

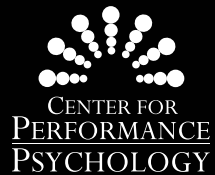
## ISSUE 17

Exploring athletes' experiences of the effects of psychedelics on **sport performance and mental well-being.**



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## ABSTRACT

While limited evidence exists in the literature supporting the use of psychedelics for enhancing various aspects of mental well-being and performance for differing populations and contexts, there seems to be no existing study focusing specifically on healthy athletes despite anecdotal accounts of athletes using psychedelics to enhance sports performance. This study aimed to contribute toward filling this gap in the literature by investigating the positive and negative experiences of athletes using psychedelics relating to mental well-being and sports performance. This qualitative phenomenological study investigated the lived experiences of athletes who used psychedelics, collecting data through a semi-guided online discussion on the platform Reddit, which was observed using thematic analysis. This study identified four main themes: enhanced well-being (with sub-themes: enhanced mood, enhanced social ties, and physical benefits), and enhanced performance (with sub-themes: being in the zone and enhanced creativity, cognitive impairment, and context of administration).

The findings of this study generally corroborated findings of other studies investigating performance and well-being in nonathletic populations. This exploratory study found potential positive and negative effects of psychedelics on performance and well-being for athletes that could provide direction for future research in areas such as team cohesion, flow state, and cognitive impairment. Some limitations of this study included the low number of participants and risk of participant bias, as participants were recruited from online psychedelic communities. More research is needed for more concrete conclusions.

*Keywords: psychedelics, hallucinogens, performance, mental-well-being, athletes*





## INTRODUCTION

To explore athletes' experiences of the effects of psychedelics on sports performance and mental well-being, it is important to operationally define the terms "sports performance," "mental well-being," and "athletes." Sports performance is a complex construct covering many aspects, since athletes draw upon a wide range of cognitive and psychomotor functions for their performance, whether it's concentration, attention, or creativity. Previous studies have associated peak athletic performance with factors such as self-confidence, feeling energized but relaxed, feeling in control, having high concentration and focus, holding positive performance attitudes, as well as being highly determined and committed (e.g., Gould et al., 1999; Gould et al., 2002; Mahoney & Avenir, 1977; Orlick, 1980; Privette & Bundrick, 1997; Ravizza, 1977; Robazza & Bortoli, 2003; Robazza et al., 2004). This study considered whether the above aspects of athletic performance could be influenced by psychedelic use.

While mental well-being is also a complex and contested term, Huppert and So (2013, pp. 838) summarized it as "feeling good and functioning effectively." This study also drew from Keyes' (2007) conceptualization of mental well-being with 13 dimensions divided into three categories of positive emotions, positive psychological functioning, and positive social functioning, as seen in Table 1. This study was interested in the experiences of anyone who participated in sports, so an athlete is defined as anyone who took part in any sport or exercise at any level.

Psychedelic research is a rapidly growing field in what has been termed a psychedelic renaissance (Sessa, 2018). While studies involving psychedelics are being increasingly published, there did not appear to be a study exploring athletes' experiences of the effects of psychedelics on sports performance and mental well-being yet. Psychedelics are known to alter states of consciousness, perceptions of reality, and induce spiritual/mystical experiences, ego dissolution, and hallucinations (Banks et al., 2021). One theory proposed that psychedelics promote neural plasticity, which aids therapeutic change (Banks et al., 2021). There is currently evidence in the literature that classical psychedelic substances such as psilocybin, ayahuasca, and lysergic acid diethylamide (LSD) can significantly reduce symptoms of anxiety and depression (e.g., Muttoni et al., 2019; Trope et al., 2019). The evidence also generally supported the efficacy of psychedelic-assisted therapy (Wheeler & Dyer, 2020). Furthermore, a systematic review investigating the long-term effects of psychedelic use found that psychedelics can relatively safely aid positive and enduring psychological changes under the right circumstances (Aday et al., 2020).

However, a common limitation across this field in general was the limited number of studies investigating the effects of psychedelics, and more research was needed to confirm their findings. While existing studies generally suggest using psychedelics can enhance mental well-being or related constructs, most of them focus on clinical populations with mental disorders like anxiety and depression in controlled, supervised settings — sometimes





with therapeutic assistance. Although a literature review found psychedelics can have well-being benefits for healthy populations, it emphasized more research was needed in the field (Gandy, 2019).

Furthermore, there was evidence indicating psychedelics have been used for enhancing performance (e.g., Hutten et al., 2019; Lea et al., 2019; Lea et al., 2020). Studies have found that psychedelics can have both positive and negative effects on performance, including effects on energy, work effectiveness, memory, creativity, mental acuity, and exercise performance (e.g., Bornemann, 2020; Fadiman & Korb, 2019; Healy, 2021; Machek, 2019; Prochazkova, 2018). Some studies found psychedelics can enhance performance in simple cognitive processes while impairing more complex ones (e.g., Barrett

et al., 2018; Hutten et al., 2020). Studies involving ayahuasca also indicated it could be effective at enhancing cognitive performance, especially for experienced users (Bouso et al., 2012; Bouso et al., 2013). While one study briefly mentioned a few participants reporting better athletic performance and physical capability with using psychedelics, this was not explored further (Lea et al., 2020).

