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Mapping the Psychedelic Experience

Subjective Experience Features and Their Relationship to Wellbeing

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Author:
Sampo Matias Mustonen

Supervisors:
Professor Markus Jokela
Professor Jussi Jylkkä
PhD Researcher Andreas Krabbe
PhD Researcher Konsta Kallio-Mannila

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Supervisors: Professor Markus Jokela, Professor Jussi Jylkkä, PhD Researcher Andreas Krabbe, PhD Researcher Konsta Kallio-Mannila

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Abstract:

Background: In recent years, classic psychedelics such as psilocybin and LSD have re-emerged as promising treatments for a wide range of mental health conditions. Beyond clinical settings, emerging evidence suggests that psychedelic experiences may also lead to improvements in wellbeing among healthy individuals. According to recent meta-analyses, these outcomes are linked to the nature and quality of the subjective experiences they induce. In this study, data from several large-scale surveys (N = 5,931) were aggregated to examine how different features of psychedelic experiences—mystical experiences, psychological insights, and challenging experiences—relate to perceived changes in wellbeing. Specifically, the relative importance and interaction effects of these features were assessed, potential non-linear associations were explored, and the effects of lower-level experiential subdimensions were examined. In addition, a broader theoretical issue was explored: To what extent are subjective experiential features *necessary* for improvements in wellbeing?

Results and conclusions: Among experiential features, psychological insights were most strongly related to higher perceived wellbeing, followed by mystical experiences, while challenging experiences were generally associated with poorer outcomes. Interaction analyses showed that mystical experiences and psychological insights were not simply additive, with diminishing additional benefits when both were high. Mystical experiences partially buffered the negative impact of challenging experiences. Relationships between experiential features and wellbeing were predominantly linear, with only negligible non-linear effects. Notably, a substantial subset of participants reported marked wellbeing improvements without high levels of mystical or insightful experiences, indicating that while intense subjective experiences may enhance outcomes, they are not strictly necessary. Overall, these findings highlight psychological insights as a key correlate of wellbeing changes and inform ongoing debates about the role and necessity of subjective experiences in wellbeing change following psychedelic experiences.

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1 Introduction

Psychedelics are a class of compounds that induce profound changes in perception, cognition, and emotions. In recent years, classic psychedelics such as psilocybin and lysergic acid diethylamide (LSD) have re-emerged as promising tools in the treatment of a range of mental health conditions, including depression, anxiety, and substance use disorders (Andersen et al., 2021; Bender & Hellerstein, 2022). Alongside clinical trials, a growing body of naturalistic and survey-based research suggests that psychedelic experiences—even outside of formal therapeutic settings—may lead to lasting improvements in wellbeing in "healthy normals" (Gandy, 2019). Importantly, emerging evidence suggests that these improvements are closely tied to the nature and quality of the subjective experiences induced by psychedelic substances (Kangaslampi, 2023; Kugel et al., 2025).

Among the various subjective effects induced by psychedelics, certain experiential features have emerged as particularly relevant to therapeutic outcomes. Most notably, mystical-type experiences—marked by a profound sense of unity, transcendence of time and space, emotional intensity, and deep personal meaning—have been repeatedly associated with lasting improvements in wellbeing (Barrett et al., 2015; Kangaslampi, 2023; Pahnke, 1966). Similarly, psychological insights, involving sudden realizations about life and the self, often accompanied by a feeling of clarity or certainty, appear to play a central role in facilitating positive change (Davis et al., 2021; Kangaslampi, 2023; Kugel et al., 2025). By contrast, challenging experiences—sometimes referred to as "bad trips"—are less clearly understood; their relationship to wellbeing outcomes appears more variable and, in some cases, adverse (Andersen et al., 2025; Barrett et al., 2016).

Although several subjective effects induced by classic psychedelics have been linked to improvements in wellbeing, it remains unclear whether these experiences are *necessary* for such improvements. Some researchers argue that the therapeutic effects of psychedelics are driven primarily by enhanced neural plasticity in key circuits, suggesting that improvements could arise independently of subjective experiences (Olson, 2021). Others, however, maintain that while these neurobiological changes may be necessary, they are not sufficient on their own to

produce full and enduring therapeutic benefits (Yaden & Griffiths, 2021). This debate is closely connected to ongoing efforts to develop non-hallucinogenic neuroplastogens that could promote therapeutic effects without inducing altered states of consciousness (Chen et al., 2025).

In this study, data from several large-scale survey studies (N = 5,931) were aggregated to investigate the relationship between subjective features of psychedelic experiences and perceived long-term wellbeing changes. Specifically, the relative importance and interaction effects of these features were assessed, potential non-linear associations were explored, and the effects of lower-level experiential subdimensions were examined. Finally, this study aimed to address a broader theoretical question: to what extent are subjective experiential features *necessary* for improvements in wellbeing?

1.1 Overview of classic psychedelics

Psychedelics are a class of compounds that induce profound changes in perception, cognition, and emotions (Nichols, 2016). Naturally occurring psychedelic substances have been used by human cultures for millennia (Garcia & Maia, 2022), yet systematic scientific investigation in Western contexts only began in the mid-20th century. Psychedelic research was a flourishing field from the late 1950s to the early 1970s. During this period, over 40,000 individuals participated in clinical studies, and the field produced more than 1,000 peer-reviewed publications (Ross et al., 2022). However, by the late 1960s, a convergence of sociopolitical factors and the increasing non-medical use of psychedelics led to growing public concern and regulatory restrictions (Dyck, 2019; Soylemez et al., 2025). These developments significantly impeded research, which largely came to a halt by the 1970s. In recent decades, however, there has been a resurgence of scientific and clinical interest in the therapeutic potential of psychedelics, particularly since the early 2000s, following an extended period of dormancy.

Psychedelics can be categorized into different classes based on their pharmacological profile. This study focuses specifically on so-called *classic psychedelics*, such as psilocybin, LSD, and mescaline. These compounds display striking similarities in

their subjective effects and share the same primary mechanism of action (Halberstadt, 2015; Nichols, 2016). Classic psychedelics are structurally similar to the neurotransmitter serotonin, and their effects are primarily attributed to agonism at the $5HT_{2A}$ receptor. This receptor is implicated in various neurocognitive functions, including learning, memory, and pain processing (van Elk & Yaden, 2022).

Psychedelics act across several functional systems (van Elk & Yaden, 2022). On the neural-systems level, several models have been proposed to explain their effects on brain activity. The most prominent is the REBUS model, which emphasizes increased neural entropy—or "disorder"—alongside enhanced global connectivity and communication between typically segregated networks (Carhart-Harris & Friston, 2019). Alternative explanations highlight other mechanisms, such as reduced thalamic gating of sensory input, which may result in a flooding of the cortex with sensory information (Vollenweider & Geyer, 2001). More recently, the cortico-claustro-cortical model has drawn attention to the claustrum, a thin structure rich in 5-HT2A receptors that coordinates cortical network activity. Psychedelics appear to disrupt claustro-cortical coupling, destabilizing network states and impairing cognitive control (Doss et al., 2021). Importantly, psychedelics have also been shown to promote central nervous system plasticity, a mechanism that may underlie some of their long term therapeutic effects (de Vos et al., 2021).

On a psychological level, psychedelics alter consciousness by, for example, intensifying emotional experiences, inducing altered affective states, temporarily reducing cognitive and attentional control, altering perceptions, increasing associative thinking, and enhancing feelings of connectedness (van Elk & Yaden, 2022). Post-acutely, psychedelics can lead to changes in values and beliefs and increase psychological flexibility (Davis et al., 2020; Kähönen, 2023; Timmermann et al., 2021; Jylkkä et al., 2024). They may also open a "therapeutic window for change"—a period of heightened neuroplasticity that enhances receptivity to behavior change interventions (Agnorelli et al., 2025).

Taken together, psychedelics exert widespread effects at neural and psychological levels. At the psychological and experiential level, researchers have highlighted several broad categories of subjective experiences as especially relevant for

understanding their phenomenology and potential therapeutic impact. Among these, mystical-type experiences, psychological insights, and challenging experiences have received the most attention in contemporary literature and will be introduced in the following section.

