An online survey of tobacco smoking cessation associated with naturalistic psychedelic use. *Journal of Psychopharmacology*, 31(7):841-850.
9. Moreno, F. A. Weigand, C. B. Taitano, E. K., Delgado P. D. (2006). Safety, tolerability, and efficacy of psilocybin in nine patients with Obsessive-Compulsive Disorder. *Journal of Clinical Psychiatry*, 67(11):1735-1740.
10. Bouso, J. C., Doblin, R. Farre, M. Alcazar, M.A., Gomez-Jarabo G. (2008). MDMA-Assisted psychotherapy using low doses in a small sample of women with chronic Post-traumatic Stress Disorder. *Journal of Psychoactive Drugs*, 40(3):225-236.
11. Rucker, J. J. H. Jelen, L. A. Flynn, S. Frowde, K. D. Young A. H. (2016). Psychedelics in the treatment of unipolar mood disorders: A systematic review. *Journal of Psychopharmacology*, 30(12):1220-1229.
12. Carhart-Harris, R. L., Bolstridge, M. Rucker, J Day, C. M. J. Erritzoe, D. Kaelen, M. Bloomfield, M. Rickard, J. A. Forbes, B. Feilding, A. Taylor, D. Pilling, S. Curran, V. H. Nutt, D. J. (2016a). Psilocybin with psychological support for treatment-resistant depression: an open-label feasibility study. *Lancet Psychiatry* 3:619-627. [https://doi.org/10.1016/S2215-0366\(16\)30065-7](https://doi.org/10.1016/S2215-0366(16)30065-7)
13. Griffiths, R. R. Johnson, M. W. Carducci, M. A. Umbricht, A. Richards, W. A. Richards, B. D. Cosimano, M. P. Klinedinst, M. A. (2016). Psilocybin produces substantial and sustained decreases in depression and anxiety in patients with life-threatening cancer: A randomized double-blind trial. *Journal of Psychopharmacology*, 30(12):1181-1197.
14. Ross, S. Bossis, A. Guss, J. Agin-Lieb, G. Malone, T. Cohen, B. Mennenga, S. E. Belser, A. Kalliontzi, K. Babb, J. Su, Z. Corby, P. Schmidt B. L. (2016). Rapid and sustained symptom reduction following psilocybin treatment for anxiety and depression in patients with life-threatening cancer: A randomized controlled trial. *Journal of Psychopharmacology*, 30(12): 1165-1180.
15. Turner, S. Mota, N. Bolton, J. Sareen, J. (2018). Self-medication with alcohol or drugs for mood and anxiety disorders: A narrative review of the epidemiological literature. *Depression and Anxiety*, 35:851-860.
16. Lo, C. C. Cheng, T. C. del la Rosa, I. A. (2015). Depression and substance use: A temporal-ordered model. *Substance Use and Misuse*, 50:1274-1283.
17. Blacha C., Schmid, M. M. Gahr, M. Freudenmann, R. W. Plener, P. L. Finter, F. Connemann, B. J. Schonfeldt-Lecuona, C. (2013). Self-inflicted testicular amputation in first Lysergic Acid Diethylamide use. *Journal of Addictive Medicine*, 7: 83-84.
18. Khanra, S. Khess, C. R. J. Srivastava, N. (2015). Chronic non-fatal Datura abuse in a patient of paranoid schizophrenia: A case report. *Addictive Behaviors*, 43:39-41.
19. Marta, C. J. Ryan, W. C. Kopelowicz, A. Koek, R. J. (2015). Mania following use of Ibogaine: A case series. *The American Journal on Addictions*, 24:203-205.
20. Jansen, K. L. R. (1999). Ecstasy (MDMA) dependence. *Drug and Alcohol Dependence*, 53:121-124.
21. Liu, J. X. Zerbo, E. Ross, S. (2015). Intensive Ketamine use for multiple years: A case report. *The American Journal on Addictions*, 24:7-9.

22. Moreno, F. A. Delgado, P. L. (1997). Hallucinogen-induced relief of obsessions and compulsions. *American Journal of Psychiatry*, 154(7):1037-1038.
