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Strong Bipartisan Support for Controlled Psilocybin Use as Treatment or Enhancement in a Representative Sample of US Americans: Need for Caution in Public Policy Persists

Julian D. Sandbrink^{a,b,*} , Kyle Johnson^{c,*}, Maureen Gill^c, David B. Yaden^d , Julian Savulescu^{a,e,f} , Ivar R. Hannikainen^{g,*} , and Brian D. Earp^{a,c,*} 

^aUniversity of Oxford; ^bCharité Universitätsmedizin Berlin; ^cYale University; ^dJohns Hopkins University School of Medicine; ^eNational University of Singapore; ^fMurdoch Children's Research Institute; ^gUniversity of Granada

ABSTRACT

The psychedelic psilocybin has shown promise both as treatment for psychiatric conditions and as a means of improving well-being in healthy individuals. In some jurisdictions (e.g., Oregon, USA), psilocybin use for both purposes is or will soon be allowed and yet, public attitudes toward this shift are understudied. We asked a nationally representative sample of 795 US Americans to evaluate the moral status of psilocybin use in an appropriately licensed setting for either treatment of a psychiatric condition or well-being enhancement. Showing strong bipartisan support, participants rated the individual's decision as morally positive in both contexts. These results can inform effective policy-making decisions around supervised psilocybin use, given robust public attitudes as elicited in the context of an innovative regulatory model. We did not explore attitudes to psilocybin use in unsupervised or non-licensed community or social settings.

KEYWORDS



treatment; enhancement; mental health; psychedelics; policy

Psilocybin is a naturally occurring psychedelic found in certain species of mushroom. It has been a highly regulated Schedule 1 drug under the United States Controlled Substances Act since the 1970s. However, a recent wave of research has produced an array of striking findings, considered promising for psychiatric medicine. Thought to be physiologically safer than many currently-prescribed drugs, as well as non-habit forming, psilocybin, in combination with psychotherapy in appropriately prepared and prescreened individuals, has been found efficacious in treating a variety of psychiatric conditions including major depressive disorder (MDD) (Carhart-Harris et al. 2021; Davis et al. 2021; Goodwin et al. 2022).

Beyond therapeutic efficacy, a variety of positive neuropsychological effects have been observed in not only patients but also healthy participants, including increases in prosocial attitudes, mindfulness, and improved overall psychosocial functioning (Gandy 2019; Griffiths et al. 2006). Thus, the appropriately controlled

and guided use of psilocybin appears to have both “treatment” (i.e., reducing the symptoms of recognized disorders) and “enhancement” (i.e., improving function or well-being in healthy individuals) effects. Psychedelics can lead to acute psychological adverse reactions, such as anxiety or panic, as well as some longer-term harms such as a sense of disconnection from one's community (see below). However, these outcomes seem to be highly context-dependent and more likely to occur during unstructured or unlicensed activities (e.g., recreational use, “underground” therapy by unqualified or unethical practitioners). This emphasizes the importance of adequate screening, mental and emotional preparation, skilled, ethical supervision, and a safe, comfortable environment (Johnson, Richards, and Griffiths 2008).

While recreational use of psilocybin is federally prohibited, the FDA recently granted psilocybin “breakthrough therapy status” for use in MDD and treatment-resistant depression, facilitating clinical research. The state of Oregon has moreover decriminalized psilocybin and

CONTACT Brian D. Earp  brian.earp@philosophy.ox.ac.uk  Uehiro Centre for Practical Ethics, Faculty of Philosophy, University of Oxford, Oxford, UK.
*Julian D. Sandbrink and Kyle Johnson contributed equally to this work (first coauthors). Brian D. Earp and Ivar R. Hannikainen contributed equally to this work (senior coauthors).

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legalized it for supervised consumption in licensed facilities as of January 2023, including for non-medical reasons (Jacobs 2023), such as elevating well-being beyond a healthy baseline, which we here refer to as “well-being enhancement.” While these legislative changes may seem consistent with the emerging scientific picture, drug policy discussions should take stock of public moral attitudes as well (Earp et al. 2021; Savulescu, Gyngell, and Kahane 2021). Especially considering that the Oregon law might soon be followed by similar legislation elsewhere (e.g., in Colorado), the question arises: How do these legal and regulatory changes align with public attitudes and moral sentiment?