1.2 Experiential domains relevant to therapeutic outcomes

Psychedelic experiences encompass a wide range of subjective phenomena. Among these, three domains—mystical-type experiences, psychological insights, and challenging experiences—have received particular attention in research because of their potential relevance for therapeutic outcomes and safety.

Particularly at higher doses, psychedelics can induce mystical-type experiences. Mystical experience is a broad, multidimensional construct encompassing features such as a profound sense of connectedness, transcendence of space and time, a sense of the experience of truth and reality at a fundamental level (noetic quality), difficulty putting the experience into words, deeply felt positive mood, and feelings of sacredness and awe (Barrett et al., 2015; Barrett & Griffiths, 2018; van Elk & Yaden, 2022). Comparable states have been reported in individuals engaging in deep meditation, participating in religious or ritual practices, or undergoing near-death experiences (Yaden et al., 2017), and they are often described as deeply meaningful (Griffiths et al., 2006). From the earliest stages of research into the therapeutic potential of psychedelics, researchers have suggested that mystical-type experiences contribute to improved wellbeing or mental health after psychedelic use (e.g., Barrett & Griffiths, 2018; Pahnke, 1969). Empirical studies across laboratory and clinical settings indicate that such experiences are relatively common, even at moderate doses, (Davis et al., 2021; Griffiths et al., 2006).

Various psychometric instruments have been developed to systematically assess mystical experiences. Among these, the Mystical Experience Questionnaire (MEQ) is one of the most widely used and theoretically influential instruments (Barrett et al., 2015), and is grounded in the conceptual framework described above. Alongside the dimensions assessed by the MEQ, several related aspects of psychedelic experiences have been introduced in the literature. One such aspect is ego dissolution,

characterized by a blurring or complete loss of self-boundaries, and is strongly associated with MEQ items assessing unitive experiences (Nour et al., 2016). Another related construct is oceanic boundlessness, assessed via a subscale of the 5-Dimensional Altered States of Consciousness Rating Scale (5D-ASC), which captures positively experienced depersonalization and derealization, profound positive mood, and experiences of unity (Studerus et al., 2010). These overlapping yet distinct constructs highlight the multifaceted nature of mystical-type experiences, as well as the challenges inherent in assessing experiences that, by definition, are difficult to put into words (Breeksema & van Elk, 2021; Griffiths et al., 2006; Pahnke, 1969; Stace, 1960).

In addition to mystical experiences, psychological insights—during which individuals gain novel perspectives or understandings about their life and themselves—constitute another core domain of psychedelic experiences, with potential relevance for therapeutic outcomes. Insights are a regularly reported feature of psychedelic experiences, increasing in frequency with higher doses (Kugel et al., 2025). They also constitute a frequent motivation for both clinical and naturalistic use (Johnstad, 2023; van Oorsouw et al., 2022). Individuals often attribute subsequent improvements in wellbeing or behavior to the perspectives and understandings gained during these experiences (Carhart-Harris & Nutt, 2010). Insights frequently occur suddenly and are accompanied by affective intensity and a heightened sense of clarity or certainty (Kugel et al., 2025), features that may enhance their therapeutic significance.

Several psychometric instruments have been developed to specifically assess psychological insights, such as the Psychological Insight Questionnaire (PIQ; Davis et al., 2021). However, because insights are central to psychedelic experiences, many scales assessing subjective effects also include related items—for example, MEQ items assessing noetic quality (Barrett et al., 2015) and Altered States of Consciousness Rating Scale items measuring “insightfulness” (Studerus et al., 2010). This overlap reflects some conceptual proximity between mystical experiences—particularly noetic quality—and psychological insights. However, a key distinction is that noetic quality involves the perception of “profound truths” or ultimate reality, often ineffable in

nature, whereas psychological insights pertain to more practical, personal, or psychological understanding rather than abstract universal truths.

Challenging experiences, sometimes referred to as “bad trips,” represent another important experiential domain of psychedelic experiences, with implications for both safety and potential therapeutic processing. Overall classic psychedelics are considered relatively safe when administered under supportive conditions, with appropriate screening and preparation; in the modern clinical trials few serious adverse effects have thus far been reported (Holze et al., 2024; Yao et al., 2024). These substances also have low potential for physical dependence or addiction relative to other psychoactive drugs (Calderon et al., 2023). Nonetheless, milder and transient adverse effects are relatively common and remain a concern, particularly in naturalistic settings (Barrett et al., 2016). Such effects may include affective symptoms (e.g., panic, anxiety, or depressed mood), cognitive disturbances (e.g., confusion, disorientation, or feelings of losing one’s sanity), and somatic symptoms (e.g., nausea or heart palpitations) (Barrett et al., 2015).

Challenging experiences are more likely to occur at higher doses, during first time use, or in less comfortable or supportive environments, whereas factors such as social support, and a safe setting appear to reduce their intensity and duration (Carbonaro et al., 2016; Goldy et al., 2025). Individual characteristics also influence the likelihood of challenging experiences. Traits such as openness and acceptance and a willingness to surrender to the experience are associated with more positive and mystical-type experiences, whereas lower openness or preoccupied, anxious, or confused states increase the risk of adverse reactions (Aday et al., 2021). Many of these contextual and individual factors affecting the experience are collectively described by the concept of “set and setting”. In psychedelic therapy, set and setting are considered central determinants of outcomes, although the precise mechanisms through which they exert their influence remain incompletely understood (Borkel et al., 2024; Golden et al., 2022).

Although challenging experiences and adverse effects are often discussed primarily in terms of safety, they may also offer opportunities for therapeutic processing. In a large survey study examining individuals’ single most psychologically difficult

psychedelic experience, 84% of respondents reported deriving benefits despite the challenges encountered (Carbonaro et al., 2016). Challenging experiences can, in certain cases, facilitate psychological insights and support emotional processing, with individuals sometimes attributing positive outcomes directly to these difficult experiences (Gashi et al., 2021). Building on this perspective, the next section reviews evidence linking mystical experiences, psychological insights, and challenging experiences to long-term changes in wellbeing.

1.3 Wellbeing effects associated with subjective experiences

An emerging body of evidence indicates that the administration of classic psychedelics—particularly when combined with appropriate support and guidance—can lead to improvements in wellbeing and mental health. Recent reviews of modern-era clinical trials have reported significant reductions in symptoms of depression, anxiety, end-of-life distress associated with terminal illness, obsessive–compulsive disorder, and substance use disorders (Andersen et al., 2021; Bender & Hellerstein, 2022; Yao et al., 2024). Specifically, the evidence is most robust for mood and anxiety disorders, with Yao et al. (2024) reporting large effect sizes for psilocybin (Hedges' g = 1.49, 22 studies), followed by ayahuasca (g = 1.34, 7 studies) and LSD (g = 0.65, 3 studies). Beneficial effects have also been reported in non-clinical populations, including improvements in life satisfaction, mood, social connectedness, prosocial behavior, and reductions in subclinical distress (Gandy, 2019). However longitudinal studies have yielded mixed results, suggesting that naturalistic use may be highly context-dependent and not uniformly beneficial (Nayak et al., 2023; Simonsson et al., 2025).

Subjective experiences occasioned by psychedelics—particularly mystical experiences and psychological insights—have been linked to changes in wellbeing in several studies. A recent review of 44 studies by Kangaslampi (2023) reported that mystical-type experiences and related phenomena—such as boundless states and ego dissolution—occasioned by classic psychedelics were associated with wellbeing improvements in both clinical and non-clinical populations, with somewhat stronger evidence among healthy individuals (see also: Ko et al., 2022). The same review also identified positive associations between psychological insights or emotional

breakthroughs and improvements in wellbeing. In contrast, other common subjective effects, such as visual or auditory hallucinations, were generally not linked to improved wellbeing. Complementing these findings, Kugel et al. (2025) reviewed 29 studies and observed that insights catalyzed by classic psychedelics were linked to therapeutic improvements in 25 of them, spanning a broad range of wellbeing and mental health outcomes. Notably, both reviews suggested that insights may play a more central role in facilitating wellbeing improvements than mystical-type experiences. Although only a limited number of studies directly compared these experiential domains or included them in the same statistical models, insights tended to show stronger and more consistent associations with therapeutic outcomes.