23. Sessa, B. (2010). Self-medication of LSD and MDMA to treat mental disorders: A case series. In *Alternative Medicine Yearbook*, ed. J. Merrick, 291-297. Hauppauge, NY: Nova Science.
24. Wilcox, J. A. (2014). Psilocybin and Obsessive-Compulsive Disorder. *Journal of Psychoactive Drugs*, 46(5):393-395.
25. Callaway, J. C. (2021). Set, setting, and dose. In *Handbook of Medical Hallucinogens*, eds. C. S. Grob and J. Grigsby, 347-362. New York, NY: Guilford Press.
26. Strassman, R. (2001). *DMT: The spirit molecule*. Rochester, VT: Park Street Press.
27. Krebs, T. S. Johansen, P. Ø. (2013). Psychedelics and mental health: A population study. *PLoS One*, 8:e63972.
28. Wolfe, T. (1969). *The electric Kool-Aid acid test*. Picador.
29. Carhart-Harris, R. L. Bolstridge, M. Rucker, J. Day, C. M. J. Erritzoe, D. Kaelen, M. Bloomfield, M. Rickard, J. A. Forbes, B. Feilding, A. Taylor, D. Pilling, S. Curran, V. H. Nutt, D. J. (2016a). Psilocybin with psychological support for treatment-resistant depression: an open-label feasibility study. *Lancet Psychiatry* 3:619–627. [https://doi.org/10.1016/S2215-0366\(16\)30065-7](https://doi.org/10.1016/S2215-0366(16)30065-7)
30. Polito, V. Stevenson, R. J. (2019). A systematic study of microdosing psychedelics. *PLoS ONE*, 14(2):e0211023.
31. Johnstad, P. G. (2018). Powerful substances in tiny amounts: An interview study of psychedelic microdosing. *NAT Nordisk Alkohol & Narkotikatidskrift*, 35(1):39-51.
32. Anderson, T. Petranker, R. Christopher, A. Rosenbaum, D. Weissman, C. Dinh-Williams, L. Hui, K. Hapke, E. (2019). Psychedelic microdosing benefits and challenges: An empirical codebook. *Harm Reduction Journal*, 16:43.
33. Carhart-Harris, R. L. Kaelen, M. Bolstridge, M. Williams, T. M. Williams, L. T. Underwood, R. Nutt, D. J. (2016b). The paradoxical psychological effects of lysergic acid diethylamide (LSD). *Psychological Medicine*, 46:1379–1390.
34. Prochazkova, L. Lippelt, D. P. Colzato, L. S. Kuchar, M. Sjoerds, Z. Hommel, B. (2018). Exploring the effect of microdosing psychedelics on creativity in an open-label natural setting. *Psychopharmacology*, 235:3401-3413. <https://doi.org/10.1007/s00213-018-5049-7>
35. Lebedev, A. V. Lovden, M. Rosenthal, G. Feilding, A. Nutt, D. J. Carhart-Harris, R. L. (2015). Finding the self by losing the self: Neural correlates of ego-dissolution under psilocybin. *Human Brain Mapping*, 36(8):3137-3153. <https://doi.org/10.1002/hbm.22833>
36. Hendricks, P. S. Thorne, C. B. Clark, C. B., Coombs, D. W. Johnson, M. W. (2015). Classic psychedelic use is associated with reduced psychological distress and suicidality in the United States adult population. *Journal of Psychopharmacology*, 29(3):280-288.
37. Carhart-Harris, R. L. Bolstridge, M. Rucker, J. Day, C. M. J. Erritzoe, D. Kaelen, M. Bloomfield, M. Rickard, J. A. Forbes, B. Feilding, A. Taylor, D. Pilling, S. Curran, V. H. Nutt, D. J. (2016a). Psilocybin with psychological support for treatment-resistant depression: an open-label feasibility study. *Lancet Psychiatry* 3:619–627. [https://doi.org/10.1016/S2215-0366\(16\)30065-7](https://doi.org/10.1016/S2215-0366(16)30065-7)
38. Grof, S. (2008). *LSD Psychotherapy* (4th ed.). Multidisciplinary Association for Psychedelic Studies.