There is a burgeoning empirical literature studying public attitudes toward pharmacological treatment vs. enhancement, though these studies have focused primarily on “smart pills” for cognitive enhancement. The public generally seems to be cautiously accepting of such enhancement, though approval drops markedly in scenarios where potential issues such as societal pressure or unfairness arise (Cabrera, Fitz, and Reiner 2015; Fitz et al. 2014; Mihailov et al. 2021). There has been much less research on attitudes toward drug use for well-being enhancement, and virtually none on the use of psychedelics such as psilocybin for this purpose.

Concerning psychedelics more generally, in several studies, mental health professionals reported supporting further research but also showed reservations: 65% of psychiatrists claimed that psychedelic use increases the risk for subsequent psychiatric disorders (Barnett, Siu, and Pope 2018), a claim for which there is extremely limited evidence beyond a few anecdotal case reports. This suggests a knowledge deficit, similar to what has been observed in other groups, such as psychologists, mental health service users, and American college students (Corrigan et al. 2022; Davis et al. 2022; Wang et al. 2023; Wildberger, John, and Hallock 2017). Given basic information on promising medical findings, however, 51% of a Norwegian sample recently showed openness to psilocybin use for psychiatric treatment; however, neither enhancement nor social acceptance of others using it were explored (Jacobsen et al. 2021). Overall, research has revealed both a knowledge gap and reserved attitudes toward psychedelics, which might be a remnant of decades of criminalization and stigmatization during the War on Drugs (Belouin and Henningfield 2018; Earp, Lewis, and Hart 2021). However, to our knowledge, no studies to date have specifically explored attitudes toward psychedelic use in legal, supervised settings, which is what the new Oregon law allows for.

Given the limitations of current evidence, we ask: (1) How do diverse stakeholders morally judge the

legal, supervised use of psychedelics when given basic information about known risks and benefits? (2) How do these judgments differ depending on the purpose of use? We provided minimal, but accurate scientific background to a large sample of US participants. We then asked them, in a between-subjects design, to morally evaluate the use of psilocybin for either treatment or well-being enhancement in a legal, supervised setting (similar to the Oregon model). The pre-registration form and sampling plan are available on AsPredicted: <https://aspredicted.org/e43yz.pdf>. Anonymized data and an analysis script for this study are available on the Open Science Framework: <https://osf.io/e95cg/>.

We recruited 805 US participants, representative of national demographics according to age, race, and gender, on the crowdsourcing platform Prolific. Ten participants who failed either of our attention checks were excluded from analyses (final $N=795$). With this sample size, we obtained a margin of error of 5% in each experimental condition with a confidence level of 95%, as well as 80% power to observe a small difference (Cohen's $d=0.20$) in moral approval across conditions. Participants' ages ranged from 18 to 92, with a median age of 44 years. 49% of the sample ($n=390$) were men, 48% ($n=385$) were women, and 2% ($n=15$) selected other/choose not to disclose. Participants identified as White ($n=591$, 74%), Black/African ($n=113$, 14%), Asian ($n=56$, 7%), Hispanic/Latinx ($n=37$, 5%), Native American ($n=12$, 2%), Pacific Islander ($n=2$, <1%) and ($n=8$, 1%) as having other origins.

All participants were provided basic information on psilocybin, including its psychedelic properties and the fact that it is the active ingredient of “magic mushrooms.” Moreover, they were informed about the recent Oregon law that legalized psilocybin for personal use in supervised settings, and they were asked to imagine a future in which such a law has been passed at the federal level. Then, participants were randomly assigned to one of two vignettes about an individual taking the drug under the supervision of a trained professional (Figure 1). Participants were provided with scientifically accurate information on psilocybin, which stated that psilocybin has been shown to be medically safe and non-addictive if administered in an appropriately controlled setting, both for those with certain mental health disorders and for healthy individuals. Participants were then asked to morally evaluate the supervised use of the drug by the identified individual for either treatment or enhancement, depending on condition assignment.