Although the above-mentioned evidence in the literature supported the use of psychedelics for enhancing mental well-being and performance in various populations and contexts, there seemed to be no existing study focusing specifically on healthy athletes. This study was interested in the athletic population because athletes using psychedelics have anecdotally reported performance and mental

well-being-enhancing effects, notably the famous anecdote of baseball player Doc Ellis throwing a no-hitter while on LSD (Oroc, 2011). Grey literature suggested there was a heavy psychedelic subculture in extreme sports, reporting remarks like, “You couldn’t calculate the number of people who are tripping when it snows in the Rockies (Oroc, 2011, p.29).” Given the supposed prevalence of psychedelic usage among athletes and the current gap in the literature, it would be beneficial for athletes using or considering using psychedelics to be informed by more empirical research investigating the positive and negative effects of their use. This research would also be beneficial in helping to guide future studies on this topic.

This study was interested in athletes’ experiences of classical and nonclassical

psychedelics. Classical psychedelics are thought to work primarily through agonist activity at serotonin 2A (5HT<sub>2A</sub>) receptors and share a similar phenomenological profile, including LSD, ayahuasca/N,N-dimethyltryptamine (DMT), psilocybin, and peyote/mescaline (Bogenschutz & Ross, 2018). Nonclassical psychedelics are non-serotonergic psychoactive substances sometimes considered to be psychedelics, such as cannabis, 3,4-methylenedioxy-methamphetamine (MDMA), and ketamine, and there was evidence they also have therapeutic effects (Corrigan & Pickering, 2019; Gill et al., 2020; Pratt et al., 2019). There was a systematic review on cannabis and sports which found two studies reporting a negative impact on performance, and two studies reporting no impact, but it noted that the available literature was generally poor

while emphasizing a need for further research in the topic (Docter et al., 2020).

Additionally, this study was interested in athletes' experiences of both microdose and full-dose psychedelic use. A microdose is usually defined as a sub-perceptual dose between a tenth to a twentieth of a full dose (Fadiman & Korb, 2019). Many existing studies, especially on LSD, focused on microdosing, so it seemed valuable to further investigate effects of full-doses and microdoses together (e.g., de Wit et al., 2022; Hutten et al., 2020). This wide range of interests was due to the nature of this study as preliminary and exploratory, since it was the first on this specific topic.

#### **Research Aims:**

This study aimed to contribute toward filling the gap in the literature by investigating athletes' experiences of the effects of psychedelics on sports performance and mental well-being.

#### **Research Questions:**

1. How have athletes using psychedelics experienced enhanced effects on performance and mental well-being?
2. How have athletes using psychedelics experienced negative effects on performance and mental well-being?







## **METHODS**

### **Design**

This study was of a qualitative phenomenological design, investigating the lived experiences of athletes who have used psychedelics. Data was collected through leading an online discussion on the social forum platform Reddit. This method was selected as previous qualitative studies researching psychedelics have analyzed content from Reddit, and there appeared to be a robust psychedelic community on the platform (e.g., Pestana et al., 2020; Lea et al., 2019). While these studies analyzed content already existing on Reddit, the present study involved a guided discussion to ensure the content is relevant to the research questions. A semi-structured interview design was considered, but the guided discussion on Reddit was chosen because it was deemed more time efficient and more protective of participants' anonymity since Reddit usernames are anonymous. It was also hoped the discussion aspect may lead to deeper engagement and understanding. Thematic analysis was used to identify and analyze themes in the data (Braun & Clarke, 2006). These designs and methods were consistent with the researcher's interpretative, constructivist stance.

### **Participants**

Participants were recruited online using a convenience sampling method from various sports- and psychedelics-related Reddit communities known as subreddits, as well as Facebook psychedelic communities. The researcher initially anticipated 40 participants based on the

number of comments on popular posts, but only 12 participants responded to the study. This may have been due to the open and public nature of the online discussion involved in the study and the need for participants to create a new anonymous “throwaway” account, which increased the difficulty of participating. Nevertheless, the 12 participants provided sufficient data for thematic analysis. No demographic details were collected from participants to protect their anonymity, as participation in the study involved a public online discussion about psychedelic substances, which are illegal and stigmatized in many areas.

Inclusion criteria for participants in this study were: a) members of online psychedelic or sports communities; b) those who participated in any sports or exercise at any level, e.g., from casual to elite; c) athletes who have used any kind of psychedelics, including classic psychedelics such as LSD, psilocybin, peyote/mescaline, and ayahuasca/DMT, as well as other psychoactive substances sometimes considered to be psychedelics, like cannabis and MDMA.

Exclusion criteria for participants in this study were: a) those under the age of 18; b) those suffering from any mental disabilities; c) those who did not have a working knowledge of English; d) those who were otherwise vulnerable and could not give informed consent for whatever reason.

## Materials

A Reddit post was created containing information about the study, instructions

on how to participate, and a consent form. The post contained 12 open-ended questions designed to provide the online discussion with direction. It also asked participants not to share any identifying information and to use “throwaway” accounts (accounts which would only be used once) to ensure anonymity. Support helplines from major English-speaking countries were provided in case participants experienced any distress.

