Classic psychedelic use and current meditation practice

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Abstract

Objectives
Previous research has investigated potential synergies between classic psychedelics and meditation practice, but relatively little remains known about the relationship between classic psychedelic experiences and engagement with meditation practice.

The purpose of this study was to investigate associations between classic psychedelic experiences and engagement with two popular types of meditation: mindfulness meditation and loving-kindness or compassion meditation.

Methods
This retrospective, population-based observational study included 2,822 respondents aged 18 years or older in the United States. Using covariate-adjusted regression models, this study examined associations of classic psychedelic experiences with current practice of mindfulness meditation and loving-kindness or compassion meditation.

Results
In covariate-adjusted regression models, lifetime classic psychedelic use was associated with a higher frequency of current mindfulness meditation practice but not current loving-kindness or compassion meditation practice. Both psychological insight and "ego dissolution" were associated with a higher frequency of current mindfulness meditation practice and current loving-kindness or compassion meditation practice. Notably, when psychological insight and "ego dissolution" were entered into the regression model simultaneously, only greater psychological insight was associated with having a higher frequency of current mindfulness meditation practice and current loving-kindness or compassion meditation practice.

Conclusion
Although the findings in this study cannot demonstrate causality, they suggest that classic psychedelic experiences may exert a positive effect on the cultivation and maintenance of health-related behaviors such as regular meditation practice, with psychological insight appearing to be a stronger predictor than "ego dissolution."

Preregistration
This study was not preregistered.

Keywords: Psychedelics, psilocybin, LSD, meditation, mindfulness

Classic psychedelics include N,N-dimethyltryptamine (DMT), ayahuasca, lysergic acid diethylamide (LSD), mescaline, the mescaline-containing cacti peyote and San Pedro, and psilocybin (Sexton et al., 2019). These compounds exert effects through serotonin 2A receptor agonist activity (Carhart-Harris, 2019), appear safe in clinical trials (Dos Santos et al., 2018; see also Schlag et al., 2022, for potential risks), and may be effective in the treatment of various psychiatric disorders when administered in conjunction with therapy (e.g., Bogenschutz et al., 2022; Carhart-Harris et al., 2021;). Recent evidence suggests that "ego dissolution" (i.e., reduced self-focus; Nour et al., 2016; Uthaug et al., 2018), psychological insight (i.e., realizations about one's relationships, personality or behavioral patterns; Davis et al., 2021), and other constructs related to the quality of acute classic psychedelic experiences may be important for mental health outcomes (Barrett et al., 2015; Peill et al., 2022).

Previous work has identified potential synergies between classic psychedelics and meditation practice (Griffiths et al., 2018; Smigielski et al., 2019). For example, in a cross-sectional study with a nationally representative sample of the US adult population, greater "ego dissolution" – as measured by the highest loading item from Ego Dissolution Inventory (Nour et al., 2016) – during respondents' most intense classic psychedelic experience was associated with having tried meditation and, among meditators, having lower perceived barriers to meditation practice and a more frequent meditation practice (Simonsson & Goldberg, 2022). The study did not, however, investigate relationships with classic psychedelic-associated psychological insight, which has been linked to other types of health behavior (e.g., diet, exercise) in prior research (Simonsson et al., 2022). It is possible that psychological insight could lead to greater awareness of helpful and unhelpful behavioral patterns in day-to-day life. Such experiences could potentially facilitate engagement with meditation practice, especially for meditators who have experienced barriers to their

meditation practice or who may not have prioritized a regular meditation practice. If such a relationship exists, to better understand mechanisms of action, it would be important to compare the relative strength of psychological insight and "ego dissolution" as predictors of meditation practice.

Using a large, nationally representative sample of the US adult population with regard to sex, age and ethnicity, we aimed to contribute to this nascent field by investigating the associations between classic psychedelic experiences and engagement with two popular types of meditation practice: mindfulness meditation and loving-kindness or compassion meditation. We hypothesized that greater psychological insight during respondents' most insightful classic psychedelic experience would be associated with greater frequency of current mindfulness meditation practice and current loving-kindness or compassion meditation practice. We also conducted an exploratory analysis to investigate the relative strength of psychological insight and "ego dissolution" as predictors of meditation practice.

Methods

Participants

The sample size was determined using GPower (Faul et al., 2007). The analysis (linear multiple regression, fixed model, R2 increase) revealed that 395 lifetime classic psychedelic users would achieve 80% power to detect small effect sizes with an alpha of .05. Assuming similar prevalence of lifetime classic psychedelic use in the US adult population as recent investigations (~14%; Simonsson et al., 2021), we estimated that 2800 total participants would be necessary to recruit approximately 395 lifetime classic psychedelic users in the sample. We therefore aimed to recruit 2800 participants.

2,822 respondents (18 years or older) were recruited in October, 2021 through Prolific Academic (https://app.prolific.co). Using Prolific Academic's representativeness function,

the sample was stratified across three demographics – sex, age and ethnicity – to reflect the demographic distribution of the US adult population.

