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Psychedelic experiences and long-term spiritual growth: a systematic review

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Abstract
Psychedelic substances, which can occasion mystical experiences, are sometimes used for religious and spiritual reasons. Despite strong links between psychedelics and spirituality, no previous systematic review has investigated connections between psychedelics and indicators of long-term spiritual growth. Thus, 34 empirical studies were analyzed with 19,724 total participants from 32 independent samples. A variety of methodologies were used among the reviewed studies, and some studies included international samples. Results showed that psychedelics—especially classic psychedelics (e.g., psilocybin, LSD, and DMT)—have been studied more often in this context than other substances. Findings indicate that psychedelic use is linked with a variety of subjective indicators of spiritual growth, including stronger perceived connections with the divine, a greater sense of meaning, increased spiritual faith, increased engagement in religious and spiritual practices, an increase in feelings of unity and self-transcendence, positive changes in worldview, increased connectedness with others, and reduced fear of death. Many studies that reported on one of these indicators also reported on others, implying a co-occurrence of these facets during and after psychedelic experiences. Spiritual growth was often related to mystical experiences, with higher mystical experience ratings associating positively with perceived spiritual growth.

Keywords Psychedelics · Spirituality · Religion · Spiritual growth · Clinical psychology

Psychedelics, and particularly *classic psychedelics*, encompass a class of serotonin 2A receptor (5-HT2AR) agonists that can produce changes in consciousness. These substances can affect cognitions, perceptions, emotions, and sense of self (Aday et al., 2020, 2021). They can also occasion *mystical experiences* (Barrett et al., 2015; Carhart-Harris et al., 2016; Griffiths et al., 2006, 2008, 2016), characterized by feelings of meaning/sacredness, interconnectedness, transcendence of time and space, ineffability, and positive mood (Aday et al., 2020). People sometimes turn to these substances for spiritual reasons (Popovici & Simion, 2017), and many people interpret psychedelic experiences through a spiritual lens (Exline et al., 2023; Baumeister & Placidi, 1983). Although using psychedelics recreationally is illegal in most parts of the U. S., controlled clinical studies have shown that psychedelics have the power to reduce symptoms of depression (Carhart-Harris et al., 2016; Griffiths et al., 2016), addiction (Bogenschutz & Johnson, 2016; Garcia-Romeu et al., 2014), obsessive–compulsive disorder (Moreno et al., 2006), death anxiety (Griffiths et al., 2016; Ross et al., 2016), and post-traumatic stress (Krediet et al., 2020). We were interested in a complementary question: Might psychedelics have the potential to facilitate perceptions of spiritual growth? We reviewed prior studies that addressed this question.

What are psychedelics?

Broadly speaking, psychedelics—sometimes called *hallucinogens* or *entheogens* (i.e., "generating the god within"; Ruck et al., 1979)—include substances such as psilocybin ("magic mushrooms"), lysergic acid diethylamide (LSD; "acid"), N,N-dimethyltryptamine (DMT), ayahuasca, mescaline, ketamine, and methylenedioxy-methylamphetamine (MDMA; "ecstasy"). Psychedelic effects vary and can be unpredictable (for a review, see Aday et al., 2021). The

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effects of psychedelics may include distortion, enhancement, or amplification of human perceptions, cognitions, and emotions (Preller & Vollenweider, 2018). Scientific interest in psychedelics exploded in the 1950s and 1960s, and early researchers recognized their therapeutic potential (Pollan, 2018). However, psychedelics are also laced with controversy; psychedelic research was largely suspended in the 1970s due to tightening pharmaceutical regulations and increasing social pressure to restrict research (Oram, 2016; Strassman, 1991).

Although Nichols (2016) suggested that psychedelics are physiologically safe and not physically addictive, psychedelic use carries important risks, including impaired judgment (Nichols, 2016), "bad trips" (intense, frightening experiences; Barrett et al., 2016; Carbonaro et al., 2016, Johnstad, 2021), persisting changes in perception or mood (e.g., Hallucinogen Persisting Perception Disorder; Halpern et al., 2018), adverse neurological side effects (see Parrott, 2014a, b), and legal problems in areas where the substances are illegal (Pilecki et al., 2021). Psychedelic use may carry religious and spiritual risks, as well, including spiritual struggles (Citations removed for masked peer review). Evidence regarding the relationship between psychedelic use and psychopathology is mixed, but there is enough concern for psychedelics to encompass their own class of substance-related disorders in the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; American Psychiatric Association, 2013). Psychedelics can worsen existing mental health conditions, and some studies found weak associations between psychedelic use and psychosis (Lebedev et al., 2021; Nutting et al., 2021).

Because of these risks and controversies, psychedelic science remained mostly dormant until the 1990s. However, psychedelic research has recently seen a substantial resurgence (Apud, 2016). This recent wave of research has largely focused on the promising clinical applications of psychedelic substances in controlled settings, with an emphasis on the mechanisms underlying psychedelic effects (Mitchell & Anderson, 2024).

Psychedelics, spirituality, and psychology

Links between psychedelics and spirituality continue to have major implications for the field of psychology. Historically, these connections influenced the transpersonal paradigm, which focuses on integrating spiritual phenomena to serve individual and societal development (Ferrer, 2014). Spiritual experiences also played an important role in shaping scientific ideas for researchers interested in the therapeutic potential of psychedelics (Apud, 2016). Psychedelics can produce potent subjective experiences, which may play a role in the clinical effectiveness of these substances (Yaden & Griffiths, 2021). As early as 1967, Hoffer and Osmond found that alcoholic patients who received large doses of LSD and had mystical or meaningful experiences showed the greatest improvement in their substance use treatment outcomes (Apud, 2016). Although some consider mystical experiences to be crucial to the therapeutic use of psychedelics (Yaden & Griffiths, 2021), there is some contention around this point (e.g., Olson, 2020). In two separate studies, Ross et al. (2016) and Griffiths et al. (2016) found that the more mystical one's psilocybin session was rated, the greater the reductions in depression six months after the session. Other researchers found that the degree to which one had a spiritual and unitive experience while using psychedelics predicted reductions in depression (Aday et al., 2020).

Spiritual growth

The purpose of this systematic review is to summarize previous findings on psychedelic use and indicators of spiritual growth. *Spiritual growth* involves positive transformations in a person's larger sense of purpose and their relationship with whatever they perceive as sacred (Pargament & Exline, 2022). Spiritual growth can also be thought of as a deepening of the dimension of a person that is concerned with ultimate ends and values (Tu, 2006). It is typically framed as a long-term subjective effect (vs. more immediate mystical or spiritual experiences).

People can perceive spiritual growth in many ways. For example, some might see themselves as drawing closer to divine entities through reading scripture; others could feel an increased sense of meaning by adhering to religious and spiritual (r/s) values or rules, and still others may experience a sense of awe or self-transcendence through practices like meditation. Researchers have used a variety of indicators to study perceptions of spiritual growth (see Table 1 below), including increased r/s faith, increased engagement with r/s practices, increased spiritual well-being, self-transcendence, closeness with divine entities, positive changes in worldview, and more. Although these indicators can be challenging to quantify, several instruments have been created to measure aspects of spiritual growth. For example, the Spiritual Transformation Scale (Cole et al., 2008) assesses spiritual growth across four domains (worldview, goals/priorities, sense of self, and relationships). Because growth is a broad concept and there are many ways to conceptualize spiritual growth (Pargament & Exline, 2022; Piedmont, 1999), we considered a wide range of growth indicators for this review. These indicators were condensed and categorized in Table 1.

