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The interplay of psychedelic use and meditation in shaping psychological well-being

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ABSTRACT

Psychedelic substances and meditation can elicit personally meaningful experiences that support well-being, yet their relative and combined contributions remain unclear. Meditation typically produces gradual improvements through sustained practice, whereas psychedelics may induce acute shifts. To examine these dynamics, we re-analysed data from two cross-sectional online surveys using multiple regression models. In Study 1 (N = 679), we assessed associations of cumulative psychedelic use and meditation practice with well-being, ill-being, and psychological flexibility. When examined separately, both practices were associated with greater well-being and flexibility. However, when considered jointly, the associations for psychedelics were reduced or became nonsignificant, whereas meditation remained consistently associated with the outcomes. Weak evidence also emerged for a potential synergy effect via an interaction between the two practices. In Study 2 (N = 137), we examined perceived well-being changes following a personally meaningful experience facilitated by psychedelics alone, meditation alone, or both combined. Participants in the combined and meditation groups reported significantly greater improvements compared with the psychedelic-only group, although all groups showed positive change on average. Together, these findings suggest that meditation may enhance the benefits of psychedelic experiences and that meditation practice can confound associations between psychedelic use and well-being. More broadly, they highlight the importance of considering both practices together when evaluating their contributions to mental health outcomes.

1. Introduction

Serotonergic psychedelics (e.g., LSD, psilocybin, DMT, mescaline) and meditation are increasingly recognized for their capacity to improve mental health and well-being (Andersen et al., 2021; Goldberg et al., 2018, 2023; Goldin et al., 2021; Haijen et al., 2018; Ko et al., 2022; Nayak et al., 2023; Rahl et al., 2017; Schlechta Portella et al., 2021; Thomson & Thomacos, 2025). Both have been associated with reduced symptoms of depression and anxiety, enhanced well-being, and increased psychological flexibility, likely via overlapping psychological and neurobiological mechanisms (Heuschkel & Kuypers, 2020; Holas & Kamińska, 2023; Payne et al., 2021;

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Walsh & Thiessen, 2018). Emerging evidence also points to potential synergistic effects, with psychedelics and meditation amplifying each other's benefits (Griffiths et al., 2018; Meling et al., 2024; Smigielski et al., 2019). Despite these parallels, the two practices differ markedly in their trajectories of change – psychedelics tend to produce rapid, lasting changes following one or a few administrations, whereas meditation is typically associated with gradual, cumulative benefits through sustained practice. However, little is known about how these practices compare in their relative and combined effects, whether through cumulative engagement over time or acutely through a single, meaningful experience.

1.1. Cumulative effects of psychedelic use and meditation on well-being

The cumulative effects of psychedelic use and meditation refer to the idea that repeated engagement with either practice separately leads to progressively greater improvements in well-being. Thus, increased exposure, either via more frequent use or sustained practice, is associated with better outcomes. However, most studies on psychedelic use treat it as a binary variable (used vs. never used), with limited insight into how the frequency of use relates to mental health outcomes (e.g., Krebs & Johansen, 2013). Similarly, many meditation studies focus on short-term interventions rather than the effects of sustained, long-term practice (Goldberg et al., 2018).

Recent studies suggest that cumulative psychedelic use may be linked to long-term mental health benefits. Raison et al. (2022) found that individuals with higher number of lifetime use reported reduced symptoms of depression and anxiety, as well as increased well-being in a naturalistic sample. Likewise, Lafrance et al. (2021) showed that more frequent psychedelic use was associated with greater spirituality, improved emotion regulation, and lower levels of anxiety, depression, and disordered eating.

Parallel findings have been observed in the meditation literature. Accumulated lifetime practice hours have been linked to a range of positive psychological outcomes, such as greater mindfulness and well-being, as well as lower psychological inflexibility (Bowles et al., 2022; Smith et al., 2019). For example, a two-year longitudinal study found that frequent meditation practice predicted greater progress toward personal values, enhanced subjective well-being, and a better ability to respond non-reactively to experiences, especially among those individuals with longer sessions and more extensive prior experience (Smith et al., 2019). A longitudinal, randomized controlled study, where participants were randomly assigned to either an 18-month meditation training or a non-native language (English) training, revealed that greater time spent practicing meditation was linked to greater self- and teacher-perceived responsiveness to training (Schlosser et al., 2024). Together, these findings suggest that sustained engagement with either psychedelic use or meditation may contribute to long-term improvements in mental health and well-being.

1.2. Single meaningful experiences and their effect on well-being

In addition to cumulative effects, both psychedelics and meditation have been studied for their capacity to facilitate single, meaningful experiences that can lead to long-term improvements in psychological well-being (Heuschkel & Kuypers, 2020; Holas & Kamińska, 2023; Payne et al., 2021; Walsh & Thiessen, 2018). Psychedelics are especially known for inducing profound, transformative experiences, often described as insightful or mystical-type in nature (Ko et al., 2022). While meditation is typically associated with gradual change over time, it can also generate meaningful or transformative experiences (Chirico et al., 2022; Goleman & Davidson, 2018). In fact, some studies suggest that even a single mindfulness training session can evoke such states, especially when compared to active control conditions (Dambrun, 2016; Dambrun et al., 2019; Hanley et al., 2018; Hanley & Garland, 2019).

Research on psychedelics has shown that acute, transformative experiences are strong predictors of positive health outcomes in both clinical and naturalistic settings. For example, Ko et al. (2022) reported significant associations between mystical experiences and clinical improvements in cancer-related adjustment disorders, major depression, addiction, and treatment-resistant depression. In naturalistic studies, prospective longitudinal data collected before and after a planned psilocybin experience revealed that scores on the Mystical Experience Questionnaire (MEQ30; Barrett et al., 2015) predicted lasting changes across multiple longitudinal outcomes, including reductions in symptoms of depression, burnout, and state anxiety, as well as increases in cognitive flexibility and spiritual well-being (Nayak et al., 2023). Similarly, Kervadec et al. (2024) found that individuals who had more intense mystical experiences also reported greater reductions in alcohol consumption and improvements in psychological flexibility. Taken together, these findings suggest that single, meaningful experiences, whether elicited via psychedelics or meditation, can have long-lasting effects on mental health and well-being.

1.3. Synergistic effects of combining psychedelics and meditation

While both psychedelics and meditation have independently been shown to improve well-being, both cumulatively and through single transformative experiences, emerging evidence suggests that their combination may yield even greater benefits. Studies indicate that combining the two may enhance various aspects of well-being and potentially reduce adverse effects of psychedelics, leading to better overall outcomes (Griffiths et al., 2018; Meling et al., 2024; Smigielski et al., 2019).

Griffiths et al. (2018) found that psilocybin, when combined with spiritual support, including meditation, led to greater improvements in well-being, meaning, and resilience, especially among participants in the high-dose and high-support condition. Although participants were not instructed to meditate during acute psychedelic session, the effects likely reflect the influence of preparatory meditation or related practices. In a more integrative design, Smigielski et al. (2019) administered psilocybin during a meditation retreat and found that the combination led to greater long-term improvements in life appreciation, self-acceptance, and reduced fear of death compared to meditation alone. Similarly, Meling et al. (2024) reported that combining DMT and harmine with

mindfulness meditation resulted in deeper mystical experiences and longer-lasting improvements in well-being.

These studies suggest a bidirectional synergy: prior meditation practice may enhance the psychedelic experience, while psychedelics may enhance the benefits of meditation. Theoretical work supports this idea, proposing that psychedelics may spark insight and motivation, while meditation helps to integrate and sustain those insights over time (Heuschkel & Kuypers, 2020; Holas & Kamińska, 2023; Payne et al., 2021; Walsh & Thiessen, 2018).

Survey studies further support the potential synergistic effects between psychedelics and meditation. Naturalistic research has found that psychedelic use is associated with the maintenance of salutogenic behaviours, such as regular meditation practice (Osto, 2016; Simonsson et al., 2023; Simonsson & Goldberg, 2022). In a large qualitative study of psychedelic users ($N = 1315$), the majority (66.5 %) reported engaging in meditation practice, and 39.4 % had combined the two practices on at least one occasion (Azmoodeh et al., 2023). More recently, Jiwani et al. (2024) found that psychedelics were perceived to benefit participants' meditation practice. A longitudinal study found that psychedelic use during the study period was linked to a greater increase in mindfulness and loving-kindness meditation practice, particularly among those with no prior experience. However, it also showed that psychedelic use was associated with more difficulties and impairments related to loving-kindness meditation (Simonsson, et al., 2025). Together, these findings suggest that psychedelic use and meditation practice frequently co-occur and may reinforce one another, highlighting the importance of examining their combined effects.

1.4. Aims of the present Study

The aim of the present study was to examine how psychedelic use and meditation, individually and in combination, are associated with psychological flexibility, well-being, and ill-being. To this end, we re-analysed data from two previous studies in which participants reported on their psychedelic use and meditation practice (Jylkkä et al., 2025; Krabbe et al., 2024).

Study 1 explored the relative importance of the frequency of each practice (i.e., cumulative engagement) and its association with mental well-being, ill-being (i.e., symptoms of depression and anxiety), and psychological flexibility. Specifically, we examined (a) the unique associations of frequency of meditation practice and psychedelic use with these outcomes, (b) whether psychedelic use remained associated with the outcomes after controlling for meditation frequency, and (c) whether engaging in both practices more frequently showed synergistic effects beyond their individual contributions (operationalized as an interaction term). This approach is motivated because previous studies on the associations between psychedelic use and wellbeing have typically not controlled for meditation, and meditation studies have not typically controlled for psychedelic use. Given evidence that these two practices might co-occur (Osto, 2016; Simonsson et al., 2023; Simonsson & Goldberg, 2022), our approach enables examining both independent and joint contributions of both practice (e.g., whether psychedelic use is a significant predictor after meditation has been controlled).

Study 2, in turn, examined differences in the perceived well-being changes after a single personally meaningful experience, facilitated either by psychedelics, meditation, or both simultaneously. Additionally, we examined differences in mystical-type aspects of the experiences, given that these subjective effects have been consistently linked with well-being outcomes (Ko et al., 2022).

In addition to general indicators of well-being, both studies included peace of mind as a distinct well-being outcome (Lee et al., 2013), because it remains relatively underexplored in psychedelic research. Peace of mind has been proposed as a unique aspect of well-being that predicts important outcomes, such as anxiety and depression, beyond what is captured by traditional well-being measures (Sikka et al., 2018, 2023). Additionally, we included a multidimensional measure of psychological flexibility and inflexibility, given evidence that improvements in psychological flexibility may mediate the therapeutic effects of psychedelics (Davis et al., 2020; Sloshower et al., 2024). Most previous studies have relied on a unidimensional measure of psychological flexibility, potentially overlooking the distinct role of psychological inflexibility.