## Procedure

This study was conducted ethically in accordance with the BPS Code of Human Research Ethics and was approved by the Glasgow Caledonian University Research Ethics Committee (British Psychological Society, 2021). The post containing participant information, instruction, and consent form was posted on the subreddit r/psychonaut because it was one of the biggest and oldest subreddits dedicated to psychedelics.

The post on r/psychonaut was then cross-posted to other sports- and psychedelics-related subreddits and was also shared to Facebook psychedelic communities to recruit participants. To take part in the study, participants created a new “throwaway account” on Reddit, then followed the instructions on the post and left their answers to the 12 questions in the comments section. The instructions in the post also encouraged participants to engage with one another and reply to each other’s comments. The post was left on the subreddit for two months before the data was collected by the researcher, and the post was then deleted on Reddit to further protect the anonymity and







privacy of participants. All data was stored securely on a password-protected device accessible only to the researcher.

### **Data Analysis**

Prior to starting data analysis, the comments on the subreddit post were copied onto a word document and the already anonymous reddit usernames were given pseudonyms to further ensure participant anonymity. The data was analyzed using thematic analysis as described by Braun and Clarke (2006), utilizing an inductive approach at a semantic level.

First, the researcher familiarized himself with the data through multiple readings of the transcript. Then, the researcher generated initial codes to label key elements from engaging with the data. Once the data was coded and collated, the codes were reviewed, analyzed, and grouped to identify and form initial themes that appeared to be logical and cohesive. After the initial themes were formulated, they were reviewed and refined to ensure the codes made sense in their themes. Finally, the themes were named and defined to identify what Braun and Clarke (2006) referred to as the "essence of the story."





## RESULTS

Participants (n=12) involved in the study took part in various sports, including snowboarding (n=5), splitboarding (n=1), hiking (n=2), tennis (n=1), ballet (n=1), roller skating (n=2), mountaineering (n=1), Spartan race (n=1), weightlifting (n=1), gym (n=1), badminton (n=1), volleyball (n=1), football (n=1), running (n=1), trail running (n=1), mountain biking (n=1), Thai boxing (n=1), Brazilian jiu-jitsu (n=1), mixed martial arts (n=1), and kickboxing (n=1). Participants competed at elite (n=1), national/semiprofessional (n=2), and amateur/recreational (n=9) levels, and some took part in more than one sport (n=9). Participants have also taken different psychedelic substances in the past, including LSD (n=8), psilocybin (n=4), cannabis (n=3), MDMA (n=3), ketamine (n=2), and ayahuasca/DMT (n=1), with some reporting having taken multiple types of psychedelics before (n=7). Three participants had experience in microdosing. Five participants did not directly follow the instruction format and answer the questions, but they engaged in the discussion and provided insightful data.

The researcher identified four main themes of enhanced well-being, enhanced performance, cognitive impairment, and context of administration. The researcher also identified sub-themes within the main enhanced well-being and enhanced performance themes, as well as various interactions between the themes and sub-themes. A theme map illustrating these interactions and relationships can be found in Figure 1.

### Enhanced Well-Being

A major theme identified by this study was enhanced well-being, which included the sub-themes of enhanced mood, enhanced social ties, and physical benefits. Enhanced well-being was closely related to enhanced performance, as good well-being is crucial for improving and maintaining performance (Arnold & Fletcher, 2021). Hence, the three sub-themes were also related to the enhancing performance theme. This was something recognized by participants:

*“But it puts me in a better place in life in general, which will always improve performance.”*

Participants in the study reported enhanced mood, including enhanced enjoyment from sports, reduced anxiety and stress, enhanced motivation, improved outlook, and enhanced spiritual connection. These enhancing effects were observed for participants using full-dose and microdose psilocybin and LSD, ketamine, cannabis, and ayahuasca. This enhancement in mood was also identified as contributing toward an enhancement in performance, as it enhanced motivation/endurance and made performing in sports more enjoyable:

*“Mushrooms (low dose) = Increased mental ability to handle long periods of exercise without mentally giving up (the term I’ve heard is “trail shortener”, i.e., it makes long periods of exercise and tedium seem more fun, more engaging, and to go by quicker).”*

Outside of a sports context, participants also reported that psychedelic use made them laugh more, feel relaxed, and have a better outlook, indicating enhanced mental well-being.

Another prominent sub-theme was enhanced social ties. This was included into the enhanced well-being theme, as there was evidence that social support is important for mental well-being (Cohen & Janicki-Deverts, 2009). Participants reported ayahuasca, psilocybin, MDMA, and cannabis helped deepen connections to friends, family, and partners while also enhancing romantic and sexual connection:

*“Deeper connection to family, kids and friends. Closer connection to friends with whom I am sharing a snowboarding experience, which survives the drug and is captured in long-term memories of those experiences.”*

These enhanced social ties not only contributed to enhanced well-being but could potentially enhance performance as well. In the example of a closer connection to friends, the participant was snowboarding with suggested enhanced social ties from psychedelic use that could have a direct impact on sports and might even help improve team building and cohesion.