Several mechanisms have been proposed to account for how these subjective experiences contribute to wellbeing. Griffiths et al. (2006) suggested the therapeutic potential of mystical-type experiences derives from their profound perceived meaning and spiritual significance, which may offer individuals new perspectives on life and foster a greater sense of meaning and purpose. Hendricks (2018) proposed that the therapeutic potential of mystical experiences may derive from their capacity to evoke awe, which in turn fosters a diminished self-focus (which they termed “the small self”). This notion closely parallels the construct of self-transcendence, defined as a shift of attention beyond the self toward a larger perspective (Ge & Yang, 2023). Both Hendricks (2018) and Ge and Yang (2023) emphasized that such experiences may enhance wellbeing by promoting positive affect, connectedness, mindfulness, adaptive meaning-making, and encouraging prosocial motivation.

Another proposed mechanism contributing to wellbeing is the noetic quality of psychedelic experiences—the sense that an experience conveys profound, intuitive knowledge or insight. Research on noetic and transcendent experiences suggests that they can foster personal growth, self-understanding, and enduring improvements in wellbeing (Yaden et al., 2017). This concept closely parallels psychological insights, which, as noted above, appear particularly salient for wellbeing outcomes.

Relatedly, Kangaslampi (2023) highlighted the role of emotional breakthroughs. While these overlap substantially with insights, they differ in emphasis and temporal focus. Emotional breakthroughs typically reflect the acute process of confronting and

releasing difficult emotions, often accompanied by relief or resolution (Roseman et al., 2019). Insights, in turn, may follow these breakthroughs, capturing the subsequent processes of understanding and meaning-making (Nygart et al., 2022). Notably, recent evidence indicates that psychological insights may mediate the relationship between emotional breakthroughs and improvements in mental health outcomes (Peill et al., 2022), pointing to the possibility that insights, rather than breakthroughs themselves, are the more direct mechanism of change.

To summarize, although mystical experiences have traditionally received greater attention, emerging evidence suggests that psychological insights may be equally—if not more—relevant to therapeutic and wellbeing outcomes. Insights have long been examined in psychotherapy literature, where they are consistently associated with positive treatment outcomes across a range of therapeutic modalities (Jennissen et al., 2018). Accordingly, insights may represent a central mechanism of action, particularly in the context of psychedelic-assisted therapy, where structured counseling and integration are provided to facilitate the translation of these experiences into lasting psychological change.

By contrast, the role of challenging experiences in shaping wellbeing is considerably more complex. Across the studies reviewed by Kangaslampi (2023), challenging experiences showed predominantly null associations with wellbeing outcomes, with some evidence of negative associations depending on the specific outcome and analytic model. However, the effects of challenging experiences appear to vary across their specific dimensions. For example, Barrett et al. (2016) examined different dimensions of challenging experiences and found that fear and paranoia experienced during a psychedelic experience predicted increased wellbeing, whereas experiences involving death were negatively associated with improvements. In contrast, Andersen et al., (2025) reported a somewhat opposing pattern: fear, isolation, and paranoia were negatively associated with changes in wellbeing, whereas grief, feelings of insanity, and experiences of death were positively associated with wellbeing.

Overall, no clear conclusions can yet be drawn. However, these findings underscore that all challenging experiences are possibly not equally detrimental, and that certain types may even facilitate wellbeing, particularly when processed effectively within a

supportive context. Another plausible interpretation is that challenging experiences may be beneficial up to a certain threshold of intensity—especially when accompanied by emotional breakthroughs and insights (Nygart et al., 2022)—but can become detrimental when the experience is too intense or overwhelming. Individual differences in response to challenging experiences also appear to play a role in shaping their impact on wellbeing (Wood et al., 2024).

Taken together, these findings illustrate that challenging experiences are an integral—but complex—component of psychedelic experiences. While their direct impact on wellbeing remains uncertain, certain types of challenging experiences may support psychological growth, particularly when accompanied by emotional breakthroughs, insights, and supportive integration. Understanding the nature and effects of these experiences is therefore essential—not only for maximizing safety, but also for guiding the design, delivery, and perception of psychedelic-assisted therapies.

1.4 Are the subjective experiences necessary for therapeutic effects?

Although the preceding evidence highlights that various subjective experiences—in particular mystical experiences and psychological insights—are associated with improvements in wellbeing, it remains unclear whether these experiences are *necessary* for therapeutic effects. Olson (2021) argues that the therapeutic properties of psychedelics are driven primarily by enhanced neural plasticity in key circuits. From this perspective, associations between subjective experiences and improvements in wellbeing reflect shared dose-dependent neural effects rather than a causal role for the experiences themselves. On the other hand, Yaden & Griffiths (2021) contend that although the underlying neurobiological effects are likely necessary, they are not sufficient to produce full and enduring therapeutic improvements on their own. This view is supported by findings showing that while many subjective effects are dose dependent, only a subset—such as mystical experiences and psychological insights—consistently relate to wellbeing outcomes, whereas other common effects (e.g., perceptual alterations) do not. However Olson (2021) notes that claims about subjective experiences driving therapeutic effects rest largely on correlational evidence, and that mystical-type experiences may instead

serve as indicators of the underlying neurobiological mechanisms engaged during a psychedelic experience.

Support for the plasticity-first perspective comes from emerging evidence on non-hallucinogenic psychedelic analogues. Chen et al. (2025) reviewed recent preclinical animal studies in which several novel compounds (e.g., tabernanthalog, 2-Br-LSD, lisuride) demonstrated antidepressant- and anxiolytic-like effects without triggering hallucinogenic behaviors. One case report and an ongoing clinical trial further suggest that combining psychedelics with $5HT_{2A}$ antagonists may suppress hallucinatory effects while retaining antidepressant efficacy (Chen et al., 2025). Furthermore, a recent Phase Ib trial of the non-hallucinogenic neuroplastogen zalsupindole (DLX-001) reported improvements in depressive symptoms in adults with major depressive disorder, despite the absence of hallucinatory or dissociative effects (Delix Therapeutics, 2025). Though preliminary, these findings lend credibility to the argument that the therapeutic effects of psychedelics might primarily arise from their neuroplastic properties.

The question about *the necessity* of subjective experiences is not merely of theoretical interest but of considerable practical importance. Along with a myriad of political, social and legislative factors (Soylemez et al., 2025), the intense and varied subjective effects of psychedelics are likely one aspect which has hindered psychedelic assisted therapies from becoming widely used treatments (Olson, 2021). These effects necessitate prolonged therapeutic support and medical monitoring to ensure safety, which substantially increases the cost and complexity of treatment delivery (Chen et al., 2025). They can also be distressing for some patients, raising concerns about tolerability and suitability across broader clinical populations. At present, people with—for example—personal or family histories of psychosis, bipolar disorder, or recent suicidal ideation are commonly excluded from clinical studies (Kratina et al., 2025).

If subjective experiences were deemed unnecessary for therapeutic benefits, then developing or prioritizing psychoplastogens with fewer unpredictable subjective effects might be preferable (Chen et al., 2025; Olson, 2021). Although beyond the scope of this study, it is worth noting, that whether subjective experiences are

necessary or not, full and long lasting therapeutic effects can be achieved only if the increased plasticity is “put to use”, by working towards wanted change, for example in the context of psychedelic assisted therapy, and that increased plasticity in itself does not guarantee positive outcomes (Jones, 2025).

1.5 Aims of this study

In this preregistered study (https://osf.io/dksjf/), data from previous studies were aggregated to evaluate how different features of psychedelic experiences relate to perceived changes in wellbeing.

The specific aims were to:

1) Evaluate the relative importance and interaction of different experiential features

The relative importance of mystical experiences, psychological insights, and challenging experiences for wellbeing was evaluated. In addition, potential interactions between these experiential features were examined.

2) Investigate possible non-linear relationships

Exploratory analyses were conducted in which non-linear terms of mystical experiences, psychological insights, and challenging experiences were included as predictors.

3) Analyze the impact of lower-level experiential dimensions on wellbeing

More detailed analyses were conducted to examine the relationships between wellbeing outcomes and specific aspects (subscales) of mystical experiences, psychological insights, and challenging experiences.