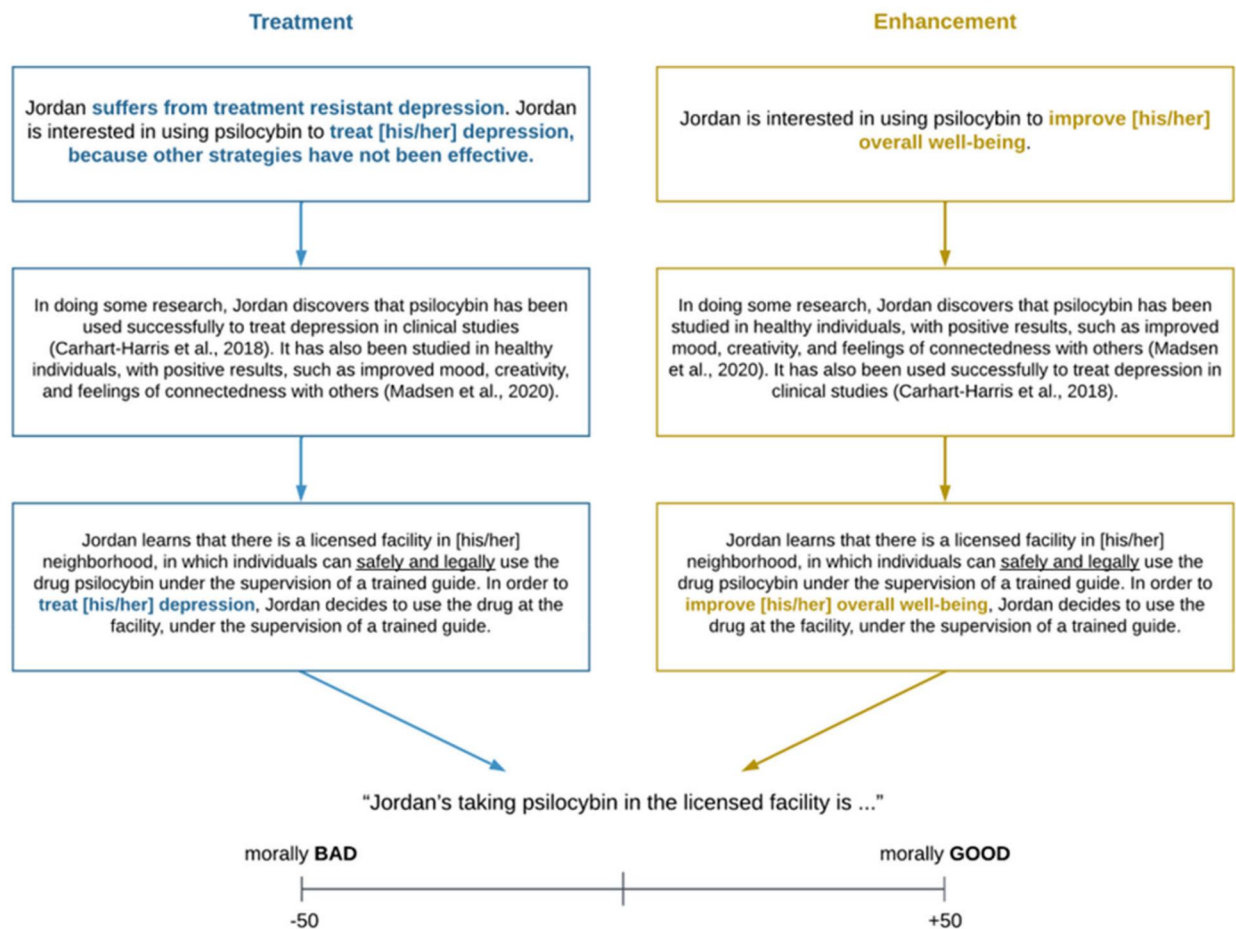


Figure 1. Study protocol.

At the end of the study, participants completed individual difference measures related to morality (i.e., "moral foundations," see Graham, Haidt, and Nosek 2009), empathy, and disgust, and provided demographic information including age, gender, race/ethnicity, political orientation (two-item average; Cronbach's $\alpha = 0.92$), religiosity, and spirituality. Disgust sensitivity (Cronbach's $\alpha = 0.88$) and empathic concern (Cronbach's $\alpha = 0.89$) were not associated with attitudes toward psilocybin use and will therefore not be discussed further.