Table 1 Subjective indicators of long-term spiritual growth

Indicator	Description	Sample References
Increased Perceived Closeness with the Divine	A greater sense of interconnectedness, communion, or relationship with a transcendent or divine entity, presence, or perceived reality (e.g., God, Vishnu, Buddha)	Hukkinen et al. (2023); Haugen (2011); Pargament et al (1990)
Greater Sense of Meaning	A lasting positive change in an individual's perception of the purpose and significance of life, as well as their understanding of their own place within the broader human experience	Cole et al. (2008); Ai (2000)
Increased Religious or Spiritual Faith	Deepening of an individual's belief in, devotion to, or engagement with religious or spiritual principles or traditions over an extended period of time	Hukkinen et al. (2023); Hancock et al. (2005); Tedeschi and Calhoun (1996); Pargament and Exline (2022)
Increased Engagement with Religious or Spiritual Practices	Increased participation in religious/spiritual activities (e.g., prayer, meditation, worship, mindfulness, sacred rituals). May include greater commitment to embracing traditions or activities of a specific religious or spiritual belief system	Cole et al. (2008); Hancock et al. (2005)
Greater Feelings of Unity and Self-Transcendence	Transformation of perception of self and world, reflecting a positive change in one's sense of interconnectedness, oneness, and/or transcendence of personal boundaries	Cole et al. (2008); Ai (2000)
Positive Changes in Worldview	Positive shift in fundamental beliefs, perspectives, and values, which may reflect a more optimistic or constructive outlook	Cole et al. (2008); Mytko and Knight (1999); Pargament and Exline (2022)
Increased Connectedness with Others	Greater sense of interconnectedness, empathy, or compassion with other people. May include increased awareness of and engagement with broader community, greater sense of shared humanity, or ongoing commitment to fostering harmonious and supportive relationships	Tedeschi and Calhoun (1996)
Reduced Fear of Death	Shift in perceptions of mortality, resulting in diminished apprehension and anxiety about death. May include a sense of acceptance or peace regarding the end of life	Ai (2000); Vachon et al. (2012)

Hypotheses

Many people have psychedelic experiences that they frame as spiritual or mystical (e.g., Barrett et al., 2015; Yaden et al., 2017), and psychedelic use can lead to lasting positive changes in a variety of mental health conditions (Luoma et al., 2020). In a parallel fashion, we expected that changes in spirituality related to psychedelic use have the potential to last beyond the brief timeframe of the psychedelic experience itself, creating longer-term changes that could include spiritual growth (or at least perceptions of growth). For example, psychedelic experiences might prompt individuals to contemplate or re-evaluate r/s ideas. Psychedelics could also give rise to revelations about the divine, the self, and the human condition, leading to enduring changes in one's philosophical or spiritual beliefs. Additionally, psychedelics may evoke strong feelings of empathy, compassion, and awe, inspiring a deeper appreciation for the mysteries of existence and encouraging individuals to be more altruistic. Such changes could persist long after the psychedelic experience is over. Thus, we expected to find links between psychedelic use and the spiritual growth indicators outlined in Table 1.

Method

We conducted a literature search using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) review methodology (Page et al., 2021). We included only studies that: (a) were empirical, (b) included use of at least one psychedelic substance, and (c) evaluated at least one of the spiritual growth indicators from Table 1. We included studies focusing on both recreational and clinical use. We reviewed the literature in two phases: a first search focused on work published before June 13, 2022; phase two went to September 18, 2023.

During each phase, two steps were used. First, we searched keywords using PubMed and EBSCOhost Research Platform, which were filtered for peer-reviewed journal articles. EBSCOhost allows access to a range of databases, including APA PsycArticles, APA PsycBooks,

Psychology and Behavioral Sciences Collection, AHFS Consumer Medication Information, CINAHL Complete, eBook Collection, Education Source, GreenFILE, Health Source: Nursing/Academic Edition, Library, Information Science & Technology Abstracts, MEDLINE, SocINDEX with Full Text, and ERIC. We paired keywords "psychedelics" and "entheogens" with: "spiritual growth," "spiritual experiences," "religious experiences," "spiritual struggles," "religious struggles," "religious coping," "coping," and "spirituality," for a total of 16 search combinations. There were no restrictions based on publication date, language, or sample size. The first search yielded 114 potentially relevant articles, and the second yielded 41. The first author screened each article.

Second, we searched the reference lists of each article to find additional studies. After screening the studies, we eliminated 88 articles in the first phase and 32 in the second. Table 3 in Appendix 1 shows examples of excluded studies and their reasons for exclusion. Most studies were excluded because they were irrelevant, measured immediate spiritual experiences vs. perceptions of longer-term spiritual growth, did not measure any indicators of spiritual growth, were not empirical (e.g., literature reviews), or used insufficiently rigorous methodology.

In phase one, 25 papers (24 independent samples) met inclusion criteria. In phase two, nine papers (eight independent samples) met criteria. The final review included 34 studies (32 independent samples). We then grouped studies according to each indicator of spiritual growth. When coding the studies, we included the citation, sample size, demographics, type(s) of psychedelics used, publication status, research design, measures of psychedelic experiences, measures of spirituality, indicator of spiritual growth, and general findings.

Results

Results are organized into two subsections. The first subsection discusses the methodology of the studies. The second subsection reviews empirical findings related to spiritual growth and is organized by specific indicators of spiritual growth.

Review of methodology

The 25 studies from Phase 1 included a total of 11,940 participants, and the nine studies from Phase 2 included 7,784 participants (total $n = 19{,}724$). See Table 4 in Appendix 1 for detailed information about sample demographics, including gender, median age, r/s orientation, and race/ethnicity. Table 5 in Appendix 1 includes the measures that were used to evaluate psychedelic experiences and religious/spiritual effects in each study. Table 2 (below) presents information about each study's research design, sample size, the psychedelics that were investigated, indicators of spiritual growth, general findings, study strengths, and study weaknesses. Note that Table 2 is meant to provide a general orientation to the studies. Specific findings related to spiritual growth are detailed in the section labeled "Psychedelics and Indicators of Long-term Spiritual Growth" section immediately following Table 2.

Psychedelics and indicators of long-term spiritual growth

We interpreted increases in indicators of spiritual growth from before to after psychedelic use as perceived spiritual growth. Additionally, we included cross-sectional studies that asked participants about indicators of spiritual growth retrospectively, given they provided sufficient detail. The subsequent sections highlight the most salient findings and are categorized by the indicators outlined in Table 1.

Perceived closeness with the divine In a large survey ($n = 4{,}285$), Griffiths et al. (2019) found that more than two-thirds of those who identified as atheists before encountering God while using psilocybin no longer identified as atheists after the experience. These results resembled those of another large cross-sectional study (Davis et al., 2020, $n = 2{,}561$), which showed a shift from 28% atheists and 27% agnostics before DMT use to 10% atheists and 16% agnostics after. Beliefs in ultimate reality or a higher power increased from 36 to 58%. In a third cross-sectional study ($n = 800$), some U.S. adults indicated a belief that psychedelics could facilitate communication with divine entities when asked about their attitudes toward psychedelics (Exline et al., 2022). A mixed-method study (Kavenská & Simonová, 2015) found that nearly 50% of participants who traveled to the Amazon for an ayahuasca ceremony reported (re)-discovering God or the purpose of life, in addition to overall spiritual development. Finally, Nayak et al. (2023) factor analyzed 45 belief statements from survey respondents ($n = 2{,}374$) who endorsed having a belief-changing psychedelic experience. The percentage of participants who identified as a "Believer (e.g., in Ultimate Reality, Higher Power, and/or God, etc.)" increased from 29 to 59% after the psychedelic experience. Taken together, findings suggest that DMT, ayahuasca, and psilocybin may strengthen some people's belief in divine entities.

Sense of meaning Two months after Griffiths et al. (2006) administered psilocybin to 36 participants, most participants (71%) rated their psilocybin session as among the top

Table 2 Research information for included studies (in Alphabetical Order)

Citation	*N*	Design	Psychedelics Used[c]	Growth Indicator	General Findings	Study Strengths	Study Weaknesses
Agin-Liebes et al. (2020)	15	Crossover design	Psilocybin	Reduced fear of death; Greater meaning	Psilocybin-assisted psychotherapy may promote long-term relief from cancer-related distress; may enhance psychological, emotional, and spiritual well-being of patients with life-threatening cancer	R/S orientation well assessed; Several spiritual outcomes assessed at four time points, including two long-term follow-ups after using psilocybin	Limited conclusions can be drawn regarding efficacy due to crossover design; Small, homogeneous sample
Carbonaro et al. (2016)	1,993	Cross-sectional	Psilocybin; LSD; Morning Glory seeds; Mescaline; Peyote; San Pedro; DMT; Ayahuasca	Greater meaning	Psychologically difficult psilocybin experiences include distress, dangerous behavior, & enduring psychological problems. Despite difficulties, 84% endorsed benefits from psilocybin	Large sample; Assessed many variables, including psychedelic dosage and set and setting	Self-report; Potential self-selection bias; High rate of non-completion; Homogeneous sample (largely White, male); R/S orientation not well assessed
Carhart-Harris and Nutt (2010)	626	Cross-sectional	Psilocybin; LSD; Ketamine; MDMA	Positive changes in worldview; Reduced fear of death	Many benefits reported for past users of psychedelics, including help with mood disorders, addictions, and migraines; long-term increases in wellbeing	Assessed both risks and benefits of psychedelic use; Included several psychedelic substances	Potential self-selection bias; Lack of experimental control; Minimal demographic information; R/S orientation not well assessed
Corneille and Luke (2021)	153	Mixed within and between-participants self-report survey design	Psilocybin; DMT	Perceived closeness with divine; Spiritual faith or engagement with r/s practices	Distribution of spontaneous spiritual or kundalini awakenings were similar to other altered states of consciousness (ASCs) but greater in magnitude; most similar in distribution and magnitude to ASCs induced by DMT and psilocybin	R/S well assessed; Used several well-validated scales	Relied on subjective retrospective measures; Internal consistency for 11D-ASC subscales was lower than other studies
Davis et al. (2020)	2,561	Cross-sectional	DMT	Perceived closeness with the divine; Positive changes in worldview	People believe they encounter many entities when using DMT, many of which are perceived as divine and benevolent	Large sample; Several indicators of spiritual growth; Thorough and descriptive	Potential for retrospective recall and social desirability biases; R/S orientation not assessed
Exline et al. (2022)	800	Cross-sectional	LSD, Mescaline, Psilocybin, DMT, Ayahuasca	Perceived closeness with the divine; Positive changes in worldview	Supernatural message beliefs linked with more prior psychedelic use, younger age, r/s identification, more past experiences seen as supernatural, attitudes about psychedelic use and legalization, and interest in personal use	Large sample; Thorough data collection; Included several psychedelics; R/S well assessed	Not a representative sample; Attitude-focused study in which many had not used psychedelics themselves