4) Assess whether subjective effects are necessary for wellbeing improvement

The extent to which subjective effects are necessary for wellbeing improvement was evaluated. Specifically, it was examined whether a substantial number of individuals reported low levels of mystical experience and psychological insight alongside high levels of wellbeing improvement. If high levels of mystical experience or psychological insight were necessary for high wellbeing improvement, such cases would be expected to be rare.

2 Methods

2.1 Data

Data was aggregated from previously published studies in which participants retrospectively evaluated their psychedelic experiences and their perceived impact on wellbeing (Agin-Liebes et al., 2021; Davis et al., 2021; Davis et al., 2024; Davis, et al., 2021; Lancelotta et al., 2025). All participants were naturalistic users, having consumed psychedelics outside of clinical or research settings. The studies involved a range of psychedelic substances including LSD, psilocybin and mescaline. Participants assessed their experiences and wellbeing-related outcomes through online surveys.

2.2 Measurements

The acute psychedelic experience features were measured in retrospect using the following three questionnaires: 1) Mystical Experience Questionnaire (MEQ; Barrett et al., 2015); 2) Psychological Insight Questionnaire (PIQ; Davis et al., 2021); and 3) Challenging Experiences Questionnaire (CEQ; Barrett et al., 2016). All items were rated on a 6-point Likert scale (0 = 'none; not at all', 1 = 'so slight cannot decide', 2 = 'slight', 3 = 'moderate', 4 = 'strong', and 5 = 'extreme; more than ever before in my life').

The revised version of MEQ (MEQ30; Barrett et al., 2015) comprises 30 items and captures mystical-type experiences through a four-factor structure. The first and largest factor (15 items) measures "core" mystical features, including internal and external unity, noetic quality, and sacredness. For example, participants rated statements such as *"I experienced oneness or unity with objects and/or persons perceived in my surroundings."* The second factor (6 items) assesses positive mood, while the third (6 items) captures altered perceptions of time and space. The fourth factor focuses on ineffability—the difficulty of describing the experience in words. Additionally the MEQ can be used to determine whether a participant had a "complete mystical experience," defined as scoring ≥60% of the maximum possible score on each of the four subscales (Barrett et al., 2015).

In their original article validating the MEQ30, Barrett et al. (2015) demonstrated strong internal and external validity for the measure. In the four-factor structure, factor loadings were high for all items on their intended factors, and internal consistency was excellent across subscales ($\alpha = 0.86–0.97$). A second-order latent variable model (MEQ30-total) also demonstrated acceptable fit, supporting the use of a total score representing an overarching mystical experience construct. Subsequently, the MEQ30 has been validated in a number of independent samples and has also been translated into several languages, demonstrating consistently good psychometric properties (Andersen et al., 2025; Hovmand et al., 2025; Wirsching et al., 2024).

The PIQ consists of 23 items and measures psychological insights with two factors. The first factor reflects insights related to avoidance and maladaptive patterns (14 items), including statements such as *"I discovered a clear pattern of avoidance in my life"*, while the second factor captures insights related to goals and adaptive patterns (9 items), including statements such as *"Awareness of my life purpose, goals, and/or priorities"*. In the original article validating the Psychological Insight Questionnaire (PIQ), Davis et al. (2021) demonstrated acceptable fit for the two-factor structure, with high internal consistency for both subscales and strong item–total and inter-item correlations. Construct validity was supported by moderate correlations with mystical experiences (MEQ) and low correlations with challenging experiences (CEQ), indicating that the PIQ captures aspects of the psychedelic experience distinct from these domains. The PIQ also predicted retrospective changes in psychological flexibility and wellbeing, explaining unique variance beyond MEQ and CEQ scores. Subsequent validation studies have confirmed good internal consistency, as well as strong criterion and concurrent validity; however, some evidence suggests that the PIQ may be best represented by a single general factor, with much of the variance in the subscale scores accounted for by this underlying dimension (Flameling, 2025).

The CEQ was developed to capture the core phenomenological dimensions of challenging psychedelic experiences while differentiating them from more positive experiential domains (Barrett et al., 2016). The questionnaire contains 26 items and measures challenging aspects of the psychedelic experience across seven dimensions: fear, grief, death, insanity, isolation, physical distress, and paranoia. Here,

participants rate items such as *"I felt like I was losing my mind,"* or *"I felt my body shake/tremble"*. The seven-factor structure was derived from large-scale qualitative and quantitative analyses, capturing the major recurring experiential themes reported during difficult psychedelic experiences. Importantly, the CEQ has shown good discriminant validity to measures of mystical experience, oceanic boundlessness and ego dissolution, indicating that the CEQ assesses a distinct and more negatively valanced experiential domain rather than an extension of positive or transcendent states (Barrett et al., 2016; Dworatzyk et al., 2022).

Perceived change in wellbeing was assessed with the following item, used in previous research: *"Do you believe that the experience and your contemplation of that experience has led to long-term and persisting changes in your current sense of personal wellbeing or life satisfaction?"* (Griffiths et al., 2008). Responses ranged from -3 ("strong negative change that I consider undesirable") to 3 ("strong positive change that I consider desirable"), with 0 indicating no change.

2.3 Data analysis

To address the first three research questions, a series of linear regression analyses were performed. First, to evaluate the relative importance of different experiential features and their interactions on wellbeing, mean scores from the MEQ, PIQ, and CEQ were entered as predictors along with their two-way interaction terms (Model 1). Second, to investigate potential non-linear relationships, the same mean scores and their squared terms were included as predictors, excluding interaction terms (Model 2). Third, to examine the contribution of specific experiential dimensions, only subscale scores from all three measures were entered simultaneously as predictors (Model 3). Age and sex were included as covariates in all models. Model assumptions were evaluated for the regression analyses. The Breusch–Pagan test indicated a violation of the homoscedasticity assumption; however, visual inspection of residual plots did not reveal substantial or systematic heteroscedastic patterns. Inspection of Q–Q plots indicated deviations from normality of the residuals. Nevertheless, given the large sample size, linear regression analyses were retained. Prior work has shown that linear models are generally robust to non-normality when sample sizes are sufficiently large, no influential outliers are present, and predictor variables are not

highly skewed (Knief & Forstmeier, 2021). Standardized regression coefficients (β) were used to evaluate the relative strength of predictors. Following Cohen's (1988) guideline for small effect sizes, coefficients ≥ 0.10 were considered meaningful for interpretation; all estimates are reported in tables, but effects below this threshold are not discussed in the text.

To evaluate whether subjective experience features were necessary for perceived improvements in wellbeing, cases were cross-tabulated based on levels of subjective effects and perceived wellbeing change, and the frequency and proportion of cases in each group were reported. Subjective effects were categorized using percentile based cutoffs into three groups: low (<25th percentile), moderate (25th–75th percentile), and high (>75th percentile). Here MEQ and PIQ were aggregated into a single Subjective Experience Index (SEI; i.e., high MEQ *or* PIQ) by taking the greater score of participants' standardized scores on the MEQ and the PIQ. This approach reflects the assumption that either a strong mystical experience or strong psychological insights may be sufficient to drive wellbeing improvement. Due to the seven-point response scale of the perceived wellbeing change measure (ranging from –3 to +3) and a distribution characterized by strong positive skew, percentile-based categorization was not applied to the wellbeing variable. Instead, wellbeing change was grouped into three ordered categories reflecting meaningful differences in reported change, while also aiming to yield groups of broadly comparable size: high improvement (score = 3), moderate improvement (score = 2), and small improvement to negative change (scores from 1 to –3).

Additionally, Necessary Condition Analysis (NCA; Dul, 2016) was used to examine whether high mystical experience or psychological insight was necessary for wellbeing improvement. NCA identifies whether a certain level of a predictor (X) is required for a specific level of an outcome (Y), even though X alone may not be sufficient to produce Y. The method plots the data on an X–Y graph and estimates a 'ceiling line' that separates the observed data from an empty upper-left zone, where low values of X prevent achieving high values of Y, thus quantifying bottlenecks or constraints. The size of the empty zone reflects the strength (i.e. effect size) of the necessary relationship. Ceiling lines can be estimated using various techniques (Dul, 2016); here, the CR-FDH (Ceiling Regression–Free Disposal Hull) technique was

used, which allows some points to fall above the line and provides a robust estimate while accommodating variability in the data.