Our primary pre-registered analysis revealed a treatment-enhancement distinction, such that psilocybin use was judged to be morally better in the treatment condition ($n = 395$, $M = 29.5$, $SD = 21.7$) than in the enhancement condition ($n = 400$, $M = 24.1$, $SD = 24.3$), Welch's $t_{(786)} = 3.34$, $p < .001$, Cohen's $d = 0.24$. This conventionally small effect corresponds to a 56% chance that a randomly selected response in the treatment condition will be higher than a randomly selected response in the enhancement condition. Comparisons to the scale midpoint in both conditions revealed substantial moral approval, rather

than disapproval, of psilocybin use in licensed settings whether for treatment, Cohen's $d = 1.36$, or enhancement, Cohen's $d = 0.99$, both $ps < .001$ (see Figure 1). Expressed in terms of probability of superiority (i.e., over the midpoint), 85% (95% CI [81.5, 88.5]) of participants reported moral approval of enhancement, while 89% (95% CI [85.2, 92.1]) reported approval of treatment (Figure 2).

In exploratory analyses (see Appendix Figure A1), we tested whether demographic characteristics were associated with varying attitudes toward psilocybin use. Indeed, political liberals reported greater approval of psilocybin use than conservatives, $B = 4.92$, $t = 4.00$, $p < .001$, and younger adults expressed greater support for psilocybin use than older adults, $B = -3.74$, $t = -2.61$, $p = .009$. Entering participants' moral foundations ratings (i.e., the extent to which concerns about care, fairness, and purity factor into their moral reasoning) as predictors of attitudes toward controlled psilocybin use uncovered a main effect of care values, $B = 3.63$, $t = 2.80$, $p = .005$, while fairness values, $B = 2.42$, $t = 1.64$, $p = .10$, and purity values, $B = -2.11$,

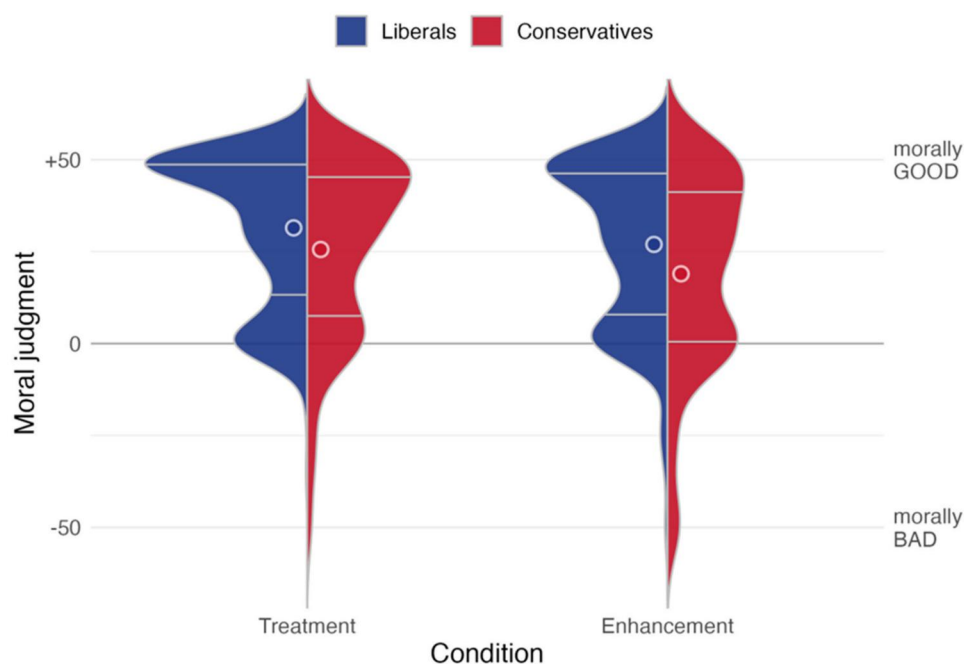


Figure 2. Violin plots of moral judgment by condition and political orientation. Horizontal marks indicate the 1st and 3rd quartiles, and overlaid circles display the group means.

$t = -1.21$, $p = .23$, were not statistically significant. In this model, the effect of age remained significant, $B = -4.15$, $t = -2.92$, $p = .004$, whereas the effect of political orientation did not, $B = 2.55$, $t = 1.86$, $p = .063$. This result indicates that political differences in support for psilocybin use may be partly explained by liberals' greater emphasis on care values, whereas age differences were unrelated to moral values.

Our results revealed strong bipartisan support for supervised psilocybin use for either treatment (89%) or enhancement (85%) in a demographically nationally representative sample of US Americans, although approval was slightly reduced among older and conservative participants. Overall, support for treatment was very high in both political groups: 91% of liberals and 86% of conservatives reported favorable attitudes toward treatment uses of psilocybin.