Table 2 (continued)

Citation	*N*	Design	Psychedelics Used[c]	Growth Indicator	General Findings	Study Strengths	Study Weaknesses
Garcia-Romeu et al. (2014)	15	Clinical Trial	Psilocybin	Unity and self-transcendence	Retrospective ratings of personal meaning and spiritual significance correlated with mystical experience on psilocybin session days. Results suggest mediating role of mystical experience in psychedelic-facilitated addiction treatment	Tested different dosages; Measured psilocybin effects at several time points; Smoking outcomes well-assessed (including biomarkers)	Small sample; R/S orientation not thoroughly assessed
Gashi et al. (2021)	50	Qualitative	Psilocybin ($n=36$); LSD ($n=37$); DMT or ayahuasca ($n=20$); 2C-B ($n=20$); MDMA ($n=34$)	Greater meaning	Negative experiences are common among Norwegian psychedelic users; through storytelling, bad experiences are often transformed into valuable experiences	Included several psychedelics; Included descriptive qualitative data	Potential self-selection bias; Insufficient demographic information; No empirical measures used; Homogeneous sample (mostly male)
Griffiths et al. (2006)	36	Double-blind between-group crossover design	Psilocybin; Methylphenidate Hydrochloride	Greater meaning	Psilocybin can occasion experiences similar to spontaneously occurring mystical experiences. Two months post-session, participants rated their psilocybin experience as having substantial personal meaning and spiritual significance	Double-blind experimental design; R/S well assessed; Several validated scales were used; Psilocybin effects were assessed at multiple time points	Small sample; Insufficient demographic information; Study population may limit generalizability
Griffiths et al. (2008)	36	Double-blind clinical trial	Psilocybin; Methylphenidate Hydrochloride	Greater meaning; Connection with others	Positive attitudes, positive mood, positive behaviors, and positive social effects two months after psilocybin sessions were significantly greater than those two months after methylphenidate sessions	Good study design; Used several validated measures; Psychedelic effects were assessed at multiple time points; Different dosages were assessed	Small sample; Insufficient demographic information; Study population may limit generalizability
Griffiths et al. (2011)	18	Double-blind between-group crossover design	Psilocybin	Greater meaning; Spiritual faith or engagement in r/s practices; Positive changes in worldview; Connections with others	Under supportive conditions, 20 and 30 mg/70 kg psilocybin occasioned mystical-type experiences that had persisting positive effects on attitudes, mood, and behavior	Good study design; Included several indicators of spiritual growth; Psychedelic effects were assessed at multiple time points; Different dosages were assessed	Small sample; Insufficient demographic information; Homogeneous sample; Study population may limit generalizability

Table 2 (continued)

Citation	*N*	Design	Psychedelics Used[c]	Growth Indicator	General Findings	Study Strengths	Study Weaknesses
Griffiths et al. (2018)	75	Randomized double-blind clinical trial	Psilocybin	Greater meaning; Reduced fear of death; Connection with others; Spiritual faith or engagement in R/S practices	Compared with group receiving low dose of psilocybin, both high-dose groups showed large increases on longitudinal measures of interpersonal closeness, gratitude, life meaning, forgiveness, death transcendence, daily spiritual experiences, and religious faith	Good study design; Included several indicators of spiritual growth; Used many validated measures; Psychedelic effects were assessed at multiple time points; Different dosages assessed	Homogeneous sample (mostly White, college educated, and employed); R/S orientation not thoroughly assessed
Griffiths et al. (2019)	4,285	Cross-sectional	Psilocybin ($n=1,184$); LSD ($n=1,251$); Ayahuasca ($n=435$); DMT ($n=606$)	Greater meaning; Perceived closeness with the divine	Many participants who identified as atheist no longer identified as atheist after the experience. These experiences were rated as among the most personally meaningful and spiritually significant lifetime experiences	Detailed information about psychedelic experience; Large sample; Several substances and non-drug group were compared	Retrospective self-report; Potential self-selection bias; Long delay between experience and questionnaire; R/S not thoroughly assessed
Gukasyan et al. (2022)	24	Randomized controlled trial	Psilocybin	Greater meaning	Ratings of personal meaning, spiritual experience, mystical experience after psilocybin-assisted therapy predicted increased well-being after 12 months, but did not predict improvement in depression	Good study design; Primary outcome measure was assessed by blinded clinicians; Excellent participant retention; Psychedelic effects were assessed at multiple time points; Different dosages were assessed	Small, homogeneous sample (mainly Caucasian and non-Hispanic); R/S orientation not thoroughly assessed; Participants were not blinded to study condition
Kavenská and Simonová (2015)	77	Mixed-methods	Ayahuasca	Perceived closeness with the divine; Unity and self-transcendence; Connections with others	According to participants from Czech Republic and Peruvian Amazon, traveling to the Amazon for ayahuasca ceremony led to profound positive psychosocial-spiritual effects	Included several indicators of spiritual growth; Included qualitative and quantitative data	Snowball sampling; Retrospective self-report data; No validated R/S or psychedelic measures; Insufficient demographic information
Lerner and Lyvers (2006)	183	Cross-sectional	Psychedelic substances were unspecified ($n=88$)	Connections with others; Perceived closeness with the divine	Psychedelic users from Israel and Australia scored higher on mystical beliefs (e.g., oneness with God and universe) and life values of spirituality and concern for others than users of nonpsychedelic illegal drugs and non-illicit drug-using social drinkers	Compared different drug groups and different cultures; Several validated measures were used	Small sample; Snowball sampling; Retrospective self-report data; Psychedelic substances unspecified

Table 2 (continued)

Citation	*N*	Design	Psychedelics Used[c]	Growth Indicator	General Findings	Study Strengths	Study Weaknesses
Nayak and Griffiths (2022)	1,606	Cross-sectional	Psilocybin (49%); LSD (33%); Ayahuasca (7%); N,N-DMT (6%); 5-MeO-DMT (3%); Mescaline (2%)	Positive changes in worldview	Participants who reported belief-changing psychedelic experiences increased attribution of consciousness to various living and non-living entities	Large sample; Several beliefs were assessed before and after the psychedelic experience	Retrospective self-report design; Only included participants who endorsed belief change; Possible demand effects
Nayak et al. (2023)	2,374	Cross-sectional	Classic psychedelic substances (e.g., psilocybin, LSD, ayahuasca); unspecified	Positive changes in worldview	Single psychedelic experience changed beliefs about consciousness, meaning, and purpose. The magnitude of belief change was associated with subjective features of the psychedelic experience	Large sample; Analyses included exploratory factor analysis and mean differences; Many belief changes were measured	Retrospective self-report design; Sample may not reflect typical psychedelic users; Study used some ad hoc and unvalidated measures
Nicholas et al. (2018)	12	Clinical trial	Psilocybin	Existential meaning	High doses of psilocybin elicited effects at least as strong as lower doses and resulted in positive persisting subjective effects 30 days after. "Complete" mystical experience may not be necessary for positive outcomes	Clinical trail; Psilocybin was given at different doses; Psychedelic effects were well-assessed (including biomarkers)	Very small sample; No control group; R/S orientation not thoroughly assessed
Pokorny et al. (2017)	32	Double-blind, randomized placebo-controlled within-subject design	Psilocybin	Unity and self-transcendence; Connection with others	Psilocybin appears to promote emotional empathy via activation of serotonin 2A/1A receptors	Double blind, randomized, placebo-controlled design; Several indicators of spiritual growth	Small sample; R/S not thoroughly assessed; Insufficient demographic information
Ross et al. (2016)	29	Randomized double-blind cross-over design	Psilocybin	Reduced fear of death	Participants in psilocybin group reported improvements in anxiety, depression, spiritual well-being, and quality of life; Decreases in cancer-related hopelessness	Randomized, double-blind design; Control group; Measured psychedelic effects at three time points; R/S orientation and demographics well assessed; Several validated measures	Relatively small, homogeneous sample (90% Caucasian); Crossover design may limit interpretation of outcomes after crossover
Ross et al. (2021)	11	Randomized double-blind, cross-over, controlled trial	Psilocybin	Reduced fear of death	Psilocybin-assisted psychotherapy led to rapid, sustained improvements in depression, demoralization, hopelessness for cancer patients	Randomized, double-blind design; Control group; Measured effects at several time points; R/S factors, demographics well assessed	Small, homogeneous sample (91% Caucasian); Crossover design of parent trial may limit ability to assess long-term effects

