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Lifetime classic psychedelics use is associated with positive environmental attitudes and adopting a vegetarian diet

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Abstract

While some studies suggest that psychedelic use may be linked to positive environmental attitudes and health behaviors, the relationship between these factors remains underexplored. This study investigates the associations between lifetime use of psilocybin and LSD, environmental attitudes, and dietary behaviors using data from two UK birth cohort studies: the 1958 National Child Development Study and the 1970 British Cohort Study. Data on these variables were collected in 2000, when participants were aged 42 and 30, respectively (N=21,837−21,855). Findings indicate that individuals who had used psilocybin or LSD at least once in their lifetime were more likely to endorse pro-environmental attitudes (Spearman r = .09, p < .001) and adopt a vegetarian diet (adjusted OR 1.44–1.48, p < .013). Past psilocybin users show a healthier dietary profile, including eating more salads and raw vegetables, fewer biscuits and cakes, and less red meat. As hypothesized, the link between psychedelic use and vegetarian diets was partially mediated by pro-environmental attitudes. The results of this retrospective observational study suggest that psilocybin and LSD use may promote positive environmental attitudes, which could, in turn, be associated with a greater likelihood of adopting a vegetarian diet.

Keywords Psilocybin · LSD · Dietary behaviors · Vegetarianism · Environmental attitudes

Introduction

The effects of using psychedelic drugs (e.g., psilocybin, lysergic acid diethylamide [LSD], ayahuasca/NN-dimethyltryptamine [DMT], and mescaline), including acute effects and potential long-term changes, have been the subject of increasing scientific research[1]. Especially when administered by health professionals in a safe and supportive environment, psychedelics are associated with a low risk of adverse effects[2]. There is growing optimism that psychedelic-assisted therapies may contribute to effective treatments for various mental disorders[3], enhance transdiagnostic psychological factors[4], and even promote physical health such as in chronic pain management[5] or after traumatic brain injuries[6].

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Evidence suggests that lifetime use of psychedelics is associated with better self-reported health outcomes. For instance, population studies in the United States have found that individuals who reported having used a classic psychedelic at least once in their lifetime also reported better physical health. These individuals had significantly higher odds of self-reported overall health, significantly lower odds of being overweight or obese (compared to those with a normal weight), and a reduced prevalence of cardiometabolic diseases, particularly hypertension[7–9]. Similarly, a study focusing on lifetime MDMA use found associations with lower self-reported disease risks, including reduced rates of overweight and obesity, heart conditions, cancer, hypertension, and diabetes, as well as higher odds of overall better self-reported health[10].

Psychedelics may contribute to overall health and reduce the incidence of "lifestyle diseases" by promoting positive changes in specific health behaviors, including dietary choices[11]. In fact, in various survey studies with psychedelic users (in naturalistic settings) a substantial percentage of participants (34–63%) reported improving their dietary habits as a result of one or several psychedelic experiences[12–15]. Other studies where participants were asked about "major life changes" after their psychedelic use, changes in eating habits were also among the most frequent[16,17]. Similar trends were found in two studies where participants used psychedelics in microdoses[18,19]. Unfortunately, in all these studies, specific details about which habits were changed were not reported.

From its inception, psychedelic culture has emphasized environmental care and healthy living, particularly within certain communities[20]. Research has demonstrated an empirical association between lifetime psychedelic use and both objective knowledge about climate change[21] and engagement in pro-environmental behaviors[22]. This relationship may be linked to the tendency of psychedelics to enhance feelings of nature-relatedness, which encompasses the affective, cognitive, and experiential aspects of self-identification, connection to, or merging with the natural world[23]. Not only are people high in baseline nature-relatedness drawn to psychedelics in the first place[24], but studies also show that psychedelic experiences can foster increased nature-relatedness for up to at least 2 years afterward, with concomitant increases in psychological well-being related to the perceived influence of natural surroundings during the acute psychedelic state[25]. Notably, Forstmann and colleagues[26] found that only psilocybin and, to a lesser extent, DMT were predictive of increased nature-relatedness, while other substances (such as LSD, mescaline, Salvia divinorum, ketamine, and ibogaine) were not. However, no research has directly examined whether the relationship between psychedelic use and environmental attitudes extends to associations with health behaviors.

