

**Survey study of challenging and mystical experiences after consuming psilocybin  
mushrooms in New Zealand**

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**Attestation of Authorship**

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgements), nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning.

Signed \_\_\_\_\_ Date 12/07/23

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Ethical approval was obtained by the Auckland University of Technology Ethics Committee (AUTEC) and granted in August 2022. Reference number: 22/225.

## **Abstract**

**Background:** Psilocybin is a psychedelic substance which is contained within certain species of mushrooms. Research has identified that in addition to the acute psychedelic effects of psilocybin, there are longer-lasting consequences of psilocybin consumption, including change in personality, and reduction in depressive symptoms and substance use disorder. However, little research has investigated the acute and lasting effects of psilocybin consumption in the New Zealand population.

**Aim:** The present study aims to explore the extent of mystical experiences, meaningfulness, spiritual significance, and enduring changes in wellbeing resulting from recreational psilocybin experiences, and how these factors are affected by difficult or challenging experiences.

**Method:** A quantitative anonymous survey was distributed online by convenience sampling and was open between August 31, 2022 to November 5, 2022. 511 New Zealanders completed the survey. Participants completed the Mystical Experience Questionnaire 30 (MEQ30) and survey questions about the difficulty, meaningfulness, spiritual significance, and enduring changes to wellbeing as a result of the psilocybin experience. Participants could also provide open-ended written comments about their experience.

**Results:** Participants reported high levels of mystical experiences (MEQ30 Total Average = 99.3), with 36.2% achieving Complete Mystical Experiences. High levels of meaningfulness, spiritual significance, enduring positive changes in wellbeing due to the psilocybin experience were also found, with a moderate number of participants having a challenging psilocybin experience. A Spearman's rho correlation analysis showed significant positive correlations between all previously mentioned factors with a  $p < .001$ , except for the relationship between the

estimated psilocybin dosage and enduring changes in wellbeing ( $p < .01$ ), difficulty and enduring changes in wellbeing ( $p < .01$ ), and between difficulty and positive mood (not significant). A slight difference was found between participants who achieved a Complete Mystical Experience, and those who did not.

Conclusion: This study provided an initial insight into the recreational psilocybin experiences of people in New Zealand, looking at the relationship between psilocybin experiences, challenging or otherwise, and their impact on personal meaning, spiritual significance, and enduring changes in wellbeing. The findings are consistent with prior research, indicating that both mystical and challenging experiences of higher intensity are associated with greater increases in personal meaning, spiritual significance, and lasting improvements in wellbeing.

## **Literature Review**

### **Early History of Psilocybin**

For thousands of years, people have been aware of the psychedelic effects that some plants and certain fungi can produce and have deliberately consumed them for their psychoactive properties. Psilocybin, an extract of mushrooms, has been used historically as a psychedelic for religious and spiritual ceremonies (Lowe et al., 2021).

Pre-Columbian Mesoamerican cultures incorporated psilocybin mushrooms into their religious, magical, and therapeutic rituals with the aim of inducing a trance-like state and attaining enlightenment. Users sought to achieve an altered state of consciousness, characterized by sensations of inner peace, ecstasy, disorientation in space and time, vivid hallucinations, introspection, and a profound connection with nature and deities (Carod-Artal, 2015).

Mesoamerican religions and myths also emphasize the role of the priest or shaman in facilitating the relationship between the spiritual and physical worlds. This encouraged the use of psilocybin mushrooms for religious ceremonies and prophecy. To complete their shamanic journeys, shamans, who were seen as intermediaries between the supernatural and natural realms, would use a variety of psychoactive substances, and the psychoactive plants were also believed to have been associated with certain gods. They had voices that the shaman was expected to adopt after taking them (Carod-Artal, 2015).

### **Pharmacology and Effects**

Psilocybin (4-phosphoryloxy-N, N-dimethyltryptamine) is a metabolite produced by a variety of mushroom species. Upon ingestion, psilocybin is metabolised in the body, converting into psilocin (Passie et al., 2002). While consumed for its psychoactive properties, psilocybin itself does not produce these effects, as it cannot freely cross the blood–brain barrier, while

psilocin can. Psilocin acts as an agonist at cortical serotonin 5-HT<sub>2A</sub> receptors, and it is now widely accepted that the agonist activity at this receptor is responsible for the effects of psilocin and other psychedelic substances (Carhart-Harris et al., 2017). Carhart-Harris & colleagues (2012) propose that this agonist activity induces the reorganisation of neural networks within the brain, resulting in an alternative state of consciousness, facilitating feelings and experiences that are not typically accessible without the substance. This results in reduced activity between the medial prefrontal cortex and the posterior cingulate cortex, which may be beneficial, as it has been observed that during depressive states, the medial prefrontal cortex tends to be overactive (Carhart-Harris et al., 2012). Thus, psilocybin-induced reductions in activity within the medial prefrontal cortex may contribute to the decrease in depressive symptoms observed in patients (Carhart-Harris et al., 2012).

The effects of consuming psilocybin typically begin to manifest between 30 to 60 minutes after ingestion (Nichols, 2016). When taking a moderate dose (2-3 grams of dried psilocybin mushrooms), these effects generally last for a duration of 4 to 6 hours. Throughout the course of the ‘trip’, users may experience different effects at different points in time, with certain effects being more likely to occur during the onset, peak, or comedown stages (Nichols, 2016).

The effects encountered during a psilocybin experience are also influenced by the external context of the user, referred to as the “set and setting” (Hartogsohn, 2016). Psilocybin induces perceptual changes that range from intensified colour perception to intricate visual hallucinations (Hartogsohn, 2016). Some users have reported experiencing synaesthesia, where their senses merge, resulting in phenomena like seeing sound or hearing colour. Additionally, alterations in the perception of time are commonly reported. Many users describe subjective

effects, such as changes in emotions, intense euphoria and bliss, dissolution of the ego, and heightened introspection (Studerus et al., 2011).

### **Changes in Personality, Spirituality and Wellbeing**

Psilocybin consumption has been shown to result in lasting changes in personality (MacLean et al., 2011). Many studies based on Big Five personality domains have shown that the core personality traits tend to remain stable past the age of 30 (Wortman et al., 2012). There is limited research showing personality changes in healthy adults after an experimentally manipulated event (MacLean et al., 2011). MacLean & colleagues (2011) conducted a double-blind, controlled study showing that psilocybin can produce mystical experiences that are predictive of long-term changes in behaviour, attitudes, and values. It was observed that psilocybin consumption results in changes in the five domains of personality: neuroticism, extroversion, openness, agreeableness, and conscientiousness. Most notably, researchers found significant increases in ‘openness’ following high dose psilocybin sessions, and ‘openness’ was significantly higher in participants who experienced mystical experiences while receiving psilocybin. Furthermore, these changes were observed to persist after more than one year after the psilocybin experience, suggesting that psilocybin can play an important role in facilitating change in adult personality (MacLean et al., 2011).

Erritzoe & colleagues (2018) confirmed these results by conducting research using psilocybin-assisted therapy with people suffering from severe, treatment-resistant depression. Patients were administered psilocybin at the same time each week. The Revised NEO Personality Inventory (NEOPIR) was used to determine a baseline personality score. After three months it was found that the participants’ extraversion and openness had significantly increased, conscientiousness had slightly increased, there was a moderate decrease in neuroticism and there

were no changes in agreeableness scores. These personality changes were linked to a patient's insight during the psilocybin experiences (Erritzoe et al., 2018).

As previously mentioned, psilocybin has been found to facilitate mystical experiences, as demonstrated in the pioneering study conducted by Griffiths and colleagues (2006). In this study, participants were administered a high dose of psilocybin and instructed to close their eyes and focus their attention inward. At a follow-up assessment conducted 14 months later, a significant proportion of participants reported profound effects from the psilocybin experience. Specifically, 58% of participants rated it as one of the top five most personally meaningful experiences of their lives, 67% rated it among the top five spiritually significant experiences of their life, and 64% reported an increase in wellbeing or life satisfaction. Importantly, there was a strong correlation between the occurrence of a mystical experience during the psilocybin session and higher ratings of spiritual significance, personal meaning, and overall quality of life at the follow-up assessment (Griffiths et al., 2008).

These studies add to the growing evidence that psilocybin use can result in positive personality changes. Both healthy people and those experiencing pre-existing mental disorders may benefit from the use of psilocybin. This new finding adds to the debate about the possible use of psychedelic drugs in the treatment of mental disorders and the benefit it could have on the healthy population.

## **Risks**

As per the Misuse of Drugs Act 1975, psilocybin falls under the category of Schedule 1, Class A controlled drugs (Misuse of Drugs Act 1975). This means that psilocybin is not currently approved for medicinal use in New Zealand.

Psilocybin use can lead to “bad trips”, which are intense negative experiences while under the influence of psilocybin or other drugs, and is more common in uncontrolled settings such as recreational use[]. This is a dangerous or even traumatic experience that can lead to subjective effects such as distorted visual perception, heightened anxiety, fear, impaired coordination, and paranoia. Physiological effects like nausea, vomiting, headaches, and chills may also accompany these experiences, with some of these symptoms persisting even after psilocybin is no longer detectable in the body (Studerus et al., 2011).