Table 2 (continued)

Citation	*N*	Design	Psychedelics Used[c]	Growth Indicator	General Findings	Study Strengths	Study Weaknesses
Shnayder et al. (2023)	30	Phase II, single-center, fixed dose, open label trial	Psilocybin	Greater meaning; Connection with others	Psilocybin-assisted therapy facilitated psycho-social-spiritual growth in cancer patients, including connection, reflection and introspection, trust, and acceptance	Clinical trial; Multi-method measurement; systematic procedures	No control group; Self-report measures, small homogeneous sample
Smigielski et al. (2019)	39	Double-blind clinical trial	Psilocybin	Greater meaning; Spiritual faith or engagement in r/s practices; Unity & self-transcendence; Positive changes in worldview	Compared with placebo at 5-day mindfulness group retreat, psilocybin enhanced post-intervention mindfulness and produced larger positive changes in psychosocial functioning at 4-month follow-up	Double-blind clinical trial; Several indicators of spiritual growth; Several validated measures; Results corroborated by external ratings	Study used inert placebo (possible recognition of active and non-active conditions by participants); Insufficient demographic information
Søgaard Juul et al. (2023)	500	Cross-sectional	Psilocybin (56.4%); LSD (28.4%); DMT (15.2%)[WS2]	Greater meaning; Connection with others	Danish participants used psychedelics mostly for therapeutic or spiritual reasons and self-reported positive persisting effects in well-being, social relationships, meaning in life	Several substances assessed; Researchers considered many effects (mental health status, patterns of use, persisting effects)	Retrospective self-report; Potential for recall, response, or selection bias; Individuals who preferred mescaline were excluded
St. Arnaud and Sharpe (2023)	684	Cross-sectional	Psychedelic substances were unspecified	Unity and self-transcendence	Entheogenic classic psychedelic use associated with more spiritual seeking, self-transcendence, psychological well-being, psychospiritual development than non-entheogenic classic psychedelic use and non-use	Large international sample; Multiple analyses; Many validated scales and study variables	Retrospective self-report; Psychedelic substances not specified; Sample self-selected and not random
Sweeney et al. (2022)	3,192	Cross-sectional	LSD ($n=904$); Psilocybin ($n=766$); ayahuasca ($n=282$); DMT ($n=307$)	Reduced fear of death; Positive changes in worldview; Greater meaning	Psychedelic experiences can lead to new perspectives on death and dying. Psychedelics & near-death experiences linked to less fear of death & high ratings of positive persisting effects & personal meaning, spiritual significance, psychological insight	Large sample; Several psychedelics were directly compared; Analyses of differences were adjusted for demographic differences	Retrospective self-report; Sample was self-selected, not random; Psychedelic sample was mainly male, White, Non-Hispanic, residing in the U.S
Swift et al. (2017)	13	Qualitative	Psilocybin	Greater meaning; Reduced fear of death	Adult cancer patients described immersive and distressing effects of past psilocybin sessions, which led to reconciliations with death, acknowledging cancer's place in life, reconnecting with life, and emotional uncoupling from cancer. Participants made r/s interpretations of their experiences	All participants completed a Phase 2 RCT clinical trial of psilocybin treatment; Included descriptive qualitative data	Small, homogeneous sample (largely Caucasian, well-educated and middle-class); Used no validated measures; Possible issues with participant recall

Table 2 (continued)

Citation	*N*	Design	Psychedelics Used[c]	Growth Indicator	General Findings	Study Strengths	Study Weaknesses
Timmerman et al. (2021)	866	Longitudinal Survey, controlled clinical trial	Psilocybin; Ayahuasca; DMT; San Pedro; LSD	Positive changes in worldview	After psychedelic ceremony, metaphysical beliefs about nature of reality, consciousness, and free-will shifted away from materialist views and toward non-physicalist beliefs. Changes endured for at least six months and were positively correlated with extent of past use and improved mental health	Measured beliefs at three time points; Validated scales; Observed belief shifts post-psychedelic-use were consolidated by data from independent controlled clinical trial	R/s orientation not assessed; Samples largely Western and well-educated; Samples not random
Trichter et al. (2009)	54	Mixed-design	Ayahuasca ($n=49$)	Connection with others	For ayahuasca ceremony participants, higher PEP scores linked with more positive changes in spiritual well-being, mysticism. Many reports of spiritual themes, including gratitude, awe; sense of connection; self-reflection and/or insights on personal life; spiritual experience; supernatural experiences; sense of peace/calm	Several validated measures; R/S well assessed; Quantitative and qualitative data	Participants were self-selected; Self-report; Insufficient demographic information; Homogeneous sample; Researcher knew several participants
Watson and Beck (1991)	100	Mixed-method	MDMA	Connection with others	Recreationally oriented participants saw minimal long-term benefits from MDMA. Spiritual seekers differed in motivations for use & perceptions of MDMA's influence in their lives; some saw MDMA having lasting spiritual value	Focused on MDMA; Descriptive qualitative data; In-depth interviews (3–4 h); Qualitative and quantitative components	Subjects recruited using chain-referral method and theoretical sampling; Homogeneous sample (White, highly educated); No validated measures
Watts et al. (2022)	52	Phase 2 double-blind randomized controlled trial	Psilocybin ($n=27$)	Connection with others	First study validates WCS. We are focusing on the second study (a controlled trial), in which significant post-psychedelic increases were observed for total connectedness scores on WCS	Assessed connectedness at 2 weeks, 4 weeks, and 6 months after psychedelic use; Several dimensions of connectedness	Validation of WCS limited by self-selection bias; Item creation may be biased by previous qualitative sample; Small sample in controlled trial

Table 2 (continued)

Citation	*N*	Design	Psychedelics Used[c]	Growth Indicator	General Findings	Study Strengths	Study Weaknesses
Xin et al. (2023)	86	Prospective chart review	Ibogaine; 5-MeO-DMT	Greater meaning	In U.S. Veteran sample, ibogaine-and-5-MeO-DMT linked with increased personal meaningfulness & spiritual significance from baseline to 1-month follow-up. Greater personal meaningfulness, spiritual significance correlated with better long-term mental health outcomes	Assessed a variety of spiritual, psychological, and cognitive domains; Surveys completed at four time points	Homogeneous sample (e.g., all participants were male); No control group; Self-selection bias
Yaden et al. (2017)	739	Cross-sectional	Psychedelic substances were unspecified	Greater meaning; Reduced fear of death	Religious, spiritual, or mystical experiences (RMSEs) induced by psychedelics rated more mystical, led to reduced fear of death, increased sense of purpose, increased spirituality compared with non psychedelically triggered RMSEs	Large sample; Demographics, R/S well assessed; Assessed several RMSEs	Sample was self-selected, not representative; Psychedelics unspecified; Potential confounds between comparison groups

DMT N,N-dimethyltryptamine, *5-MeODMT* 5-methoxy-N,N dimethyltryptamine, *LSD* Lysergic acid diethylamide, *MDMA* 3,4-Methylenedioxymethamphetamine

[c]Sample sizes were included for each psychedelic substance when possible

five most spiritually significant experiences of their lives. These findings were replicated by the same research group: About two-thirds of participants rated their psilocybin session as one of their top five most meaningful experiences two months after the session, and 58% responded similarly at the 14-month follow-up (Griffiths et al., 2008). In a subsequent experiment, most volunteers rated their psilocybin experience as highly personally and spiritually significant one month after sessions at the two highest doses; at 14 months, ratings were undiminished and consistent with community observer ratings (Griffiths et al., 2011).

More recent studies report similar findings. In a double-blind trial, Smigielski et al. (2019) administered either psilocybin or placebo to 39 participants at a 5-day mindfulness group retreat. At four-month follow-up, 50% and 35% of participants who took psilocybin rated their experience as among the ten or five most meaningful life experiences, respectively. Griffiths et al. (2018) found that approximately two-thirds of the sample rated their psilocybin session as among their five most meaningful experiences five months later. Likewise, Nicholas et al. (2018) found that 83% of participants rated their psilocybin session as one of their five most spiritually significant experiences, with persisting meaningfulness 30 days after their last dose.