2. Study 1: Is the frequency of psychedelic use and meditation practice associated with psychological flexibility, mental well-being and ill-being?

We analysed data from a previously published study (Krabbe et al., 2024), where the methodology is described in more detail. The original studies recruited individuals with a history of psychedelic use to examine whether the quality of a single meaningful psychedelic experience or the frequency of psychedelic use was associated with psychological flexibility, mental well-being, and ill-being. However, we also collected data regarding meditation frequency, not analysed previously. In the present study, we focused on the relative contributions of the frequency of psychedelic use and meditation practice to psychological flexibility/ inflexibility, mental well-being, and ill-being.

2.1. Method

2.1.1. Participants and Procedure

Participants were recruited via the online crowdsourcing platform Prolific (https://www.prolific.com/). First, to identify individuals with experience using psychedelics, a pre-screening survey was completed by 2,500 participants. Of these, 1360 reported having had at least one experience with classical psychedelics and were invited to participate in the main study. Following data quality checks, 13 participants were excluded for reporting a lifetime frequency of classical psychedelic use of 0, and 1 participant was excluded for reporting an implausibly high frequency of 1996. Additionally, 8 participants who identified as "other" gender were excluded due to the small number of observations in this category (gender was included as a covariate in the analyses). Thus, the final sample for Study 1 was 679 participants (age: $M = 32$, $SD = 10$; gender: 282 females, 397 males).

The online survey was administered using the in-house survey platform "Soile." Prior to accessing the survey, participants completed an informed consent form delineating the study's objectives and eligibility criteria (age 18 years or older, prior exposure to classical psychedelics such as LSD, psilocybin, Ayahuasca, DMT, 5-MeO-DMT, or mescaline). The survey included demographic questions (e.g., age, gender, socioeconomic status, lifetime psychiatric history, country of origin), specifics regarding past psychedelic usage (types, dosages, frequency) as well as meditation frequency, scales assessing psychological flexibility, mental well-being and ill-being. The survey also included questions regarding the participants' most profound psychedelic experience as well as scales assessing worldview and metaphysical beliefs, the results of which are reported elsewhere (Jylkkä et al., 2024). The full participant information sheet for Study 1 can be found in the Appendix.

Data collection adhered to GDPR regulations and was carried out in compliance with the Declaration of Helsinki. The study received approval from the Ethics Board of the Departments of Psychology and Logopaedics at the Abo Akademi University, Finland (decision number 22/2022). The data collection and measures were preregistered at https://osf.io/pbcvq, but the analyses of the present study were not preregistered.

With regards to sample size, because data collection was completed prior to analysis, an a priori power analysis was not feasible. Following current reporting standards, we conducted sensitivity power analyses using G*Power 3.1 to determine the minimum effect sizes detectable with the achieved sample sizes. Study 1. Using the Linear Multiple Regression: Fixed Model, R^2 Increase option, and assuming $\alpha = 0.05$ and $1–\beta = 0.80$, the detectable effect sizes ranged from $f^2 = 0.0116$ to 0.0117 depending on the number of predictors in the model (4–6). Thus, Study 1 was powered to detect small effects.

2.1.2. Measures

Frequency of Psychedelic Use. To assess the frequency of psychedelic use, we asked the participants:" If you use classical psychedelics, how often do you use them on average?". Responses were provided on a 9-point scale: "Never" (0), "Once every four years or less often" (1), "Once every three years" (2), "Once every two years" (3), "Once a year" (4), "Few times a year" (5), "Monthly" (6), "Weekly" (7), and "Daily" (8).

Frequency of Meditation Practice. To assess the frequency of meditation practice, we asked the participants: "Do you practice meditation?". Participants answered on a 7-point scale: "No" (0), "I have tried once or twice but do not practice regularly" (1), "Few times per year" (2), "Few times per month" (3), "Every week" (4), "Daily" (5), "Several times a day" (6).

Psychological Flexibility / Inflexibility. We used the Multidimensional Psychological Flexibility Inventory (MPFI-24; Rolffs et al., 2018) to assess psychological flexibility and inflexibility. This inventory comprises 24 items (e.g., "I was receptive to observing unpleasant thoughts and feelings without interfering with them") assessing six psychological components constituting psychological flexibility (Acceptance, Present Moment Awareness, Self-as-Context, Defusion, Values, Committed Action), and six components constituting psychological inflexibility (Experiential Avoidance, Lack of Awareness, Self-as-Content, Fusion, Lack of Contact with Values, Inaction). Participants rated how frequently they had experienced each item over the past two weeks using a six-point Likert scale ranging from 1 ("Never true") to 6 ("Always true"). In this study we computed aggregated mean scores across the six psychological flexibility components and across the six psychological inflexibility components. Higher scores indicated a greater degree of psychological flexibility and inflexibility, respectively (see Table 3 table for Cronbach's alphas for all scales).

Peace of Mind. We used the Peace of Mind Scale (PoMS; Lee et al., 2013) to assess the extent to which the participants experienced internal peace and harmony in their lives. Although originally developed within a Chinese cultural context, studies have demonstrated its validity in Western cultural contexts (Sikka et al., 2018, 2023; Sophie et al., 2022). The PoMS comprises 7 items (e.g., "I have peace and harmony in my mind"), of which two items are reverse-coded (e.g., "It is difficult for me to feel settled"). Each item is rated on a five-point Likert scale from 1 ("Not at all") to 5 ("All of the time"). We averaged the items to produce a composite score, with higher scores reflecting higher levels of peace of mind.

Psychological Well-being. We employed the Warwick-Edinburgh Mental Wellbeing Scale (WEMWBS; Tennant et al., 2007) to assess overall mental well-being. This scale comprises 14 items (e.g., "I've been feeling optimistic about the future") addressing both hedonic and eudaimonic aspects of well-being. Participants rated how often they experienced each item over the past two weeks on a five-point Likert scale ranging from 1 ("None of the time") to 5 ("All of the time"). We averaged the items to produce a composite score, with higher scores reflecting greater mental well-being.

Depression. We used the depression module of the Patient Health Questionnaire (PHQ-9; Kroenke et al., 2001) to assess symptoms of depression. This scale comprises nine items addressing each of the diagnostic criteria outlined in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association, 2013). Participants rated the frequency with which each of the nine symptoms (e.g., "Little interest or pleasure in doing things") bothered them in the past two weeks on a scale from 0 ("Not at all") to 3 ("Nearly every day"). We summed the items to produce a total score reflecting overall symptom severity. Standard cut-off scores indicate depression severity as follows: 0–4 (minimal), 5–9 (mild), 10–14 (moderate), 15–19 (moderately severe), and 20–27 (severe).

Anxiety. We used the Generalized Anxiety Disorder Scale (GAD-7; Spitzer et al., 2006) to assess symptoms of anxiety. This scale comprises 7 items based on the diagnostic criteria A, B, and C for Generalized Anxiety Disorder from the DSM-5. Participants rated the frequency with which each symptom (e.g., "Worrying too much about different things") had bothered them in the past two weeks on a scale from 0 ("Not at all") to 3 ("Nearly every day"). We summed the items to produce a total score reflecting overall symptom severity. Standard cut-off scores indicate anxiety severity as follows: 0–4 (minimal), 5–9 (mild), 10–14 (moderate), and 15–21 (severe).

Previous Psychiatric Diagnoses. To account for previous psychiatric diagnoses, participants were asked whether they had been diagnosed with one or more of the following diagnoses in the past: severe depression, anxiety disorder, bipolar disorder, psychosis or schizophrenia, or obsessive–compulsive disorder. To increase power, we dummy-coded the presence of any of the abovementioned diagnoses as 0 = no diagnosis or 1 = presence of diagnosis.

2.1.3. Statistical analyses

All analyses were conducted using SPSS version 29.0.2.0.(20). Bivariate correlations were calculated for all the study variables. We performed separate multiple regression analyses for each of the six outcome variables (psychological flexibility, psychological inflexibility, peace of mind, psychological well-being, depression, and anxiety).

Study 1 was designed to examine the relative importance of meditation and psychedelic use in relation to these outcomes. To do so, we estimated four separate regression models for each outcome: (a) the unique associations of each practice, with the frequency of psychedelic use as the explanatory variable (Model 1) and frequency of meditation practice as the explanatory variable (Model 2), each controlling for demographics; (b) whether the association of psychedelic use remained after additionally controlling for meditation practice as well as demographics (Model 3); and (c) whether their combination, operationalized as an interaction between frequency of psychedelic use and meditation practice, was associated with the outcomes after controlling for both meditation and psychedelics as well as demographics (Model 4). It is important to note that we did not ask whether participants engaged in meditation and psychedelic use simultaneously. Therefore, the interaction should be interpreted as reflecting the combined effects of cumulative exposure to both practices rather than simultaneous engagement. All models included the following demographic variables as covariates: age (continuous), gender (dummy coded, 0 = female, 1 = male), and history of mental illness diagnosis (dummy coded, 0 = no, 1 = yes).

Because the original response scale for meditation and psychedelic use was ordinal with non-equidistant frequency categories (e.g., "once or twice a year," "few times per month," "daily"), we conducted two parallel analyses. First, predictors were modelled using the original scale values. Second, to more accurately reflect the underlying frequency of practice/use, we mapped response categories to approximate annual event counts, applied a log transformation to correct for skewness, and standardized the resulting values (for transformation details see Appendix Table A1). The results of the second (log-transformed) analyses are presented in the Appendix Table A2, and the discussion considers findings across both analytic strategies. This dual approach allowed us to test the robustness of findings under both conventional continuous treatment and a more scale-sensitive, distribution-adjusted representation of the data.

We chose not to apply formal corrections for multiple comparisons. Instead, we interpret the findings in light of prior evidence, effect sizes, and theoretical coherence, consistent with guidelines emphasizing prespecification when possible and transparency over

Table 1
Demographic Information of Study 1 Participants (N = 679).

	M	***SD***
Age	32	10
Gender	***n***	**%**
Female	282	41
Male	397	58
Other	8	2
Education	***n***	**%**
Primary education	0	0
Lower Secondary education	10	2
Higher Secondary education	160	23
Vocational education	47	7
University: Bachelor's degree	317	46
University: Master's degree	130	19
University: Doctoral degree	7	1
Income	***n***	**%**
Much below average	57	8
Below average	166	24
Average	325	47
Above average	122	18
Much above average	9	1
Psychiatric diagnoses	***n***	**%**
No disclosure	15	2
Severe depression	73	11
Bipolar disorder	11	2
Psychosis or Schizophrenia	6	1
Anxiety	163	24
OCD	16	2
Most frequently reported country of origin	***n***	**%**
South Africa	162	24
United Kingdom	114	17
Poland	78	12
Portugal	60	9
Italy	34	5
Spain	21	3
Other	96	14

Note: Income was assessed using the question: "Please estimate your personal income compared to the average income in your current country of residence," rated on a 5-point ordinal scale from 1 (much below average) to 5 (much above average).

rigid error control (Hooper, 2025; Rothman, 1990; Wasserstein et al., 2019). Moreover, defining the "family" of tests for family-wise error correction is often arbitrary and context-dependent, which can result in misleading adjustments (García-Pérez, 2023). Given the lack of consensus on best practices, we adopted a contextual interpretation approach focusing on effect sizes, confidence intervals, and consistency of results, rather than applying blanket corrections.