Procedures

The respondents were asked to complete questions related to demographic characteristics, substance use, classic psychedelic use, and meditation practice. Study procedures were approved by the Institutional Review Board at the University of Wisconsin – Madison. Respondents who completed the study received a $2.20 reimbursement payment.

Measures

Demographics and substance use.

All respondents were asked to report age in years, gender, educational attainment, lifetime use of cocaine, and alcohol-related risk behavior (as measured by the 3-item Alcohol Use Disorders Identification Test – Concise; Bradley et al., 2007).

Classic psychedelic use.

All respondents were asked to report which, if any, of the following classic psychedelics they had ever used: DMT, ayahuasca, LSD, mescaline, peyote, San Pedro, and psilocybin. Respondents who reported using any of these were coded as positive for lifetime classic psychedelic use, whereas those indicating that they had never used any of these substances were coded as negative (0 = No, 1 = Yes). Those respondents who reported lifetime classic psychedelic use (n = 613) were also asked to complete the Psychological Insight Questionnaire (PIQ; Davis et al., 2021), which aims to capture the acute psychologically insightful experiences that can arise during classic psychedelic experiences. The original instructions published by Davis et al. (2021) were adapted in order to ask participants about the experiences that occurred during the most insightful classic psychedelic experience of their life. The PIQ comprises 23 items with a 6-point Likert scales anchored at 0 (No; not at all) and 5 (Extreme [more than ever before in my life]). Total scores are derived by averaging

the 23 item scores. Higher total scores reflect higher levels of psychological insight. Internal consistency in the current sample was excellent (Cronbach's $\alpha = 0.98$ and McDonald's $\omega = 0.98$). Those respondents who reported lifetime classic psychedelic use were also asked to complete the Ego Dissolution Inventory (Nour et al., 2016), with eight items designed to capture reduced self-focus (e.g., "I experienced a dissolution of my 'self' or ego", "I felt at one with the universe"). The original instructions published by Nour et al. (2016) were adapted in order to ask participants about the experiences that occurred during the most intense classic psychedelic experience of their life. The items were rated on a scale from 0 to 100 (0 = No, not more than usually, 100 = Yes, entirely or completely). Higher total scores reflect higher levels of "ego dissolution". Internal consistency in the current sample was excellent (Cronbach's $\alpha = 0.91$ and McDonald's $\omega = 0.91$).

Meditation practice.

All respondents were asked to report if they had ever tried any form of meditation. If respondents reported past meditation use, they were also asked whether they had ever tried mindfulness meditation, including Vipassana, Zen Buddhist meditation, Mindfulness-Based Stress Reduction, and Mindfulness-Based Cognitive Therapy. Those respondents who responded positively were asked to estimate how many days per week, on average, over the past 30 days they engaged with mindfulness meditation (0-7). No experience of mindfulness meditation was coded as 0. If respondents reported past meditation use, they were also asked whether they had ever tried loving-kindness or compassion meditation, including Metta, Compassion Cultivation Training, and Cognitively-Based Compassion Training. Those respondents who responded positively were asked to estimate how many days per week, on average, over the past 30 days they engaged with loving-kindness or compassion meditation (0-7). No experience of loving-kindness or compassion meditation was coded as 0.

Data Analyses

To evaluate the associations between classic psychedelic use and current meditation practice, we used linear regression models. In these models, lifetime classic psychedelic use, psychological insight (z-scored) or "ego dissolution" (z-scored) were entered as the independent variables while current meditation practice variables were entered as the dependent variables. In line with previous research on classic psychedelics and meditation (Simonsson & Goldberg, 2022), all analyses were adjusted for age in years (18–25, 26–34, 35–49, 50–64 or 65 or older), gender (male, female, transgender/non-binary), educational attainment (some high school or less, high school graduate or equivalent, some college/community college degree, Bachelor's degree or higher), lifetime use of cocaine (yes, no), and problematic alcohol use (continuous).

Results

Table 1 shows results from the regression models testing the associations between classic psychedelic use and current meditation practice. As shown in the table, lifetime classic psychedelic use was associated with a higher frequency of current mindfulness meditation practice but was not associated with current loving-kindness or compassion meditation practice. Greater psychological insight during respondents' most insightful classic psychedelic experience was associated with a higher frequency of current mindfulness meditation practice and current loving-kindness or compassion meditation practice. Greater "ego dissolution" during respondents' most intense classic psychedelic experience was associated with a higher frequency of current mindfulness meditation practice and current loving-kindness or compassion meditation practice. Notably, when psychological insight and "ego dissolution" were entered into the regression model simultaneously, only greater psychological insight was associated with having a higher frequency of current mindfulness meditation practice and current loving-kindness or compassion meditation practice, with effects moderate in size.