Psychedelic experiences often revolve around themes of nature, the environment, or the body[25,27,28], which makes it unsurprising that psychedelic insights and behavior changes might relate to one's health and relationship with nature. In this article, we focus on pro-environmental attitudes as a potential mediator of links between psychedelic use and health behaviors. Generally, pro-environmental attitudes are associated with both physical and mental health[29], in part because of their connection to health behaviors[30]. For example, several studies have confirmed the positive effects of physical activity in nature on a range of psychological outcomes and diseases[31].

This study uses data from birth cohort studies conducted in the UK to examine the associations between lifetime use of classic psychedelics, environmental attitudes, and health behaviors, with a particular focus on dietary practices. We hypothesized that lifetime use of classic psychedelics is associated with more pro-environmental attitudes and a greater likelihood of endorsing healthy dietary behaviors. Furthermore, we proposed that environmental attitudes would partially mediate the relationship between classic psychedelic use and dietary behaviors, specifically adopting a vegetarian diet and red meat consumption[32,33].

Methods

This study utilizes data from the 1999–2000 follow-ups of the 1958 National Child Development Study (NCDS)[34] and the 1970 British Cohort Study (BCS70)[35]. Both studies are nationally representative longitudinal surveys that follow individuals born in Great Britain during a single week in 1958 and 1970, respectively. At the time of the 1999–2000 data collection, the NCDS cohort members were 41–42 years old, while the BCS70 cohort members

were 29–30 years old. While the original birth cohorts were significantly larger at inception (approx. $N = 17{,}000$ for each study), the 1999–2000 sweeps (administered as a joint project) achieved total productive sample sizes of $N = 11{,}419$ (49.3% male, 50.7% female) for the NCDS and $N = 11{,}261$ (48.6% male, 51.4% female) for the BCS70. Comprehensive details regarding the sampling design, fieldwork, and data collection methodology are documented in the NCDS and BCS70 1999/2000 technical report[36]. All data were accessed via the UK Data Service. Final sample sizes for each analysis varied slightly for each analysis due to case-wise deletion based on missing data for our variables of interest. The follow-up assessment in 2000 (November 1999–September 2000) contains information about psilocybin use and LSD use. The other variables—about environmental attitudes and diet - were also assessed in the 2000 wave.

The current study is a secondary analysis of publicly available data files and received an exemption from ethical approval via the University of Zurich Ethics Self-Assessment Tool. All procedures were in accordance with the applicable ethical standards of the 1964 Helsinki Declaration and its amendments or comparable ethical standards.

Measures

The dependent variables were divided into environmental attitudes, vegetarian diet, consumption of healthy foods (fresh fruit, salad or raw vegetables, wholemeal bread or rolls), and consumption of unhealthy foods (red meat, food fried in hard fat, sweets or chocolates, biscuits and cakes, and chips). While grouping healthy and unhealthy foods in this way is debatable, as it ignores that different perspectives on nutrition and health (and other cultural, social, and environmental factors) could lead to organizing these foods differently, readers can still view associations for each dietary variable separately, or consider different classifications. For these reasons, we chose not to calculate composite scores for each group of variables. However, since this study is a priori focused on health-related (dietary) questions in relation to psychedelics, and considering the general consensus in nutritional sciences about the relative healthfulness of the food groups we measured[37], we decided to present data this way.

The main environmental attitudes variable was comprised of three items rated on a 1- (Strongly disagree) to 5- (Strongly agree) Likert scale, with greater scores indicating more environmentally friendly attitudes: “Problems in the environment are not as serious as people claim” (reverse-scored); “Preserving the environment is more important than any other political issue today”; “We should tackle problems in the environment even if this means slower economic growth.” A mean score of the three variables was computed.

The vegetarian diet variable was comprised of one dichotomous (yes, no) item: “Are you a vegetarian?” The consumption of healthy foods included three categories of food: “How often do you eat fresh fruit?”; “How often do you eat salads or raw vegetables?”; “How often do you eat wholemeal bread or rolls?” The consumption of unhealthy foods included five categories of food: “How often do you eat red meat like beef, lamb or pork?”; “How often do you eat food fried in hard fat such as lard or butter, not counting chips?”; “How often do you eat sweets or chocolates?”; “How often do you eat biscuits and cakes of all kinds?”; “How often do you eat chips?” All variables related to consumption of healthy and unhealthy foods were rated from 1 to 7 (More than once a day, Once a day, 3–6 days a week, 1–2 days a week, Limited to 1 day a week, Occasionally, Never), with lower scores indicating greater consumption.