Participants' approval of controlled psilocybin use for enhancement was slightly weaker, though still very high: 89% of liberals and 78% of conservatives indicated approval. Across conditions, favorable attitudes toward controlled psilocybin use were linked to the moral foundation of care, suggesting that a concern for both patients' and non-patients' wellbeing underlies the tendency to approve of controlled psilocybin use. We note that our study was conducted at a time (Summer 2021) when the state of Oregon had already taken highly publicized steps toward facilitating

psilocybin use and psilocybin's efficacy began to see increased media coverage, which might have affected attitudes.

Earlier work on pharmacological *cognitive* enhancement had found less support than we observed here (Cabrera, Fitz, and Reiner 2015; Mihailov et al. 2021; Sabini and Monterosso 2005). One possible reason is that the enhancement of well-being, in comparison to cognitive function, constitutes a non-positional rather than positional good (i.e., its value does not depend on how it compares with other people's goods) and has a weaker association with competitiveness and coercion. Nevertheless, the magnitude of observed approval is especially notable given the substantial reservations about the use of psychedelics revealed in past research (Barnett, Siu, and Pope 2018; Corrigan et al. 2022; Davis et al. 2022; Jacobsen et al. 2021; Wang et al. 2023; Wildberger, John, and Hallock 2017) as well as the decades of stigmatization and criminalization during the War on Drugs (Belouin and Henningfield 2018; Lewis, Earp, and Hart 2022).

It is important to point out that the present study did not examine attitudes surrounding unsupervised uses of psychedelics, use under the supervision of "underground" practitioners, or other illegal uses, which incur distinctive risks (Johnson, Richards, and Griffiths 2008; Schlag et al. 2022), including the potential for long-lasting harms (Evans et al. 2023). Rather, inspired by the Oregon law, the study focused

exclusively on attitudes toward *legal and supervised* use.¹ Our results suggest that, under these circumstances, surveyed members of the US public are generally morally supportive of psilocybin use for *both* treatment and well-being enhancement.

Given such bipartisan positive attitudes, future legislative changes allowing psychedelic use in supervised settings for both purposes, even at the federal level, seem unlikely to trigger major public backlash, assuming similar background information about (known) benefits or risks, which may change over time. Nevertheless, policy changes related to psychedelics must be carefully considered, and the risk of inflated expectations is a concern. Psilocybin is not a silver bullet for treating mental illness: A recent phase II clinical trial showed no significant difference in primary endpoints of psilocybin vs. escitalopram (first line) treatment of MDD, suggesting psilocybin's efficacy above and beyond current measures might be limited (Carhart-Harris et al. 2021). Still, psilocybin may turn out to have a more tolerable side effect profile than escitalopram and other selective serotonin reuptake inhibitors, and the drugs' subjective effects may be valued differently by different users (i.e., in the context of shared clinical decision-making) (Cheung et al. 2023; Cheung, Earp, and Yaden 2024; Yaden, Earp, and Griffiths 2022).

That being said, recent research on adverse events reported in clinical trials of a different psychoactive drug—esketamine, a form of ketamine, also used to treat depression—found that substantial percentages of adverse events went unreported in the studies' final publications (de Laportalière et al. 2023). Although we are not aware of research suggesting similar underreporting of adverse events in controlled scientific studies of psilocybin (a drug with different chemical properties and hypothesized mechanisms of action), seeing such reports in any area of psychopharmacology raises serious concerns. More broadly, it has been noted that, similar to other areas of medicine, a range of issues including invalid statistical inferences, flexibility regarding the analysis of primary outcome measures, a lack of adequate control groups, and

researcher conflicts of interest may be worryingly common in psychedelic science, and that studies in this field need to be held to a much higher standard by reviewers and journal editors, as well as covered more critically by journalists and other science communicators (van Elk and Fried 2023; see also Stegenga 2018, Ioannidis 2023).

It is difficult to estimate the public health impacts of wider availability of psilocybin, particularly for use outside of clinical contexts. For example, it is unknown whether wider access to or perceived acceptability of psilocybin might foster openness toward other, potentially more harmful drugs, such as cocaine, opioids, and methamphetamines (cf. Mennis, Stahler, and Mason 2021). Allowing psychedelic use in supervised settings could also possibly affect the incidence of risky, unsupervised use in other settings (Johnson, Richards, and Griffiths 2008; Schlag et al. 2022), which the current study did not explore. Such concerns should be kept in mind by policymakers. In particular, there is a need to address considerable knowledge deficits observed in both lay populations and among some health experts, not only with regards to psychedelics, but other drugs as well (see, e.g., Hart 2020).