In a survey study of these challenging experiences, Carbonaro & colleagues (2016) reported that about 10% of participants rated their “bad trip” as the single most difficult experience of their life, and another 50% stated that it was among their top ten. Despite the challenge, 84% of the participants who had a challenging psilocybin experience endorsed the experience, reporting enduring increases in wellbeing as a result of the experience.

Additionally, the consumption of psilocybin may carry risks for individuals with mental or psychiatric disorders. There have been rare, documented cases of suicidal thoughts and self-harm (Müller et al., 2013), while the more common outcome is the exacerbation of psychotic symptoms (James et al., 2020). One of the most serious concerns about psilocybin is that it increases the risk of the onset of schizophrenia. Most people do not experience any psychotic symptoms after psilocybin use. If psychotic symptoms persist it is most likely due to a predisposition rather than the consumption of psilocybin (James et al., 2020). It is therefore important to screen patients to prevent such adverse effects.

Psilocybin has been rated by the Registry of Toxic Effects of Chemical Substances (RTECS) with a therapeutic index of 641. It has a higher safety profile compared to nicotine (therapeutic index of 21) and aspirin (therapeutic index of 99), and the highest safety profile of

all psychedelic drugs (Johnson et al., 2018). This means that psilocybin has very low chronic toxicity and moderate acute toxicities, and has negligible criminal or public health effects (van Amsterdam et al., 2011). The only known death attributed to psilocybin consumption occurred in a patient who had consumed a low dose of psilocybin mushrooms 6 months after receiving a heart transplant for end-stage rheumatic heart disease (Johnson et al., 2018). There is limited research in this area due to the general low risk of psilocybin consumption, and it is unknown what the current lethal dose for humans is, though it is hypothesized that it is much higher than its effective dose (Johnson et al., 2018).

There are many ways to minimize or eliminate the risk of using psilocybin. These include a medically supervised environment, expert clinical psychological and physiological assistance, and proper preparatory counselling to induce the right patient mindset. Participants may experience high blood pressure, nausea and vomiting in controlled settings; however, these side effects are temporary and of low risk to a participant's safety (van Amsterdam et al., 2011).

Overall, psilocybin has the best safety profile of any psychedelic drug (van Amsterdam et al., 2011). Thousands of years of anecdotal evidence in addition to modern research confirms that psilocybin has low toxicity, low abuse/addictive potential, and with proper efforts to mitigate risks, results in safe psychological responses and no persisting adverse physiological or psychological effects after use.

### **Therapeutic Potential and Medical Applications**

In the 1960s and 1970s, pharmaceutical companies and academic institutions conducted studies to investigate the therapeutic potentials of psychedelics, including psilocybin. However, in the early 1970s, strict prohibition measures were implemented worldwide, resulting in a nearly

complete halt in biomedical research on psychedelics for nearly five decades (Matzopoulos et al., 2022).

In the past decade, there has been a resurgence of interest in the use of psychedelics as an approach to treating mental health conditions and substance abuse disorders (Lowe, et al., 2021). Several early phase clinical trials have explored the potential of psilocybin in treating various conditions, including obsessive-compulsive disorder, anxiety and depression in terminal cancer patients, tobacco addiction, alcohol dependence, and treatment-resistant depression (Lowe, et al., 2021). It is crucial to note that these clinical trials have limited sample sizes and incorporate existing psychotherapy or psychological therapies alongside psilocybin treatment. Therefore, the findings from these studies should be approached with caution.

These studies share a common goal of harnessing the profound experiential effects induced by psilocybin to address complex health issues (de Veen et al., 2017; Erritzoe et al., 2018). Several randomized, double-blind, placebo-controlled trials have provided evidence supporting the efficacy of psilocybin therapy in alleviating distress and anxiety among cancer patients nearing the end of their life (Ross et al., 2016; Grob et al., 2011). In a double-blind, randomized control trial conducted by Ross et al. (2016) with 51 participants, a significant decrease in end-of-life anxiety was observed, with the results lasting for up to 6 months. Interviews conducted with cancer patients who participated in the psilocybin research trials revealed that their psilocybin experiences facilitated a reconnection with life, increased confidence in dealing with cancer recurrence, and emotional detachment from cancer (Ross et al., 2016). Carhart-Harris & Goodwin (2017) note that conventional pharmaceuticals used to treat anxiety and end-of-life distress often suppress emotions, whereas psychedelics enhance

emotions and create an environment where users can confront issues and trauma with heightened openness (Carhart-Harris & Goodwin, 2017).

Psilocybin has also been explored in the context of addiction and substance dependence research. In a pilot study conducted by Johnson & colleagues (2014), 15 participants suffering from tobacco dependence were administered psilocybin alongside cognitive-behavioural therapy. At the 6-month follow-up, approximately 80% of participants successfully quit smoking and remained smoke-free, showing higher success rates compared to traditional therapies (Johnson et al., 2014). In a subsequent follow-up study, Johnson and colleagues (2017) made the discovery that individuals who underwent psilocybin therapy and successfully reduced or quit tobacco consumption experienced a profound shift in their life priorities and values. Notably, participants who experienced a relapse during the study rated their psilocybin experiences as less personally meaningful and spiritually impactful compared to those who were able to achieve lasting reductions or quit smoking altogether. Furthermore, in a separate open-label clinical trial led by Bogenschutz and colleagues (2015), involving a cohort of 10 participants, significant and enduring reductions in problematic drinking behaviours were reported for up to 9 months following psilocybin treatment combined with motivational therapy sessions. This highlights the potential of psilocybin-assisted interventions in addressing addictive behaviours and promoting long-term positive outcomes. These studies provide valuable insights into the therapeutic potential of psilocybin in combination with psychotherapeutic approaches, demonstrating its ability to facilitate meaningful changes in life priorities, values, and behavioural patterns.

The integration of psychological interventions alongside psilocybin treatment is widely recognized by researchers as a crucial element for achieving successful therapeutic outcomes (Carhart-Harris & Goodwin, 2017). However, it is important to note that due to the concurrent

use of these therapies with psilocybin administration, it is difficult to definitively attribute the observed positive health outcomes solely to psilocybin. Mental health and substance dependence are multifaceted issues, and from an ethical standpoint, researchers are unlikely to provide treatment to these populations without established psychotherapy or psychological interventions (Carhart-Harris & Goodwin, 2017). Future clinical trials must navigate this complex landscape, striking a delicate balance between ensuring patient safety and fostering rigorous scientific inquiry. By carefully designing studies that address these considerations, researchers can continue to explore the therapeutic potential of psilocybin while upholding the highest standards of ethical practice and patient wellbeing.

### **Recreational Use**

Recreational use of psilocybin refers to the consumption of the psychedelic compound for non-medical purposes. Psilocybin-containing mushrooms have been used recreationally for centuries, with varying cultural and social contexts influencing the motivations and practices associated with their consumption (Carod-Artal, 2015).

In recreational settings, individuals often consume psilocybin mushrooms seeking subjective effects such as sensory distortions, visual hallucinations, changes in perception, and alterations in mood and emotions (Riley & Blackman, 2008). These experiences can be characterized by a sense of connection with the environment, enhanced introspection, and profound insights. Many individuals also report feelings of euphoria, awe, and spiritual or mystical experiences (MacLean et al., 2011).

As mentioned previously, the experiences associated with psilocybin use are influenced by the user's "set and setting", their mindset and the environment in which the substance is consumed (Hartogsohn, 2016). It is important to note that in recreational use, the "set and

settings” can vary significantly compared to the standardized procedures and controlled environments typically observed in medical settings during the administration of psilocybin. Thus, the subjective effects in recreational settings can vary drastically, sometimes resulting in difficult psilocybin experiences (Hartogsohn, 2016). Factors associated with alleviating the difficult experience are having social support, trust for others physically present, and a positive emotional state before taking psilocybin (Carbonaro, et al., 2016).

Motivations behind psilocybin consumption appear to be driven by a multitude of factors, the nature of which can be influenced by the prevailing cultural context. In 2004, a year when the sale of hallucinogenic mushrooms was legal in the UK, 174 psilocybin mushroom users were surveyed regarding their motivations for psilocybin use (Riley & Blackman, 2008). Researchers found that the primary motivation for using magic mushrooms was to experience laughter (66.1%), happiness (37.4%), celebration (37.4%), and socializing (27.6%), with psilocybin mushroom use associated with a wider recreational drug, alcohol, and party culture.

Meanwhile, an American survey study conducted in 2021 found that the primary motivations for using psilocybin were focused on general mental health and overall wellbeing, as indicated by 63.6% of respondents (Matzopoulos et al., 2022). A significant number of individuals reported using psilocybin for medically diagnosed conditions (31.8%) and self-diagnosed conditions (19.0%) and reported higher levels of depression and anxiety (Matzopoulos et al., 2022). The researchers reported that a considerable portion of the American population was engaging in "self-medication" with psilocybin, and that as the media continues to highlight the positive aspects of psychedelics, generating public interest in the potential health advantages of psilocybin, this number is expected to rise, with further research being necessary to investigate the relationship between psilocybin use and mental health issues (Matzopoulos et al., 2022).