3 Results

3.1 Summary of Subjective Experience Measures

The sample consisted of 5931 respondents, with an average age of 33.5 years (SD=16.8). Of the respondents, 66.5% identified as male and 31.4% as female. Descriptive statistics are presented in Table 1. The overall mean score on the MEQ was 3.58 (SD = 0.99), with approximately 48.5% of participants meeting the criteria for a full mystical experience, as defined by Barrett et al. (2015). The PIQ had an overall mean of 3.03 (SD = 1.10), while the CEQ had a mean score of 1.22 (SD = 1.09). The three subjective experience measures demonstrated good to excellent internal consistency. Cronbach's alpha values for all MEQ and PIQ subscales ranged between 0.85 and 0.95. Similarly, most CEQ subscales showed alpha values between 0.80 and 0.95, with the exception of the Paranoia subscale, which consists of only two items. However, these two items showed a moderately strong correlation (r = 0.63), suggesting acceptable internal consistency.

Table 1. *Descriptive statistics for MEQ, PIQ, and CEQ subscales.*

Subscale	M	SD	Cronbach's *α*
MEQ Mystical	3.57	1.18	.94
MEQ Positive Mood	3.84	0.99	.85
MEQ Time/Space	3.16	1.31	.88
MEQ Ineffability	3.99	1.12	.85
PIQ Maladaptive	2.88	1.25	.93
PIQ Adaptive	3.26	1.10	.87
CEQ Grief	1.34	1.32	.90
CEQ Fear	1.40	1.43	.93
CEQ Physical Distress	1.25	1.12	.82
CEQ Insanity	1.14	1.40	.84
CEQ Isolation	1.24	1.46	.89
CEQ Death	1.11	1.66	.87
CEQ Paranoia	0.55	1.09	.77

In terms of intercorrelations, MEQ total scores were moderately correlated with PIQ scores (r = .49), suggesting some overlap between mystical-type experiences and psychological insights. By contrast, MEQ total scores were essentially unrelated to CEQ scores (r = .04). PIQ scores showed a small positive correlation with CEQ scores (r = .20). The correlations between the MEQ, PIQ and CEQ subscales are presented in Table 2.

Table 2. *Pearson correlations between MEQ, PIQ and CEQ subscales.*

	1	2	3	4	5	6	7	8	9	10	11	12
1. MEQ Mystical	—											
2. MEQ Positive Mood	**.69**	—										
3. MEQ Time–Space	**.64**	**.43**	—									
4. MEQ Ineffability	**.53**	**.50**	**.51**	—								
5. PIQ Maladaptive	.37	.31	.25	.26	—							
6. PIQ Adaptive	**.62**	**.52**	.36	.35	**.67**	—						
7. CEQ Grief	−.02	−.18	.13	.05	.31	.07	—					
8. CEQ Fear	−.03	−.20	.22	.09	.17	.02	**.73**	—				
9. CEQ Physical Distress	.03	−.07	.18	.06	.22	.11	**.57**	**.63**	—			
10. CEQ Insanity	.02	−.14	.26	.11	.13	.02	**.60**	**.77**	**.57**	—		
11. CEQ Isolation	−.08	−.24	.15	.03	.17	−.02	**.73**	**.69**	**.51**	**.62**	—	
12. CEQ Death	.22	.01	.38	.15	.22	.17	**.46**	**.54**	**.45**	**.53**	**.41**	—
13. CEQ Paranoia	−.08	−.21	.08	−.07	.12	.00	**.53**	**.57**	**.52**	**.57**	**.56**	.37

Note. Correlations greater than .40 are shown in bold.

3.2 Associations between subjective experiences and perceived wellbeing effects

The majority of participants reported that their psychedelic experience resulted in long-term and persistent improvements in personal wellbeing or life satisfaction. Specifically, 60.7% of respondents rated the change as a “strong positive change that I consider desirable” (score = 3), while an additional 32.4% indicated either slight

(score = 1) or moderate (score = 2) positive change. A small proportion of participants (4.1%) reported no change (score = 0), and 2.7% indicated a negative impact on wellbeing (scores = −1 to −3).

Subjective experience features of the psychedelic experience were significantly associated with perceived changes in wellbeing. A summary of Model 1 is presented in Table 3. The model was statistically significant overall, $F(8, 5813) = 205.1$, $p < .001$, explaining approximately 22% of the variance in wellbeing change scores (adjusted $R^2 = .219$). All three main experience-related predictors were statistically significant. Among these, PIQ emerged as the strongest positive predictor of wellbeing change ($\beta = 0.570$, $p < .001$), followed by MEQ ($\beta = 0.351$, $p < .001$). In contrast, higher CEQ scores were associated with lower wellbeing change scores ($\beta = -0.540$, $p < .001$).

Table 3. *Model 1 summary. Linear regression model with perceived wellbeing change as the dependent variable and MEQ, PIQ, and CEQ mean scores and interactions as predictors.*

Predictor	Estimate	β	Std. Error	t-value	p-value
Intercept	0.437	-	0.111	3.95	< .001
MEQ	0.385	0.351	0.033	11.77	< .001
PIQ	0.568	0.570	0.042	13.37	< .001
CEQ	−0.539	−0.540	0.048	−11.35	< .001
Age	0.002	0.036	0.001	3.00	.003
Sex	−0.075	−0.032	0.027	−2.78	.005
MEQ × PIQ	−0.087	−0.462	0.011	−8.18	< .001
MEQ × CEQ	0.069	0.273	0.014	5.01	< .001
PIQ × CEQ	0.021	0.077	0.013	1.64	.102

Note. Adjusted $R^2 = 0.219$; $F(8, 5813) = 205.1$, $p < .001$. Sex coded as 0 = Male, 1 = Female.

The two-way interaction between MEQ and PIQ was significant ($\beta = -0.462$, $p < .001$) and is illustrated in Figure 1, suggesting that the beneficial effects of each are not simply additive; the positive influence of one is weakened at higher levels of the

other. The MEQ × CEQ interaction was significant (β = 0.273, p < .001) and illustrated in Figure 2, indicating that mystical-type experiences may buffer against the negative impact of challenging experiences.