Some people facing mental and physical health challenges also experience positive changes in meaning after using psychedelics. A small sample of cancer patients ($n = 13$) who received psilocybin reported a heightened sense of meaning and perspective even compared to life before their diagnoses (Swift et al., 2017). Among U.S. Special Operations Forces Veterans who engaged in a three-day clinical retreat in Mexico (Xin et al., 2023), ibogaine-and-5-methoxy-N,N-dimethyltryptamine treatment was associated with greater improvements in personal meaningfulness and spiritual significance from baseline to 1-month follow-up.

A qualitative study found that almost all Norwegian participants had faced at least one frightening or "bad" experience when using psilocybin ($n = 36$), LSD ($n = 37$), DMT ($n = 20$), 2C-B ($n = 20$), or MDMA ($n = 34$; Gashi et al., 2021). Yet, some believed their bad experiences provided deep existential and life-altering insights. Carbonaro et al.'s (2016) cross-sectional data showed similar effects, with personal meaning and spiritual significance positively related to the difficulty of the psychedelic experience and the degree of difficulty correlated with personal meaning ($r = 0.41$). Carbonaro et al. (2016) suggested that the

duration of the challenging experience matters, as longer challenges associated negatively with personal meaning, spiritual significance, and well-being. Dosage also seemed to matter. At 6 months, compared to very low doses of psilocybin ($n = 25$), participants receiving high doses of psilocybin ($n = 50$) showed large significant positive changes in longitudinal measures of life meaning and purpose (Griffiths et al., 2018). Taken together, findings suggest that using psychedelics—in particular, psilocybin—can significantly increase one's sense of spiritual meaning, even months or years after the psychedelic experience.

Spiritual faith or engagement in R/S practices Griffiths et al. (2018) found large, significant, and positive changes in religious faith and daily spiritual experiences when two psilocybin sessions were paired with spiritual practices. Griffiths et al. (2011) administered psilocybin to 18 adults over five 8-h sessions spaced a month apart. At the 14-month follow-up, 71.6% reported the maximum possible Increased Spirituality score on the Persisting Effects Questionnaire. Very few (0.8%) scored comparatively on the Decreased Spirituality score. A double-blind between-group crossover study found that, on average, participants increased spiritual practice after psilocybin sessions (Griffiths et al., 2011). Moreover, Smigielski et al. (2019) found that psilocybin increased meditation depth and enhanced post-intervention mindfulness more than placebo four months after administering psilocybin at a mindfulness retreat. External ratings bolstered these findings.

DMT may also lead to increases in spiritual engagement. Using a self-report survey ($n = 153$), Corneille and Luke (2021) found that participants who endorsed spiritual awakenings while using DMT or psilocybin reported increased engagement with a variety of r/s practices following their experiences, including contact with nature, reading spiritual literature, mindfulness and meditation, yoga, and more. Furthermore, participants who took classic psychedelics (i.e., psilocybin, LSD, ayahuasca, or DMT) reported moderate to strong changes in spiritual practice (e.g., contemplative prayer, meditation) after their psychedelic session (Griffiths et al., 2019). These studies suggest that classical psychedelics—particularly psilocybin and DMT—can deepen belief, devotion, and engagement with r/s principles and practices.

Unity and self-transcendence Kavenská and Simonová (2015) found that ayahuasca use associates with the development of intuition and an understanding of world unity. Prior engagement in r/s practices may underlie these effects: Compared to healthy non-meditating participants, psilocybin users who regularly meditate scored significantly higher on ratings of spiritual experience (66% vs. 22%), blissful state (86% vs. 48%), and feelings of unity (70% vs. 40%; Smigielski et al., 2019). In a study investigating psilocybin-occasioned mystical experiences in the treatment of tobacco addiction, open-ended responses seven days after the experience included themes related to unity, sacredness, and spiritual significance (Garcia-Romeu et al., 2014). Finally, self-dissolution predicted global changes in behavior and attitudes, with experiences of unity being a key component (Pokorny et al., 2017).

Underlying feelings of unity is a sense of self-transcendence, in which a person perceives the self going beyond the barriers of their body (St. Arnaud & Sharpe, 2023). As perceptions of the boundaries between the self and the external world dissolve, some people perceive the world as unified or harmonious. Self-transcendence includes changes in self-views (e.g., increases in self-acceptance or self-love), which appear to associate with psychedelic use (Lebedev et al., 2015). Semi-structured interviews investigating the perceived benefits of past ayahuasca use emphasized benefits like positive changes in self-knowledge, self-acceptance, self-love, inner serenity, and a sense of responsibility for one's life (Kavenská & Simonová, 2015). Some participants even reported finding a deeper spirituality of being beyond oneself, leading to positive changes in life values. Furthermore, St. Arnaud and Sharpe (2023) found that classic entheogenic psychedelic use was associated with higher levels of spiritual seeking, self-transcendence, and psychospiritual development compared to non-entheogenic classic psychedelic use and non-use using a large international survey. These findings collectively illustrate that ayahuasca and psilocybin can enhance experiences of self-transcendence and unity for some users.

Positive changes in worldview Davis et al. (2020) found that entity encounters occasioned by DMT produced profound and enduring changes in worldview, and Pokorny et al. (2017) found that using psilocybin changed the significance participants attributed to objects or their surroundings. In another study, 35% of the 176 participants commented on the health benefits of psilocybin use, including improved perspective, optimism, and an increased sense of spirituality (Carhart-Harris & Nutt, 2010).

These changes in worldview appear to be lasting for many participants. After testing 18 adults with five eight-hour psilocybin sessions spaced a month apart, researchers found that participants reported positive changes in attitudes, mood, and behavior one month after the sessions, especially at the highest doses (Griffiths et al., 2011). At a 14-month follow-up, changes were sustained and consistent with community observer ratings. Furthermore, mindfulness

retreat participants in the psilocybin group reported greater changes in attitudes than the placebo group on an inventory measuring life changes (Smigielski et al., 2019). Findings were bolstered by post-hoc tests, which showed significantly higher scores on several scales, including appreciation for life, quest for meaning/sense of purpose, and appreciation of death. Smigielski et al. (2019) reported on other spiritual growth indicators, as well: The psilocybin group scored higher on the Concern for Others and Spirituality scales.

In a large cross-sectional survey ($n = 1{,}606$), participants rated attributions of consciousness to a range of living and non-living entities before and after a psychedelic experience (Nayak & Griffiths, 2022). There were large increases in attribution of consciousness to non-human primates (63–83%), quadrupeds (59–79%), insects (33–57%), fungi (21–56%), plants (26–61%), inanimate natural objects (8–26%), and inanimate manmade objects (3–15%). Higher ratings of mystical experience associated with greater increases in the attribution of consciousness, and increased attributions were sustained years after the experience. Using a similar sample, Nayak et al. (2023) factor analyzed 45 belief statements, which revealed five factors. After a psychedelic experience, participants believed more in "Dualism" ($\beta = 0.72$), "Paranormal/Spirituality" ($\beta = 0.90$), "Non-mammal consciousness" ($\beta = 0.72$), and "Mammal consciousness" ($\beta = 0.74$). Increases in non-physicalist beliefs included belief in reincarnation, communication with the dead, existence of consciousness after death, telepathy, and consciousness of inanimate natural objects. Higher ratings of mystical experience were associated with greater changes in beliefs, and belief changes assessed after the experience (an average of 8.4 years) remained largely unchanged.

Converging cross-sectional, prospective observational and controlled research data suggest a relationship between psychedelic experiences and shifts away from hard physicalism and towards panpsychism, dualistic, and fatalistic beliefs (Timmerman et al., 2021). These changes persisted for up to six months in most domains. Authors found a positive correlation between shifts away from hard materialism and changes in well-being at four weeks and six months after the psychedelic ceremony. In another cross-sectional survey, participants who had tried psychedelics saw the potential for spiritual benefits, including increased belief in a world beyond the material realm and insights into ultimate reality (Exline et al., 2022). Overall, these findings indicate that psychedelic experiences can lead to profound and enduring shifts in worldview, which often correlate with a sense of improved well-being.

Connectedness with others Lerner and Lyvers (2006) compared users of nonpsychedelic drugs like marijuana and amphetamines ($n = 29$), social drinkers who do not use illicit drugs ($n = 66$), and psychedelic drug users ($n = 88$) on questionnaires measuring values, beliefs, and emotional empathy. Psychedelic users scored significantly higher on mystical beliefs, having spirituality as a personal value, and concern for others. According to qualitative data from ayahuasca ceremony participants, an increased sense of connection to nature, love for living things, belief in a higher power, faith in maintaining peace, and social service could underlie these changes (Trichter et al., 2009).