## **Present Study**

In New Zealand, psychedelic research is currently in its infancy, with a handful of phase 2 clinical trials assessing the safety and efficacy of clinical use (Inserra, 2019). While there are studies, most are focused on Ketamine, Lysergic acid diethylamide (LSD) or Ibogaine, with few studies on psilocybin (Inserra, 2019). As stated above, the effects of consuming psilocybin are dependent on the mindset of the individual, and their environment (Passie, et al., 2002); however, little is known about how the modern cultural context of New Zealand and how it affects psilocybin experiences.

Since 2020, the mental health crisis in New Zealand has been exacerbated by COVID-19, with the population already having higher depression and anxiety compared with other population norms (Gasteiger, et al., 2021). There is ample opportunity to seek new treatment options. The effects of psilocybin are subject to the user's mindset and context, so it is currently unknown how this is affected by the unique context of New Zealand. This increasing public interest and research surrounding the therapeutic applications of psilocybin may also be affecting the recreational use of psilocybin within New Zealand.

Additionally, while recreational use of psilocybin may lead to more difficult or challenging experiences, Carbonaro & colleagues (2016) observed that despite the challenging experiences, users may also find these experiences to be spiritually significant, meaningful, and contribute to a long-term positive change in wellbeing.

This study aims to explore the extent of mystical experiences, meaningfulness, spiritual significance, and enduring changes in wellbeing occasioned by recreational psilocybin experiences, and how these factors are affected by difficult or challenging experiences. This

research also seeks to assess the risks and benefits associated with recreational psilocybin use and contribute to harm prevention.

Based on prior research, it is hypothesized that individuals who report very challenging experiences after consuming psilocybin will experience more enduring positive changes in wellbeing compared to those who report low-challenging experiences, as well as higher levels of mystical experiences, spiritual significance, and meaningfulness.

## Methods

### Participants

A total of 511 people participated in this study. To be eligible to participate in this study, participants must have been residing in New Zealand at the time of responding, be over the age of 18 years, and have had experience of consuming psilocybin. Participants ranged from age 18 to 69, with a mean age of 34 years ( $SD = 11.40$ ), consisting mostly of New Zealand European (75.5 %) and educated individuals having attended a Polytechnic institution or University (79.9%). Age and ethnicity data were missing for 31 of these people, as displayed in Table 1. 41% of participants reported currently having experiences of anxiety or depression.

**Table 1**

*Descriptive Information of Participants (511)*

| Category                 | n   | %     |
|--------------------------|-----|-------|
| <i>Ethnicity</i>         |     |       |
| NZ European              | 386 | 75.54 |
| European                 | 48  | 9.03  |
| Māori                    | 41  | 8.02  |
| Asian                    | 9   | 1.76  |
| Other                    | 17  | 3.32  |
| Missing                  | 10  | 1.96  |
| <i>Education level</i>   |     |       |
| Primary school           | 3   | 0.58  |
| Secondary school         | 77  | 15.06 |
| Polytechnic              | 126 | 24.65 |
| Some University          | 85  | 16.63 |
| University Undergraduate | 135 | 26.41 |

|                                           |     |       |
|-------------------------------------------|-----|-------|
| University Postgraduate                   | 76  | 14.87 |
| Missing                                   | 9   | 1.76  |
| <i>Experiencing Anxiety or Depression</i> |     |       |
| Yes                                       | 210 | 41.09 |
| No                                        | 289 | 56.56 |
| Missing                                   | 12  | 2.35  |

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## Measures

### *Mystical Experience Questionnaire (MEQ30)*

The MEQ30 questionnaire is used to assess mystical experiences induced by classical hallucinogens and is derived from a subset of 30 items selected from the MEQ43 (MacLean et al., 2012). It consists of four subscales: mystical (which encompasses items related to internal unity, external unity, noetic quality, and sacredness scales from the MEQ43), positive mood, the transcendence of time and space, and ineffability. It consists of 30 statements that participants rate on a six-point Likert scale (0 = none, 1 = very slight, 2 = slight, 3 = moderate, 4 = strong, 5 = extreme) (MacLean et al., 2012).

The four factors of the MEQ30 have excellent reliability, as evidenced by Cronbach's alpha coefficients of 0.97, 0.92, 0.86, and 0.90 for the mystical, positive mood, transcendence of time and space, and ineffability subdomains, respectively in the initial study (MacLean et al., 2012). MEQ30 that had a score  $\geq 60\%$  of the maximum possible score on each of the four subscales of the MEQ30 were considered a "Complete Mystical Experience" (CME).

### *Survey Questions about the psilocybin experience*

Participants were instructed to answer four questions about their chosen psilocybin session. The questions were rated on a similar six-point Likert scale as with the MEQ30, except

question 4, which was answered on a seven-point Likert scale (-3 = decreased very much, -2 = decreased moderately, -1 = decreased slightly, 0 = no change, 1 = increased slightly, 2 = increased moderately, 3 = increased very much). The questions were as follows: (1) How psychologically difficult or challenging was the experience? (2) How personally meaningful was the experience? (3) Indicate the degree to which the experience was spiritually significant to you; and (4) Do you believe that the experience and your contemplation of that experience have led to a change in your current sense of personal wellbeing or life satisfaction?

#### *Open-ended written comments*

Participants were offered an optional opportunity to provide a written description of their psilocybin experience.

#### *Questions about Anxiety or Depression*

Participants were asked if they were currently experiencing Anxiety or Depression and offered an optional opportunity to provide a written description of it.

### **Procedure**

Participants were recruited online. A link to the Qualtrics survey was posted on websites that attract people interested in hallucinogens, such as Reddit, Facebook and Instagram. Data was collected from August 31, 2022 to November 5, 2022. To maintain confidentiality the survey was anonymous, and participation was voluntary. Participants were considered as part of the study upon clicking the "submit" button at the conclusion of the survey. Detailed information regarding privacy, confidentiality, the study itself, and survey procedures were explicitly provided to participants through the participant information sheet (see Appendix A) before entering the survey. Participants were explicitly informed of their right to withdraw from the

survey at any time. However, once the final "submit" button was clicked, responses could no longer be removed due to the anonymity of the survey. The study received ethical approval from the Auckland University of Technology Ethics Committee (AUTEC 22/225), affirming that it met the required ethical standards for conducting research.

### *Statistical Analysis*

Data was downloaded from Qualtrics and opened in Microsoft Excel. Incomplete surveys were removed in Excel, then the data was imported into Jamovi Version 2.3.2, which was used for all the analyses.

A reliability analysis was conducted for the MEQ30, as well as an Exploratory Factor Analysis (EFA) using Principal Axis Factoring extraction and Obliman rotation. Based on a fixed number of four factors, it showed that a four-factor solution for the MEQ30 was justified with all factor loadings being larger than 0.50, with each question being associated with the correct subscale.

As the data was not normally distributed, Spearman's rho correlations were calculated to analyse the strength of associations between the results of the MEQ30 subscales and participant ratings of the degree of difficulty, personal meaning, spiritual significance, and enduring change in wellbeing associated with their given psilocybin experience.

## Results

### Descriptive Statistics

A summary of the descriptive statistics of each subscale of the MEQ30 is provided in Table 2. Higher mean scores indicate a more intense mystical experience. The reliability analyses for each subscale show a strong Cronbach's alpha that does not increase if items are deleted from a subscale. A full reliability analysis and EFA can be found in Appendix C. Figure 1 shows the frequency of responses to the four survey questions about the psilocybin experience. Results showed moderate levels of challenging experiences, with a high level of spiritual significance, meaningfulness, and enduring change in positive wellbeing.

**Table 2**

*Descriptives, Means (M), Standard Deviations (SD), and Cronbach's Alpha (αc) for the scales of the MEQ30 (N = 511)*

| Subscale                      | Scale Items | M    | SD   | αc   |
|-------------------------------|-------------|------|------|------|
| Mystical                      | 15          | 3.26 | 1.30 | .959 |
| Positive Mood                 | 6           | 3.77 | 1.10 | .904 |
| Transcendence of Time & Space | 6           | 2.80 | 1.42 | .918 |
| Ineffability                  | 3           | 3.79 | 1.29 | .893 |

**Figure 1**

*Distributions of ratings for survey questions about the psilocybin experience (N=511)*



## Correlation Analysis

To explore the relationship between mystical experiences measured by the MEQ30, challenging experiences, meaningful experiences, spiritually significant experiences, and

enduring changes in wellbeing, a Spearman's rho correlation analysis was conducted. The results, as shown in Table 3 indicate significant positive correlations between all factors with a  $p < .001$ , except for the relationship between dose and enduring changes in wellbeing ( $p < .01$ ), difficulty and enduring changes in wellbeing ( $p < .01$ ), and between difficulty and positive mood (not significant).