The independent variables were psilocybin use (never used, ever used, used in past year) and LSD use (never used, ever used, used in past year). The control variables were coded as separate covariates: sex (male, female); age when the respondent left full-time continuous education (continuous); lifetime cocaine use (yes, no); and frequency of alcohol consumption (on most days, 2 to 3 days a week, once a week, 2 to 3 times a month, less often/only on special occasions, never nowadays, never had an alcoholic drink). “Not Answered” and “Don’t Know” were coded as missing values. We included alcohol and cocaine use as control variables as is often done in studies of psychedelics[38] to isolate the effects/associations involving psychedelics from those of other common psychoactive substances.

Statistical analyses

Multivariate linear and logistic regression models were used to assess the association between dependent and independent variables, further including the covariates listed above. We also conducted sensitivity analyses with additional covariates included.

Multivariate linear regression models were used for continuous outcomes (environmental attitudes and frequency of food consumption), while logistic regression was used for the binary outcome (vegetarian diet). All predictor variables were entered simultaneously in the models as we were interested in their unique associations with the outcomes while controlling for each other. Variance Inflation Factors (VIF) were examined to assess multicollinearity among predictors, with values ranging from 1.04 to 1.94, indicating no concerning collinearity. Visual inspection of diagnostic plots indicated no substantial violations of model assumptions. For the logistic regression predicting vegetarian diet, model fit was acceptable (McFadden's $R^2 = 0.109$). For linear regression models predicting food consumption, the proportion of variance explained was modest (R^2 values ranging from 0.018 to 0.075). To assess prediction accuracy in the original scale of the food consumption variables (rated from 1 to 7), we calculated Root Mean Square Error (RMSE; ranging from 1.05 to 1.96 scale points) and Mean Absolute Error (MAE; ranging from 0.78 to 1.74 scale points). Each model included the following covariates: sex, age when left full-time education, lifetime cocaine use, and frequency of alcohol consumption. Cases with missing values (between $n = 825$ and $n = 842$, depending on analysis) were omitted from all analyses.

To test whether environmental attitudes mediated the relationship between psychedelic use and dietary behaviors, we conducted structural equation modeling (SEM) mediation analyses, estimating all paths simultaneously, using lavaan for R (version 0.6–18). This approach allowed us to test multiple indirect effects (i.e., for recent and past use) concurrently. The model specified direct paths from psychedelic use (recent and past) to environmental attitudes (a paths) and dietary behaviors (c paths), and from environmental attitudes to dietary behaviors (b path). Parameters were estimated using a diagonally weighted least squares (DWLS) procedure with NLMINB optimizer. We used bootstrapped standard errors with 5000 resamples to account for potential non-normality and to obtain confidence intervals for indirect effects. All models included the following covariates: alcohol consumption, cocaine use, cohort, age when leaving education, sex, and authoritarian attitudes. Indirect effects were computed as the product of the a and b paths (ab). Total effects were calculated as the sum of direct and indirect effects (c + ab). The significance of indirect effects was assessed using 95% bias-corrected bootstrap confidence intervals.

Results

Table 1 shows the prevalence of use of psilocybin and LSD in the past year and past lifetime use. About 10% of the sample reported lifetime use of either substance, whereas only 1 in 200 (0.5%) reported using one or both substances in the last 12 months before filling out the survey.

Regarding the adoption of a vegetarian diet (Table 2), results show that, after adjustment for covariates, recent psilocybin users were about 14% vegetarian compared with 4% of never-users – a difference of roughly 10% points. Those who had used psilocybin only in the more distant past were ~9% vs. 6% (≈+3 pp). For LSD, the pattern was weaker: past-year use showed ~10% vs. 6% (≈+5 pp, not statistically reliable), whereas earlier LSD

Table 1 Prevalence of psychedelic use.

	Never		Past		Recent		DK/DA	
	Total	%	Total	%	Total	%	Total	%
Psilocybin	20,076	90%	2181	10%	121	0,5%	20	0,09%
LSD	20,289	91%	1970	9%	120	0,5%	17	0,08%

DK/DA, don't know or don't answer.

Table 2 Psychedelic use and vegetarian diet.