Griffiths et al. (2008) compared psilocybin and methylphenidate administered in separate sessions, spaced two months apart. Psilocybin group participants scored significantly higher than the methylphenidate groups on positive attitudes about life and self, positive behaviors, and positive social effects two and 14 months after the sessions. According to community observer ratings, small positive attitude and behavior changes were observed two months post-psilocybin sessions but not post-methylphenidate sessions. After 14 months, the psilocybin group's ratings of positive behavior, mood, attitude, and social changes were comparable to those observed two months after the session. Griffiths et al. (2011) also found that psilocybin users reported positive social changes, including better social relationships with family and others.

Some evidence suggests that psychedelics engender qualities like empathy (i.e., one's perceived ability to identify and feel the emotions of others). In a cross-sectional study, psychedelic users scored higher on emotional empathy (measured as an outcome) than nonusers and users of other drugs, although only the comparison with nonusers was significant (Lerner & Lyvers, 2006). Other studies found close relationships between spirituality and positive social outcomes. For example, psilocybin-occasioned mystical experiences, along with spiritual practices like meditation, produced lasting changes in prosocial attitudes and behaviors (Griffiths et al., 2018). Compared with low doses of psilocybin, high-dose groups scored significantly higher on longitudinal measures of interpersonal closeness and community observer ratings. Authors concluded that psilocybin can occasion lasting trait-level increases in prosocial attitudes/behaviors and psychological functioning. Additionally, in a sample of 32 healthy participants, psilocybin significantly increased emotional empathy (Pokorny et al., 2017). This study also revealed significantly higher experiences of unity, spiritual experience, and changed meaning of percepts among those who took psilocybin relative to a placebo control group.

Shnayder et al. (2023) found that all three factors of the NIH-HEALS (Connection, Reflection & Introspection, and Trust & Acceptance) improved in response to psilocybin treatment. These effects were recorded one day after

participants took psilocybin and were sustained for at least 8 weeks. The Connection factor, measuring connection to a higher power and to loved ones, increased by 12.7% on average by week 8. On the Watts Connectedness Scale (Watts et al., 2022), significant post-psilocybin increases were observed for total connectedness scores, as well as on each of its subscales. Compared with escitalopram, psilocybin therapy was associated with greater increases in connectedness scores.

Ayahuasca and MDMA may produce similar results. In one project, over half of ayahuasca ceremony participants attributed overall improvements in relationships with others to ayahuasca (Kavenská & Simonová, 2015). Participants believed these effects were due to the development of empathy, gratitude, unconditional love, compassion, tolerance, and honesty. Among Danish adults, psilocybin experiences were associated with subjective improvements in social relationships (Søgaard Juul et al., 2023). Respondents in the DMT group reported significantly greater persisting effects of their most memorable experiences on life satisfaction, social relationships, and meaning of life when compared to psilocybin and LSD. The DMT group also reported higher personal meaningfulness and spirituality. Finally, some spiritual seekers reported using MDMA for the compassion, empathy, and unconditional love they believed it fosters (Watson & Beck, 1991). In summary, findings indicate that substances like psilocybin, DMT, and MDMA can significantly enhance prosocial attitudes, empathy, and emotional connections, often resulting in lasting positive changes in social relationships and spirituality.

Reduced fear of death When compared with non-psychedelically triggered religious, spiritual, and mystical experiences, experiences induced by psychedelics were rated as more mystical and resulted in a reduced fear of death, increased sense of purpose, and increased spirituality (Yaden et al., 2017). In another study, the psychedelic group was more likely to endorse a decreased fear of death than the non-drug group (70% vs. 57%; Griffiths et al., 2019).

Among people with a life-threatening diagnosis, psilocybin produced significant, enduring decreases in anxiety and depression (Griffiths et al., 2016; Ross et al., 2016). Adult participants with clinically elevated anxiety associated with a cancer diagnosis reported reconciliations with death after a single dose of psilocybin (Swift et al., 2017), and most participants made spiritual or religious interpretations of their experiences. In another study, psilocybin was administered to cancer patients experiencing psychological and existential distress (Agin-Liebes et al., 2020). Spiritual well-being, faith, meaning/peace, and death anxiety significantly improved 4.5 years after baseline measurements. In a randomized controlled trial, psilocybin-assisted psychotherapy (PAP) was associated with reductions in suicidal ideation and loss of meaning, reductions in cancer-related hopelessness and demoralization, and increased spiritual well-being (Ross et al., 2021).

Sweeney et al. (2022) directly compared psychedelic experiences and near-death experiences, both of which changed participants' perspectives on death and dying. A large majority of participants in both groups (88% of the Non-Drug Group and 89% of the Psychedelic Group) reported that their experience resulted in decreased fear of death. Changes in death attitudes attributed to the experience were similar in both groups, including a reduced fear of death and high ratings of positive persisting effects and personal meaning and spiritual significance. Ayahuasca and DMT groups tended to report stronger and more positive effects than the psilocybin and LSD groups, which were comparable. Taken together, findings suggest that psilocybin, ayahuasca, and DMT may contribute to reduced fear of death and existential distress, particularly for individuals facing life-threatening illnesses.

Discussion

This review examined connections between psychedelic use and long-term spiritual growth. All major serotonergic psychedelics were considered, as were a variety of spiritual growth indicators. Results suggest that psychedelics are associated with distinctly spiritual benefits, including stronger perceived connections with the divine, a greater sense of meaning in one's life, increased spiritual faith or engagement in r/s practices, enduring feelings of unity and self-transcendence, positive changes in worldview, increased connectedness with others, and reduced fear of death. Although relationships were observed between the consumption of psychedelic substances and spiritual growth, causality and direct benefit from this consumption cannot be assumed.

The trend toward spiritual growth could be rooted in mystical experiences, which are often induced by psychedelics. Profound mystical experiences might deepen one's spiritual faith or inspire one to become more involved with r/s practices. Intense mystical experiences could also encourage people to confront and overcome existential anxiety, leading to a more profound and peaceful relationship with life and death. Mystical experiences might also lead individuals to feel interconnected with a greater spiritual reality, fostering

a sense of unity with the divine. Although the specific role that mystical experiences play is still unclear, such experiences do appear to contribute to the relationship between psychedelic use and spiritual growth.

Of all the psychedelics studied, psilocybin was the most common, followed by ayahuasca and DMT. Psychedelic researchers reporting on spirituality have given classic psychedelics more attention than others (e.g., MDMA, ibogaine). This makes it unclear whether certain substances have stronger associations with specific indicators of spiritual growth, as we found few studies making direct comparisons between psychedelic substances (and these substances were rarely compared in controlled settings). Notably, many of the articles included a variety of substances but did not group participants based on the psychedelic they used. Two studies did not specify which substances their participants used. In some cases, though, researchers did compare and find meaningful differences in the spiritual effects of different psychedelics. For instance, when Sweeney et al. (2022) compared across substances, participants in the ayahuasca and DMT groups reported stronger and more positive enduring consequences of their psychedelic experiences than the psilocybin and LSD groups, which were largely indistinguishable.

As expected, many indicators of spiritual growth were closely related. For example, it was common for people who experienced an enduring sense of unity after taking psychedelics to also experience greater spiritual significance, feelings of awe, self-transcendence, and connectedness with others. Many studies that reported on one of these indicators also reported on others, implying a co-occurrence of several spiritual facets during and after psychedelic experiences. Positive changes in these indicators were sometimes dose-dependent, with higher doses relating to greater changes. Also, in some cases, people reported more long-term spiritual benefits if they had already participated in religious or spiritual practices, used psychedelics with spiritual intentions, or used psychedelics in religious or spiritual contexts.

The results of this review have potential implications for people who are experiencing spiritual struggles, which are experiences of tension, conflict, or strain that center on whatever people view as sacred (Exline, 2013; Pargament & Exline, 2022). Some psychedelic experiences may trigger spiritual struggles, such as religious doubts, concerns about demonic attacks, or threats to existing meaning systems. Yet psychedelics may help individuals grow spiritually or navigate spiritual struggles when they arise. We have found evidence for both of these possibilities in our ongoing research (Schutt et al., 2024). Carefully controlled and professionally facilitated psychedelic use may offer insights into spiritual struggles and could open the door to meaningful experiences that help people understand their place in the universe. For example, psychedelics might compel users to confront spiritual questions or problems they were avoiding, whether those questions are related to ultimate meaning, morality, doubt, or supernatural entities like God and the devil. By providing a different perspective on spiritual problems, psychedelics may help people answer religious questions or see their struggles from a new point of view. They could even give users a chance to confront spiritual struggles more directly—perhaps through personal exchanges with perceived supernatural entities.