**Table 3**

*Spearman's rho correlation coefficient between MEQ30 subscales, survey questions about the psilocybin experience, and dose (N = 511)*

|                                  | Mystical | Positive mood | Time and space | Ineffability | Q1       | Q2       | Q3       | Q4       | Dose |
|----------------------------------|----------|---------------|----------------|--------------|----------|----------|----------|----------|------|
| Mystical                         | —        |               |                |              |          |          |          |          |      |
| Positive mood                    | 0.555*** | —             |                |              |          |          |          |          |      |
| Time and space                   | 0.596*** | 0.330***      | —              |              |          |          |          |          |      |
| Ineffability                     | 0.525*** | 0.446***      | 0.504***       | —            |          |          |          |          |      |
| Q1 Difficulty                    | 0.237*** | -0.009***     | 0.352***       | 0.277***     | —        |          |          |          |      |
| Q2 Meaningfulness                | 0.642*** | 0.472***      | 0.356***       | 0.463***     | 0.300*** | —        |          |          |      |
| Q3 Spiritual Significance        | 0.764*** | 0.409***      | 0.439***       | 0.418***     | 0.311*** | 0.673*** | —        |          |      |
| Q4 Enduring Changes in Wellbeing | 0.398*** | 0.230***      | 0.188***       | 0.254***     | 0.116*** | 0.427*** | 0.358*** | —        |      |
| Dose                             | 0.387*** | 0.224***      | 0.404***       | 0.308***     | 0.253*** | 0.265*** | 0.249*** | 0.130*** | —    |

Note. \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

Positive scores indicate increased wellbeing

## Complete Mystical Experiences

Participants were grouped based on their CME status. A summary of the descriptive statistics of results from the survey questions about the psilocybin experience is provided in Table 4, with participants grouped based on their CME status.

**Table 4**

*Descriptives, Means (M), Standard Deviations (SD) for survey questions about the psilocybin experiences and dose by group*

|                        | Group   | Mean | SD    |
|------------------------|---------|------|-------|
| Difficulty             | Not CME | 2.04 | 1.483 |
|                        | CME     | 2.66 | 1.488 |
| Meaningfulness         | Not CME | 3.55 | 1.214 |
|                        | CME     | 4.30 | 0.754 |
| Spiritual Significance | Not CME | 2.53 | 1.643 |
|                        | CME     | 3.86 | 1.122 |
| Change in Wellbeing    | Not CME | 1.29 | 1.650 |
|                        | CME     | 1.93 | 1.500 |
| Dose                   | Not CME | 3.21 | 1.085 |
|                        | CME     | 3.84 | 0.951 |

Note. Not CME group (N = 326), CME group (N = 185)

## **Discussion**

The aim of this study is to explore acute and enduring consequences of psilocybin use in New Zealand, and the extent of mystical experiences, meaningfulness, spiritual significance, and enduring changes in wellbeing that occur as a result of this, and how these factors are affected by difficult or challenging experiences.

### **Mystical Experiences**

The results of the study indicate that a considerable proportion of participants reported having mystical experiences during their psilocybin sessions. Among 511 participants, the average total score on the MEQ30 was found to be 99.3, indicating a relatively high occurrence of mystical experiences among the participants. Specifically, 36.2% of the respondents met the criteria for a Complete Mystical Experience (CME). These findings are significantly different when compared to the prior study by Carbonaro & colleagues (2016), where the mean total score on the MEQ30 was 50.3, with only 21% of participants meeting the criteria for a CME.

The notable disparity in scores between the two studies could be due to the different focuses of each investigation. The previous study specifically focused on the participants' most challenging psilocybin experience. In contrast, the present study aimed to capture the most notable experience reported by the participants. This difference in focus likely influenced the results, as individuals tend to perceive and interpret their most intense or profound experiences differently compared to their most challenging ones.

In a laboratory study where participants were administered a 20 mg per 70 kg dose of psilocybin, the researchers found the mean total score of 70.0 amongst participants with 61% CME (Barrett et al., 2015). Though not well understood, these differences may be attributed to the difference in the “set and setting” between the varied recreational settings and the controlled

laboratory setting. Though the participants in the present study achieved a higher mean total score for the MEQ30, the laboratory study had a higher rate of CME.

This CME has been found to hold significant predictive value for positive outcomes in various contexts. For example, in a study of psychedelic-assisted psychotherapy involving cancer patients, individuals who met the criteria for a CME demonstrated greater clinical improvements compared to those who did not meet these criteria (Richards et al., 1977).

Participants in the present study who achieved a CME were compared to those who did not. The two groups (CME group and non-CME group) were compared based on their self-reported enduring change in wellbeing. This was done using a Mann Whitney U test due to the non-normal distribution of the data. Despite obtaining a significant result ( $Z=5.03$ ,  $p<0.001$ ), the effect size was determined to be small (0.22). This suggests that the CME group experienced more positive enduring change in wellbeing compared to the non-CME group, though the difference was of a relatively small magnitude.

A CME is classified as MEQ30 results that had a score  $\geq 60\%$  of the maximum possible score on each of the four subscales. In the present study, only 47% participants achieved this threshold for the ‘transcendence of time and space’ subscale, whereas 67%, 83% and 80% achieved this threshold for the ‘mystical’, ‘positive mood’ and ‘ineffability’ subscales. As a result, many participants were classified as not achieving CME due to their scores on the ‘transcendence of time and space’ subscale. ‘Transcendence of time and space’ also showed a lower correlation to enduring changes in wellbeing (0.188), compared to the other subscales, while the ‘mystical’ subscale had the greatest (0.398). If the ‘transcendence of time and space’ requirement for CME was reduced by one point, then the CME group grew from 185 (36.2% of participants) to 248 (48.5% of participants). Profound experiences related to the ‘mystical’,

‘positive mood’ and ‘ineffability’ subscales may result in positive changes in wellbeing for participants without the requirement of ‘transcendence of time and space’. The slight differences found between the CME and non-CME groups may be attributed to the current definition of CMEs. Enhancing the clarity and distinctiveness of results could potentially be achieved by further refining the definition of a CME.

Previous studies observed participants who achieved a CME to have greater clinical outcomes. While the slight, but statistically significant positive changes in wellbeing in this study may hint achieving CME to be better clinical outcomes, ultimately these may not be valid measurements to compare. The present study did not assess participants in a clinical setting, and outcomes were not determined by a clinical tool, but reported in a single Likert question response.

It is important to note that the data may be influenced by certain factors. Both groups differ in size, which could affect the comparability of the results, and there were numerous outliers present in the CME group, which may have impacted the overall data quality and interpretation. These issues could potentially be alleviated by changing the definition of a CME, though more research is warranted.

It is worth noting that not all individuals who consume psilocybin will necessarily have a mystical experience. Factors such as dosage, “set and setting”, individual characteristics, and expectations can influence the likelihood and intensity of these experiences. Nonetheless, the potential for mystical experiences underscores the importance of providing a supportive and conducive environment for individuals undergoing psilocybin-assisted therapies (Ziff et al., 2022).

While mystical experiences are often described in positive terms, it is crucial to recognize that they can also be challenging and emotionally intense. The profound nature of these experiences may bring forth difficult emotions or insights that require integration and support. This highlights the need for skilled facilitation, appropriate preparation and integration practices to ensure the safe and beneficial navigation of these experiences (Ziff et al., 2022).

In conclusion, the occurrence of mystical experiences following psilocybin consumption holds significant implications for understanding the therapeutic potential of this substance. These experiences have been consistently reported and are associated with profound psychological, spiritual, and enduring changes in wellbeing.

### **Challenging Experiences**

This study presents evidence that psychologically challenging experiences following the consumption of psilocybin mushrooms can be linked to both acute adverse effects and enduring psychological issues, as well as lasting benefits. More than 45% of participants reported their psilocybin experience to be at least a moderately difficult experience, with a 7.6% of participants regarding their chosen psilocybin experience to be the single most difficult experience of their life. However, despite 45% of the participants reporting challenging/difficult psilocybin experiences, only 11% reported an enduring decrease in wellbeing due to the experience. Approximately 78% of participants reported an enduring increase in wellbeing, with 35% reporting that their wellbeing had increased very much because of their psilocybin experience.

The results of the correlation analyses showed significant positive associations between the level of difficulty experienced during psychedelic experience and the personal meaning (0.30,  $p < 0.001$ ), spiritual significance (0.36,  $p < 0.001$ ), and positive enduring change in wellbeing (0.12,  $p < 0.01$ ). These findings are consistent with Carbonaro & colleagues' (2016)

study, with similar levels of positive correlation between each factor. While these findings may seem counterintuitive, they align with the clinical observations shared by psychedelic psychotherapists. These professionals have noted that the resolution of psychologically challenging experiences within the context of a psychedelic session can yield profound outcomes, including the attribution of meaning, spiritual significance, and an overall enhancement in life satisfaction (Carhart-Harris & Goodwin, 2017). The resolution of challenging experiences within the therapeutic context of psychedelics is believed to promote catharsis and facilitate profound personal growth (Carhart-Harris & Goodwin, 2017).