The last sub-theme was physical benefits, which included improved sleep, muscle recovery, as well as reduced stress from sporting injury and pain management. Physical benefits were grouped into the enhancing well-being theme as the

researcher considered lowering pain and stress to be important for well-being. These physical benefits were reported by participants who used cannabis, full-dose LSD, and psilocybin. There was one particularly striking example from a martial arts athlete who indicated the potential benefits in recovering from injury:

*“Frequent brain damage in my sport can definitely put me in a bad place at times, which could last anywhere from weeks to months. Psychedelics ease this mental stress.”*

This recovery aspect of the physical benefits of psychedelics seemed to be related to improving performance as well, suggesting psychedelics could aid performance indirectly through helping with recovery, as indicated below:

*“But the medium-term effect is that my muscles recover faster and I sleep better, so my performance in sports the next day is much better!”*

### **Enhanced Performance**

Another key theme this study identified was enhanced performance, which was further divided into two sub-themes: being in the zone and enhanced creativity. The first sub-theme of being in the zone was identified by participants who reported feeling “in the zone;” feeling performance becoming effortless; enhanced body connection, awareness, and control; reduced overthinking; a clearer mind; time slowing down; and a connection to nature. There were two quotes from the data which embodied this sub-theme:



*"There is a very significant improvement in body awareness. It feels like time has slowed down and your body smoothly does what you want it to do with little or no effort. You get a 'tuned in' feeling where you feel really connected to your body. You are able to use the ability of your body without the hindrance of the mind thinking, 'Can I do this?' With mountaineering, a similar dose removes any struggle or effort from the day. Massive elevation gains are, again, just play. Being out in nature playing around, and at the end, you're on top of a mountain. The mental effects: the headspace is fairly clear."*

These in-the-zone effects were reported by participants who used microdose and full-dose LSD and psilocybin, as well as cannabis.

The second sub-theme was enhanced creativity, which was reported by participants using cannabis and full-dose psilocybin. This enhanced creativity could improve sports performance in terms of problem solving, as one participant reported that it helped them plan a strategy for boxing.

### **Cognitive Impairment**

Another major theme identified in this study was cognitive impairment, which was associated with negative performance and mental well-being outcomes. Participants reported impairment in balance, coordination, perception, and concentration, as well as experiencing slowness, cloudy

thinking, and time skips which would negatively affect sports performance. Participants also reported feeling increased laziness and tiredness, as well as impaired restorative sleep which could negatively affect well-being. One participant who was a snowboarder made this point succinctly:

*"My body balance and coordination will be shot. Visuals will be very nice and pretty but not so nice for riding and perceiving the terrain. Headspace will be all over the place. Getting off the lift will be an absolute nightmare as well."*

Participants reporting cognitive impairment used full-dose LSD and cannabis, and microdose LSD and psilocybin.

### **Context of Administration**

The final theme identified in this study was the context of administering psychedelics. Taking psychedelics in different sets and settings and different dosage will affect user's experience. Participants who took overly high doses of cannabis, LSD, and psilocybin reported paranoia, overly intense feelings, body discomfort, nausea, throwing up, anxiety, and bad trips. One participant also noted that microdosing LSD had diminishing returns due to tolerance, and they would not

recommend microdosing for consecutive days. A quote from one participant highlighted how taking cannabis in different contexts has different effects:

*"Well, if I take weed after a workout, I get the best highs. I feel really good and tingly all over. And I feel relaxed, and everything feels great. It's like I feel at peace with everything. When I take weed when I haven't done a workout or when I'm tired, stressed, or uncomfortable, I get really bad trips, panic attacks, and generally feel really bad and not in control. I also get paranoid. Weed, I have found, compounds and magnifies any feelings I'm already feeling. So, when I have low self-esteem and sense of belonging and high anxiety, weed makes me feel ten times worse. But when I'm feeling happy, confident, and good, then weed makes those feelings x100."*

This seemed to relate to what is termed "set and setting" in the psychedelics community, where the effects of the drug will largely depend on the mindset and environment of the person taking it (Hartogsohn, 2017).





## DISCUSSION

This study aimed to explore athletes' experiences with the effects of psychedelics on sports performance and mental well-being. Through a qualitative thematic analysis of a semi-guided online discussion, four main themes were identified: enhanced well-being (with sub-themes of enhanced mood, enhanced social ties, and physical benefits), enhanced performance (with sub-themes of being in the zone and enhanced creativity), cognitive impairment, and context of administration. These themes and sub-themes generally corroborated findings of existing studies investigating the effects of psychedelics on performance and well-being that did not focus on athletes, suggesting psychedelic research on other populations may be potentially relevant to athletic

contexts (e.g., Bornemann, 2019; Fadiman & Korb, 2019; Healy, 2021; Lea et al., 2019, Lea et al., 2020; Machek, 2019; Prochazkova, 2018). While there was much existing research on the effects of psychedelic use in clinical/therapeutic contexts (e.g., Aday et al., 2020; Wheeler & Dyer, 2020), the illegal status of psychedelics in many jurisdictions and the usual high cost of psychedelic-assisted therapy would mean that many athletes who may be interested in using psychedelics for purposes of enhancing performance and well-being would likely do so in nonclinical or recreational settings, so more research in these contexts would be valuable.