Multicollinearity was evaluated using the variance inflation factor (VIF). VIF remained well below 5 for all predictors and, therefore, multicollinearity did not pose any issues (Field et al., 2012).

2.2. Results

2.2.1. Descriptive Statistics

Table1 presents demographic information for the 679 participants who completed the study survey. The majority reported having completed a bachelor's degree and indicated an average income level. The most frequently reported country of origin was South Africa followed by the United Kingdom.

Table 2 presents participants' past and current experience with psychedelics and meditation. Most participants reported using psychedelics once every four years or less (35 %), followed by those who used them a few times per year (21 %). Similarly, the largest proportion of participants (30 %) reported never having tried meditation, followed by those who had tried it once but did not practice regularly (29 %).

Table 3 displays the bivariate correlations between the frequency of psychedelic use, meditation practice, and all outcome variables, along with the means and Cronbach's α values for the scales used in Study 1. A weak positive correlation ($r = 0.16$, $p < 0.001$) was found between frequency of psychedelic use and meditation practice.

2.2.2. Relative importance of meditation and psychedelics use frequency on outcomes

All regression models are presented in Table 4, with a summary of the key findings below. We highlight instances where the results differ between original and transformed scale values, noting how the choice of scaling influences the outcomes. The full results of the second (log-transformed) analyses can be found in the Appendix Table A2.

Psychological flexibility. Both higher frequency of psychedelic use (β = 0.12, 95 % CI [0.03, 0.15], $p = 0.002$) and meditation practice (β = 0.25, 95 % CI [0.13, 0.24], $p < 0.001$) were individually associated with higher psychological flexibility (Model 1 and 2). However, when both variables were simultaneously included in the same model (Model 3), the frequency of meditation practice remained strongly associated with the outcome (β = 0.24, 95 % CI [0.12, 0.23], $p < 0.001$), while the effect of the frequency of psychedelic use was weaker (β = 0.08, 95 % CI [0.01, 0.12], $p = 0.030$). There was no significant interaction between psychedelic use

Table 2
Background information on past and current psychedelic use and meditation experience Study 1.

Meditation frequency	***n***	**%**
Never	209	30
I have tried once or twice but do not practice regularly	200	29
Few times per year	82	12
Few times per month	81	12
Every week	62	9
Daily	44	6
Several times a day	1	1
Meditation experience	***n***	**%**
No meditation experience	250	36
Less than a month	110	16
1–6 months	74	11
Between 1 and 2 years	30	4
Between 2 and 5 years	75	11
Over 5 years	78	11
Frequency of psychedelics use	***n***	**%**
Never	59	9
Once every four years or less often	243	35
Once every three years	30	4
Once every two years	77	11
Once a year	86	11
Few times a year	147	21
Monthly	26	4
Weekly	8	1
Daily	3	1
Time since last psychedelics use	***M***	**SD**
Months	38	79
years	3	7

Note: frequency of meditation practice was assessed on a 7-point scale, ranging from "No" (0) to "Several times a day" (6). Frequency of psychedelic use was assessed on a 9-point scale ranging from "Never" (0) to "Daily" (8).

Table 3
Correlations of scales used in the Study 1.

	1	2	3	4	5	6	7	8
1 Frequency of psychedelics use	–-							
2 Frequency of meditation practice	0.16***	–-						
3 Psychological flexibility	0.13***	0.25***	–-					
4 Psychological inflexibility	0.04	−0.04	−0.17***	–-				
5 Mental well-being	0.06	0.19***	0.53***	−0.51***	–-			
6 Peace of mind	0.05	0.13***	0.43***	−0.55***	0.78***	–-		
7 Anxiety	0.05	−0.04	−0.23***	0.64***	−0.59***	−0.64***	–-	
8 Depression	0.06	−0.05	−0.28***	0.64***	−0.63***	−0.61***	0.81***	–-
Mean	2.72	1.59	3.56	3.11	3.30	2.99	1.06	0.91
Standard deviation	1.95	1.57	0.73	0.89	0.71	0.88	0.77	0.70
Cronbach's α			0.88	0.88	0.93	0.90	0.91	0.89

Note: $p < 0.05$ (*), $p < 0.01$ (**), $p < 0.001$ (***).

and meditation practice (β = 0.01, 95 % CI [-0.05, 0.05], $p = 0.906$; Model 4), indicating that their contributions were not synergistic. The analyses using log-transformed scales were consistent with those based on the original scales.

Psychological inflexibility. There was no significant association between the frequency of psychedelic use and psychological inflexibility (β = -0.02, 95 % CI [-0.09, 0.05], $p = 0.551$; Model 1). Higher frequency of meditation practice was weakly associated with lower psychological inflexibility (β = -0.07, 95 % CI [-0.13, 0.01], $p = 0.044$; Model 2). However, when both predictors were included simultaneously (Model 3), neither meditation practice (β = -0.07, 95 % CI [-0.13, 0.00], $p = 0.052$) nor psychedelic use frequency (β = -0.01, 95 % CI [-0.06, 0.06], $p = 0.780$) remained significant. There was also no interaction between the two practices (β = -0.02, 95 % CI [-0.08, 0.04], $p = 0.545$; Model 4). In Model 2, the results from the transformed scales differed from the original scale analyses, with the transformed scale values showing no significant association between frequency of meditation practice and psychological inflexibility (β = -0.051, 95 % CI [-0.11, 0.19], $p = 0.167$).

Peace of mind. Both higher frequency of psychedelic use (β = 0.085, 95 % CI [0.01, 0.14], $p = 0.026$; Model 1) and meditation practice (β = 0.155, 95 % CI [0.07, 0.20], $p < 0.001$; Model 2) were individually associated with higher peace of mind. However, when both variables were included simultaneously (Model 3), the frequency of meditation practice remained significantly associated (β = 0.146, 95 % CI [0.06, 0.19], $p < 0.001$), while the frequency of psychedelic use was no longer significantly associated (β = 0.061, 95 % CI [-0.01, 0.12], $p = 0.109$) with peace of mind. There was also no interaction effect between meditation and psychedelic use (β = 0.066, 95 % CI [-0.05, 0.12], $p = 0.076$, Model 4). In Model 4, the results from the transformed scales differed from the original scale analyses, with the transformed scale values showing a weak association between the interaction of meditation practice and psychedelic use and higher peace of mind (β = 0.09, 95 % CI [0.01, 0.13], $p = 0.017$).

Mental well-being. Both higher frequency of psychedelic use (β = 0.092, 95 % CI [0.01, 0.12], $p = 0.017$; Model 1) and meditation practice (β = 0.212, 95 % CI [0.09, 0.20], $p < 0.001$; Model 2) were individually associated with higher mental well-being. However, when both variables were included simultaneously (Model 3), only the frequency of meditation practice remained significantly associated with mental well-being (β = 0.203, 95 % CI [0.09, 0.20], $p < 0.001$), while the effect of the frequency of psychedelic use was no longer significant (β = 0.059, 95 % CI [-0.01, 0.11], $p = 0.124$). The interaction between the frequency of meditation practice and psychedelic use was associated with higher mental well-being (β = 0.081, 95 % CI [0.01, 0.11], $p = 0.027$; Model 4), suggesting a potential synergistic effect. The analyses using log-transformed scales were consistent with those based on the original scales.

Depression. Neither the frequency of psychedelic use (β = -0.01, 95 % CI [-0.06, 0.05], $p = 0.874$; Model 1) nor the frequency of meditation practice (β = -0.07, 95 % CI [-0.10, 0.00], $p = 0.053$; Model 2) was significantly associated with symptoms of depression. Similarly, when both variables were included simultaneously (Model 3), neither the frequency of meditation practice (β = -0.07, 95 % CI [-0.10, 0.00], $p = 0.054$) nor psychedelic use (β = 0.006, 95 % CI [-0.05, 0.06], $p = 0.880$) were a significant predictor. There was also no interaction effect between the two practices (β = -0.01, 95 % CI [-0.05, 0.05], $p = 0.869$; Model 4). The analyses using log-transformed scales were consistent with those based on the original scales.

Anxiety. Neither the frequency of psychedelic use (β = -0.02, 95 % CI [-0.08, 0.04], $p = 0.520$; Model 1) nor the frequency of meditation practice (β = -0.07, 95 % CI [-0.11, 0.00], $p = 0.068$; Model 2) was significantly associated with symptoms of anxiety. When both variables were included simultaneously (Model 3) neither the frequency of meditation practice (β = -0.06, 95 % CI [-0.11, 0.01], $p = 0.081$) nor psychedelic use (β = -0.01, 95 % CI [-0.07, 0.05], $p = 0.720$) showed a significant association. There was also no interaction between the two practices (β = -0.02, 95 % CI [-0.07, 0.04], $p = 0.636$; Model 4). The analyses using log-transformed scales were consistent with those based on the original scales.

2.3. Discussion of Study 1

Consistent with prior cross-sectional studies (Azmoodeh et al., 2023; Simonsson et al., 2023; Simonsson & Goldberg, 2022), we found a weak but significant bivariate correlation between the frequency of psychedelic use and the frequency of meditation practice. In regression models, both higher frequency of psychedelic use and meditation practice were associated with higher psychological flexibility, peace of mind, and mental well-being, but meditation emerged more consistently associated with outcomes across different models. When entered into the same model, higher frequency of meditation practice remained significantly associated with higher

Table 4
Regression coefficients for Study 1.