Discussion

This study sought to examine the associations between classic psychedelic use and current meditation practice in a representative sample of the US adult population with regard to sex, age and ethnicity. The results showed that lifetime classic psychedelic use was associated with a slightly higher frequency of current mindfulness meditation practice but not current loving-kindness or compassion meditation practice. Both psychological insight and "ego dissolution" during respondents' most insightful and intense classic psychedelic experiences were associated with a higher frequency of current mindfulness meditation practice and current loving-kindness or compassion meditation practice, though effects were larger for psychological insight than "ego dissolution". Notably, when psychological insight and "ego dissolution" were entered into the regression model simultaneously, only greater psychological insight was associated with having a higher frequency of current mindfulness meditation practice and current loving-kindness or compassion meditation practice, with effects moderate in size.

Although the findings in this study cannot demonstrate causality, they suggest that classic psychedelic experiences may exert a positive effect on the cultivation and maintenance of regular meditation practice. If classic psychedelic experiences can indeed influence meditation practice, it could have important implications for research on both meditation and classic psychedelics. It is possible, for example, that administration of classic psychedelics could increase motivation for meditation practice and thereby reduce attrition rates in meditation-based interventions. It is also possible that meditation practice may prove a valuable adjunct to support integration of the classic psychedelic experience (Payne, Chambers & Liknaitzky, 2021). Mindfulness and loving-kindness or compassion meditation techniques may be promising candidates for this purpose, given the substantial body of

evidence suggesting these techniques in particular may confer psychological benefits generally (Galante et al., 2014; Goldberg et al., 2022) and share phenomenological and neurophysiological similarities with classic psychedelics (e.g., sense of connection with others, present-moment awareness; Heuschkel & Kuypers, 2020; Pots & Chakhssi, 2022).

Limitations and Future Directions

The present study has several limitations worthy of consideration when interpreting the overall results. First, due to the cross-sectional design, a cause-and-effect relationships between classic psychedelic-related variables and current meditation practice variables cannot be established. It is, for example, possible that those who engage in meditation tend to experience greater psychological insight during classic psychedelic experiences (or that a latent variable such as absorption explains the relationship). Although our models used *lifetime* classic psychedelic use to predict *current* meditation, it is still entirely possible that meditation practice preceded classic psychedelic use (or that a reciprocal relationship exists between these variables). Second, the sample was stratified only across sex, age and ethnicity to reflect the US adult population. The sample might not have been representative on other variables that may be related to meditation use (e.g., socioeconomic status, political affiliation, sexual orientation; Simonsson, Fisher & Martin, 2021; Simonsson, Martin & Fisher, 2020). Third, the retrospective component of the questionnaire may be susceptible to recall bias, which means that responses about past use of classic psychedelics or meditation may have been inaccurate. The use of a single measurement method in this study may also have produced additional biases (Podsakoff et al., 2012). Fourth, the questionnaire did not include information about set and setting related to classic psychedelic use, which are known to influence the effects of classic psychedelics (Carhart-Harris et al., 2018). Fifth, the introduction to the psychological insight and "ego dissolution" measures differed slightly (i.e., most insightful versus most intense), which may have influenced the results. Lastly, we

recommend that future research in this area utilize a more comprehensive assessment of meditation practice to further differentiate distinct practices and mechanisms (e.g., Dahl et al., 2015; Schlosser et al., 2022) and their relationships with classic psychedelic use. Future research should also utilize longitudinal designs to explore the potential cause-and-effect relationships between classic psychedelic use and current meditation practice.

Declarations

Conflict of Interest

PSH is on the scientific advisory board of Bright Minds Biosciences Ltd., Eleusis Benefit Corporation, and Reset Pharmaceuticals Inc. EC is a board member of Osmond Foundation. OS and RC are co-founders of Eudelics AB. The remaining authors have nothing to disclose.

Ethical Approval

All procedures performed involving human participants were in accordance with the ethical standards of the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Study procedures were determined to be exempt from review by the Institutional Review Board at the University of Wisconsin–Madison.

Informed Consent

Informed consent was obtained from all individual participants included in the studies.

Author CRediT Statement

Charlotta Simonsson: Writing – original draft.

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Data Availability Statement

The data and Stata syntax are available at Figshare: https://doi.org/10.6084/m9.figshare.22099673.v1 [Data] and https://doi.org/10.6084/m9.figshare.22092968.v1 [Syntax].

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Tables

Table 1. Classic psychedelic use and current meditation practice

	Mindfulness			Loving-kindness or compassion		
	β	*p*	*n*	*β*	*p*	*n*
		Model 1				
Lifetime classic psychedelic use	0.13	<0.01	2,822	0.02	0.38	2,822
Psychological insight	0.26	<0.01	613	0.25	<0.01	613
"Ego dissolution"	0.12	<0.01	613	0.12	<0.01	613
		Model 2				
Psychological insight	0.30	<0.01	613	0.26	<0.01	613
"Ego dissolution"	-0.05	0.28	613	-0.03	0.62	613

β = standardized coefficients. All analyses have been adjusted for age in years, gender, educational attainment, lifetime use of cocaine, and problematic alcohol use. Lifetime classic psychedelic use, psychological insight and "ego dissolution" were entered into Model 1 separately. Psychological insight and "ego dissolution" were entered into Model 2 simultaneously.