Despite the generally positive outcomes among participants in response to psilocybin and low amount of people reporting a decrease in wellbeing, there is still more risk in recreational use of psilocybin as opposed to controlled laboratory studies. In the open question section, though rare, a few participants reported risks such as suicidal ideation, panic attacks, and exacerbating the difficult experience by using other drugs or alcohol. There is much more risk in recreational use of psilocybin due to the absence of psychological screening and unknown psychological background among recreational users prior to ingesting psilocybin (Griffiths et al., 2011). Additionally, only a small proportion of recreational psilocybin users report taking psilocybin under conditions that closely resemble laboratory settings (Bienemann et al., 2020). These ideal conditions typically include being in a calm emotional state before the administration of psilocybin, ensuring physical comfort and safety, having access to social support, and being guided by an experienced professional throughout the psychedelic experience (Carbonaro et al., 2016). The absence of these crucial elements in the survey respondents' experiences may have contributed to higher rates of challenging experiences and decreases in wellbeing. By

implementing these measures, it may be possible to mitigate potential challenges and enhance the overall safety and positive outcomes of psilocybin-assisted experiences.

In the present study, 29% of respondents indicated that they consumed a high dose of psilocybin (3-4grams of dried mushrooms), and 19% indicated that they consumed a heroic dose of psilocybin (5 or more grams of dried mushrooms), which may have contributed to an increased intensity and difficulty during their experience, as there is a significant correlation between the estimated dose amount and difficulty of the experience (0.253,  $p < 0.001$ ). This finding aligns with previous research conducted in laboratory settings, which has consistently shown an increase in the frequency of challenging experiences with higher doses of psilocybin (Studerus et al., 2012). These controlled studies have provided evidence supporting the notion that the intensity and nature of psilocybin experiences are dose dependent.

Despite generally positive outcomes of this study, the risks encountered and the negative outcomes underscore the importance of considering the various factors that may influence the outcomes of psilocybin experiences. The absence of controlled laboratory conditions, the use of higher doses, and the concurrent use of other drugs can significantly impact the challenges associated with psilocybin experiences. Future research should further investigate these factors and their interactions to provide a more comprehensive understanding of the effects and risks associated with different contexts, and substances used in conjunction with psilocybin, to help maximise the benefits and while minimising potential risks associated with psilocybin consumption.

### **Self-medication**

The data collected revealed that a substantial number of participants in the study reported currently experiencing anxiety or depression (41%), indicating a substantial burden of mental

health conditions within the sample. Moreover, a significant percentage of individuals mentioned in their open-ended written comments that they were using psilocybin with the intention of addressing their mental health concerns. While some individuals may indeed engage in recreational use for novelty or adventure, our study reveals a significant subset of individuals who turn to psilocybin with the explicit aim of addressing mental health issues. This finding suggests a shifting perspective and highlights a deeper motivation underlying psilocybin use beyond mere recreational enjoyment.

These views align with the changing attitudes around psychedelics observed in the United States (Polito & Stevenson, 2019). In recent years, the landscape surrounding psychedelics has undergone a significant transformation, influenced by emerging research studies, shifting media portrayals, and a growing public interest. This shift has reshaped the perception of psychedelics, transitioning them from being regarded as dangerous, illicit, recreational substances to being recognised for their therapeutic and medicinal effects (Davis et al., 2022).

These attitudes towards psilocybin use, where psilocybin is valued for self-medication of mental health concerns may be as a result of New Zealand's unique sociocultural context[] and with the increasing availability of information on psilocybin's therapeutic potential, it is crucial to acknowledge that self-medication carries higher risks, and there is the need for scientifically grounded research and responsible guidance to ensure safe and effective use.

The findings of this study contribute to the broader discussion on the responsible use of psilocybin and the potential integration of psychedelics into mental health care. The recognition of the role that self-medication plays in psilocybin use highlights the urgency for evidence-based protocols and therapeutic frameworks that address the specific needs of individuals seeking relief from mental health conditions. It is important to note that while self-medication with psilocybin

may offer potential benefits, it should not replace professional mental health support. The integration of psilocybin into mental health care requires comprehensive clinical frameworks, ethical considerations, and legal regulations to ensure patient safety, informed consent, and access to proper guidance.

## **Limitations**

While the research on the recreational use of psilocybin and its effects on psychological wellbeing and related factors provides valuable insights, it is important to acknowledge several limitations that may impact the interpretation and generalizability of the findings.

As this study was an anonymous internet survey, we cannot know if respondents were truthful in completing the survey. Due to the recruitment methods employed, which primarily targeted individuals through psychedelic-focused internet media, it is important to acknowledge the potential bias in the participant sample of this survey. The nature of the recruitment strategy likely attracted individuals with a pre-existing favourable interest in psychedelic drugs, thereby creating a selection bias. Consequently, the survey results may have underestimated the severity of negative effects associated with psilocybin use. It is plausible that individuals who experienced severe negative effects may have been less likely to come across or participate in the survey due to their negative experiences and subsequent avoidance of discussions related to psychedelics. This highlights the need for caution when interpreting the findings, as they may not fully capture the breadth of experiences and potential adverse effects associated with psilocybin use in the general population. Future research should strive to employ more diverse and representative recruitment strategies to obtain a more comprehensive understanding of the risks and benefits associated with psilocybin use.

Additionally, there was a lack of diversity in the participant sample. The sample was predominately New Zealand European/European (81%) people who had some tertiary education (79.9%). Asians, Māori, Pacific Islanders and other cultural groups in New Zealand were underrepresented in the sample. In fact, there were no participants who identified as Pacific Islander, even though they are a sizeable minority population within New Zealand. Therefore, the findings may not accurately represent the broader population of individuals who engage in recreational psilocybin use.

Due to a clerical error in the online survey, the gender of participants was not collected. Although previous research has not reported that gender has an impact on psilocybin experiences and outcomes (MacLean et al., 2011; Carbonaro et al., 2016), this is still worth considering. While the absence of gender data in this study limits our ability to explore potential gender-related differences, it is unlikely to substantially affect the overall findings and conclusions of the study. However, future research should strive to collect comprehensive demographic data, including gender and perhaps city of residence, to further enhance our understanding of the nuances and potential influences on psilocybin experiences.

While efforts were made to address these limitations within the scope of this research, it is important to acknowledge these factors when interpreting the findings. Future studies should aim to address these limitations to further enhance our understanding of the recreational use of psilocybin and its effects on wellbeing and related factors.

## **Future directions**

This study has provided valuable insights into the relationship between challenging experiences and outcomes in the context of psilocybin use. Building upon these findings, several

avenues for future research can be explored to further deepen our understanding and expand the knowledge in this field.

Future research in the field of psilocybin should strive to investigate a range of factors related to safe and responsible recreational use, thereby advancing our knowledge, and promoting informed consumption practices. Several promising directions are proposed to deepen our understanding of the relationship between challenging experiences and positive outcomes. Firstly, exploring the influence of the emotional state before psilocybin ingestion can shed light on how pre-existing mood and mindset shape the overall experience. Secondly, investigating the impact of the physical comfort of the setting can help identify the environmental conditions that facilitate a more supportive and conducive experience. Additionally, examining the role of social support during the psilocybin session can provide insights into the importance of interpersonal dynamics and the presence of trusted individuals for psychological wellbeing. Lastly, investigating the impact of a guide's presence during the experience can illuminate the benefits of professional assistance in navigating challenging moments and fostering a sense of safety and guidance. By exploring these factors, researchers can contribute to the development of evidence-based guidelines for recreational psilocybin use, ensuring a more informed and beneficial experience for individuals.

In a study conducted by Carbonaro and colleagues (2016), findings revealed that the while the difficulty of a psilocybin experience positively predicted personal meaningfulness, spiritual significance, and enduring change in wellbeing, the duration of the experience was found to have a negative predictive effect on these factors. This finding highlights the importance of focus on reducing the duration of challenging experiences rather than solely reducing the peak difficulty. Although the present study did not collect data on the duration of

challenging experiences, future research should prioritize obtaining this metric. By including the duration of challenging experiences as a measured variable, researchers can gain a more comprehensive understanding of its impact on individuals' overall psilocybin experiences.

Finally, it is worth noting that this study received a substantial number of open-ended written comments, totalling more than 280 submissions. Although these comments were utilised to provide contextual insights for the study's findings, they also present an opportunity for further exploration through qualitative analysis or text-based analysis. Analysing these comments in-depth could offer valuable qualitative insights into participants' experiences, perceptions, and subjective accounts related to challenging experiences and their impact. Such qualitative investigations could provide a richer understanding of the nuances and intricacies surrounding the phenomena under study.