Psychological flexibility		*B*	Std. Error	Beta	*p*	95 % CI Lower	95 % CI Upper	R^2	*F*	*p*
Model 1	(Constant)	3.675	0.049		<.001	3.578	3.771	0.039	*F*(4,674) = 6.902	<.001
	Age	−0.068	0.028	−0.09	0.017	−0.124	−0.012			
	Gender	−0.135	0.057		0.019	−0.247	−0.023			
	Diagnoses	−0.137	0.062		0.028	−0.26	−0.015			
	Psychedelic Freq.	0.09	0.029	0.123	0.002	0.034	0.146			
Model 2	(Constant)	3.642	0.048		<.001	3.548	3.736	0.087	*F*(4,674) = 16.081	<.001
	Age	−0.087	0.027	−0.12	0.0010	−0.14	−0.034			
	Gender	−0.081	0.056		0.149	−0.19	0.029			
	Diagnoses	−0.133	0.06		0.028	−0.252	−0.014			
	Meditation Freq.	0.183	0.027	0.251	<.001	0.13	0.236			
Model 3	(Constant)	3.653	0.048		<.001	3.559	3.747	0.094	*F*(5,673) = 13.887	<.001
	Age	−0.073	0.028	−0.1	0.008	−0.128	−0.019			
	Gender	−0.091	0.056		0.103	−0.201	0.018			
	Diagnoses	−0.148	0.061		0.015	−0.267	−0.029			
	Meditation Freq.	0.173	0.027	0.238	<.001	0.12	0.227			
	Psychedelic Freq.	0.061	0.028	0.084	0.03	0.006	0.116			
Model 4	(Constant)	3.652	0.048		<.001	3.558	3.746	0.094	*F*(6,672) = 11.557	<.001
	Age	−0.074	0.028	−0.1	0.008	−0.128	−0.019			
	Gender	−0.091	0.056		0.102	−0.201	0.018			
	Diagnoses	−0.148	0.061		0.015	−0.267	−0.028			
	Meditation Freq.	0.173	0.028	0.237	<.001	0.119	0.227			
	Psychedelic Freq.	0.061	0.028	0.084	0.031	0.006	0.116			
	Interaction	0.003	0.026	0.004	0.906	−0.048	0.054			

Psychological inflexibility		*B*	Std. Error	Beta	*p*	95 % CI Lower	95 % CI Upper	R^2	*F*	*p*
Model 1	(Constant)	3.083	0.057		<.001	2.97	3.196	0.096	*F*(4,674) = 18.983	<.001
	Age	−0.145	0.033	−0.16	<.001	−0.21	−0.08			
	Gender	−0.169	0.067		0.011	−0.301	−0.038			
	Diagnoses	0.442	0.073		<.001	0.299	0.586			
	Psychedelic Freq.	−0.02	0.033	−0.02	0.551	−0.085	0.046			
Model 2	(Constant)	3.093	0.057		<.001	2.981	3.205	0.101	*F*(4,674) = 18.983	<.001
	Age	−0.141	0.032	−0.16	<.001	−0.204	−0.077			
	Gender	−0.187	0.067		0.005	−0.318	−0.056			
	Diagnoses	0.444	0.072		<.001	0.302	0.586			
	Meditation Freq.	−0.066	0.032	−0.07	0.044	−0.129	−0.002			
Model 3	(Constant)	3.091	0.058		<.001	2.978	3.204	0.101	*F*(5,673) = 15.181	<.001
	Age	−0.143	0.033	−0.16	<.001	−0.208	−0.078			
	Gender	−0.185	0.067		0.006	−0.317	−0.054			
	Diagnoses	0.446	0.073		<.001	0.303	0.59			
	Meditation Freq.	−0.064	0.033	−0.07	0.052	−0.129	0.001			
	Psychedelic Freq.	−0.009	0.034	−0.01	0.78	−0.076	0.057			
Model 4	(Constant)	3.094	0.058		<.001	2.981	3.207	0.102	*F*(6,672) = 12.700	<.001

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Table 4 (*continued*)

Psychological flexibility		*B*	Std. Error	Beta	*p*	95 % CI Lower	95 % CI Upper	R^2	*F*	*p*
	Age	−0.142	0.033	−0.16	<.001	−0.207	−0.076			
	Gender	−0.185	0.067		0.006	−0.317	−0.053			
	Diagnoses	0.447	0.073		<.001	0.303	0.59			
	Meditation Freq.	−0.062	0.033	−0.07	0.064	−0.127	0.004			
	Psychedelic Freq.	−0.008	0.034	−0.01	0.81	−0.075	0.058			
	Interaction	−0.019	0.031	−0.02	0.545	−0.081	0.043			

Peace of mind		*B*	Std. Error	Beta	*p*	95 % CI Lower	95 % CI Upper	R^2	*F*	*p*
Model 1	(Constant)	3.085	0.057		<.001	2.973	3.197	0.091	$F(4,674) = 16.959$	<.001
	Age	0.032	0.033	0.037	0.331	−0.033	0.097			
	Gender	0.117	0.067		0.08	−0.014	0.247			
	Diagnoses	−0.539	0.073		<.001	−0.682	−0.396			
	Psychedelic Freq.	0.074	0.033	0.085	0.026	0.009	0.14			
Model 2	(Constant)	3.059	0.057		<.001	2.948	3.171	0.108	$F(4,674) = 20.499$	<.001
	Age	0.016	0.032	0.018	0.614	−0.047	0.079			
	Gender	0.158	0.066		0.017	0.028	0.288			
	Diagnoses	−0.534	0.072		<.001	−0.674	−0.393			
	Meditation Freq.	0.136	0.032	0.155	<.001	0.073	0.199			
Model 3	(Constant)	3.069	0.057		<.001	2.957	3.18	0.112	$F(5,673) = 16.953$	<.001
	Age	0.028	0.033	0.032	0.389	−0.036	0.093			
	Gender	0.148	0.066		0.026	0.018	0.279			
	Diagnoses	−0.547	0.072		<.001	−0.688	−0.405			
	Meditation Freq.	0.128	0.032	0.146	<.001	0.064	0.192			
	Psychedelic Freq.	0.054	0.033	0.061	0.109	−0.012	0.119			
Model 4	(Constant)	3.061	0.057		<.001	2.95	3.173	0.116	$F(6,672) = 14.706$	<.001
	Age	0.025	0.033	0.028	0.45	−0.04	0.089			
	Gender	0.146	0.066		0.027	0.016	0.276			
	Diagnoses	−0.547	0.072		<.001	−0.688	−0.406			
	Meditation Freq.	0.12	0.033	0.137	<.001	0.056	0.184			
	Psychedelic Freq.	0.05	0.033	0.057	0.136	−0.016	0.115			
	Interaction	0.055	0.031	0.066	0.075	−0.005	0.116			

Mental well-being		*B*	Std. Error	Beta	*p*	95 % CI Lower	95 % CI Upper	R^2	*F*	*p*
Model 1	(Constant)	3.387	0.047		<.001	3.295	3.48	0.067	$F(4,674) = 12.006$	<.001
	Age	0.009	0.027	0.012	0.747	−0.045	0.062			
	Gender	0.041	0.055		0.456	−0.067	0.148			
	Diagnoses	−0.383	0.06		<.001	−0.5	−0.266			
	Psychedelic Freq.	0.065	0.027	0.092	0.017	0.012	0.119			
Model 2	(Constant)	3.362	0.046		<.001	3.272	3.452	0.103	$F(4,674)$ 19.348	<.001
	Age	−0.005	0.026	−0.01	0.842	−0.056	0.046			
	Gender	0.084	0.054		0.119	−0.022	0.19			
	Diagnoses	−0.382	0.058		<.001	−0.496	−0.267			
	Meditation Freq.	0.151	0.026	0.212	<.001	0.099	0.202			

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Table 4 (*continued*)

Psychological flexibility		***B***	**Std. Error**	**Beta**	***p***	**95 % CI Lower**	**95 % CI Upper**	R^2	***F***	***p***
Model 3	(Constant)	3.369	0.046		<.001	3.278	3.46	0.106	$F(5,673) = 15.985$	<.001
	Age	0.004	0.027	0.006	0.872	−0.048	0.057			
	Gender	0.077	0.054		0.155	−0.029	0.183			
	Diagnoses	−0.392	0.059		<.001	−0.507	−0.277			
	Meditation Freq.	0.144	0.026	0.203	<.001	0.092	0.196			
	Psychedelic Freq.	0.042	0.027	0.059	0.124	−0.011	0.095			
Model 4	(Constant)	3.362	0.046		<.001	3.271	3.452	0.113	$F(6,672) = 14.214$	<.001
	Age	0.001	0.027	0.001	0.977	−0.051	0.053			
	Gender	0.075	0.054		0.165	−0.031	0.18			
	Diagnoses	−0.392	0.058		<.001	−0.507	−0.278			
	Meditation Freq.	0.137	0.027	0.193	<.001	0.085	0.189			
	Psychedelic Freq.	0.038	0.027	0.053	0.162	−0.015	0.091			
	Interaction	0.056	0.025	0.081	0.027	0.006	0.105			

Depression		***B***	**Std. Error**	**Beta**	***p***	**95 % CI Lower**	**95 % CI Upper**	R^2	***F***	***p***
Model 1	(Constant)	0.788	0.045		<.001	0.699	0.877	0.107	$F(4,674) = 20.205$	<.001
	Age	−0.092	0.026	−0.13	<.001	−0.144	−0.041			
	Gender	−0.012	0.053		0.814	−0.116	0.091			
	Diagnoses	0.459	0.058		<.001	0.346	0.573			
	Psychedelic Freq.	−0.004	0.026	−0.01	0.874	−0.056	0.048			
Model 2	(Constant)	0.794	0.045		<.001	0.705	0.883	0.112	$F(4,674) = 21.246$	<.001
	Age	−0.092	0.025	−0.13	<.001	−0.142	−0.042			
	Gender	−0.024	0.053		0.647	−0.128	0.079			
	Diagnoses	0.463	0.057		<.001	0.351	0.576			
	Meditation Freq.	−0.05	0.026	−0.07	0.053	−0.1	0.001			
Model 3	(Constant)	0.795	0.045		<.001	0.705	0.884	0.112	$F(5,673) = 16.977$	<.001
	Age	−0.091	0.026	−0.13	<.001	−0.142	−0.039			
	Gender	−0.025	0.053		0.639	−0.129	0.079			
	Diagnoses	0.462	0.058		<.001	0.349	0.575			
	Meditation Freq.	−0.05	0.026	−0.07	0.054	−0.101	0.001			
	Psychedelic Freq.	0.004	0.027	0.006	0.88	−0.048	0.056			
Model 4	(Constant)	0.795	0.046		<.001	0.706	0.885	0.112	$F(6,672) = 14.131$	<.001
	Age	−0.09	0.026	−0.13	<.001	−0.142	−0.039			
	Gender	−0.025	0.053		0.641	−0.129	0.079			
	Diagnoses	0.462	0.058		<.001	0.349	0.576			
	Meditation Freq.	−0.05	0.026	−0.07	0.059	−0.101	0.002			
	Psychedelic Freq.	0.004	0.027	0.006	0.872	−0.048	0.057			
	Interaction	−0.004	0.025	−0.01	0.869	−0.053	0.045			