Limitations and future directions

The results of this review should be considered in light of several limitations. There was an oversight during the literature review process: Though we kept track of the overall number of studies that were eliminated, we failed to methodically record how many studies were eliminated for specific reasons. For example, we cannot say exactly how many studies were eliminated because they measured immediate spiritual experiences rather than longer-term spiritual development. Our search was also limited to peer-reviewed articles accessible through PubMed and EBSCOhost Research Platform.

The studies to date also share a variety of limitations. Many studies were cross-sectional and used convenience samples. Several studies reported the likelihood of self-selection or other biases. Some participants may have been reluctant to disclose their opinions or past drug use. Furthermore, several studies collected data using online surveys, which are only available to people with reliable Internet access. Some studies used small or homogeneous samples (e.g., White, Western, and educated participants), and several articles failed to specify important demographic information like race/ethnicity and r/s orientation (see Table 3).

It is also worth mentioning that, for some sections of the current study (e.g., the Positive Changes in Worldview section), the extent to which spiritual changes were perceived as positive was unclear. Similarly, some of the studies included in this review—especially the survey and qualitative studies—are vague as to the exact nature of changes occasioned by psychedelics, as well as their strength and duration (e.g., Carhart-Harris & Nutt, 2010). These issues limit the generalizability of our results, and hence the conclusions we can draw from the data.

Future research can address these limitations and criticisms by leveraging longitudinal designs and in-depth analyses (e.g., structural equation modeling) to investigate

how psychedelic use interacts with spirituality over time. It is also clear that some substances have received more research attention than others. Future research might focus on understudied psychedelics that show therapeutic promise (e.g., mescaline), perhaps using randomized controlled trials to compare the perceived spiritual effects of various substances over time. Also, whereas specific domains have been relatively well-studied regarding psychedelics and spirituality (e.g., existential meaning), other areas have received less attention. As previously mentioned, future research could target spiritual struggles (Exline et al., 2024; Schutt et al., 2024), which are widespread and linked with mental and physical health (see Pargament & Exline, 2021, 2022, for reviews). Psychedelics might trigger spiritual struggles or aid those struggling spiritually. For example, could one's yearning for the mystical experiences associated with psychedelics clash with a conscience that warns against illegal drug use? Might experiences of oneness with the divine be helpful for people who feel that divine entities have abandoned them? Questions like these highlight the need for more targeted research across the spectrum of spiritual struggles.

Conclusion

This systematic review investigated relationships between psychedelic use and perceptions of long-term spiritual growth. Thirty-four peer-reviewed empirical studies were analyzed with 19,724 total participants. Results show that relationships between psychedelic use and spirituality exist, but these connections are complex. Links were found between serotonergic psychedelic use and various indicators of spiritual growth, including perceived connections with the divine, a greater sense of meaning in one's life, increased spiritual faith or engagement in r/s practices, enduring feelings of unity and self-transcendence, increased connectedness with others, and reduced fear of death. A more tentative link was found between psychedelic use and positive changes in worldview. Sometimes, positive changes in these spiritual domains were more common at higher psychedelic doses (particularly for psilocybin) and for specific substances (i.e., psilocybin, DMT, and ayahuasca, which received more research attention in the included studies than other psychedelics). Mystical experiences were also important, with higher mystical experience ratings usually associating positively with indicators of spiritual growth after psychedelic use. Taken together, this review highlights several distinct ways in which psychedelics relate to spirituality and adds to a growing literature on the potential benefits of psychedelic use.

Appendix 1

Studies excluded from the analysis

The table below presents examples of studies identified during the literature search, screened, and ultimately excluded from the final analysis, along with their reasons for exclusion. These listed reasons represent the most common criteria for exclusion.

Table 3 Examples of studies excluded from the analysis

Citation	General Findings	Reasons for Exclusion
Mabry and Khavari (1986)	Hallucinogen use was associated with needs for novel or unconventional experiences and negative attitudes toward conventionally defined social values	Did not measure any specific indicators of spiritual growth
Pahnke (1963)	Most members of the psilocybin group reported experiencing religious or mystical experiences after taking psilocybin in a chapel on Good Friday	Used insufficiently rigorous methodology: Lacked consistency in how the outcomes were defined and measured
Mellifont (2021)	While on DMT, people often report experiencing the dissolution of ego, an expansion of consciousness, contact with the divine, and psychological transformation	The study design was not appropriate: Not novel empirical research, but rather a literature review
Smigielski et al. (2020)	Psilocybin abolished distinctiveness of self-related scalp configurations via P300-related mechanisms in association with altered activity in the supragenual cingulate cortex and insula	Measured the immediate effects of psilocybin rather than longer-term spiritual growth
Ona et al. (2019)	According to a self-administered questionnaire, long-term ayahuasca users around Spain scored higher in personal values measures, suggesting that long-term ayahuasca use in communitarian settings could be beneficial for public health	Not relevant enough to the specific topic of this paper (i.e., psychedelics and long-term spiritual growth)
Baker (2005)	Using psychedelics as sacraments helps to structure and channel the experiences induced by these substances, thereby increasing the likelihood of individually constructive and socially integrative experiences	Not novel empirical research Not relevant enough to the topic of this paper Did not measure any specific indicators of spiritual growth

Participant characteristics for the included studies

The table below includes information about sample demographics for each of the included studies, including gender, median age, r/s orientation, and race/ethnicity.

Table 4 Participant characteristics for included studies (in Alphabetical Order)

Citation	Gender	Median Age	R/S Orientation	Race/Ethnicity
Agin-Liebes et al. (2020)	40% male	53	Atheist/agnostic: 33.33%; Jewish: 20%; Catholic: 6.67%; Other Christian: 13.33%; Other faith/tradition: 13.33%	White: 93.33%; Asian: 6.67%
Carbonaro et al. (2016)	78% male	30	not provided	White: 89%; American Indian: 1.3%; Asian: 1.2%; Black: 0.3%; Some other race: 1.7%; Hispanic or Latino: 6%
Carhart-Harris and Nutt (2010)	85% male	26	not provided	not provided
Corneille and Luke (2021)	45% male	41	Spiritual but not religious: 63.2%; Christian: 5.3%; Hindu: 5.3%, Agnostic: 2.6%; Buddhist: 2%; Muslim: 2%; Atheist: 1.3%; Jewish: 0.7%; Other: 17.8% (of which 2% identified as Omnist)	White: 74.3%; Mixed/multiple ethnic groups: 11.8%; Asian: 9.2%; Black: 0.7%; Other: 3.9%
Davis et al. (2020)	77% male	32	not provided	White: 85%; Mixed race: 10%; Asian: 2%; Black: 1%; Native American: 1%; Hawaiian or Pacific Islander: 1%
Exline et al. (2022)	37% male	46	Christian (total): 56%; Jewish: 3%; Muslim: 3%; Hindu: 0.1%; Buddhist: 1%; Spiritual (but not religious): 6%; Non-traditional or Earth-spirited (e.g., pagan, Wicca): 2%; Atheist: 3%; Agnostic: 4%; None: 17%	White: 81%; American Indian/Native American/Alaska Native: 3%; Asian/Pacific Islander: 3%; Black: 11%; Middle Eastern: 0.2%; Other: 0.9%; Prefer not to say: 2%
Garcia-Romeu et al. (2014)	67% male	51	not provided	White: 93%; Asian: 7%
Gashi et al. (2021)	84% male	not provided	not provided	not provided
Griffiths et al. (2006)	44% male	46	53% of participants indicated affiliation with a r/s community	not provided
Griffiths et al. (2008)	44% male	46	not provided	not provided
Griffiths et al. (2011)	44% male	46	not provided	not provided
Griffiths et al. (2018)	40% male	42	not provided	White: 85.33%; Black: 5.33%; Asian: 9.33%; Hispanic: 5.33%
Griffiths et al. (2019)	69% male	38	not provided	White: 88%; Black: 1%; Asian: 3%; Native American: 1%; Mixed race: 8%
Gukasyan et al. (2022)	33% male	40	not provided	White: 92%; Black: 4%; Asian; 4%
Kavenská and Simonová (2015)	61% male	37	not provided	not provided
Lerner and Lyvers (2006)	46% male	35	not provided	not provided
Nayak and Griffiths (2022)	67% male	35.1 (13.3)	not provided	White: 89%; Black: 1%; Asian: 6%; Native American: 2%; Other: 9%; Hispanic: 11%;
Nayak et al. (2023)	67% male	35.1 (14.0)	not provided	not provided
Nicholas et al. (2018)	83% male	43[a]	not provided	White; 75%; Native American: 17%; Native Hawaiian/Pacific Islander: 8%
Pokorny et al. (2017)	53% male	27	not provided	not reported
Ross et al. (2016)	38% male	56	Atheist/agnostic: 48%; Jewish: 17%; Catholic: 7%; Other Christian: 14%; Other faith/tradition: 14%	White: 90%; Other: 10%