## **Conclusion**

In conclusion, this study explored psilocybin-induced challenging and mystical experiences through the Mystical Experience Questionnaire 30 (MEQ30). The findings shed light on the people's psilocybin experiences, encompassing not only positive dimensions but also the challenging encounters that may arise. By examining the correlations between mystical experiences, challenging encounters, enduring change in wellbeing, personal meaningfulness, and spiritual significance, this research contributes to our understanding of the interplay between these factors and their implications for psychological wellbeing.

The results reveal that participants reported moderate to high levels of mystical experiences, as measured by the MEQ30 dimensions of mystical, positive mood, transcendence of time and space, and ineffability. The study demonstrated a noteworthy correlation between mystical experiences and challenging experiences.

Participants who reported more difficult psilocybin experiences also tended to report greater positive enduring change in wellbeing. This finding aligns with previous research and suggests that the depth and intensity of challenging experiences can lead to positive long-term outcomes for the participant. It seems these challenging moments can serve as catalysts for personal growth, self-reflection, and transformative change.

Furthermore, the study identified strong connections between challenging experiences and personal meaningfulness and spiritual significance. These findings align with previous research and support the notion that challenging experiences within the context of a psilocybin session can lead to positive changes in wellbeing, increased personal meaning, and enhanced spiritual experiences.

Participants assessed to have experienced a Complete Mystical Experience tended to have slightly higher positive change in wellbeing. Although the effect size was small, this association highlights the potential role of mystical experiences in facilitating positive psychological changes. These findings support previous research regarding the transformative potential of such experiences. However, it is important to note that the overall effect size indicates a subtle influence rather than a robust impact. Thus, whilst experiencing a Complete Mystical Experience may contribute to positive outcomes, other factors and individual differences are likely to play important roles in determining the overall effects of psilocybin experiences.

It is imperative to acknowledge the limitations of this study. Participants were recruited from psychedelic-focused internet media, which may limit the generalizability of the findings and introduce bias. Additionally, the reliance on self-report measures introduces the possibility of response bias and variations in interpretation. Future research should aim to include more diverse samples, employ a variety of assessment tools, and incorporate longitudinal designs to further explore the nuanced relationships between challenging experiences, mystical experiences, and the dimensions examined in this study.

Despite these limitations, the present study adds insights into the transformative potential of psilocybin-induced mystical experiences. The findings highlight the interconnectedness between challenging experiences, positive changes in wellbeing, personal meaningfulness, and spiritual significance. This knowledge can inform the development of targeted therapeutic interventions and guide clinicians in leveraging the transformative effect of psilocybin for individuals seeking personal growth, improved psychological wellbeing, and treatment of mental disorders.

In summary, this study emphasizes the significance of mystical experiences within the context of psilocybin consumption and their associations with challenging encounters and positive change in wellbeing. The findings suggest that while recreational psilocybin use is riskier than clinical use, it can have a positive effect on long-term wellbeing, enhance personal meaningfulness, and deepen spiritual significance.

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## Appendices

### Appendix A - Participant Information Sheet



#### Participant Information Sheet

Dear Participants,

My name is Jonathan Zixuan Zong, psychology student at AUT (Auckland University of Technology), studying a Bachelor's of Health Science (Honours) degree. I am conducting a research project investigating the various experiences people have after consuming psilocybin mushrooms (also known as Magic Mushrooms, Shrooms, Mushies, Blue meanies). I will be working with my supervisor Dr Rita Csako, an established clinician who has worked with client populations using various substances (including psilocybin) and has recent and appropriate training in the area, e.g., Understanding Psilocybin: Effects, Neurobiology, and Therapeutic Approaches by Psychedelic Support.

If you are residing in New Zealand, at least 18 years old, have had experience of consuming psilocybin and interested in sharing it with us, you are invited to participate in this research, by completing an anonymous survey.

The aim of this research is to gain a better understanding of what people experience when consuming psilocybin, here in Aotearoa/New Zealand to help us better understand the potential risks and benefits of this substance.

If you are to participate, you will be asked to complete an **online, anonymous survey**, which includes questions about common experiences related to the use of psilocybin. Please be aware that some questions might be challenging, and that you can always skip those that you are not comfortable answering.

**Participation in this research is completely voluntary and anonymous**, you have the freedom to withdraw at any stage without question. You will not be compensated for your participation in this survey. The survey takes approximately 10-15 minutes to complete (on average), will be open and available for completion until: 15 October 2022.

The results of this study will later be used in publications and presented at scientific conferences. **Data during the study will be collected anonymously**, and no personal data will be obtained. All information collected during the research process will be handled **strictly confidentially**. Data obtained during the research are stored as coded information on a secured computer. Data of the research are analysed statistically during which **no personal identification is possible**.

The primary researcher is Jonathan Zixuan Zong, psychology student at AUT (Auckland University of Technology), Faculty of Health and Environmental Science. This project is part of the requirements for completing Bachelor's of Health Science (Honours) degree. The project supervisor is Dr Rita Csako (AUT).

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor: Dr Rita Csako, rita.csako@aut.ac.nz, +64 9 921 9999 Ext.7970. Concerns regarding the conduct of the research should be notified to the Executive Secretary of AUTECH, ethics@aut.ac.nz, (+649) 921 9999 ext 6038.

**For further information about this research, please contact the researcher:** email: kfg8042@aut.ac.nz

## Appendix B – Online Survey

If you consent to participating in the please check the box below.

If you do not agree with the terms of the survey, you may close this tab and there will be no penalty nor record of your responses.

☐ By checking this box, I affirm that I have given my informed consent and that I am at least 18 years old. I understand that I can stop taking the questionnaire at any time and decide not to submit my responses. In doing so, there will be no penalty nor record of my responses.

This first section will ask about your experience after consuming psilocybin mushrooms.

---

Think about your most notable experience after consuming Psilocybin Mushrooms, and answer all the following questions with that one experience in mind.

Approximately how many grams of Psilocybin Mushrooms did you consume?

- ☐ Microdose (0.25-1grams of dried mushrooms)
  - ☐ Low dose (1-2grams of dried mushrooms)
  - ☐ Medium dose (2-3grams of dried mushrooms)
  - ☐ High dose (3-4grams of dried mushrooms)
  - ☐ Heroic dose (5 or more grams of dried mushrooms)
- 

**Instructions:** With your one most notable experience in mind, looking back on the entirety of your psilocybin session, please rate the degree to which at any time during that session you experienced the following phenomena.

Answer each question according to your feelings, thoughts, and experiences at the time of the psilocybin session. In making each of your ratings, use the following scale: 0 – none; not at all. 1 – so slight cannot decide. 2 – slight. 3 – moderate. 4 – strong (equivalent in degree to any other strong experience). 5 – extreme (more than any other time in my life).

---

Factor 1: Mystical

0 1 2 3 4 5

|                                                                                                                                                                 |                                                                                      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Experience of oneness in relation to an “inner world” within.                                                                                                   |    |
| Experience of pure being and pure awareness (beyond the world of sense impressions).                                                                            |    |
| Experience of oneness in relation to an “inner world” within.                                                                                                   |    |
| Experience of the fusion of your personal self into a larger whole.                                                                                             |    |
| Experience of unity with ultimate reality.                                                                                                                      |    |
| Feeling that you experienced eternity or infinity.                                                                                                              |    |
| Experience of oneness or unity with objects and/or persons perceived in your surroundings.                                                                      |    |
| Experience of the insight that “all is One”.                                                                                                                    |    |
| Awareness of the life or living presence in all things.                                                                                                         |   |
| Gain of insightful knowledge experienced at an intuitive level.                                                                                                 |  |
| Certainty of encounter with ultimate reality (in the sense of being able to “know” and “see” what is really real at some point during your experience.          |  |
| You are convinced now, as you look back on your experience, that in it you encountered ultimate reality (i.e., that you “knew” and “saw” what was really real). |  |
| Sense of being at a spiritual height.                                                                                                                           |  |
| Sense of reverence.                                                                                                                                             |  |
| Feeling that you experienced something profoundly sacred and holy.                                                                                              |  |

Answer each question according to your feelings, thoughts, and experiences at the time of the psilocybin session. In making each of your ratings, use the following scale: 0 – none; not at all. 1 – so slight cannot decide. 2 – slight. 3 – moderate. 4 – strong (equivalent in degree to any other strong experience). 5 – extreme (more than any other time in my life).

#### Factor 2: Positive Mood

|                                        | 0 | 1 | 2 | 3 | 4 | 5 |
|----------------------------------------|---|---|---|---|---|---|
| Experience of amazement.               |   |   |   |   |   |   |
| Feelings of tenderness and gentleness. |   |   |   |   |   |   |
| Feelings of peace and tranquility.     |   |   |   |   |   |   |
| Experience of ecstasy.                 |   |   |   |   |   |   |
| Sense of awe or awesomeness.           |   |   |   |   |   |   |
| Feelings of joy.                       |   |   |   |   |   |   |

Page \_\_\_\_\_

Break

Answer each question according to your feelings, thoughts, and experiences at the time of the psilocybin session. In making each of your ratings, use the following scale: 0 – none; not at all. 1 – so slight cannot decide. 2 – slight. 3 – moderate. 4 – strong (equivalent in degree to any other strong experience). 5 – extreme (more than any other time in my life).