Anxiety		***B***	**Std. Error**	**Beta**	***p***	**95 % CI Lower**	**95 % CI Upper**	R^2	***F***	***p***
Model 1	(Constant)	0.944	0.049		<.001	0.847	1.041	0.133	$F(4,674) = 25.931$	<.001
	Age	−0.13	0.028	−0.17	<.001	−0.186	−0.075			
	Gender	−0.063	0.057		0.27	−0.176	0.049			
	Diagnoses	0.537	0.063		<.001	0.414	0.661			

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Table 4 (*continued*)

Psychological flexibility		*B*	Std. Error	Beta	*p*	95 % CI Lower	95 % CI Upper	R^2	*F*	*p*
	Psychedelic Freq.	−0.018	0.029	−0.02	0.52	−0.075	0.038			
Model 2	(Constant)	0.952	0.049		<.001	0.855	1.048	0.137	$F(4,674) = 26.778$	<.001
	Age	−0.127	0.028	−0.16	<.001	−0.181	−0.072			
	Gender	−0.077	0.057		0.178	−0.19	0.035			
	Diagnoses	0.538	0.062		<.001	0.416	0.66			
	Meditation Freq.	−0.051	0.028	−0.07	0.068	−0.106	0.004			
Model 3	(Constant)	0.95	0.049		<.001	0.853	1.047	0.137	$F(5,673) = 21.420$	<.001
	Age	−0.129	0.028	−0.17	<.001	−0.185	−0.073			
	Gender	−0.076	0.058		0.19	−0.189	0.038			
	Diagnoses	0.54	0.063		<.001	0.417	0.663			
	Meditation Freq.	−0.049	0.028	−0.06	0.081	−0.105	0.006			
	Psychedelic Freq.	−0.01	0.029	−0.01	0.72	−0.067	0.047			
Model 4	(Constant)	0.952	0.05		<.001	0.854	1.049	0.138	$F(6,672) = 17.867$	<.001
	Age	−0.128	0.029	−0.17	<.001	−0.184	−0.072			
	Gender	−0.075	0.058		0.193	−0.189	0.038			
	Diagnoses	0.54	0.063		<.001	0.417	0.664			
	Meditation Freq.	−0.048	0.028	−0.06	0.095	−0.104	0.008			
	Psychedelic Freq.	−0.01	0.029	−0.01	0.743	−0.067	0.048			
	Interaction	−0.013	0.027	−0.02	0.636	−0.066	0.04			

outcome scores, while the association between higher frequency of psychedelic use and higher psychological flexibility was attenuated, and its associations with peace of mind and well-being were no longer significant. Notably, psychedelic use was not associated with psychological inflexibility or ill-being (i.e., depression and anxiety), whereas more frequent meditation practice was associated with lower psychological inflexibility. However, since the analyses with the transformed scale yielded no significant association between meditation and inflexibility, the finding should be interpreted with caution and regarded as preliminary. Finally, a small but significant interaction between psychedelic use and meditation emerged for mental well-being, suggesting a potential synergistic effect: individuals who meditate more frequently may experience greater well-being benefits from psychedelic use, or people who use psychedelics more often may experience more benefit from meditation. For peace of mind, the transformed scale values showed a significant association between the interaction of meditation practice and psychedelic use: suggesting that individuals who meditate more frequently may experience greater benefits in peace of mind from psychedelic use, or people who use psychedelics more often may experience more benefit from meditation. However, since the analyses with the original scale resulted in divergent findings, these results should be considered tentative evidence regarding the interaction effect.

These findings align with prior research linking meditation to increased well-being, life satisfaction, and mindfulness-related capabilities such as present-moment awareness, decentering, and experiential acceptance Goldberg et al., 2023; Goldin et al., 2021; Rahl et al., 2017; Schlechta Portella et al., 2021). Although earlier naturalistic studies have found that frequent psychedelic use is associated with lower depression and anxiety (Lafrance et al., 2021; Raison et al., 2022) this study did not support those findings, possibly because the sample consisted mainly of psychologically healthy individuals with mild symptoms. These findings suggest that in non-clinical populations, both psychedelics and meditation may serve more as resilience-enhancing practices rather than direct interventions for ill-being.

3. Study 2: Is a single meaningful experience, facilitated by psychedelics, meditation, or both, associated with perceived changes in well-being?

We analysed data collected as part of a previous study designed to compare the phenomenological content and perceived impact of personally meaningful experiences facilitated by either psychedelics or meditation (Jylkkä et al., 2025). The full participant information sheet for study 2 can be found in the Appendix. Unlike Study 1, which focused exclusively on psychedelic users, Study 2 recruited meditators and psychedelic users as separate groups. The preregistered aims of the original study were to compare the reported content of a single personally meaningful psychedelic or meditation experience (hereafter referred to as "the experience"), and to examine how this content related to perceived changes in well-being. Although the original study included only two groups (psychedelic users and meditation practitioners), we found that some participants who reported a psychedelic experience also indicated they practiced meditation during it by checking "Yes" to the question: "Was there a meditation technique involved in addition to

the drug?" If "Yes," they specified the technique used. Similarly, participants who reported a meditation experience could disclose if any psychoactive substances were involved by checking "Yes" or "No" to the question: "Was there any kind of psychoactive substance involved?" and specifying the substance used. This allowed us to define a third group post hoc: those who had a meditation-assisted psychedelic experience. Therefore, in the present study, we compared the perceived changes in well-being after a single meaningful experience facilitated by (a) meditation alone, (b) psychedelics alone, or (c) psychedelics combined with meditation. This third group enabled an initial test of a potential synergy effect, whether meditation enhances the effects of psychedelics, or vice versa. Additionally, we examined whether the groups differed in the intensity of mystical-type features (as measured using the MEQ30).

3.1. Methods

3.1.1. Participants and Procedure

Meditation participants were recruited from various meditation communities and psychedelic participants through psychedelic communities through direct email invitations or social media outreach. They were asked to complete an online survey in which they reported their most personally meaningful psychedelic or meditation experience. The questionnaires distributed to the two groups were identical, except for sections specific to the type of the experience, such as questions about the type of substance used (for psychedelic experience) or the meditation technique practiced (for meditation experience). Both groups provided information about their prior psychedelic use and meditation practice, including details such as frequency of use/practice, the most recent use of psychedelics, and the duration of meditation practice. Additionally, we gathered data on participant characteristics, including the timing, setting, social context, and primary purpose of their experiences. Finally, information on gender, education, income level, religious affiliation, and history of psychiatric disorders was also collected.

The survey was administered via the in-house survey platform SOILE. Prior to answering the questionnaire, participants provided informed consent, which included a description of the study's aims and eligibility criteria (being 18 years or older and having had a personally meaningful experience facilitated by either a psychedelic substance in the psychedelic group, or meditation in the meditation group). Although the original study recruited participants in the psychedelic group regardless of substance type (including both classical and non-classical psychedelics), the present analysis focuses exclusively on experiences with one classical psychedelic substance. Limiting the analysis to a single class of substances aligns our methodology with previous research, facilitating direct comparisons and contributing to a more coherent and robust evidence base regarding the effects of these compounds. This focus also avoids including individuals engaging in poly-drug use, an area with limited research on the interactions between different substances.

Following data quality checks, among the psychedelic and combined groups, several exclusions were made to minimize potential confounding from varying substance combinations and to control for differences in pharmacological properties. Specifically, 17 participants were excluded because their experience was not facilitated by a classical psychedelic. Additionally, 41 participants were excluded for reporting the use of more than one psychedelic or the inclusion of other substances, such as cannabis. Nine participants were excluded due to missing data on perceived changes in well-being. From the combined group, 4 participants were excluded due to inconsistent reporting of meditation frequency. Furthermore, 4 participants who selected "other" as their gender identity were excluded, as gender was used as a covariate in the analyses and the small number of observations precluded reliable statistical analyses. No participants were excluded from the meditation group, and none in this group used psychedelics to facilitate their experience. The final sample ($N = 137$) included 49 participants in the psychedelic group, 25 in the combined group, and 63 in the meditation group. The study obtained approval from the Research Ethics Committee at Åbo Akademi University, Finland (decision number #15092022). The original study was preregistered at https://osf.io/5pa8f, however, the present analysis was not part of the preregistered plan.

With regard to sample size, similar to Study 1, we conducted a sensitivity power analysis using G*Power 3.1 to estimate the minimum effect size detectable with the achieved sample size. Study 2 used ordinal logistic regression, for which G*Power does not provide a power routine. Following standard practice, we applied the G*Power linear-model approximation using the same N and number of predictors. With N = 137 and 4 predictors, the minimum detectable effect size was $f^2 = 0.059$, corresponding to small-to-medium effects. One category of the ordinal predictor had 25 cases, which may reduce precision and was interpreted cautiously.

3.1.2. Measures

Perceived Changes in Well-being. To assess perceived changes in wellbeing as a result of the experience, participants responded to five items on a five-point scale from "Decreased a lot" (1) through "Stayed the same" (3) to "Increased a lot" (5). The prompt asked: "As a result of the Experience, have you noticed any persisting increases or decreases in the following?" The five items were: "1) How satisfied you are with your life as a whole; 2) How positive you feel in your daily life; (3) How negative you feel in your daily life; (4) The extent to which you feel that your life has meaning and purpose; and (5) The extent to which you feel you have peace and harmony in your mind".

Frequency of Psychedelic Use and Meditation Practice. To assess the frequency of psychedelic use, participants were asked how many times they had used classic psychedelics in their lifetime ("Cumulative frequency"), with the question "Have you ever tried classical psychedelics (e.g., LSD, psilocybin, ayahuasca, DMT, 5-MeO-DMT)?" using the following scale: "Never" (0), "Once" (1), "Twice" (2), "3–5 times" (3), "6–10 times" (4), "10–50 times" (5), "Over 50 times" (6). The frequency of meditation practice was assessed using the same scale as in Study 1.

Mystical-Type Features of the Experience. The Mystical Experience Questionnaire (MEQ30; Barrett et al., 2015) was used to assess mystical-type features of the Experience. The MEQ30 consists of 30 items categorized into four factors: Mystical, Positive Mood, Transcendence of Time and Space, and Ineffability. Participants rated each item on a six-point Likert scale, ranging from 0 ("None at all") to 5 ("Extreme ("more than ever before in my life"). Mean scores for the overall scale were calculated to capture the overall

intensity of mystical-type experiences, with higher scores reflecting a greater intensity of these experiences. Cronbach's alpha 0.95.

3.1.3. Statistical analyses

All analyses were conducted using SPSS (version 29.0.2.0.). We examined whether the perceived changes in well-being differed between the three groups: the psychedelic group, the meditation group, and the combined group. We conducted five models where the outcome measures were perceived changes in life satisfaction, positive affect, negative affect, meaning and purpose in life, as well as peace and harmony. Given that the outcome variables were ordinal with discrete values, consisted of only one item each, and were not normally distributed, we employed ordinal logistic regression models. The main explanatory variable of interest was group (categorical; psychedelic, meditation, or combined), and the models included the following covariates: age (continuous), gender (dichotomous; female = 0, male = 1), and the history of psychiatric diagnoses (dichotomous; 0 = no diagnosis, 1 = history of diagnosis).