This exploratory study, the first focusing on the effects of psychedelics on performance and well-being in athletes in nonclinical contexts, also found several

areas of interest which may help provide direction for future research. One area was the sub-theme of enhanced social ties with implications for team building and team cohesion. This was consistent with evidence from the broader field that psychedelics can enhance interpersonal perceptiveness, empathy, prosocial behavior, and positive perceptions of formerly difficult relationships (e.g., Belser et al., 2017; Dolder et al., 2016; Griffiths et al., 2006; Griffiths et al., 2018; Preller et al., 2015; Schmid et al., 2015). However, there did not appear to be any current research into the effects of psychedelics on athlete team cohesion, so further research in this area would be especially valuable.

Another area that would benefit from future research is the sub-theme of being in the zone, which seemed similar to flow

state. Existing studies on psychedelics and performance focused on cognitive and psychomotor functions (e.g., Barrett et al., 2018; Bouso et al., 2012, 2013; de Wit et al., 2022; Hutten et al., 2020), but one of the major benefits reported in this present study appeared focused on flow states rather than any specific cognitive or psychomotor functions. Enhanced enjoyment, focus, body awareness/connection/control, feeling in the zone, and perceiving time slowing down were all flow characteristics, and high levels of flow had been associated with high athletic performance (Swann et al., 2012). There is currently no research on psychedelics and flow state in athletes, so future research in this area would be beneficial. The negative effects of psychedelics on athletes also require further research, as harm reduction is important but existing



research had been deemed of poor quality (Docter et al., 2020).

Finally, there were some limitations to this study, including the risk of participant bias. Since many participants were recruited from online psychedelic communities, they may have preexisting biases regarding psychedelics which might have influenced their responses. This is a common limitation in psychedelic research, and the only feasible mitigation this study took was to remind participants in the instructions to answer as honestly and accurately as possible. Another limitation was that this study did not achieve the anticipated number of participants, possibly because the process for participating was too complex, involving the creation of a throwaway account. This complexity could also be the reason some participants did not follow the instructions and answer all the questions as requested, which was another limitation. The small sample size of this study, consisting mostly of members of online psychedelic communities, may also limit the richness and depth of the data. Furthermore, this qualitative study cannot establish relationships between the variables, so rigorous quantitative studies with a larger sample size would be another helpful step for this topic.