### Factor 3: Transcendence of Time and Space

|                                                           | 0 | 1 | 2 | 3 | 4 | 5 |
|-----------------------------------------------------------|---|---|---|---|---|---|
| Loss of your usual sense of time.                         |   |   |   |   |   |   |
| Loss of your usual sense of space.                        |   |   |   |   |   |   |
| Loss of usual awareness of where you were.                |   |   |   |   |   |   |
| Sense of being “outside of” time, beyond past and future. |   |   |   |   |   |   |
| Being in a realm with no space boundaries.                |   |   |   |   |   |   |
| Experience of timelessness.                               |   |   |   |   |   |   |

Page \_\_\_\_\_

Break

Answer each question according to your feelings, thoughts, and experiences at the time of the psilocybin session. In making each of your ratings, use the following scale: 0 – none; not at all. 1 – so slight cannot decide. 2 – slight. 3 – moderate. 4 – strong (equivalent in degree to any other strong experience). 5 – extreme (more than any other time in my life).

-----

Factor 4: Ineffability

0      1      2      3      4      5

|                                                                                                                       |                                                                                      |
|-----------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Sense that the experience cannot be described adequately in words.                                                    |  |
| Feeling that you could not do justice to your experience by describing it in words.                                   |  |
| Feeling that it would be difficult to communicate your own experience to others who have not had similar experiences. |  |

End of Block: Default Question Block

Start of Block: Block 5

How do you feel now about your chosen psilocybin session?

Retrospectively evaluate your experiences during your psilocybin session in the context of your full life experience.

How psychologically difficult or challenging was the experience?

- 0 – not challenging or difficult at all.
- 1 – minimally challenging or difficult.
- 2 – slightly challenging or difficult .
- 3 – moderately challenging or difficult.
- 4 – strong challenge or difficulty (equivalent in degree to any other strong experience).
- 5 – extreme challenge or difficulty (more than any other time in my life).

0      1      2      3      4      5



How personally meaningful was the experience?

- 0 – Not meaningful at all.

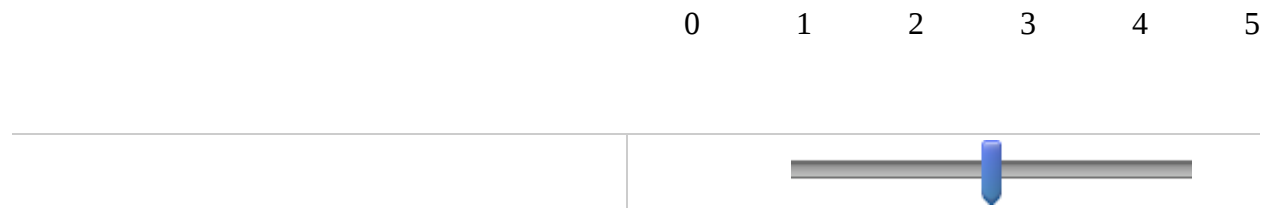
1 – very slightly meaningful.

2 – slightly meaningful.

3 – moderately meaningful.

4 – very meaningful.

5 – extremely meaningful (more than any other time in my life).



Indicate the degree to which the experience was spiritually significant to you.

0 – Not spiritually significant at all.

1 – very slightly spiritually significant.

2 – slightly spiritually significant.

3 – moderately spiritually significant.

4 – very spiritually significant.

5 – extremely spiritually significant (more than any other time in my life).

0 1 2 3 4 5



Do you believe that the experience and your contemplation of that experience have led to a change in your current sense of personal wellbeing or life satisfaction?

3 – Increased very much

2 – Increased moderately

1 – Increased slightly

0 – No Change

-1 – Decreased slightly

-2 – Decreased moderately

-3 – Decreased very much

-3      -2      -      0      1      2      3  
1



If you feel comfortable, please share with us the details of this notable psilocybin experience.

---

---

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---

---

End of Block: Block 5

---

Start of Block: Block 5

The last section will be demographics will ask about your demographics.



What is your current age?

---

What is your highest level of education completed?

- ☐ Primary school
  - ☐ Secondary school: High School/College
  - ☐ Technical College
  - ☐ Skill Certification/Other Post High School Technical Degree
  - ☐ Some University
  - ☐ University Degree: Bachelor's (undergraduate) Degree
  - ☐ University Degree: Postgraduate Degree, PhD, doctorate
-

Which ethnic group do you mostly identify with?

- ☐ New Zealand European
- ☐ Maori
- ☐ Samoan
- ☐ Cook Island Maori
- ☐ Tongan
- ☐ Niuen
- ☐ Chinese
- ☐ Indian
- ☐ European
- ☐ Other (please specify): \_\_\_\_\_

Are you currently suffering from ongoing/persistent (> 6 months) anxiety or depression?

- ☐ Yes (if you feel comfortable doing so, please explain how long this has been a problem, if you are under a physician's care, and if you are taking medication or being treated)

\_\_\_\_\_

- ☐ No

Thank you for completing the survey. Your contribution helps aid the research into the safe medical use of psilocybin.

If you have experienced significant discomfort or psychological distress during this survey, you can reach out to:

**Youthline** Free call 0800 376 633; Free text 234; Email [talk@youthline.co.nz](mailto:talk@youthline.co.nz)

**Lifeline** Free call 0800 543 354; Free Text 4357

**Appendix C – Reliability Analyses of MEQ30**

*Descriptives, Means (M), Standard Deviations (SD), and Cronbach's Alpha (ac) if item dropped for the MEQ30 Factor 1*

| Item                                                                                                                                                                                 | Mean | SD   | If item dropped     |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|---------------------|
|                                                                                                                                                                                      |      |      | Cronbach's $\alpha$ |
| Factor 1: Mystical - Experience of oneness in relation to an "inner world" within.                                                                                                   | 3.48 | 1.46 | 0.955               |
| Factor 1: Mystical - Experience of pure being and pure awareness (beyond the world of sense impressions).                                                                            | 3.51 | 1.49 | 0.955               |
| Factor 1: Mystical - Experience of the fusion of your personal self into a larger whole.                                                                                             | 3.45 | 1.65 | 0.956               |
| Factor 1: Mystical - Experience of unity with ultimate reality.                                                                                                                      | 3.32 | 1.66 | 0.954               |
| Factor 1: Mystical - Feeling that you experienced eternity or infinity.                                                                                                              | 2.64 | 1.76 | 0.958               |
| Factor 1: Mystical - Experience of oneness or unity with objects and/or persons perceived in your surroundings.                                                                      | 3.24 | 1.60 | 0.958               |
| Factor 1: Mystical - Experience of the insight that "all is One".                                                                                                                    | 3.10 | 1.76 | 0.955               |
| Factor 1: Mystical - Awareness of the life or living presence in all things.                                                                                                         | 3.60 | 1.59 | 0.957               |
| Factor 1: Mystical - Gain of insightful knowledge experienced at an intuitive level.                                                                                                 | 3.72 | 1.45 | 0.957               |
| Factor 1: Mystical - Certainty of encounter with ultimate reality (in the sense of being able to "know" and "see" what is really real at some point during your experience.          | 3.03 | 1.65 | 0.956               |
| Factor 1: Mystical - You are convinced now, as you look back on your experience, that in it you encountered ultimate reality (i.e., that you "knew" and "saw" what was really real). | 2.75 | 1.73 | 0.957               |
| Factor 1: Mystical - Sense of being at a spiritual height.                                                                                                                           | 3.20 | 1.67 | 0.956               |
| Factor 1: Mystical - Sense of reverence.                                                                                                                                             | 3.21 | 1.64 | 0.957               |
| Factor 1: Mystical - Feeling that you experienced something profoundly sacred and holy.                                                                                              | 3.04 | 1.80 | 0.956               |

*Descriptives, Means (M), Standard Deviations (SD), and Cronbach's Alpha (α) if item dropped for the MEQ30 Factor 2*

| Item                                                             | Mean | SD   | If item dropped |
|------------------------------------------------------------------|------|------|-----------------|
|                                                                  |      |      | Cronbach's α    |
| Factor 2: Positive Mood - Experience of amazement.               | 4.14 | 1.15 | 0.884           |
| Factor 2: Positive Mood - Feelings of tenderness and gentleness. | 3.57 | 1.44 | 0.891           |
| Factor 2: Positive Mood - Feelings of peace and tranquility.     | 3.69 | 1.38 | 0.893           |
| Factor 2: Positive Mood - Experience of ecstasy.                 | 3.36 | 1.45 | 0.884           |
| Factor 2: Positive Mood - Sense of awe or awesomeness.           | 3.98 | 1.35 | 0.886           |
| Factor 2: Positive Mood - Feelings of joy.                       | 3.87 | 1.29 | 0.881           |