Term	Vegetarian diet				
	aOR (95% CI)	*p*	$Prob._{Ref}$	$Prob._{Focal}$	$Prob._{Diff}$ (95% CI)
Used psilocybin in the past year	3.87 (2.06–7.04)	0.000	0.039	0.137	0.098 (0.033–0.163)
Used psilocybin but not in the past year	1.48 (1.14–1.90)	0.003	0.062	0.089	0.027 (0.006–0.048)
Used LSD in the past year	1.90 (0.92–3.72)	0.072	0.055	0.100	0.045 (− 0.014–0.104)
Used LSD but not in the past year	1.44 (1.08–1.91)	0.013	0.063	0.088	0.025 (0.002–0.048)

aOR (95% CI) = adjusted odds ratio from the logistic model. prob.ref/prob.focal = adjusted predicted probabilities for the reference and focal groups. prob_Diff (95% CI) = absolute risk difference in percentage points (focal - reference). RR = risk ratio (p_Focal / p_Ref). AME = average marginal effect (mean change in predicted probability for a 0 → 1 change). The number of observations was 21,855. aORs are adjusted for cohort membership; sex; age when the respondent left full-time continuous education; lifetime cocaine use; frequency of alcohol consumption; and authoritarian attitudes. The psilocybin and LSD variables were entered into the model simultaneously.

Table 3 Psychedelic use and healthy food consumption.

Outcome	Term	β	*p*	b (95% CI)	aOR (95% CI)	p_{aOR}
Fresh fruit	Used psilocybin in the past year	− 0.002	0.826	− 0.04 (− 0.38 to 0.30)	0.95 (0.66–1.35)	0.760
	Used psilocybin but not in the past year	− 0.003	0.699	− 0.02 (− 0.11 to 0.08)	0.98 (0.89–1.08)	0.739
	Used LSD in the past year	− 0.008	0.249	− 0.20 (− 0.55 to 0.14)	0.83 (0.58–1.20)	0.329
	Used LSD but not in the past year	− 0.020	0.024	− 0.12 (− 0.23 to − 0.02)	0.88 (0.79–0.99)	0.027
Salads, raw vegetables	Used psilocybin in the past year	− 0.001	0.889	− 0.02 (− 0.31 to 0.27)	1.00 (0.69–1.45)	0.982
	Used psilocybin but not in the past year	0.026	0.001	0.14 (0.05 to 0.22)	1.17 (1.06–1.29)	0.002
	Used LSD in the past year	− 0.010	0.159	− 0.21 (− 0.51 to 0.08)	0.76 (0.52–1.10)	0.141
	Used LSD but not in the past year	0.001	0.953	0.00 (− 0.09 to 0.09)	1.02 (0.91–1.14)	0.779
Wholemeal bread, rolls	Used psilocybin in the past year	0.018	0.012	0.50 (0.11 to 0.88)	1.58 (1.11–2.23)	0.010
	Used psilocybin but not in the past year	0.024	0.004	0.16 (0.05 to 0.27)	1.15 (1.04–1.26)	0.005
	Used LSD in the past year	− 0.001	0.905	− 0.02 (− 0.42 to 0.37)	0.97 (0.68–1.38)	0.862
	Used LSD but not in the past year	− 0.005	0.538	− 0.04 (− 0.16 to 0.08)	0.97 (0.87–1.08)	0.583

β = standardized coefficient from the linear model; b (95% CI) is the unstandardized difference in points on the 1–7 scale (focal - reference). aOR (95% CI) = adjusted odds ratio from a proportional-odds (polr) model fit to an ordered version of the outcome. Reference category for each drug variable = "never used". All models control for cohort membership, sex, age when the respondent left full-time continuous education, lifetime cocaine use, frequency of alcohol consumption, use of the other psychedelic (LSD/Psilocybin respectively) and authoritarian attitudes.

use showed a ~ 9% vs. 6% difference (≈ + 3 pp, small but significant). Expressed as risk ratios, recent psilocybin users were about 3.5× as likely to be vegetarian as never-users; distant psilocybin users about 1.4×; and earlier LSD users about 1.4× as likely. Percentages are model-adjusted; full statistics are in Table 2.

Tables 3 and 4 show associations between psychedelic use and, respectively, healthy and less healthy dietary habits (note: a positive β value indicates that psychedelic use was predictive of higher consumption of each food variable). For healthier dietary choices, LSD use in the past year was associated with less fresh fruit consumption. In turn, past psilocybin use predicted more consumption of salads and raw vegetables and wholemeal bread/rolls, whereas last year psilocybin use was associated with more wholemeal bread/rolls consumption. Regarding unhealthy dietary habits, results were significant for red meat and eating biscuits and cakes (more psilocybin use predicted less consumption) and eating chips (more past LSD use predicted greater consumption); all other associations were non-significant. As a Supplement (Table 1), readers can find a full correlation table for all variables.