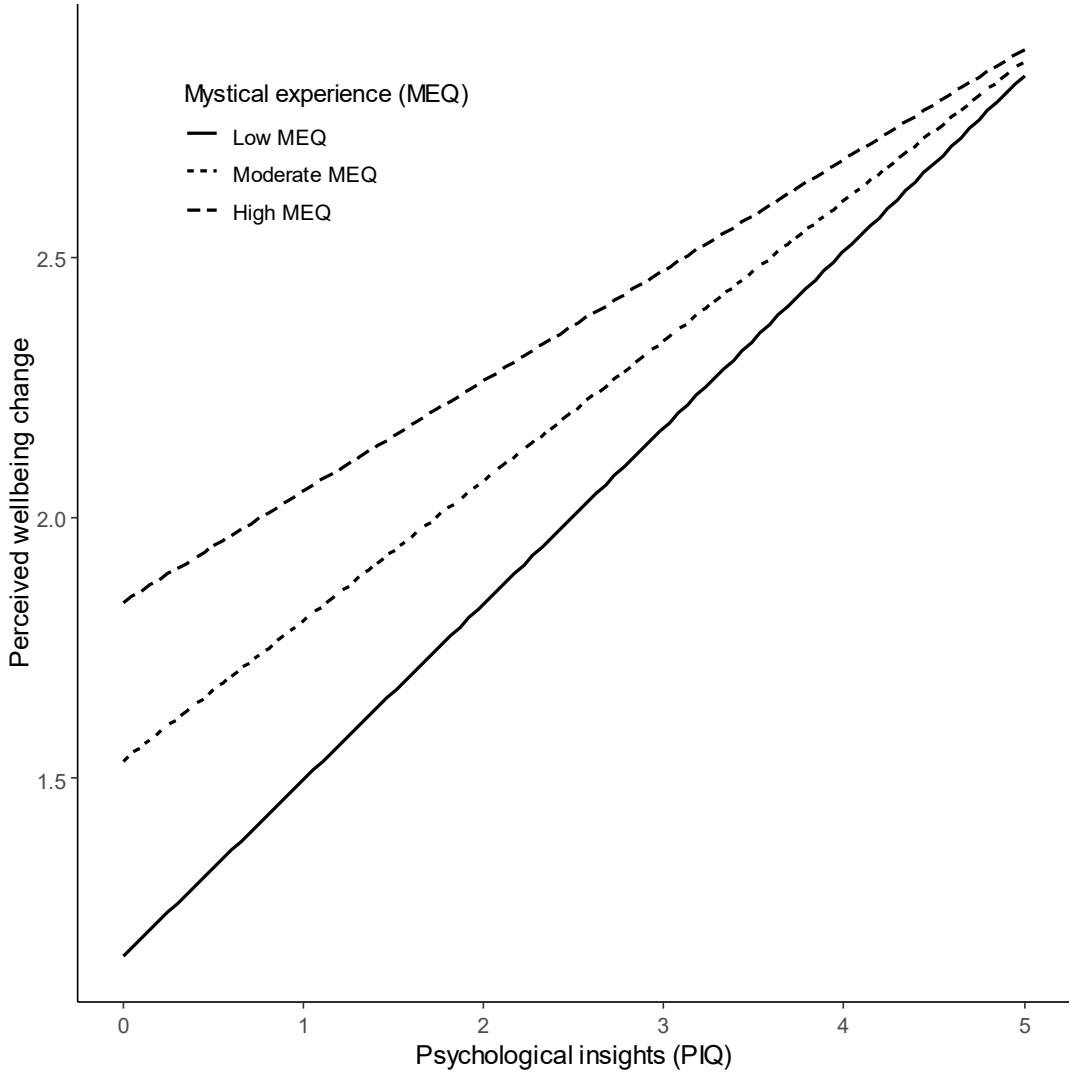

Figure 1. *Perceived wellbeing change as a function of psychological insights (PIQ), moderated by mystical experiences (MEQ).*

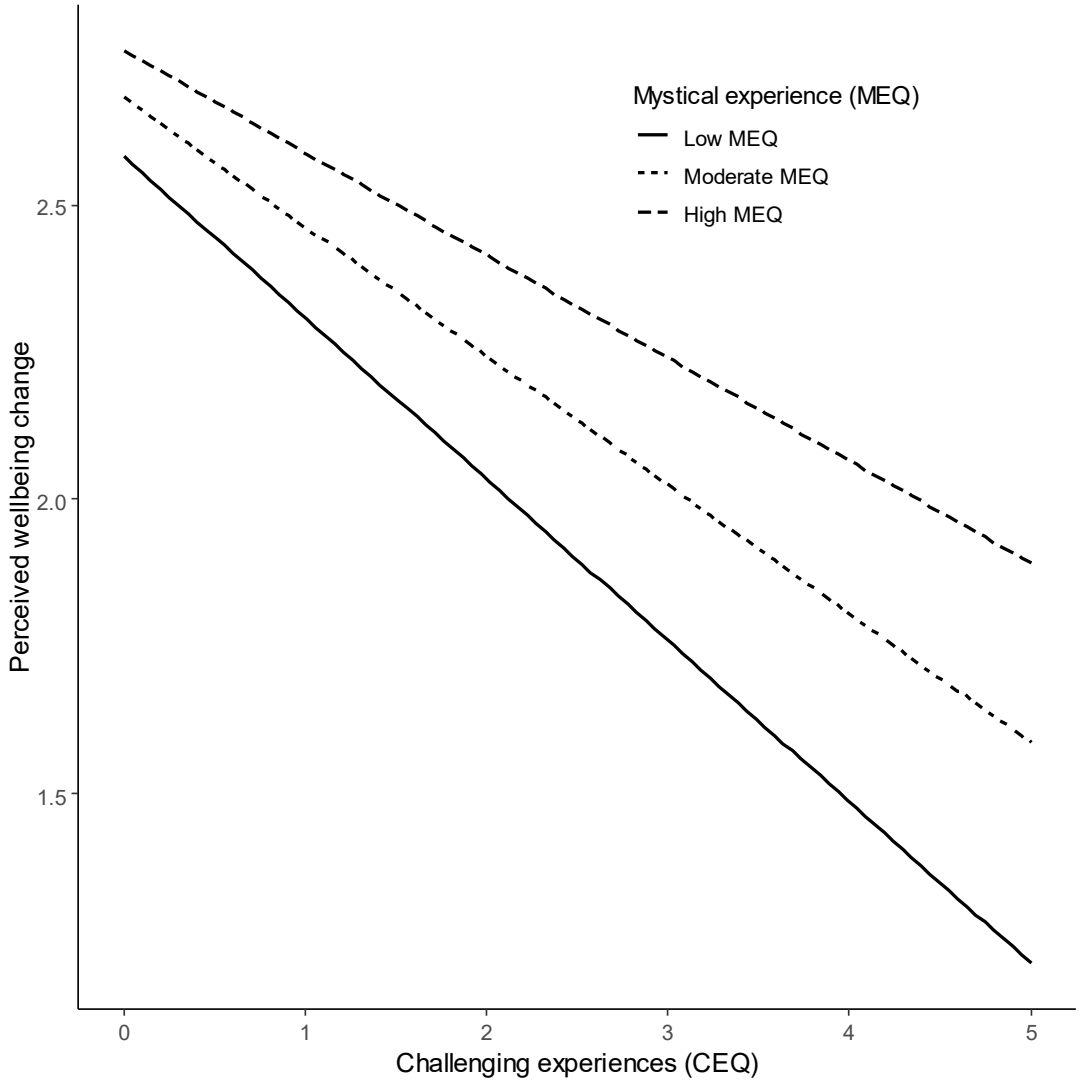

Figure 2. *Perceived wellbeing change as a function of challenging experiences (CEQ), moderated by mystical experiences (MEQ).*

To investigate potential non-linear relationships between experiential features and perceived wellbeing change, mean scores of MEQ, PIQ, and CEQ and their squared terms were entered as predictors in Model 2 (see Table 4). The model was statistically significant overall, $F(8, 5813) = 194.3$, $p < .001$, explaining approximately 21% of the variance in wellbeing change scores (adjusted $R^2 = .210$). All three linear experiential predictors were statistically significant. MEQ ($\beta = 0.241$, $p < .001$), and PIQ scores ($\beta = 0.256$, $p < .001$) remained strong positive predictors, whereas higher CEQ scores were associated with lower wellbeing change ($\beta = -0.187$, $p < .001$). Evidence for non-linear associations was observed for all three experiential measures; however, the quadratic terms were negligible in magnitude and below the predefined threshold

for practical significance, indicating that the relationships between experiential features and wellbeing were predominantly linear.

Table 4. *Model 2 summary. Linear regression model with perceived wellbeing change as the dependent variable and MEQ, PIQ, and CEQ mean scores and their squared terms as predictors.*

Predictor	Estimate	β	Std. Error	t-value	p-value
Intercept	2.315	–	0.034	69.08	< .001
MEQ	0.264	0.241	0.017	15.56	< .001
MEQ²	0.022	0.029	0.011	2.04	.041
PIQ	0.255	0.256	0.014	17.62	< .001
PIQ²	−0.032	−0.046	0.009	−3.55	< .001
CEQ	−0.187	−0.187	0.017	−11.03	< .001
CEQ²	−0.029	−0.050	0.009	−3.04	.002
Age	0.002	0.038	0.001	3.17	.002
Sex	−0.083	−0.035	0.027	−3.04	.002

Note. Adjusted R^2 = .210; $F(8, 5813) = 194.3$, $p < .001$. MEQ, PIQ, and CEQ were mean-centered prior to squaring. Sex coded as 0 = Male, 1 = Female.

To examine the contribution of specific experiential dimensions, subscale scores from the MEQ, PIQ, and CEQ were entered simultaneously as predictors in Model 3, with age and sex included as covariates. The model was statistically significant overall, $F(15, 5806) = 132.3$, $p < .001$, explaining approximately 25% of the variance in perceived wellbeing change (adjusted R^2 = .253). Several subscales emerged as significant predictors. The strongest positive predictor of perceived wellbeing change was PIQ Adaptive ($\beta = 0.229$, $p < .001$), followed by MEQ Positive Mood ($\beta = 0.106$, $p < .001$). In turn, the strongest negative predictor was CEQ Paranoia ($\beta = -0.185$, $p < .001$), followed by CEQ Physical Distress ($\beta = -0.137$, $p < .001$). Estimates for each subscale are reported in Table 5.