Caution is also required in relation to the apparent hype bubble now surrounding the so-called “psychedelic Renaissance” (Yaden, Potash, and Griffiths 2022). Given the early stage of the field, both over- and understatement of trial results are not uncommon. Current scientific evidence, however, does not allow for rash conclusions beyond the fact that psilocybin has significant medical potential and a good safety profile compared to other drugs, given the right context (Carhart-Harris et al. 2021; Davis et al. 2021; Goodwin et al. 2022; Johnson, Richards, and Griffiths 2008). It is imperative that claims do not get ahead of the state of the evidence (van Elk and Fried 2023). Nevertheless, our findings do suggest that the safe and supervised use of psychedelics under conditions of legalization has the potential to find wide public acceptance. If the field can overcome scientific inaccuracies, pursue rigorous research, and build trust—then psychedelics such as psilocybin may one day be seen as a mainstream means to treat mental illness and possibly also to promote overall well-being.

AUTHOR CONTRIBUTIONS

KJ, BDE, and MG conceptualized the project and designed the experiment. Investigation and data analysis were performed by KJ, MG, and IRH. IRH visualized the data. KJ acquired funding for data collection. BDE and JS administered the project, and BDE, MG, and IRH provided

¹Although the data on benefits and risks from such use in the context of recent scientific studies may not translate directly to non-medical supervised use, as in the Oregon model, what little data there is on potential benefits and risks in a roughly comparable setting (e.g., a legal “psilocybin truffle retreat” in the Netherlands), suggests that “integration challenges”—such as a feeling of disconnection from one's community—may occur in a minority of participants; however, such “challenges were transient; they occurred immediately after the psilocybin experience (once the main psychedelic effects had worn off) and in the days and weeks following the retreat, and resolved with time [and] were also correlated with positive after-effects including long-term remission of significant health conditions” (Lutkajtis and Evans 2023, 211).

supervision. JDS and KJ wrote the original draft. All authors helped review and edit the original draft. JDS and KJ are equal contributors listed as first coauthors. BDE and IRH are equal contributors listed as senior coauthors. BDE is the corresponding author.

DISCLOSURE STATEMENT

JDS, KJ, MG, and IRH have no disclosures or conflicts of interest to declare. JS is a Partner Investigator on an Australian Research Council grant LP190100841 which involves industry partnership from Illumina. He does not personally receive any funds from Illumina. JS is also a Bioethics Committee consultant for Bayer. BDE provided short-term unremunerated ethical guidance on harm reduction to Gather Well Psychedelics during the period in which the manuscript was being finalized. Support for DBY through the Johns Hopkins Center for Psychedelic and Consciousness Research was provided by Tim Ferriss, Matt Mullenweg, Blake Mycoskie, Craig Nerenberg, and the Steven and Alexandra Cohen Foundation.

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ORCID

Julian D. Sandbrink  <http://orcid.org/0000-0001-5452-8845>

David B. Yaden  <http://orcid.org/0000-0002-9604-6227>

Julian Savulescu  <http://orcid.org/0000-0003-1691-6403>

Ivar R. Hannikainen  <http://orcid.org/0000-0003-0623-357X>

Brian D. Earp  <http://orcid.org/0000-0001-9691-2888>

DATA AVAILABILITY STATEMENT

This study was approved by the Yale Institutional Review Board [2000029432]. Pre-registration of the design and analysis plan can be found at: <https://aspredicted.org/e43yz.pdf>. Anonymized data and analysis scripts are available on the *Open Science Framework* at: osf.io/e95cg/.

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Appendix. Exploratory analysis of individual differences

In an exploratory analysis (see Model 1 in Figure A1), we tested whether demographic characteristics were associated with varying attitudes toward psilocybin use. Controlling for the effect of condition, $B=5.68$, $t=3.51$, political liberals reported greater approval of psilocybin use than conservatives, $B=4.89$, $t=3.98$, both $ps < .001$. In addition, this model revealed a negative effect of age, $B=-3.76$, $t=-2.63$, $p = .009$ —such that younger adults expressed greater support for psilocybin use than older adults. No effects of gender, spirituality, or religiosity were observed, $ps > .14$.