Table 4 (continued)

Citation	Gender	Median Age	R/S Orientation	Race/Ethnicity
Ross et al. (2021)	36.4% male	60	Atheist/Agnostic: 46%; Catholic: 18%; Jewish: 9%; Unitarian: 9%; Other faith/tradition: 18%	White: 91%; Multiracial: 9%
Shnayder et al. (2023)	30% male	56.1 (12.4)	not provided	White: 80%; Black: 10%; Asian: 6.7%; Hispanic: 3.3%
Smigielski et al. (2019)	not provided	not provided	not provided	not provided
Søgaard Juul et al. (2023)	70% male	34.5 (11.0)	not provided	not provided
St. Arnaud and Sharpe (2023)	57.5% male	Age ranged from 18–84; median = 25–34	not provided	not provided
Sweeney et al. (2022)	32% male (Non-Drug group); 78% male (Psychedelic group)	55.2 (13.5; Non-Drug group); 31.7 (13.5; Psychedelic group)	not provided	White: 89% Non-Drug group, 84% Psychedelic group; Asian: 2% Non-Drug group, 4% Psychedelic group; More than one race: 6% Non-Drug group, 10% Psychedelic group; Other: 3% Non-Drug group, 2% Psychedelic group
Swift et al. (2017)	54% male	50	Atheist/agnostic: 38%; Other Christian: 31%; Jewish: 15%; Catholic: 8%; Other faith/tradition: 8%	White: 92%, Multiracial: 8%
Timmermann et al. (2021)	55.6% male	44.4	not provided	White: 90.7%; Black: 1.5%; Asian: 5.9%; Native American: 0.4%; Unknown: 1.3%; Prefer not to say: 2.8%
Trichter et al. (2009)	46% male	33	not provided	White: 100%
Watson and Beck (1991)	62% male	35	not provided	White: 95%
Watts et al. (2022)	60% male	42.3 (11.9; psilocybin group), 39 (10.2; escitalopram group)	Most listed their religious preference as either Spiritual (but no organized religion) or Jewish	White: 86.5%
Xin et al. (2023)	100% male	42.88 (7.88)	not provided	White: 87.2%; Black: 1.2%; Native Hawaiian or Pacific Islander: 2.3%; Native American: 3.5%; Mixed race: 5.8%
Yaden et al. (2017)	51% male	not provided	Christian: 20.7%; Atheist: 25%; Eastern religion: 7.8%; Other/unknown: 46.4%	White: 82.8%: Hispanic: 3.4%; Black: 2.3%; Asian: 2.3%; Other/unknown: 9.2%

[a]Ages were rounded to the nearest whole year

Measures used to evaluate psychedelic experiences and religious/spiritual effects

The table below includes research measures that were used in each study to investigate psychedelic experiences and the religious/spiritual effects of using psychedelics. Because so many different instruments were used in the studies, a detailed explanation of each scale is outside the scope of this review. Please note that several scales overlap in their assessment of spirituality and psychedelic effects, and some scales measured tangential subjects (e.g., mental health

outcomes). Additionally, many studies used their own items to measure psychedelic and spiritual effects; in these cases, we specified that authors "used their own measures."

Table 5 Research measures used for included studies (in Alphabetical Order)

Citation	Psychedelic Measures	R/S Measures[a]
Agin-Liebes et al. (2020)	PEQ	FACIT-SWB; ME
Carbonaro et al. (2016)	HRS, selected subscales from the 5D-ASC	MEQ
Carhart-Harris and Nutt (2010)	N/A	N/A
Corneille and Luke (2021)	11D-ASC	NETI; KAS; MEQ
Davis et al. (2020)	A questionnaire to assess God encounter experiences was modified[b]	N/A
Exline et al. (2022)	Used their own measures	Used their own measures
Garcia-Romeu et al. (2014)	HRS; SOCQ	Mysticism Scale
Gashi et al. (2021)	N/A	N/A
Griffiths et al. (2006)	HRS; APZ questionnaire; ARCI; SOCQ	Mysticism Scale
Griffiths et al. (2008)	HRS; APZ questionnaire	MAP; Mysticism Scale; STS; FMS; FACIT-SWB
Griffiths et al. (2011)	HRS; APZ questionnaire; ARCI; SOCQ	Mysticism Scale
Griffiths et al. (2018)	HRS; 5D-ASC; SOCQ	Mysticism Scale; SPQ
Griffiths et al. (2019)	N/A	MEQ
Gukasyan et al. (2022)	PEQ	MEQ
Kavenská and Simonová (2015)	Semi-structured interviews	Semi-structured interviews
Lerner and Lyvers (2006)	DUQ	MBQ
Nayak and Griffiths (2022)	Items were adapted from earlier studies	MEQ; Revised Paranormal Belief Scale
Nayak et al. (2023)	N/A	Mind–body Relationship Scale; MBQ; Revised Paranormal Belief Scale; Free Will Inventory
Nicholas et al. (2018)	PEQ; SOCQ	MEQ
Pokorny et al. (2017)	5D-ASC	N/A
Ross et al. (2016)	PEQ	MEQ; FACIT-SWB
Ross et al. (2021)	N/A	FACIT-SWB
Shnayder et al. (2023)	NA	NIH-HEALS
Smigielski et al. (2019)	5D-ASC	TMS; MEDEQ; FMI; Mysticism scale
Søgaard Juul et al. (2023)	N/A	MEQ
St. Arnaud and Sharpe (2023)	ASSIST	Dispositional Positive Emotion Scale; Mysticism Scale; Quiet Ego Scale; ASTI; Religious Schema Scale
Sweeney et al. (2022)	HRS; SOCQ; PEQ	MEQ
Swift et al. (2017)	Semi-structured interviews	Semi-structured interviews
Timmermann et al. (2021)	11D-ASC; PESC	MBQ; MEQ
Trichter et al. (2009)	PEP	SWBS; Mysticism Scale
Watson and Beck (1991)	Interviews	Interviews
Watts et al. (2022)	Emotional Breakthrough Inventory	MEQ; WCS; Social Connectedness Scale; NR-6
Xin et al. (2023)	PEQ	N/A
Yaden et al. (2017)	Used their own measures	Mystical experience subscale of the DTS

5D-ASC 5-Dimension Altered States of Consciousness, *11D-ASC* 11-Dimensional Altered States of Consciousness Rating Scale, *ARCI* Addiction Research Center Inventory, *ASSIST* Alcohol, Smoking, and Substance Involvement Screening Test, *ASTI* Adult Self-Transcendence Inventory, *DUQ* Drug Use Questionnaire, *DTS* Death Transcendence Scale, *FACIT-SWB* Functional Assessment of Chronic Illness Therapy – Spiritual Well-Being, *FMI* Freiburg Mindfulness Inventory, short form, *FMS* Faith Maturity Scale—12 item version, *HRS* Hallucinogen Rating Scale, *KAS* Kundalini Awakening Scale, *MAP* Measure of Actualization Potential, *MBQ* Mystical Beliefs Questionnaire, *MBQ* Metaphysical Beliefs Questionnaire, *MEDEQ* Meditation Depth Questionnaire, *MEQ* Mystical Experience Questionnaire, *NETI* Nondual Embodiment Thematic Inventory, *NIH-HEALS* National Institute of Health, Healing Experiences in All Life Stressors, *NR-6* Nature Relatedness Scale, *PEP* Peak Experience Profile, *PEQ* Persisting Effects Questionnaire, *PESC* Perceived Emotional Synchrony Scale, *SOCQ* States of Consciousness Questionnaire, *SPQ* Spiritual Practices Questionnaire, *STS* Spiritual Transcendence Scale, *SWBS* Spiritual Well-Being Scale, *TMS* Toronto Mindfulness Scale, *WCS* Watts Connectedness Scale

[a]Measures of mystical experience are included in this column

[b]The questionnaire is included in the Supplemental Materials of the Davis et al. (2020) article

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Declarations

Ethical approval On behalf of all authors, the corresponding author certifies that we have complied with the APA ethical principles regarding research with human participants and/or care and use of animals in the conduct of the research presented in this manuscript.

Informed consent For all original research involving human subjects, informed consent to participate in the study was obtained.

Conflict of interest On behalf of all authors, the corresponding author states that there is no conflict of interest.

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