To conduct pairwise comparisons between the groups we re-specified the reference group, comparing both the meditation and combined groups to the psychedelic group, and then the combined and psychedelic groups to the meditation group. Additionally, Kruskal-Wallis tests were used to compare whether the frequency of psychedelic use and meditation practice differed between the groups, as both have been shown to produce cumulative effects. A separate Kruskal −Wallis test was conducted to examine group differences in MEQ30 scores.

3.2. Results

3.2.1. Descriptive Statistics

Table 5 presents demographic information for the 137 participants who completed the survey. The mean age for participants in the psychedelic group was 39 years (SD = 12), followed by 40 years (SD = 12) in the combined group and 52 years (SD = 14) in the

Table 5
Demographic information across those reporting a psychedelic vs. combined vs. meditation experience of Study 2 Participants (N = 137).

	Psychedelic		Combined		Meditation	
	M	***SD***	***M***	***SD***	***M***	***SD***
Age	39	12	40	12	52	14
Gender	***n***	**%**	***n***	**%**	***n***	**%**
Female	18	37	6	24	29	46
Male	31	6	19	76	34	54
Other	1	1	0	0	2	1
Education	***n***	**%**	***n***	**%**	***n***	**%**
Primary education	0	0	1	4	0	0
Lower Secondary education	1	2	0	0	1	2
Higher Secondary education	6	12	2	8	2	3
Vocational education	5	10	0	0	3	5
University: Bachelor's degree	11	22	10	40	19	30
University: Master's degree	14	29	12	48	25	40
University: Doctoral degree	8	16	0	0	9	14
Income	***n***	**%**	***n***	**%**	***n***	**%**
Much below average	5	10	1	4	9	14
Below average	8	16	4	16	15	24
Average	11	22	5	20	11	18
Above average	21	43	11	44	23	37
Much above average	4	8	4	16	5	8
Religion	***n***	**%**	***n***	**%**	***n***	**%**
Agnostic	9	18	2	8	4	6
Atheist	12	25	5	20	2	3
Buddhist	1	2	0	0	18	27
Christian	3	6	3	12	6	10
Hindu	0	0	0	0	2	3
Non-denominational	2	4	2	8	3	5
Spiritual but not religious	14	29	12	48	22	35
Psychiatric diagnoses	***n***	**%**	***n***	**%**	***n***	**%**
No disclosed	2	4	1	4	2	3
Severe depression	12	25	3	12	5	8
Bipolar disorder	1	2	0	0	2	3
Psychosis or Schizophrenia	2	4	0	0	1	2
Anxiety	7	14	0	0	6	10

meditation group. Most participants reported having completed a master's degree and having an above-average income. Table 6 presents data on participants' past and current experiences with psychedelics and meditation.

Table 7 summarizes participant characteristics regarding the timing, setting, social context, and primary purpose of their experiences. Experiences were reported across various time frames, settings, and social contexts, and participants indicated a range of primary purposes for their experiences.

Table 8 presents the specific psychedelics and meditation practices used to facilitate the Experience. In the psychedelic group, the most commonly reported substance was psilocybin (47 %), followed by LSD (39 %). Similarly, psilocybin was the most frequently used drug in the combined group (56 %), with LSD reported by (16 %) of participants. As for meditation techniques, the most common practice in the meditation group was silent sitting or lying down meditation (54 %), followed by mindfulness meditation (26 %). These were also prevalent in the combined group, with (13 %) reporting silent sitting or lying down meditation and (9 %) reporting mindfulness meditation (the participant could select several techniques and drugs).

3.2.2. *Perceived changes in well-being as facilitated by psychedelics, meditation, or both*

Descriptive data on perceived changes in well-being are summarized in Table 9. The ordinal logistic regression coefficients are presented in Table 10 and the results are summarized below. The ordinal logistic regression models assessing perceived changes in life satisfaction and meaning and purpose in life were not statistically significant ($\chi^2 = 3.87$, $p = 0.568$; $\chi^2 = 9.78$, $p = 0.08$; and $\chi^2 = 5.56$, $p = 0.351$, respectively). In contrast, the model for perceived changes in positive affect was statistically significant ($\chi^2 = 23.30$, $p < 0.001$, Cox and Snell $R^2 = 0.156$). Participants in both the combined group ($B = 1.519$, $SE = 0.50$, $p = 0.003$) and meditation group ($B = 1.53$, $SE = 0.43$, $p < 0.001$) reported significantly greater perceived improvement in positive affect compared to the psychedelic group. However, there was no significant difference between the meditation group and the combined group ($B = -0.006$, $SE = 0.49$, $p = 0.991$). Additionally, having been diagnosed with a psychiatric diagnosis was associated with less improvements in positive affect ($B = -1.45$, $SE = 0.46$, $p = 0.002$).

The model assessing changes in peace and harmony was also significant ($\chi^2 = 21.40$, $p < 0.001$, Cox and Snell $R^2 = 0.145$). Again, both the combined ($B = 1.87$, $SE = 0.52$, $p < 0.001$) and meditation ($B = 1.66$, $SE = 0.43$, $p < 0.001$) groups reported significantly

Table 6
Background information of past and current psychedelics use and meditation experience across the groups Study 2.

	Psychedelic		Combined		Meditation	
	n	**%**	***n***	**%**	***n***	**%**
Meditation frequency						
Never	10	20	0	0	0	0
I have tried once or twice but do not practice regularly	11	22	5	20	0	0
Few times per year	6	12	0	0	3	5
Few times per month	11	22	7	28	0	0
Every week	5	10	9	36	13	21
Daily	5	10	2	8	36	57
Several times a day	1	2	2	8	11	18
Meditation experience	***n***	**%**	***n***	**%**	***n***	**%**
No meditation experience	15	31	0	0	0	0
Less than a month	3	6	0	0	1	2
1–6 months	1	2	0	0	1	2
Between 1 and 2 years	2	4	9	36	1	2
Between 2 and 5 years	11	22	4	16	4	6
Over 5 years	17	35	12	48	56	89
Frequency of psychedelics use	***n***	**%**	***n***	**%**	***n***	**%**
Never	0	0	0	0	32	51
Once	3	6	3	12	4	6
Twice	2	4	1	4	3	5
3–5 times	7	14	3	12	9	14
6–10 times	12	25	6	24	4	6
10–50 times	18	37	9	36	10	16
Over 50 times	7	14	3	12	1	2
Time since last psychedelics use	***n***	**%**	***n***	**%**	***n***	**%**
Never or over a year ago	14	29	3	12	55	87
9–12 months ago	6	12	1	4	2	3
6–9 months ago	3	6	3	12	1	2
3–6 months ago	6	12	4	16	1	2
1–3 months ago	9	18	5	20	0	0
2–4 weeks ago	5	10	3	12	3	5
One week ago	4	8	0	0	0	0
Less than one week ago	2	4	6	24	1	2

Table 7
Time since the Experience and the setting of the Experience Study 2.

	Psychedelic		Combined		Meditation	
	n	**%**	***n***	**%**	***n***	**%**
Time since the experience						
Less than one week ago	0	0	2	8	1	2
One week ago	1	2	0	0	1	2
2–4 weeks ago	1	2	1	4	2	3
1–3 months ago	4	8	1	4	3	5
3–6 months ago	2	4	3	12	4	6
6–12 months ago	4	8	3	12	2	3
1–2 years ago	8	16	5	20	11	18
2–5 years ago	15	31	6	24	11	18
Over 5 years ago	14	29	4	16	28	44
Setting	***n***	**%**	***n***	**%**	***n***	**%**
Home or home-like environment	18	37	11	44	22	35
Friend's home or home-like environment	9	19	2	8	0	0
Unknown person's home or home-like environment	0	0	0	0	0	0
Other private space	2	4	1	4	2	3
Nature	6	12	2	8	3	5
Ceremonial space or retreat	9	18	8	32	33	52
Space designed for therapeutic purpose	0	0	0	0	1	2
Public gathering (e.g., festival)	1	2	0	0	0	0
Other public space	4	8	1	4	0	0
Who was present	***n***	**%**	***n***	**%**	***n***	**%**
Alone	10	20	7	28	30	48
One other person	17	35	8	32	1	2
Several people, all familiar	14	29	4	16	7	11
Several people, some unfamiliar	8	16	6	24	25	40
Was there a guide, facilitator or therapist present	***n***	**%**	***n***	**%**	***n***	**%**
No	39	80	16	64	29	46
Yes, one	5	10	2	8	28	44
Yes, several	5	10	7	28	6	10
Main purpose of the Experience	***n***	**%**	***n***	**%**	***n***	**%**
No specific purpose	2	4	0	0	11	18
To relax and enjoy	19	39	4	16	6	10
Spiritual practice	12	25	10	40	33	52
Therapeutic work	13	27	10	40	4	6
Curiosity	25	51	14	56	5	8
Social reasons	2	4	1	4	0	0
Self-improvement	12	25	13	52	9	14
Distraction from problems or boredom	1	2	0	0	2	3
Other specific purpose	3	6	1	4	9	14

Note: Participants were allowed to select multiple purposes.

greater perceived improvements than the psychedelic group with no difference between the meditation and combined groups ($B = 0.213$, SE $= 0.52$, $p = 0.681$).

Furthermore, the model assessing changes in negative affect was also significant ($\chi^2 = 11.15$, $p = 0.049$, Cox and Snell $R^2 = 0.078$). Again, both the combined ($B = -0.929$, $SE = 0.47$, $p = 0.048$) and meditation ($B = -0.807$, $SE = 0.40$, $p = 0.042$) groups reported significantly greater perceived reductions in negative affect than the psychedelic group with no difference between the meditation and combined groups ($B = -0.122$, $SE = 0.47$, $p = 0.793$). Additionally, having been diagnosed with a psychiatric diagnosis was associated with higher scores for negative affect ($B = 1.802$, $SE = 0.42$, $p = 0.009$).

3.2.3. Differences between the groups in mystical-type experience features

The average MEQ30 scores in the psychedelic, combined, and meditation groups were 3.01 ($SD = 1.14$), 3.61 ($SD = 1.02$), and 3.2 ($SD = 1.17$), respectively, with no statistically significant differences between groups ($H(2) = 4.73$, $p = 0.094$). Overall, the scores fell within the "moderate" range on the scale from 0 "none (not at all)" to 6 "extreme (more than any other time in my life and stronger than 4").

3.2.4. Differences between the groups in frequency of psychedelics use and meditation

A Kruskal-Wallis H test was conducted to examine whether the frequency of psychedelic use differed among three groups:

Table 8
Drugs and meditation techniques used to facilitate the Experience in the Psychedelic, Combined and Meditation groups Study 2.