## REFERENCES

- Aday, J. S., Mitzkovitz, C. M., Bloesch, E. K., Davoli, C. C., & Davis, A. K. (2020).** Long-term effects of psychedelic drugs: A systematic review. *Neuroscience & Biobehavioral Reviews*, 113, 179-189. <https://doi.org/10.1016/j.neubiorev.2020.03.017>
- Arnold, R., & Fletcher, D. (Eds.). (2021).** Stress, well-being, and performance in sport. New York: Routledge.
- Banks, M. I., Zahid, Z., Jones, N. T., Sultan, Z. W., & Wenthur, C. J. (2021).** Catalysts for change: The cellular neurobiology of psychedelics. *Molecular Biology of the Cell*, 32(12), 1135-1220. <https://doi.org/10.1091/mbc.E20-05-0340>
- Barrett, F. S., Carbonaro, T. M., Hurwitz, E., Johnson, M. W., & Griffiths, R. R. (2018).** Double-blind comparison of the two hallucinogens psilocybin and dextromethorphan: Effects on cognition. *Psychopharmacology*, 235(10), 2915-2927. <https://doi.org/10.1007/s00213-018-4981-x>
- Belser, A. B., Agin-Liebes, G., Swift, T. C., Terrana, S., Devenot, N., Friedman, H. L., Guss, J., Bossis, A., & Ross, S. (2017).** Patient experiences of psilocybin-assisted psychotherapy: An interpretative phenomenological analysis. *Journal of Humanistic Psychology*, 57(4), 354-388. <https://doi.org/10.1177/0022167817706884>
- Bogenschutz, M. P., & Ross, S. (2018).** Therapeutic applications of classic hallucinogens. In Halberstadt, F. Vollenweider & D. Nichols (Eds.), *Current Topics in Behavioural Neuroscience* (pp. 361-391). Springer Berlin.
- Bornemann, J. (2020).** The viability of microdosing psychedelics as a strategy to enhance cognition and well-being - An early review. *Journal of Psychoactive Drugs*, 52(4), 300-308. <https://doi.org/10.1080/02791072.2020.1761573>
- Bouso, J. C., Fábregas, J. M., Antonijoan, R. M., Rodríguez-Fornells, A., & Riba, J. (2013).** Acute effects of ayahuasca on neuropsychological performance: Differences in executive function between experienced and occasional users. *Psychopharmacology*, 230(3), 415-424. <https://doi.org/10.1007/s00213-013-3167-9>
- Bouso, J. C., González, D., Fondevila, S., Cutchet, M., Fernández, X., Ribeiro Barbosa, P. C., et al. (2012).** Personality, psychopathology, life attitudes and neuropsychological performance among ritual users of ayahuasca: A longitudinal study. *PLoS One*, 7(8), Article e42421. <https://doi.org/10.1371/journal.pone.0042421>
- Braun, V., & Clarke, V. (2006).** Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77-101. <https://doi.org/10.1191/1478088706qp063oa>
- British Psychological Society. (2021).** BPS Code of Human Research Ethics. John Oats.
- Cohen, S., & Janicki-Deverts, D. (2009).** Can we improve our physical health by altering our social networks? *Perspectives on Psychological Science*, 4(4), 375-378. <https://doi.org/10.1111/j.1745-6924.2009.01141.x>
- Corrigan, A., & Pickering, G. (2019).** Ketamine and depression: A narrative review. *Drug Design, Development and Therapy*, 13, 3051-3067. <https://doi.org/10.2147/DDDT.S221437>
- de Wit, H., Molla, H. M., Bershada, A., Bremner, M., & Lee, R. (2022).** Repeated low doses of LSD in healthy adults: A placebo-controlled, dose-response study. *Addiction Biology*, 27(2), Article e13143. <https://doi.org/10.1111/adb.13143>
- Docter, S., Khan, M., Goyal, C., Ravi, B., Bhandari, M., Gandhi, R., et al. (2020).** Cannabis use and sport: A systematic review. *Sports Health*, 12(2), 189-199. <https://doi.org/10.1177/1941738120901670>
- Dolder, P. C., Schmid, Y., Müller, F., Borgwardt, S., & Liechti, M. E. (2016).** LSD acutely impairs fear recognition and enhances emotional empathy and sociality. *Neuropsychopharmacology: Official Publication of the American College of Neuropsychopharmacology*, 41(11), 2638-2646. <https://doi.org/10.1038/npp.2016.82>
- Fadiman, J., & Korb, S. (2019).** Might microdosing psychedelics be safe and beneficial? An initial exploration. *Journal of Psychoactive Drugs*, 51(2), 118-122. <https://doi.org/10.1080/02791072.2019.1593561>
- Gandy, S. (2019).** Psychedelics and potential benefits in "healthy normals": A review of the literature. *Journal of Psychedelic Studies*, 3(3), 280-287. <https://doi.org/10.1556/2054.2019.029>
- Gill, H., Gill, B., Chen-Li, D., El-Halabi, S., Rodrigues, N. B., Cha, D. S., et al. (2020).** The emerging role of psilocybin and MDMA in the treatment of mental illness. *Expert Review of Neurotherapeutics*, 20(12), 1263-1273. <https://doi.org/10.1080/14737175.2020.1826931>
- Gould, D., Guinan, D., Greenleaf, C., Medbery, R., & Peterson, K. (1999).** Factors affecting Olympic performance: Perceptions of athletes and coaches from more and less successful teams. *The Sport Psychologist*, 13(4), 371-394.
- Gould, D., Greenleaf, C., Guinan, D., & Chung, Y. (2002).** A survey of US Olympic coaches: Variables perceived to have influenced athlete performances and coach effectiveness. *The Sport Psychologist*, 16(3), 229-250.
- Griffiths, R. R., Johnson, M. W., Richards, W. A., Richards, B. D., Jesse, R., MacLean, K. A., Barrett, F. S., Cosimano, M. P., & Klinedinst, M. A. (2018).** Psilocybin-occasioned mystical-type experience in combination with meditation and other spiritual practices produces enduring positive changes in psychological functioning and in trait measures of prosocial attitudes and behaviors. *Journal of Psychopharmacology*, 32(1), 49-69. <https://doi.org/10.1177/0269881117731279>
- Griffiths, R. R., Richards, W. A., McCann, U., & Jesse, R. (2006).** Psilocybin can occasion mystical-type experiences having substantial and sustained personal meaning and spiritual significance. *Psychopharmacology*, 187(3), 268-283. <https://doi.org/10.1007/s00213-006-0457-5>