In general, psychedelic use was associated with small shifts in reported frequency – typically ≤ 0.15 points on the 1–7 scale (≈ 2% of the usable range). Two exceptions stood out: recent psilocybin use was linked to more wholemeal bread/rolls (+ 0.50 points; ~8% of the scale) and less red-meat consumption (about − 0.3 to − 0.5 points; ~5–8%). These patterns were mirrored in the proportional-odds models (aORs generally ≤ ~ 1.2 in absolute deviation from 1), underscoring that the effects are statistically detectable but practically modest. This aligns with expectations, given the broad population sample and the complex, multifaceted nature of dietary choices.

Finally, we tested whether the (significant) associations between psilocybin use and both vegetarianism and red meat consumption would be mediated by a psychedelic-induced increase in environmental attitudes (see Tables 5

Table 4 Psychedelic use and unhealthy food consumption.

Outcome	Term	β	*p*	b (95% CI)	aOR (95% CI)	p_{aOR}
Red meat	Used psilocybin in the past year	− 0.034	0.000	− 0.57 (− 0.81 to − 0.33)	0.43 (0.29–0.62)	0.000
	Used psilocybin but not in the past year	− 0.027	0.001	− 0.11 (− 0.18 to − 0.04)	0.89 (0.80–0.98)	0.022
	Used LSD in the past year	− 0.001	0.914	− 0.01 (− 0.26 to 0.23)	0.99 (0.69–1.45)	0.976
	Used LSD but not in the past year	0.003	0.758	0.01 (− 0.06 to 0.09)	1.04 (0.93–1.17)	0.482
Food fried in hard fat	Used psilocybin in the past year	0.005	0.478	0.07 (− 0.13 to 0.28)	1.10 (0.75–1.61)	0.623
	Used psilocybin but not in the past year	0.004	0.635	0.01 (− 0.04 to 0.07)	0.98 (0.88–1.10)	0.732
	Used LSD in the past year	− 0.012	0.098	− 0.18 (− 0.39 to 0.03)	0.74 (0.49–1.10)	0.147
	Used LSD but not in the past year	− 0.003	0.709	− 0.01 (− 0.08 to 0.05)	0.94 (0.83–1.07)	0.346
Sweets or chocolates	Used psilocybin in the past year	− 0.004	0.577	− 0.09 (− 0.42 to 0.23)	0.90 (0.63–1.28)	0.571
	Used psilocybin but not in the past year	− 0.007	0.388	− 0.04 (− 0.13 to 0.05)	0.96 (0.87–1.06)	0.392
	Used LSD in the past year	0.005	0.497	0.12 (− 0.22 to 0.45)	1.13 (0.79–1.62)	0.502
	Used LSD but not in the past year	0.010	0.267	0.06 (− 0.04 to 0.16)	1.07 (0.96–1.19)	0.241
Biscuits and cakes	Used psilocybin in the past year	− 0.005	0.494	− 0.11 (− 0.44 to 0.21)	0.88 (0.62–1.25)	0.477
	Used psilocybin but not in the past year	− 0.018	0.032	− 0.10 (− 0.19 to − 0.01)	0.90 (0.82–0.99)	0.038
	Used LSD in the past year	− 0.003	0.650	− 0.08 (− 0.41 to 0.26)	0.91 (0.64–1.30)	0.613
	Used LSD but not in the past year	− 0.005	0.600	− 0.03 (− 0.13 to 0.07)	0.97 (0.87–1.08)	0.583
Chips	Used psilocybin in the past year	− 0.008	0.238	− 0.13 (− 0.35 to 0.09)	0.77 (0.53–1.12)	0.173
	Used psilocybin but not in the past year	− 0.001	0.941	− 0.00 (− 0.06 to 0.06)	0.99 (0.90–1.10)	0.864
	Used LSD in the past year	− 0.002	0.778	− 0.03 (− 0.26 to 0.19)	0.98 (0.67–1.44)	0.925
	Used LSD but not in the past year	0.024	0.005	0.10 (0.03 to 0.17)	1.18 (1.05–1.32)	0.004

β = standardized coefficient from the linear model; b (95% CI) is the unstandardized difference in points on the 1–7 scale (focal reference); aOR (95% CI) = adjusted odds ratio from a proportional-odds (polr) model fit to an ordered version of the outcome. Reference category for each drug variable = "never used". All models control for cohort membership, sex, age when the respondent left full-time continuous education, lifetime cocaine use, frequency of alcohol consumption, use of the other psychedelic (LSD/Psilocybin respectively) and authoritarian attitudes.