*Descriptives, Means (M), Standard Deviations (SD), and Cronbach's Alpha (α) if item dropped for the MEQ30 Factor 3*

| Item                                                                                                  | Mean | SD   | If item dropped |
|-------------------------------------------------------------------------------------------------------|------|------|-----------------|
|                                                                                                       |      |      | Cronbach's α    |
| Factor 3: Transcendence of Time and Space - Loss of your usual sense of time.                         | 3.66 | 1.43 | 0.912           |
| Factor 3: Transcendence of Time and Space - Loss of your usual sense of space.                        | 3.11 | 1.55 | 0.902           |
| Factor 3: Transcendence of Time and Space - Loss of usual awareness of where you were.                | 2.23 | 1.68 | 0.907           |
| Factor 3: Transcendence of Time and Space - Sense of being "outside of" time, beyond past and future. | 2.59 | 1.78 | 0.896           |
| Factor 3: Transcendence of Time and Space - Being in a realm with no space boundaries.                | 2.37 | 1.83 | 0.902           |
| Factor 3: Transcendence of Time and Space - Experience of timelessness.                               | 2.74 | 1.77 | 0.895           |

*Descriptives, Means (M), Standard Deviations (SD), and Cronbach's Alpha ( $\alpha$ ) if item dropped for the MEQ30 Factor 4*

| Item                                                                                                                                           | Mean | SD   | If item dropped     |
|------------------------------------------------------------------------------------------------------------------------------------------------|------|------|---------------------|
|                                                                                                                                                |      |      | Cronbach's $\alpha$ |
| Factor 4: Ineffability - Sense that the experience cannot be described adequately in words.                                                    | 3.75 | 1.44 | 0.815               |
| Factor 4: Ineffability - Feeling that you could not do justice to your experience by describing it in words.                                   | 3.77 | 1.42 | 0.801               |
| Factor 4: Ineffability - Feeling that it would be difficult to communicate your own experience to others who have not had similar experiences. | 3.84 | 1.40 | 0.919               |

*Exploratory Factor Analysis of the MEQ30 with 4 fixed factors*

| Item                                                                                                                                                                        | Component |       |   |   | Uniqueness |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------|---|---|------------|
|                                                                                                                                                                             | 1         | 2     | 3 | 4 |            |
| Factor 1: Mystical - Experience of oneness in relation to an "inner world" within.                                                                                          | 0.774     |       |   |   | 0.293      |
| Factor 1: Mystical - Experience of pure being and pure awareness (beyond the world of sense impressions).                                                                   | 0.735     |       |   |   | 0.292      |
| Factor 1: Mystical - Experience of the fusion of your personal self into a larger whole.                                                                                    | 0.799     |       |   |   | 0.321      |
| Factor 1: Mystical - Experience of unity with ultimate reality.                                                                                                             | 0.845     |       |   |   | 0.227      |
| Factor 1: Mystical - Feeling that you experienced eternity or infinity.                                                                                                     | 0.567     | 0.408 |   |   | 0.360      |
| Factor 1: Mystical - Experience of oneness or unity with objects and/or persons perceived in your surroundings.                                                             | 0.584     |       |   |   | 0.476      |
| Factor 1: Mystical - Experience of the insight that "all is One".                                                                                                           | 0.823     |       |   |   | 0.300      |
| Factor 1: Mystical - Awareness of the life or living presence in all things.                                                                                                | 0.704     |       |   |   | 0.410      |
| Factor 1: Mystical - Gain of insightful knowledge experienced at an intuitive level.                                                                                        | 0.713     |       |   |   | 0.393      |
| Factor 1: Mystical - Certainty of encounter with ultimate reality (in the sense of being able to "know" and "see" what is really real at some point during your experience. | 0.774     |       |   |   | 0.385      |

*Exploratory Factor Analysis of the MEQ30 with 4 fixed factors*

| Item                                                                                                                                                                                 | Component |   |       |       | Uniqueness |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|---|-------|-------|------------|
|                                                                                                                                                                                      | 1         | 2 | 3     | 4     |            |
| Factor 1: Mystical - You are convinced now, as you look back on your experience, that in it you encountered ultimate reality (i.e., that you "knew" and "saw" what was really real). | 0.795     |   |       |       | 0.384      |
| Factor 1: Mystical - Sense of being at a spiritual height.                                                                                                                           | 0.736     |   |       |       | 0.320      |
| Factor 1: Mystical - Sense of reverence.                                                                                                                                             | 0.724     |   |       |       | 0.412      |
| Factor 1: Mystical - Feeling that you experienced something profoundly sacred and holy.                                                                                              | 0.767     |   |       |       | 0.378      |
| Factor 2: Positive Mood - Experience of amazement.                                                                                                                                   |           |   | 0.748 |       | 0.274      |
| Factor 2: Positive Mood - Feelings of tenderness and gentleness.                                                                                                                     |           |   | 0.720 |       | 0.328      |
| Factor 2: Positive Mood - Feelings of peace and tranquility.                                                                                                                         |           |   | 0.726 |       | 0.327      |
| Factor 2: Positive Mood - Experience of ecstasy.                                                                                                                                     |           |   | 0.801 |       | 0.273      |
| Factor 2: Positive Mood - Sense of awe or awesomeness.                                                                                                                               |           |   | 0.656 |       | 0.295      |
| Factor 2: Positive Mood - Feelings of joy.                                                                                                                                           |           |   | 0.910 |       | 0.236      |
| Factor 3: Transcendence of Time and Space - Loss of your usual sense of time.                                                                                                        | 0.604     |   |       | 0.303 | 0.347      |
| Factor 3: Transcendence of Time and Space - Loss of your usual sense of space.                                                                                                       | 0.768     |   |       |       | 0.264      |
| Factor 3: Transcendence of Time and Space - Loss of usual awareness of where you were.                                                                                               | 0.851     |   |       |       | 0.300      |
| Factor 3: Transcendence of Time and Space - Sense of being "outside of" time, beyond past and future.                                                                                | 0.782     |   |       |       | 0.212      |
| Factor 3: Transcendence of Time and Space - Being in a realm with no space boundaries.                                                                                               | 0.748     |   |       |       | 0.253      |
| Factor 3: Transcendence of Time and Space - Experience of timelessness.                                                                                                              | 0.815     |   |       |       | 0.228      |
| Factor 4: Ineffability - Sense that the experience cannot be described adequately in words.                                                                                          |           |   |       | 0.820 | 0.163      |
| Factor 4: Ineffability - Feeling that you could not do justice to your experience by describing it in words.                                                                         |           |   |       | 0.848 | 0.155      |
| Factor 4: Ineffability - Feeling that it would be difficult to communicate your own experience to others who have not had similar experiences.                                       |           |   |       | 0.839 | 0.264      |

Note. 'oblimin' rotation was used

## Appendix D – Ethics Approval



### Auckland University of Technology Ethics Committee (AUTEC)

Auckland University of Technology  
D-88, Private Bag 92006, Auckland 1142, NZ  
T: +64 9 921 9999 ext. 8316  
E: [ethics@aut.ac.nz](mailto:ethics@aut.ac.nz)  
[www.aut.ac.nz/researchethics](http://www.aut.ac.nz/researchethics)

5 September 2022

Rita Csako  
Faculty of Health and Environmental Sciences

Dear Rita

Re Ethics Application: **22/225 Anonymous survey of the experiences and enduring consequences after consuming psilocybin mushrooms in the context of Aotearoa.**

Thank you for providing evidence as requested, which satisfies the points raised by the Auckland University of Technology Ethics Committee (AUTEC).

Your ethics application has been approved for three years until 26 August 2025.

#### Standard Conditions of Approval

1. The research is to be undertaken in accordance with the [Auckland University of Technology Code of Conduct for Research](#) and as approved by AUTEC in this application.
2. A progress report is due annually on the anniversary of the approval date, using the EA2 form.
3. A final report is due at the expiration of the approval period, or, upon completion of project, using the EA3 form.
4. Any amendments to the project must be approved by AUTEC prior to being implemented. Amendments can be requested using the EA2 form.
5. Any serious or unexpected adverse events must be reported to AUTEC Secretariat as a matter of priority.
6. Any unforeseen events that might affect continued ethical acceptability of the project should also be reported to the AUTEC Secretariat as a matter of priority.
7. It is your responsibility to ensure that the spelling and grammar of documents being provided to participants or external organisations is of a high standard and that all the dates on the documents are updated.
8. AUTEC grants ethical approval only. You are responsible for obtaining management approval for access for your research from any institution or organisation at which your research is being conducted and you need to meet all ethical, legal, public health, and locality obligations or requirements for the jurisdictions in which the research is being undertaken.

Please quote the application number and title on all future correspondence related to this project.

For any [enquiries](#) please contact [ethics@aut.ac.nz](mailto:ethics@aut.ac.nz). The forms mentioned above are available online through <http://www.aut.ac.nz/research/researchethics>

(This is a computer-generated letter for which no signature is required)

The AUTEC Secretariat  
Auckland University of Technology Ethics Committee

Cc: [kfg8042@aut.ac.nz](mailto:kfg8042@aut.ac.nz)