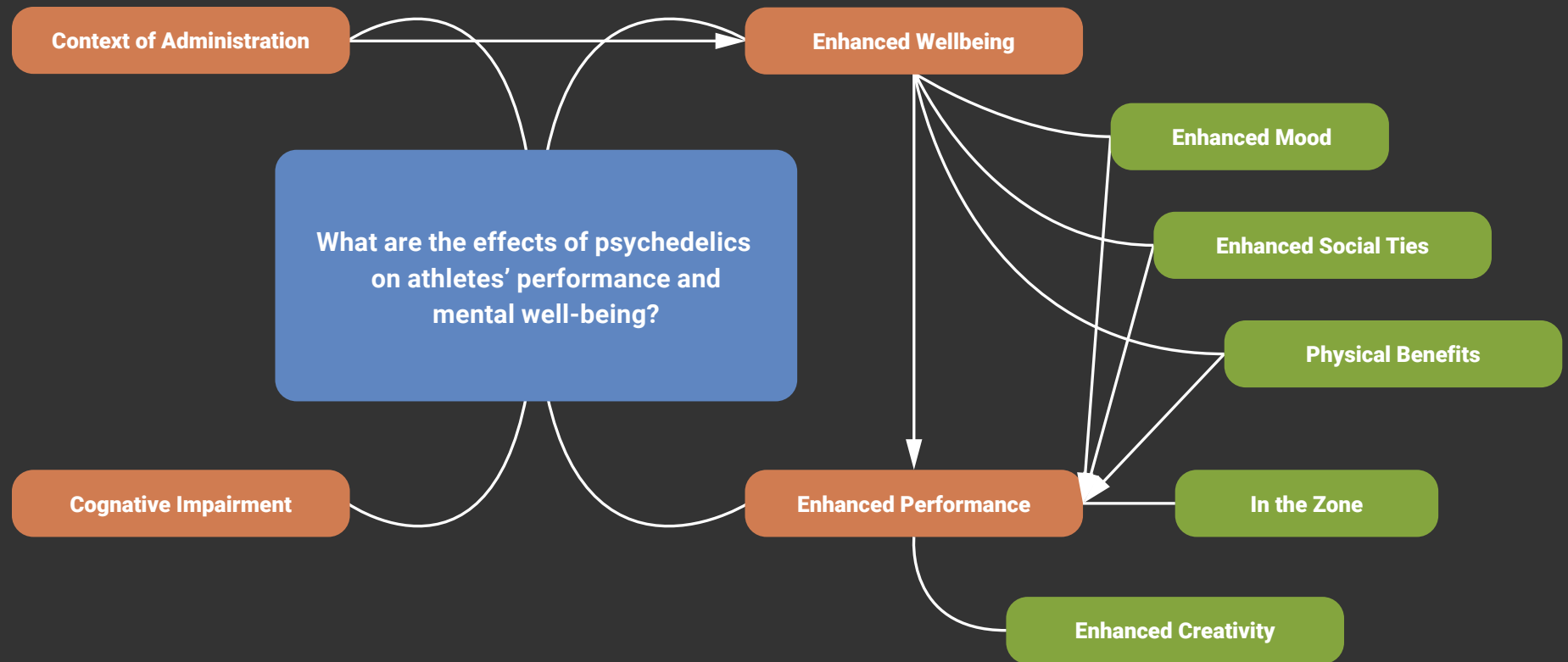


## REFERENCES

- Hartogsohn, I. (2017).** Constructing drug effects: A history of set and setting. *Drug Science, Policy and Law*. <https://doi.org/10.1177/2050324516683325>
- Healy, C. J. (2021).** The acute effects of classic psychedelics on memory in humans. *Psychopharmacology*, 238, 639–653. <https://doi.org/10.1007/s00213-020-05756-w>
- Huppert, F. A., & So, T. T. C. (2013).** Flourishing across Europe: Application of a new conceptual framework for defining well-being. *Social Indicators Research*, 110(3), 837–1246. <https://doi.org/10.1007/s11205-011-9966-7>
- Hutten, N. R. P. W., Mason, N. L., Dolder, P. C., & Kuypers, K. P. C. (2019).** Motives and side-effects of microdosing with psychedelics among users. *International Journal of Neuropsychopharmacology*, 22(7), 426–434. <https://doi.org/10.1093/ijnp/pyz029>
- Hutten, N. R. P. W., Mason, N. L., Dolder, P. C., Theunissen, E. L., Holze, F., Liechti, M. E., et al. (2020).** Mood and cognition after administration of low LSD doses in healthy volunteers: A placebo-controlled dose-effect finding study. *European Neuropsychopharmacology: The Journal of the European College of Neuropsychopharmacology*, 41, 81–91. <https://doi.org/10.1016/j.euroneuro.2020.10.002>
- Keyes, C. L. M. (2007).** Promoting and protecting mental health as flourishing: A complementary strategy for improving national mental health. *The American Psychologist*, 62(2), 95–108. <https://doi.org/10.1037/0003-066X.62.2.95>
- Lea, T., Amada, N., & Jungaberle, H. (2019).** Psychedelic microdosing: A reddit analysis. *Journal of Psychoactive Drugs*, 52(2), 101–112. <https://doi.org/10.1080/02791072.2019.1683260>
- Lea, T., Amada, N., Jungaberle, H., Schecke, H., & Klein, M. (2020).** Microdosing psychedelics: Motivations, subjective effects and harm reduction. *The International Journal on Drug Policy*, 75, Article 102600. <https://doi.org/10.1016/j.drugpo.2019.11.008>
- Machek, S. B. (2019).** Psychedelics: Overlooked clinical tools with unexplored ergogenic potential. *Journal of Exercise and Nutrition*, 2(3). <https://journalofexerciseandnutrition.com/index.php/JEN/article/view/50>
- Mahoney, M. J., & Avenier, M. (1977).** Psychology of the elite athlete: An exploratory study. *Cognitive Therapy and Research*, 1, 135–141.
- Muttoni, S., Ardissino, M., & John, C. (2019).** Classical psychedelics for the treatment of depression and anxiety: A systematic review. *Journal of Affective Disorders*, 258(1), 11–24. <https://doi.org/10.1016/j.jad.2019.07.076>
- Orlick, T. (2015).** In pursuit of excellence. *Human Kinetics*.
- Oroc, J. (2011).** Psychedelics and extreme sports. *MAPS Bulletin*, 21(1), 25–29.
- Pestana, J., Beccaria, F., & Petrilli, E. (2020).** Psychedelic substance use in the Reddit psychonaut community: A qualitative study on motives and modalities. *Drugs and Alcohol Today*, 21(2), 112–123. <https://doi.org/10.1108/DAT-03-2020-0016>
- Pratt, M., Stevens, A., Thuku, M., Butler, C., Skidmore, B., Wieland, L. S., et al. (2019).** Benefits and harms of medical cannabis: A scoping review of systematic reviews. *Systematic Reviews*, 8(1), 320. <https://doi.org/10.1186/s13643-019-1243-x>
- Preller, K. H., Pokorny, T., Krähenmann, R., Dziobek, I., Stämpfli, P., & Vollenweider, F. X. (2015).** The effect of 5-HT<sub>2A/1a</sub> agonist treatment on social cognition, empathy, and social decision-making. *European Psychiatry*, 30, 22. [https://doi.org/10.1016/S0924-9338\(15\)30017-1](https://doi.org/10.1016/S0924-9338(15)30017-1)
- Privette, G., & Bundrick, C. M. (1997).** Psychological processes of peak, average, and failing performance in sport. *International Journal of Sport Psychology*, 28(4), 323–334.
- 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(12), 3401–3413. <https://doi.org/10.1007/s00213-018-5049-7>