Table 5 Mediation analysis: Psilocybin use on vegetarian diet via environmental attitudes.

	Vegetarian diet	
	β (CI 95%)	*p*
Effects on environmental attitudes		
Used psilocybin but not in the past year	0.06 (0.05, 0.08)	< 0.001
Used psilocybin in the past year	0.03 (0.02, 0.05)	< 0.001
(Direct) effects on vegetarian diet		
Environmental attitudes	0.93 (0.47, 1.00)	< 0.001
Used psilocybin but not in the past year (direct effect)	− 0.01 (− 0.05, 0.04)	0.757
Used psilocybin in the past year (direct effect)	0.02 (− 0.01, 0.04)	0.319
Indirect effects on vegetarianism via environmental attitudes		
Used psilocybin but not in the past year	0.06 (0.03, 0.09)	0.001
Used psilocybin in the past year	0.03 (0.01, 0.05)	0.005
Total effects on vegetarianism		
Used psilocybin but not in the past year	0.05 (0.02, 0.08)	0.004
Used psilocybin in the past year	0.05 (0.02, 0.07)	< 0.001

The number of observations was 21,852. β are adjusted for cohort membership; sex; age when the respondent left full-time continuous education; lifetime cocaine use; frequency of alcohol consumption, LSD use in the past year, prior LSD use (i.e., not in the past year), and authoritarian attitudes. The reference group of the predictor was "never used psilocybin". Confidence intervals are based on 5000 bootstraps. Parameters were estimated using a diagonally weighted least squares (DWLS) procedure (optimizer: NLMINB).

and 6). Psilocybin was chosen due to the stronger reported associations with vegetarian diets and red meat consumption, in comparison with LSD. For vegetarianism, we found significant indirect effects for both recent and past psilocybin use on vegetarianism via environmental attitudes. Controlling for these indirect effects reduced the respective direct effects to non-significance, suggesting full mediation (see Fig. 1). For red meat consumption, we likewise found two significant indirect effects via environmental attitudes. Controlling for these indirect effects reduced the size of the total effect, yet still left significant direct effects for both predictors, suggesting that

Table 6 Mediation analysis: Psilocybin use on red meat consumption via environmental attitudes.

	Red meat consumption	
	β (CI 95%)	*p*
Effects on environmental attitudes		
Used psilocybin but not in the past year	0.06 (0.04, 0.08)	<0.001
Used psilocybin in the past year	0.03 (0.02, 0.05)	<0.001
(Direct) effects on red meat consumption		
Environmental attitudes	−0.10 (− 0.11, −0.08)	<0.001
Used psilocybin but not in the past year (direct effect)	−0.021 (− 0.037, −0.004)	0.017
Used psilocybin in the past year (direct effect)	−0.030 (− 0.046, −0.014)	<0.001
Indirect effects on red meat consumption via environmental attitudes		
Used psilocybin but not in the past year	−0.006 (− 0.008, −0.004)	<0.001
Used psilocybin in the past year	−0.003 (− 0.005, −0.003)	<0.001
Total effects on red meat consumption		
Used psilocybin but not in the past year	−0.027 (− 0.044, −0.009)	0.002
Used psilocybin in the past year	−0.034 (− 0.050, −0.017)	<0.001

The number of observations was 21,852. β are adjusted for cohort membership; sex; age when the respondent left full-time continuous education; lifetime cocaine use; frequency of alcohol consumption, LSD use in the past year, prior LSD use (i.e., not in the past year), and authoritarian attitudes. The reference group of the predictor was "never used psilocybin". The dependent variable was consumption of red meat. Confidence intervals are based on 5000 bootstraps. Parameters were estimated using a maximum likelihood (ML) procedure (optimizer: NLMINB).