	Psychedelic		Combined		Meditation	
	n	**%**	***n***	**%**	***n***	**%**
Psychedelic drugs used						
LSD	19	39	4	16	0	0
Psilocybin or 'magic mushrooms'	23	47	14	56	0	0
Ayahuasca	1	2	6	24	0	0
N,N-DMT	1	2	0	0	0	0
5-MeO-DMT or Bufo Alvarius	4	8	1	4	0	0
Mescaline or psychoactive cacti	1	2	0	0	0	0
Meditation	***n***	**%**	***n***	**%**	***n***	**%**
Silent sitting or lying down	0	0	19	13	34	54
Voicework (e.g. chanting)	0	0	2	2	3	5
Breathwork (intentional manipulation of breath)	0	0	4	3	5	8
Bodywork (e.g. yoga)	0	0	0	0	3	5
Mindfulness	0	0	12	9	16	25
Other type of meditation	0	0	5	4	17	26

Note: The participant could select several techniques or drugs.

Table 9
Perceived changes in well-being Study 2.

	Psychedelic		Combined		Meditation	
	M	***SD***	***M***	***SD***	***M***	***SD***
Satisfaction with life	4.27	0.81	4.52	0.65	4.38	0.94
Positive affect	3.9	0.77	4.36	0.70	4.35	0.72
Negative affect	2.24	0.96	1.88	0.93	1.95	0.92
Meaning and purpose in life	4.04	0.91	4.32	0.80	4.22	1.02
Peace and harmony	3.88	0.9	4.60	0.65	4.43	0.73

Note: perceived changes in well-being were assessed on a five-point scale from "Decreased a lot" (1) through "Stayed the same" (3) to "Increased a lot" (5).

psychedelic, combined, and meditation. The groups differed significantly in their reported frequencies of psychedelic use ($H(2) = 42.95$, $p < 0.001$). Post-hoc pairwise comparisons using Dunn's test with Bonferroni correction revealed that the meditation group had significantly lower frequency of psychedelic use ($Md = 0.00$, $M = 1.73$) than the combined group ($Md = 4.00$, $M = 4.04$, *adj.* $p < 0.001$) and the psychedelic group ($Md = 5.00$, $M = 4.24$, *adj.* $p < 0.001$). No significant difference was found between the combined group and the psychedelic groups (p = 1.00).

A second Kruskal-Wallis H test was conducted to assess whether the frequency of meditation practice differed between the three groups: psychedelic, combined, and meditation. The test showed a significant difference ($H(2) = 62.39$, $p < 0.001$). Post-hoc pairwise comparisons using Dunn's test with Bonferroni correction revealed that the meditation group ($Md = 5.00$, $M = 4.83$) reported significantly higher frequency of meditation practice than the combined group ($Md = 4.00$, $M = 3.36$, *adj.* $p < 0.001$) and psychedelic group ($Md = 2.00$, $M = 2.18$, *adj.* $p < 0.001$). No significant difference was found between the combined group and the psychedelic group (*adj.* $p = 0.111$.

3.3. Discussion of Study 2

The main finding from Study 2 was that participants in both the combined and meditation group reported significantly greater perceived improvements in positive affect and in peace and harmony as well as lesser perceived negative affect compared to those in the psychedelic group. Notably, mean scores for positive affect and peace and harmony exceeded 3.9 across all groups (on a scale where 3 indicated no change), suggesting that most participants experienced enhanced well-being after their experience. Similarly, mean scores for perceived changes in negative affect were below 2.2 in all groups, indicating decreased negative affect after the experience.

These results partially align with those of Griffiths et al. (2018), who found that combining psilocybin with spiritual support, including meditation, enhanced well-being. Similarly, we observed perceived increases in positive affect, and reductions in negative affect. However, unlike Griffiths et al. (2018), we found no evidence of synergy for life satisfaction or meaning in life. Smigielski et al. (2019) reported greater benefits, including greater meaning, when combining meditation with psilocybin, but our data did not show these effects; meditation alone produced comparable outcomes to the combined approach. The observed synergy in negative affect, positive affect and peace and harmony appeared only when comparing the combined group to the psychedelic group, suggesting that meditation may enhance the psychedelic experience. However, the combined group did not outperform the meditation group,

Table 10
Regression coefficients for perceived Changes in Well-Being, Study 2.

	B	SE	*p*	χ^2	Cox & Snell R^2	95 % Lower	95 % Higher
Life Satisfaction			0.568	3.87	0.028		
Age	0.007	0.01	0.564			−0.018	0.033
Gender	−0.010	0.35	0.977			−0.695	0.675
Psychiatric Diagnosis	0.433	0.43	0.313			−0.408	1.273
Combined Group vs Psychedelic Group	0.699	0.49	0.158			−0.271	1.668
Meditation Group vs Psychedelic Group	0.456	0.41	0.266			−0.347	1.260
Combined Group vs Meditation Group	0.242	0.50	0.628			−0.738	1.223
Meaning and Purpose			0.08	9.78	0.040		
Age	0.009	0.01	0.446			−0.015	0.034
Gender	0.023	0.34	0.946			−0.639	0.685
Psychiatric Diagnosis	0.633	0.42	0.130			−0.187	1.452
Combined Group vs Psychedelic Group	0.681	0.48	0.151			−0.249	1.611
Meditation Group vs Psychedelic Group	0.506	0.39	0.204			−0.274	1.287
Combined Group vs Meditation Group	0.175	0.48	0.714			−0.761	1.111
Positive Affect				23.30	0.156		
Age	0.003	0.01	0.838			−0.022	0.028
Gender	0.367	0.35	0.291			−0.315	1.050
Psychiatric Diagnosis	−1.45	0.46	0.002**			0.554	2.342
Combined Group vs Psychedelic Group	1.519	0.50	0.003**			0.532	2.506
Meditation Group vs Psychedelic Group	1.53	0.43	<.001***			0.674	2.375
Combined Group vs Meditation Group	−0.006	0.49	0.991			−0.967	0.955
Negative Affect				11.15	0.078		
Age	−0.003	0.01	0.787			−0.027	0.021
Gender	−0.395	0.33	0.234			−1.047	0.256
Psychiatric Diagnosis	1.802	0.42	0.009**			−1.899	−0.266
Combined Group vs Psychedelic Group	−0.929	0.47	0.048*			−1.850	−0.009
Meditation Group vs Psychedelic Group	−0.807	0.40	0.042*			−1.586	−0.028
Combined Group vs Meditation Group	−0.122	0.47	0.793			−1.036	0.792
Peace and Harmony				21.40	0.145		
Age	−0.021	0.01	0.105			−0.046	0.004
Gender	0.233	0.35	0.501			−0.446	0.912
Psychiatric Diagnosis	0.241	0.42	0.567			−0.584	1.067
Combined Group vs Psychedelic Group	1.87	0.52	<.001***			0.849	2.898
Meditation Group vs Psychedelic Group	1.66	0.43	<.001***			0.820	2.501
Combined Group vs Meditation Group	0.213	0.52	0.681			−0.801	1.226

Note: $p < 0.05$ (*), $p < 0.01$ (**), $p < 0.001$ (***). ***B*** represents the change in the log-odds of the outcome for a one-unit increase in the explanatory variable.

indicating one-directional synergy.

We also found no significant differences in MEQ30 scores across the three groups, indicating that combining psychedelics and meditation did not lead to more intense mystical-type experiences. This finding contrasts with previous research by Griffiths et al. (2018), who found that combining psychedelics with high spiritual support resulted in higher MEQ30 and Mystical scale scores compared to standard spiritual support. Similarly, Smigielski et al. (2019) reported higher 5D-ASC scores in the combined group compared to the meditation-only group. Meling et al. (2024) found that meditators who received DMT and harmine reported greater mystical-type experiences, non-dual awareness, and emotional breakthroughs than those who received placebo. One potential explanation for our findings is methodological: participants were asked to recall a single personally meaningful experience, which may have resulted in uniformly high MEQ30 scores regardless of the facilitation method. Alternatively, this may suggest that different facilitation methods can yield similarly intense mystical experiences.

Nearly half of the participants in the meditation group had prior psychedelic experience, even though they did not use psychedelics during the reported experience. This may have influenced the results, as previous psychedelic use has been shown to enhance mindfulness traits, amplifying the benefits of meditation (Madsen et al., 2020; Mian et al., 2020; Radakovic et al., 2022; Sampedro et al., 2017; Soler et al., 2016; Uthaug et al., 2019). Another possibility is that the relatively high number of psychedelic users in the meditation group may have rendered the combined and meditation groups more similar, helping to explain the lack of significant differences between these groups. Future studies should better control for participants' prior experience with both psychedelics and meditation.

Finally, meditation frequency was significantly higher in the meditation group compared to both the psychedelic and combined groups. In contrast, psychedelic use was significantly higher in the psychedelic and combined groups compared to the meditation group. However, no significant differences were found between the psychedelic and combined groups in terms of either meditation

frequency or psychedelic use. This suggests that differences in perceived effects of well-being between the combined and psychedelic groups are unlikely to be driven by cumulative effects alone.

4. General discussion

Recent surveys suggest some overlap between individuals who use psychedelics and those who are engaged in meditation practice, yet research on their combined effects remains limited. The present study aimed to address this gap through two complementary approaches. In Study 1, we examined the relative associations of the frequency of psychedelic use and meditation practice with psychological flexibility and inflexibility, mental well-being, and ill-being, as well as whether engaging in both practices (i.e., interaction effect) was linked to stronger outcomes. In Study 2, we examined perceived changes in well-being following a single, personally meaningful experience, comparing experiences facilitated by psychedelics alone, meditation alone, or a combination of both at the same time, allowing us to explore possible synergy effects.

Overall, the results from Study 1 indicated that higher meditation frequency was more consistently associated with higher psychological flexibility and well-being than higher frequency of psychedelic use. Moreover, the association between frequency of psychedelic use became weaker or vanished when frequency of meditation was considered. These findings underscore the importance of considering meditation practice as a potential confounding factor in psychedelic research and suggest that it may account for some of the well-being benefits previously attributed solely to psychedelic use. Moreover, the observed interaction between psychedelic use and meditation, albeit weak, hints at potential cumulative synergy. While prior research has found that combining psychedelic use with meditation during a single experience enhances well-being outcomes (e.g., Griffiths et al., 2018; Meling et al., 2024; Smigielski et al.,2019), our findings extend this by suggesting that frequent engagement in both practices may produce complementary effects over time. However, it is worth mentioning that we did not ask whether participants engaged in meditation and psychedelic use simultaneously.