Table 5. *Model 3 summary. Linear regression model with perceived wellbeing change as the dependent variable and MEQ, PIQ, and CEQ subscale scores as predictors.*

Predictor	Estimate	β	Std. Error	t-value	p-value
Intercept	0.584	–	0.068	8.56	< .001
MEQ Mystical	0.081	0.087	0.019	4.28	< .001
MEQ Positive Mood	0.117	0.106	0.019	6.16	< .001
MEQ Time & Space	−0.035	−0.042	0.014	−2.55	.011
MEQ Ineffability	0.076	0.078	0.014	5.34	< .001
PIQ Maladaptive	0.065	0.074	0.015	4.42	< .001
PIQ Adaptive	0.227	0.229	0.018	12.42	< .001
CEQ Grief	0.061	0.074	0.016	3.72	< .001
CEQ Fear	0.060	0.079	0.017	3.57	< .001
CEQ Physical Distress	−0.134	−0.137	0.015	−8.80	< .001
CEQ Insanity	−0.043	−0.055	0.015	−2.88	.004
CEQ Isolation	−0.020	−0.026	0.014	−1.42	.157
CEQ Death	−0.003	−0.005	0.010	−0.31	.755
CEQ Paranoia	−0.186	−0.185	0.015	−12.08	< .001
Age	0.002	0.037	0.001	3.16	.002
Sex	−0.061	−0.026	0.027	−2.24	.025

Note. Adjusted R^2 = .253; $F(15, 5806) = 132.3$, $p < .001$. Sex coded as 0 = Male, 1 = Female.

3.3 Are subjective effects necessary for wellbeing improvement?

Table 6 presents the cross-tabulation of perceived wellbeing change and the intensity of subjective effects. As outlined in the methods section, subjective effects were grouped into three categories based on the Subjective Experience Index (SEI): low (<25th percentile), moderate (25th–75th percentile), and high (>75th percentile). Participants below the 25th percentile had MEQ scores of 3.43 or lower and PIQ scores of 2.87 or lower. Those above the 75th percentile had MEQ scores of at least 4.63 or PIQ scores of at least 4.13. In contrast, wellbeing change was divided into

three groups: high improvement (score = 3), moderate improvement (score = 2), and small improvement to negative change (scores 1 to -3).

A majority of participants (60.7%) reported high wellbeing improvements, with most also reporting moderate to high levels of subjective effects. However, a considerable proportion of participants (7.7%) reported high wellbeing improvements despite low subjective effect intensity. Participants reporting moderate wellbeing improvements comprised 22.4% of the sample, with low (7.1%) and moderate (12.5%) levels of subjective effects most common in this group. Participants who reported either small improvements, no improvement or a decline in perceived wellbeing comprised 16.9% of the sample, with the largest subgroup (9.9%) also reporting low subjective effects. Notable, only 0.8% in this group reported high subjective effects.

Overall, participants who reported high subjective effects tended to also report high wellbeing improvements. In contrast, those with low subjective effects exhibited a more even distribution across all levels of wellbeing change, suggesting that subjective experiences are not strictly necessary for wellbeing improvement. This interpretation was supported by the necessary condition analysis, which found no evidence that high subjective experiences were a necessary condition for self-reported wellbeing improvements. Visual inspection of the scatterplot showed a small sparse region in the upper-left quadrant (high wellbeing, low subjective effects); however, CR-FDH ceiling estimation yielded an effect size of 0.00, indicating no substantial bottleneck pattern. These findings indicate that while the Subjective Experience Index was associated with positive wellbeing outcomes, having high subjective effects was not a strict requirement for achieving high wellbeing change. Figure 3 presents a scatterplot depicting the relationship between perceived wellbeing change and the Subjective Experience Index.

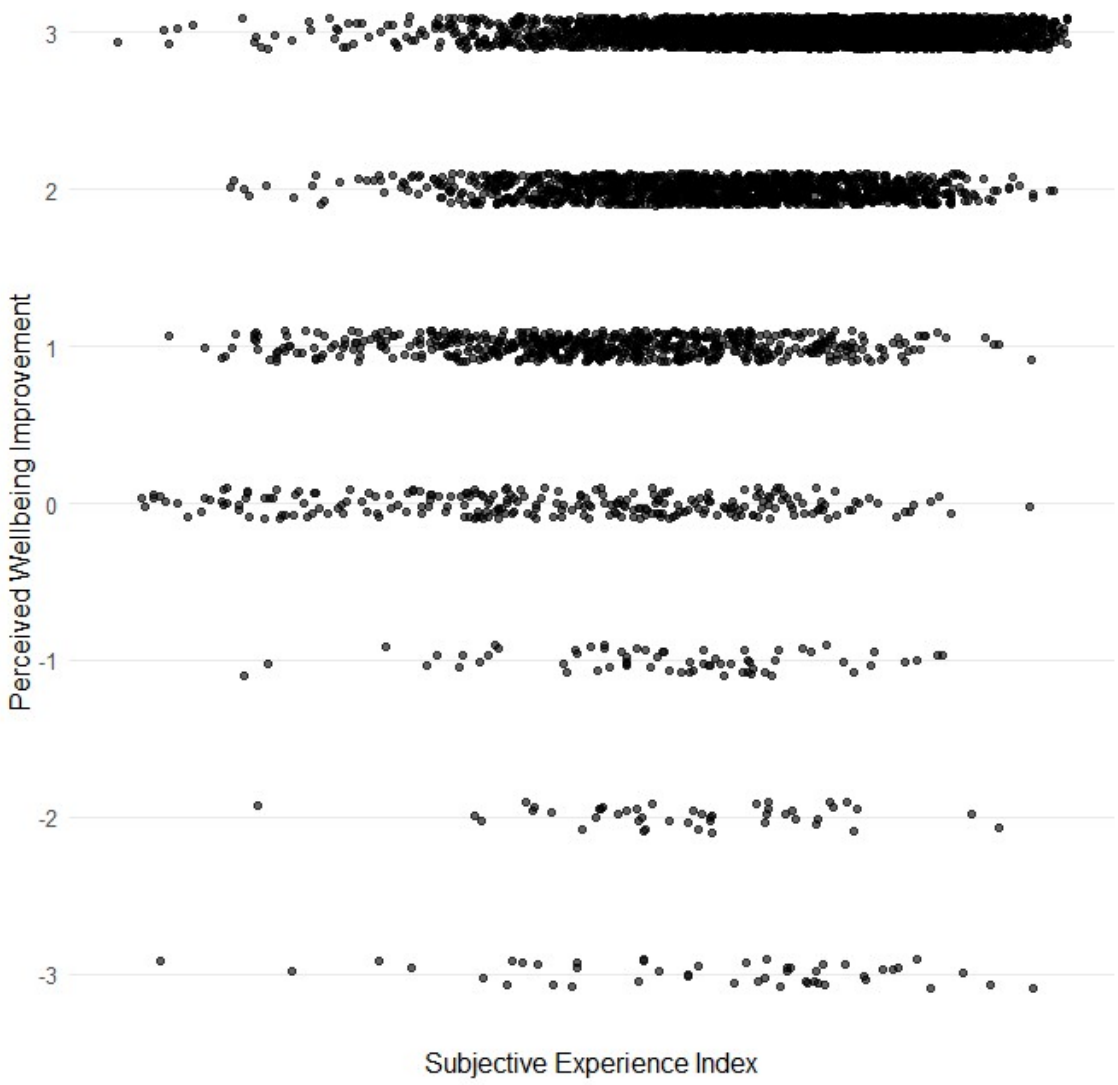

Figure 3. *A scatterplot illustrating the relationship between perceived wellbeing change and the Subjective Experience Index.*

Table 6. *Cross-tabulation of perceived wellbeing change and the Subjective Experience Index*

Wellbeing change	Subjective Effects: Low	Subjective Effects: Moderate	Subjective Effects: High	Total
High	455 (7.7%)	1855 (31.3%)	1293 (21.8%)	3603 (60.7%)
Moderate	418 (7.1%)	735 (12.4%)	173 (2.9%)	1326 (22.4%)
Low to negative	586 (9.9%)	367 (6.2%)	46 (0.8%)	999 (16.9%)
Total	1459 (24.6%)	2957 (49.9%)	1512 (25.5%)	5928

4 Discussion

This large-scale survey study examined how different features of psychedelic experiences—mystical experiences, psychological insights, and challenging experiences—relate to perceived long-term changes in wellbeing. Psychological insights emerged as the strongest positive correlate of wellbeing, followed by mystical experiences, whereas challenging experiences were generally associated with poorer outcomes. Notably, a meaningful proportion of participants reported high wellbeing improvements even in the absence of strong insights or mystical experiences, suggesting that such experiences may enhance—but are not strictly required for—therapeutic outcomes.