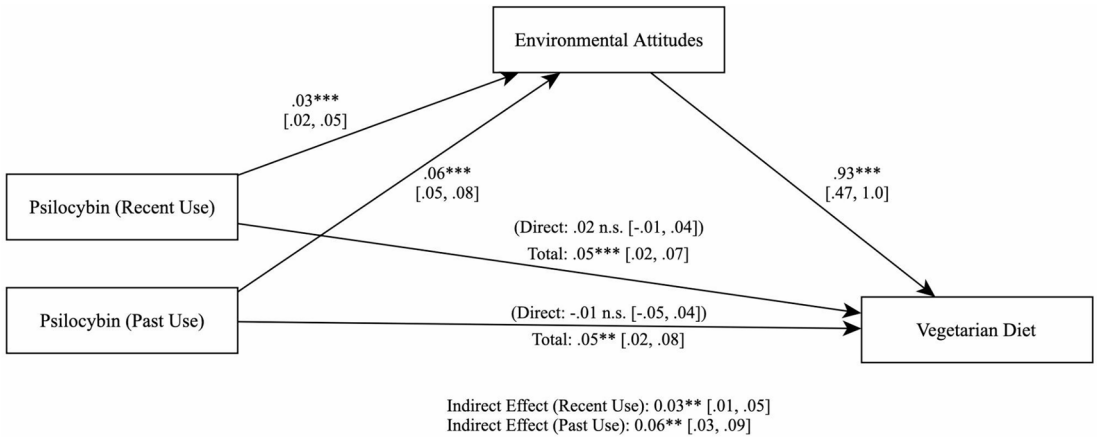


Fig. 1 Mediation analysis for the association between psilocybin use and vegetarian diet, mediated by environmental attitudes.

while increases in environmental attitudes are one mechanism explaining the association between psilocybin use and reduced red meat consumption, other unknown processes also contribute to this relationship.

For recent use, among the participants who reported using either psilocybin or LSD, 153 used only one of the substances while 44 reported using both. Similarly, for past use, 1770 participants used only one of the substances and 1190 used both. The phi coefficients for recent and past use were 0.36 and 0.53, respectively, indicating a moderate correlation between psilocybin and LSD use. This suggests that the estimation of the unique (partial) effects of psilocybin and LSD is based on a robust number of exclusive users and is not solely driven by a small subgroup.

Discussion

This study examined the associations between lifetime use of psilocybin and LSD and dietary behaviors in a large, representative sample of the UK adult population. Additionally, it explored whether environmental attitudes could mediate the relationship between psychedelic use and participants' healthy or unhealthy dietary choices. After adjusting for covariates, lifetime use of psilocybin and LSD was found to be associated with both the adoption of a vegetarian diet and more positive environmental attitudes. Psilocybin use, in particular, was linked with a healthier eating profile, including more salads, raw vegetables, and wholemeal bread/rolls (and fewer biscuits and cakes). Notably, lower red meat consumption was reported among participants who reported higher lifetime or recent use of psilocybin. Importantly, pro-environmental attitudes fully mediated the association between psychedelic use and vegetarian diets and partially mediated the link between psychedelic use and reduced red meat consumption.

Previous observational studies have found that psychedelic use is associated with healthier lifestyle choices, most notably healthier diets and higher levels of physical activity. These findings are derived from studies comparing psychedelic users with non-users in the population[39,40] or from secondary data showing that individuals who reported a reduction in substance misuse after using psychedelics also reported improved eating habits and increased exercise[11,12,41](for a review). While these studies have identified a link between psychedelic use and increased intake of fruits and vegetables, to our knowledge, no study has specifically examined the adoption of vegetarian diets in relation to psychedelic use. However, one study comparing ayahuasca users in the Netherlands with the general Dutch population found that ayahuasca users reported consuming meat less frequently: less than once a day compared to six days a week in the general population[42].

Recent research has found that psilocybin may be uniquely associated with increased nature-relatedness compared to other psychedelics including LSD[26,28], which could help explain the stronger association we observed between psilocybin use and vegetarianism. Interestingly, a large-scale international study demonstrated a strong preference for natural sources of psychedelics over synthetic alternatives[43]. Additionally, psilocybin tends to be used in more naturalistic settings compared to LSD[25], which may strengthen its connection to environmentally-motivated dietary choices. However, the exact reasons for these differential effects remain speculative without additional research specifically comparing the two substances.