In Model 2 (see Figure A1, right panel), we entered participants' measures of moral foundations as predictors of attitudes toward controlled psilocybin use. Our analysis uncovered a main effect of care values, $B=3.63$, $t=2.80$, $p = .005$, while fairness values, $B=2.42$, $t=1.64$, $p = .10$, and purity values, $B=-2.11$, $t=-1.21$, $p = .23$, were not significant. In this model, the effect of age remained significant, $B=-4.15$, $t=-2.92$, $p = .004$, whereas the effect of political orientation did not, $B=2.55$, $t=1.86$, $p = .063$. This result indicates that political differences in support for psilocybin use may be partly explained by liberals' greater emphasis on care values—whereas age differences were unrelated to differences in moral values.

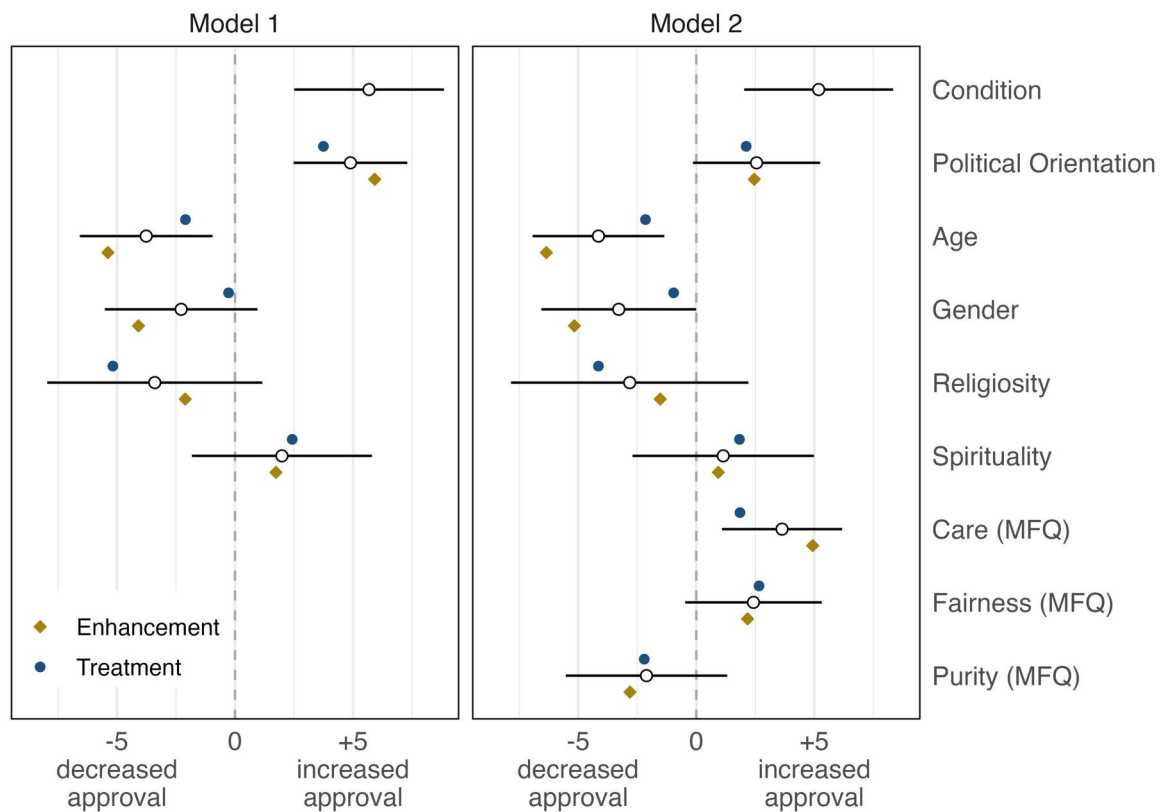


Figure A1. Coefficient plots reflecting the main effects of condition and each individual difference measure on moral judgment. Accompanying point estimates represent the simple effects in the enhancement (gold/diamonds) and treatment (blue/circles) conditions. Continuous predictors have been standardized with respect to the mean in units of the corresponding interquartile range. Condition displays the effect of treatment (with enhancement as the reference level), political orientation displays the effect of liberalism, and gender displays the difference between women and men (with men as the reference level).