- Ravizza, K. (1977).** Peak experiences in sport. *Journal of Humanistic Psychology*, 17(4), 35–40. <https://doi.org/10.1177/002216787701700404>
- Robazza, C., & Bortoli, L. (2003).** Intensity, idiosyncratic content and functional impact of performance-related emotions in athletes. *Journal of Sports Sciences*, 21(3), 171–189.
- Robazza, C., Bortoli, L., & Hanin, Y. (2004).** Pre-competition emotions, bodily symptoms, and task-specific qualities as predictors of performance in high-level karate athletes. *Journal of Applied Sport Psychology*, 16(2), 151–165.
- Schmid, Y., Enzler, F., Gasser, P., Grouzmann, E., Preller, K. H., Vollenweider, F. X., Brenneisen, R., Müller, F., Borgwardt, S., & Liechti, M. E. (2015).** Acute effects of lysergic acid diethylamide in healthy subjects. *Biological Psychiatry*, 78(8), 544–553. <https://doi.org/10.1016/j.biopsych.2014.11.015>
- Sessa, B. (2018).** The 21st century psychedelic renaissance: Heroic steps forward on the back of an elephant. *Psychopharmacology*, 235(2), 551–560. <https://doi.org/10.1007/s00213-017-4713-7>
- Swann, C., Keegan, R. J., Piggott, D., & Crust, L. (2012).** A systematic review of the experience, occurrence, and controllability of flow states in elite sport. *Psychology of Sport and Exercise*, 13(6), 807–819.
- Trope, A., Anderson, B. T., Hooker, A. R., Glick, G., Stauffer, C., & Woolley, J. D. (2019).** Psychedelic-assisted group therapy: A systematic review. *Journal of Psychoactive Drugs*, 51(2), 174–188. <https://doi.org/10.1080/02791072.2019.1593559>
- Wheeler, S. W., & Dyer, N. L. (2020).** A systematic review of psychedelic-assisted psychotherapy for mental health: An evaluation of the current wave of research and suggestions for the future. *Psychology of Consciousness: Theory, Research, and Practice*, 7(3), 279–315. <https://doi.org/10.1037/cns000023>

## FIGURES

Figure 1: Theme Map





## TABLES

**Table 1: 13 Dimensions of Mental Well-being**

Dimensions	Definition
<b>Positive Affect</b>	Positive emotions (i.e. emotional well-being).  Regular cheerful, interested in life, in good spirits, happy, calm and peaceful, full of life.
<b>Avowed quality of life</b>	Mostly highly satisfied with life overall or in domains of life.  Positive psychology functioning (i.e. psychological well-being).
<b>Self-acceptance</b>	Holds positive attitude toward self, acknowledges, likes most parts of self, personality.
<b>Personal growth</b>	Seeks challenge, has insight into own potential, feels sense of continued development.
<b>Purpose in life</b>	Finds own life has a direction and meaning.
<b>Environmental mastery</b>	Exercises ability to select, manage, and mold personal environments to suit needs.
<b>Autonomy</b>	Is guided by own, socially acceptable, internal standards and values.
<b>Positive relations with others</b>	Has, or can form, warm, trusting personal relationships.  Positive social functioning (i.e., social well-being).
<b>Social acceptance</b>	Holds positive attitudes toward, acknowledges, and is accepting of human differences.
<b>Social actualization</b>	Believes people, groups, and society have potential and can evolve or grow positively.
<b>Social contribution</b>	Sees own daily activities as useful to and valued by society and others.
<b>Social coherence</b>	Interested in society and social life and finds them meaningful and somewhat intelligible.
<b>Social integration</b>	A sense of belonging to, and comfort and support from, a community.

(Keyes, 2007, Table 1, pp. 98)

## ABOUT THIS PAPER

This paper is authored by Ka Ho Kelvin Ing with the aid of his supervisor Dr. Phil Dalgarno. The author confirms he had access to all the reported and unreported data from the study as well as complete freedom to direct its analysis and reporting without influence from any sponsors. The author also confirms there was no editorial direction or censorship from any sponsors.

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