Interaction analyses indicated that the effects of mystical experiences and psychological insights were not simply additive, with diminishing additional benefits when both were high. In addition, mystical experiences partially buffered the negative impact of challenging experiences. Exploratory analyses of non-linear associations suggested that relationships between experiential features and wellbeing were predominantly linear, with only weak non-linear effects. Analyses of lower-level experiential subdimensions revealed that insights related to goals and adaptive patterns and positive mood components of mystical experiences were particularly relevant to perceived wellbeing change, whereas physical distress and paranoia showed the strongest negative associations. Notably, MEQ and PIQ scores were moderately correlated in this sample, indicating that mystical-type experiences and psychological insights often co-occur, while still representing distinct aspects of psychedelic experiences.

The present findings suggest that psychological insights play a more prominent role than mystical experiences in relation to positive therapeutic outcomes. This pattern is consistent with previous research (Kangaslampi, 2023; Kugel et al., 2025) and suggests that the role of mystical experiences may have been overemphasized in earlier accounts. Although associations involving mystical experiences were weaker than those observed for psychological insights, they were nonetheless linked to more favorable overall outcomes. Moreover, as noted above, mystical experiences appeared to attenuate some of the adverse effects of challenging experiences.

In contrast, the role of challenging experiences appears more nuanced. At the aggregate level, they were associated with poorer wellbeing, but this pattern did not hold uniformly across subscales. Consistent with previous studies (Andersen et al., 2025; Barrett et al., 2016), substantial heterogeneity was observed; however, in the present sample, positive associations with wellbeing were negligible. Across studies, no specific dimension has shown a consistently beneficial pattern, as subscales positively associated with wellbeing have varied and sometimes shown negative associations. Moreover, the lack of meaningful non-linear effects provides little support for the notion that challenging experiences are beneficial up to a certain intensity. Notably, even the dimensions most strongly associated with poorer wellbeing differed to previous studies: paranoia and physical distress emerged as the strongest negative correlates in the present analysis, whereas prior work alternately identified isolation, fear, or experiences of death. Overall, these findings suggest that challenging experiences tend to hinder, rather than facilitate, long-term wellbeing, although the contributions of individual dimensions remain uncertain.

It has been proposed that the wellbeing effects of challenging experiences may depend on whether they lead to psychological insights or therapeutic breakthroughs (Nygart et al., 2022). Since the PIQ × CEQ interaction was not significant, no evidence for this explanation was found in the present analysis. However, mystical-type experiences seemed to partially buffer the negative effects of challenging experiences. Individual differences in responses to challenging experiences are also likely to influence their impact on wellbeing (Wood et al., 2024), though these were not evaluated here.

Notably, a subset of participants reported substantial wellbeing improvements despite not experiencing strong mystical experiences or psychological insights. This suggests that intense subjective effects are not an absolute prerequisite for therapeutic benefits, although they are associated with positive outcomes. It is worth noting that, because subjective experiences were generally strong across the sample, even participants in the bottom 25th percentile often reported experiences of moderate intensity—meaning that 'low' in this context does not imply negligible effects. Consequently, the impact of having no or minimal subjective effects on

wellbeing could not be determined. While these results support a model where subjective experiences play a useful but not strictly necessary role, this question remains open. This study adds to ongoing theoretical debates regarding the mechanisms of psychedelics: whether subjective experiences are active drivers of change or merely epiphenomena (see, Olson, 2021; Yaden & Griffiths, 2021). More experimental and longitudinal research is needed, particularly involving compounds that may produce therapeutic effects without eliciting intense subjective experiences.

The role of mysticism in psychedelic research has recently been criticized and there has been calls to "demystify" psychedelic experiences. Sanders & Zijlmans (2021) argue that the traditional mysticism framework risks conflating scientific research with supernatural interpretations, and that terms like "ineffable" and "sacred" risk biasing participant reports, misinforming the public, and limiting scientific understanding. In contrast, Breeksema & van Elk (2021) have advocated embracing the "weirdness" of psychedelic experiences, recognizing their idiosyncratic and context-dependent nature, arguing that studying mystical experiences empirically does not require endorsing supernatural interpretations. While mystical experiences remain an important aspect of the phenomenology of psychedelic experiences and may contribute to therapeutic outcomes, more emphasis on psychological insights may be beneficial in future research. In addition to their therapeutic relevance, insights can be conceptualized within a secular framework, they align well with contemporary psychological and neuroscientific research, and could facilitate the integration of psychedelic treatments into established therapeutic paradigms.

These results underscore the importance of fostering and integrating psychological insights both before and after the psychedelic experience, particularly within the context of psychedelic-assisted therapy. Consistent with Kugel et al. (2025), who observed that insights were more pronounced in clinical settings—where individuals receive structured counseling and therapeutic support for integration—our findings highlight the value of such support in maximizing therapeutic benefits. Additionally, our results emphasize the need for careful screening and preparation to identify individuals at risk for challenging experiences, which may improve overall treatment outcomes. Moreover, tailoring treatment to target specific experiential features based on therapeutic goals has the potential to enhance efficacy. Collectively, these findings

indicate that emphasizing psychological insights, alongside thorough screening and preparation, are important areas for future research aimed at improving the effectiveness and our understanding of the active components in psychedelic-assisted therapies.

This study has several limitations that should be considered when interpreting the findings. First, the cross-sectional and retrospective design precludes causal inferences regarding the effects of psychedelic experiences; however, the observed associations are broadly consistent with prior longitudinal and experimental studies (Kangaslampi, 2023; Kugel et al., 2025). Second, the use of a convenience sample limits generalizability, and substantial variability existed in substances, dosages, and settings, without experimental control. Participants also appeared to be positively predisposed toward psychedelics, as suggested by generally favorable ratings of the perceived wellbeing effects. However, because attitudes toward psychedelics were not assessed, it is unclear whether the results reflect genuinely positive outcomes or sampling bias. Third, wellbeing was measured with a single-item measure, which may have reduced sensitivity and contributed to the observed ceiling effect. In addition to the correlation between MEQ and PIQ, the ceiling effect may have contributed to the pattern observed in the MEQ × PIQ interaction, as participants with high levels of either insights or mystical experiences alone often reported high wellbeing improvement, resulting in an apparent pattern of diminishing returns. The ceiling effect may have also influenced the results of the necessary condition analysis, potentially obscuring or underestimating the strength of necessary relationships. Finally, while a necessary condition analysis (NCA) was conducted as preregistered, it should be noted that the method itself has received recent criticism regarding its sensitivity and specify (Sorjonen & Melin, 2023). Accordingly, the NCA results should be interpreted cautiously and viewed as complementary to the primary regression-based analyses.

Future research would benefit from employing experimental designs and collecting data beyond retrospective self-reports to enable causal inferences. A particularly promising direction involves investigating the role of psychological insights within psychedelic-assisted therapy, focusing on how these insights contribute to therapeutic change and how integration processes following the experience influence

outcomes. Additionally, exploring alternative compounds that induce neural plasticity without eliciting strong subjective effects may provide important evidence into the therapeutic role of subjective experiences. Although such substances may lack certain advantages that subjective experiences produced by classic psychedelics bring, they could represent viable treatment options for individuals more vulnerable to intense or challenging experiences. Understanding how subjective experiences contribute to therapeutic effects may thus help to increase patient access to medicines developed as a result of psychedelic research (Olson, 2021). Overall, research on the subjective effects of psychedelics and their relationship to wellbeing remains a vital area for advancing both our scientific understanding and the clinical efficacy of psychedelic-assisted treatments.

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