Although results should be interpreted with caution considering the relatively small effect sizes, we found that psychedelic users exhibited more positive environmental attitudes compared to non-users. Previous studies suggest that psychedelics can foster a deeper appreciation for nature and evoke a sense of interconnectedness with it, often through vivid experiences involving nature-related ideas and themes such as unity, intimate connection, and even a symbiotic relationship with the environment[22,25]. These experiences and their effects may serve as key emotional pathways to developing pro-environmental cognitions, such as heightened environmental awareness, a sense of ecological responsibility, and engagement in environmentally friendly behaviors[44]. In this context, the stronger and more consistent findings related to psilocybin use and reduced red meat consumption are particularly noteworthy, given the well-documented link between meat consumption and environmental impact[45] as well as findings that reducing meat consumption is often motivated by environmental attitudes[46].

Unlike other health-related dietary choices, vegetarianism appears to be more closely tied to moral attitudes, personal identity, social experiences and attitudes toward environmental protection[47]. Psychedelics have been shown to influence social and political beliefs[22,48] as well as moral decision-making[49]. McGovern and colleagues[50] suggest that the combined effects of ego dissolution and enhanced feelings of connectedness - with other humans, nature or animals - along with increases in positive mood and openness, may lead to changes in individuals' metaphysical beliefs, such as attributing consciousness to non-human entities (e.g., non-human primates, quadrupeds, insects, fungi, plants)[51,52]. In fact, in their evaluation of whether psychedelics can change beliefs, McGovern and colleagues[50] propose that adopting a vegan or vegetarian diet is a concrete example of a behavioral outcome that supports this hypothesis. Our finding that pro-environmental attitudes partially mediated

the relationship between psychedelic use and the adoption of a vegetarian diet provides initial, albeit exploratory, evidence that psychedelics may encourage environmentally motivated behaviors.

There are several limitations in the research design that should be considered when interpreting these results. First, the sample was drawn from two cohort studies conducted within a specific cultural context, which may limit the generalizability of the findings, as the results could reflect unique characteristics of these groups rather than broader patterns. Second, the data were collected as part of a larger epidemiological study, and participants were not asked about the frequency of use or contextual extrapharmacological factors, such as set and setting, that might influence the effects of psychedelics. The importance of contextual factors in shaping both the subjective experiences and effects of psychedelics is well documented[53]. For example, all variables were drawn from the 2000 wave, but environmental attitudes, dietary trends, and psychedelic use, as well as the associations between them have not remained stable since then[54–56]. Therefore, it would be valuable to explore whether psychedelic use in different contexts leads to varying effects on environmental attitudes and health behaviors. While we used conventional significance levels ($\alpha = 0.05$), the multiple tests conducted increase the possibility of Type I errors, particularly for exploratory analyses of specific food items. Results should be interpreted with appropriate caution.

When psychedelics are used in ritualistic or retreat settings, specific attitudes, values, or behavior changes are often explicitly encouraged, and these settings frequently emphasize themes related to pro-environmental attitudes (e.g., nature relatedness, climate concern) and dietary practices (e.g., vegetarianism, other diets, or fasting)[53]. Finally, the cross-sectional design of this study does not allow for causal inferences. Future research should employ longitudinal and/or experimental designs to clarify potential causal relationships between classic psychedelic use, environmental attitudes, and health behaviors.

There may be specific social and cultural factors in the UK that may help explain associations between psychedelic use and certain attitudes or behaviors, including healthy (or unhealthy) practices, which we were not able to measure and test (e.g., as mediators). Compared to many other countries, namely in Europe, drug/psychedelic culture in the UK is well-developed and has, for many decades, been rooted in cultural norms and prevalent practices and events (e.g., rave and music festival traditions)[57]. This could influence the way users integrate psychedelics into their lives and how that affects other parts of their lives, such as the concepts this study focuses on.

Conclusion

The findings from this retrospective observational study suggest that the use of psilocybin and LSD may be associated with the adoption of vegetarian and meat-reduced diets. Additionally, past psilocybin users reported an overall healthier eating pattern (e.g., more salads and raw vegetables) compared with non-users. Finally, in what we see as an exploratory analysis at this point, the association between psychedelic use and vegetarian diets was found to be partially mediated by pro-environmental attitudes. Future studies, most especially prospective cohort studies, are needed to confirm these findings.

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Author contributions P.J.T. conceptualized the study, provided oversight and supervision, and led the writing of the manuscript; M.F. collected and analyzed the data, and wrote the Methods section; A.D.C. contributed to several sections and edited the final manuscript. All authors reviewed and approved the final version.

Data availability No datasets were generated or analysed during the current study.

Declarations

Competing interests The authors declare no competing interests.

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