The greater importance of meditation may reflect its more regular and sustained nature compared to psychedelic use. Psychedelics are typically used infrequently due to tolerance and the intensity of the experience, while meditation, both formal and informal, is often integrated into daily routines. Informal practices, such as mindful walking or mindful chores, are central to traditions like Zen and mindfulness-based stress reduction and may contribute to the cumulative benefits of meditation (Parsons et al., 2017; Smith et al., 2019). Although our study did not differentiate between formal and informal practice, participants likely included both in their frequency estimates. Given the broad definition of meditation employed in Studies 1 and 2, it is important to acknowledge that this study may not directly align with or be easily compared to research focusing on specific meditation techniques, such as mindfulness meditation or silent sitting. While this categorization allowed us to examine general patterns of meditation frequency and their associations with well-being, it limits our ability to make more precise comparisons with studies that isolate specific meditation types. Nonetheless, similar broad classifications have been used in prior research, such as Griffiths et al. (2018) who included meditation in a broader category of spiritual support, and we believe this approach is appropriate for the exploratory nature of our work. Future studies may benefit from more granular distinctions between meditation practices to allow for more specific comparisons.

The main finding from Study 2 was that the combination of psychedelics and meditation was associated with greater perceived improvements in well-being, specifically in terms of positive affect and a sense of peace and harmony, as well as smaller increases in negative affect, compared to the use of psychedelics alone. Interestingly, meditation alone also outperformed psychedelic use alone in these domains. One possible explanation for the better outcomes in the combined compared to the psychedelics alone group is that meditation may equip individuals with psychological tools that help them better navigate the often challenging nature of psychedelic experiences (e.g., see Barrett et al., 2016). Supporting this, Azmoodeh et al. (2023) found that meditation helped participants manage anxiety, enhance focus, and set meaningful intentions, all of which may contribute to a more grounded and integrative psychedelic experience. These benefits likely arise from meditation's ability to foster mindfulness-related skills such as sustained attention, heightened awareness, openness to experience, and acceptance (Goldberg et al., 2023; Goldin et al., 2021; Rahl et al., 2017; Schlechta Portella et al., 2021). While psychedelics have also been shown to enhance these traits (Madsen et al., 2020; Mian et al., 2020; Radakovic et al., 2022; Sampedro et al., 2017; Soler et al., 2016; Uthaug et al., 2019), it is plausible that meditation further amplifies or stabilizes their effects.

Another possibility is that the superior outcomes observed in the meditation group compared to the psychedelic group reflect greater cumulative practice, which may have created a more conducive environment for a transformative acute experience, as well as greater improvements in mindfulness-related skills. In the present study, the meditation group reported significantly more frequent meditation practice than the psychedelic group, suggesting that the observed differences in outcomes could, at least in part, be attributed to the cumulative effects of more consistent practice. This highlights the challenge of disentangling cumulative effects from acute ones in observational studies. A potential solution to this issue in future studies would be to standardize meditation exposure to better isolate the effects of the acute experience or statistically control for it if sample size permits.

Building on the idea of cumulative and acute effects, it is worth considering that psychedelics and meditation may represent distinct yet complementary routes to altering conscious experience. While meditation involves a gradual, intentional shift in awareness, psychedelics typically induce a more abrupt and intense alteration in consciousness. Despite these differences, our findings suggest that combining these practices may lead to unique benefits that are not achievable through either approach alone.

A useful metaphor is that of a journey to a foreign country. Preparing for the journey by researching the destination, its culture, customs, and landmarks is akin to meditation, while taking a direct flight with no prior preparation could be argued to resemble the use of psychedelics. The former approach often leads to a more mindful and enriching visit, while the latter risks inducing a kind of cultural or "ontological shock," potentially making the experience overwhelming or less cohesive, and yielding less integrated insights. In other

words, meditation facilitates a gradual shift in the *degree* of one's mental state, fostering a foundation of mindfulness and stability. In contrast, psychedelics induce a shift in *kind*, often plunging the mind into radically different states of awareness. When combined, the two approaches can complement one another, much like taking a direct flight and then meeting a knowledgeable local guide upon arrival. This guide provides a structured framework for exploration, highlighting the most meaningful aspects of the destination, while also mitigating anxiety by narrowing the overwhelming range of possibilities through focused attention and awareness cultivated via meditation.

The finding that psychedelic use and meditation practice were primarily associated with well-being rather than ill-being highlights an important distinction: these practices may not primarily reduce psychological distress, but instead enhance positive functioning, at least in non-clinical populations. This aligns with a key principle in positive psychology: well-being is not simply the absence of ill-being, but the presence of positive psychological aspects, such as positive affect, satisfaction, and the sense of meaning. Indeed, research shows that psychological distress is often more strongly linked to a lack of positive qualities such as purpose, joy, and connection, than to the presence of symptoms like anxiety or depression (Pellerin et al., 2022; Wood & Joseph, 2010). Thus, psychedelic use and meditation may contribute to mental health by not eliminating suffering per se, but by cultivating the qualities that support well-being.

Furthermore, it is important to note that both practices have been linked to potential adverse effects. Psychedelics, in particular, have a long history of being associated with challenging experiences that may intensify emotional or psychological distress. Recent reviews of both naturalistic use and clinical psychedelic-assisted therapy have highlighted these risks and emphasized the need for careful monitoring and preparation (Simonsson et al., 2023; Simonsson et al., 2025). Similarly, while meditation is widely recognized for its benefits, it has also been associated with adverse effects, such as heightened anxiety or repetitive thinking in some individuals. These findings underscore the complexity of both practices and the importance of considering potential risks alongside therapeutic benefits (Farias et al., 2020; Farias & Wikholm, 2016; Goldberg et al., 2022; Schlosser et al., 2019). In the present study, participants with a psychiatric diagnosis reported smaller perceived improvements in positive affect and higher perceived negative affect following psychedelic, combined or meditation experiences. However, because the scale measured change from "decreased a lot – to no change – to increased a lot" and we did not examine the mean scores within the diagnosis group, these findings may simply reflect less improvement in well-being or little to no change in negative affect rather than truly worse outcomes. Thus, the results indicate group differences in perceived change without implying that individuals with a psychiatric diagnosis experienced harmful effects or objectively poorer outcomes.

Both Study 1 and Study 2 revealed clear associations between psychedelics, meditation, and peace of mind. These findings highlight a potentially unrecognized aspect of well-being, given that few studies have examined peace of mind in relation to either practice. While traditionally emphasized in Eastern perspectives on well-being, inner peace and harmony are increasingly acknowledged as core components also in Western cultural context (Delle Fave et al., 2011, 2016; Lee et al., 2013; Lomas, 2021; Sikka et al., 2023). Peace of mind, defined as the internal state of peace and harmony (Lee et al., 2013), has been shown to predict well-being outcomes above and beyond traditional well-being measures (Lee et al., 2013; Sikka et al., 2018). Importantly, research suggests that peace of mind reflects adaptive emotion regulation (Sikka et al., 2023), which may help explain its enhancement through practices like mindfulness meditation (Liu et al., 2015; Pandya, 2020). Although few studies have directly linked psychedelic use to peace of mind, related concepts such as acceptance and contentment have been associated with psychedelic use (Barrett et al., 2020; Krabbe et al., 2024; Wolff et al., 2020). Moreover, narrative reports from participants who combined psychedelics with meditation identified a subtheme of peacefulness (Azmoodeh et al., 2023), suggesting that the synergy of these practices may be especially effective in cultivating peace of mind. Together, our findings add to growing evidence that peace of mind is not only a distinct and meaningful component of well-being, but one that is particularly responsive to practices that promote affective stability and self-regulation, qualities central to both meditation and intentional psychedelic use. Hence, peace of mind may serve as a valuable indicator of the integrative potential of these practices and a promising target for future interventions.

4.1. Limitations

The results of this study should be considered in the light of several limitations. First, the cross-sectional design limits the ability to determine causal relationships. It is possible that individuals with greater well-being are more likely to engage in meditation or use psychedelics, rather than these practices causing improved well-being. Second, we did not conduct an a priori power analysis because the study was exploratory and relied on existing datasets, however our sensitivity analyses showed that both studies had sufficient power to detect small effect sizes. Third, the retrospective nature of Study 2 introduces the potential for recall biases, as participants were asked to reflect on past experiences and their effects (Alaybek et al., 2022). Fourth, no formal attention checks or bot detection mechanisms were included in the online surveys, raising potential concerns about data quality; however, manual screening of the data did not reveal any inconsistencies (Peer et al., 2021). Lastly, there is a potential risk of positivity bias, particularly in Study 2, where participants were asked to report personally meaningful experiences. This framing may have influenced participants to focus on or exaggerate positive outcomes, potentially leading to an incomplete representation of the full range of experiences. As a result, the findings may be skewed toward more favourable reports, and these factors should be taken into account when interpreting the results.

5. Conclusion

Taken together, these findings suggest that both psychedelics and meditation are associated with enhanced well-being, with meditation showing a more consistent link. In Study 1, the frequency of psychedelic use alone was only weakly linked to well-being,

and its effects weakened or diminished when the frequency of meditation practice was accounted for. Additionally, more frequent cumulative exposure to both practices may provide slight benefits for well-being. Study 2 indicated, when practiced together, the two approaches may offer complementary benefits: meditating during a psychedelic experience appears to be associated with better outcomes than using psychedelics without meditating, except for people with previous psychiatric diagnoses. These results underscore the importance of considering the role of concurrent practices like meditation in future psychedelic research, both as a potential influencing factor and as a means of enhancing safety and integration. Further longitudinal and experimental research is needed to explore the underlying mechanisms and to better understand how these practices can be effectively combined to support psychological well-being.

Authors contribution

The study was conceptualized and planned by AK and JJ together with PS. Data was gathered by AK and JJ. The analyses were performed by AK and supervised by JJ and PS. The first article draft was written by AK, then revised by all the authors.

Ethical approval

Study 1 was approved by the Ethics Board of the Departments of Psychology and Logopaedics at the Abo Akademi University, Finland (decision number 22/2022).

Study 2 was approved by the Research Ethics Committee at Åbo Akademi University, Finland (decision number #15092022).

8. Consent to participate

The participants gave informed consent in written form before starting the studies.

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CRediT authorship contribution statement

Andreas Krabbe: Writing – review & editing, Writing – original draft, Formal analysis, Data curation, Conceptualization. **Pilleriin Sikka:** Writing – review & editing, Supervision, Conceptualization. **Jussi Jylkkä:** Writing – review & editing, Supervision, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.concog.2025.103977.

Data availability

The anonymous quantitative data for the original study used in Study 1 is available at https://osf.io/yjs3p/?view_only=d2f99d3432974233af8504cf5198f68f.

The anonymous quantitative data for the original study used in Study 2 is available at https://osf.io/v4p2a/files/osfstorage

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