EXPLORING THE EXPERIENTIAL MODE OF TRANSCENDENCE IN TERROR MANAGEMENT AND SELF-DETERMINATION

by

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Dedication

To someone who would wish not be named – someone who taught

me the value of pursuing what interests me.

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Abstract

Prior research suggests that "mystical-type experiences" (MTEs) have the potential to induce significant and persisting worldview changes. MTEs are also implicated in positive outcomes in psychedelic-assisted psychotherapy. The four studies in the present work seek to test the hypothesis that MTEs change worldviews and help in psychotherapy because MTEs, with proper integration, induce intrinsic shifts in aspirations and goals. Intrinsic goals, compared to extrinsic, are better at managing existential concerns, fulfilling basic psychological needs, and reducing psychiatric risk. Studies 1 (*n* = 837) and 2 (*n* = 1,036) used correlational data to show that people who have had an MTE, versus not, during their lives had more intrinsic and growth-oriented worldviews. Study 3 (*n* = 26) collected pre/post data from participants who used psychedelics at a music festival, testing the hypothesis that psychedelic-induced MTEs plus integration can elicit an intrinsic shift in goal aspirations. The primary hypothesis in Study 3 could not be properly tested due to ceiling effects on the dependent variable and low statistical power due to attrition. However, at Time 1 (*n* = 99), veteran psychedelic users reported higher openness, flourishing, and lower death anxiety, compared to less experienced psychedelic users. Study 4 (*n* = 45) tests the intrinsic shift hypothesis by teaming up with three facilitators of Conscious Connected Breathwork, a practice known to elicit MTEs, and collecting pre/post data from their clients. The primary hypothesis, that MTEs plus integration would be positively associated with shifts in autonomy causality orientation, was not upheld. However, integration, not MTEs, predicted a significant increase in feelings of connectedness with others, but not with oneself or the world. Together, Studies 1-4 provide correlational data supporting the intrinsic shift hypothesis, but quasi-experimental data that does not. More rigorous methods, including control groups and new dependent variables, are needed to validate or disprove the intrinsic shift hypothesis.

Introduction

In 2006 the first study of psychedelic-assisted psychotherapy (PAP) was published (Moreno et al.), kicking off the second wave of psychedelic research. Since then, hundreds more papers have been published espousing the myriad benefits and applications of psychedelics, primarily in the field of mental health. To date, the leading models used to understand mechanisms of action for psychedelics are from the field of neuroscience (Carhart-Harris & Friston, 2019; Gattuso et al., 2023) while theories from psychology have received less attention. On the one hand the primacy of neuro-models is not surprising since psychedelics are drugs with potent neuropharmacological effects; however, unlike most other pharmacological treatments in mental health, psychedelics also induce a psychological experience that no doubt impacts the patients who take them. The psychological experience is known as a mystical-type experience (MTE), a specific type of non-ordinary state of consciousness (NOSC).

The present work seeks to contribute to our understanding of the psychological mechanisms by proposing that MTEs, with proper integration, induce an intrinsic shift in what clients find meaningful. An intrinsic shift in one's worldview/goals would have therapeutic value for reasons that will be elucidated and contextualized herein. Contextualization takes place primarily within the field of experimental existential psychology, a subdiscipline of social psychology.

Non-Ordinary States of Consciousness & Their Use in Psychotherapy

MTEs are related to what has historically been called by many names: peak experience (Maslow, 1964), oceanic feeling (Freud, 1927), religious experience (James, 1902), religious and spiritual experience (Hood et al., 2018), transpersonal experience (Grof, 1979), self-transcendent experience (Yaden et al., 2017), mystical experience (Barrett et al., 2015; Stace, 1960), Liminality (Turner, 1969), or, from the existential tradition, experiential transcendence (ET; Lifton, 1979).

In clinical settings, MTEs are most often induced when clients ingest a psychedelic compound (e.g. psilocybin, Lysergic-acid diethylamide [LSD], Dimethyl Tryptamine [DMT]). Other known methods of inducing MTEs include transcendent forms of breathwork (Puente, 2014), diseases, trauma, ritual, near-death-experiences, religious activity, and even spontaneously (Yaden et al., 2016). The following discussion will focus on MTEs as they occur from psychedelics and breathwork.

Psychedelics

Psychedelics are known to reliably induce MTEs and MTEs have been strongly implicated in client outcomes from PAP (Andersen et al., 2021; Garcia-Romeu & Richards, 2018; Kangaslampi, 2023). Indeed, many clinical trials have found higher scores on the mystical experience questionnaire (MEQ-30; Barrett et al., 2015) to be the best predictor of reduced clinical symptoms in the days, months, and sometimes even years after their psychedelic experience(s) (Agin-Liebes et al., 2020; Garcia-Romeu et al., 2014; Griffiths et al., 2016, Ross et al., 2016). One study out of Johns Hopkins reported that 67% of participants (16 out of 24) rated their psychedelic-induced MTE to be either the single most meaningful or among the top five most meaningful experiences of their lives with write-in responses judging the meaningfulness to be similar to that of the birth of a first child or death of a parent (Griffiths et al., 2016). In addition to reducing clinical symptoms, having an MTE also appears to increase a person's spirituality (Griffiths et al., 2006), leading some to call for greater integration of spiritual, existential, religious, and theological components in PAP (Palitsky et al., 2023). The significance of this increase in spirituality will become evident later, in the section on experimental existential psychology.

Given the ability of MTEs to predict therapeutic outcomes, there is an interest in knowing who is more likely to have an MTE. The best predictor of who will experience an MTE after ingesting a psychedelic is absorption (Studerus, 2012). Absorption is a trait described as a person's "openness to absorbing and self-altering experiences" (Tellegen & Atkinson, 1974). High scorers on this scale describe themselves as: responsive to evocative sights/sounds; readily captured by entrancing stimuli; tending to think in images; have "cross modal" experiences (i.e. synesthesia); capable of vivid and compelling imaginings; able to vividly re-experience the past; becoming deeply immersed in own thoughts and imaginings; experiencing episodes of expanded (e.g. ESP-like) awareness; and experiencing states of altered awareness (i.e. "stepping outside oneself"). Studerus (2012) analyzed pooled data from 23 controlled experimental studies involving the administration of psilocybin to 261 healthy volunteers and determined that high trait absorption was found to be predictive of MTEs.

A major aspect of NOSC that seems to contribute to their meaningfulness and therapeutic value is an increase in clients' felt sense of connection (Carhart-Harris et al., 2018; Watts et al., 2017). Watts and colleagues (2017) conducted a qualitative thematic analysis after conducting semi-structured interviews with participants who took psilocybin for treatment-resistant depression. Researchers identified a change from disconnection to connection as one of two main change processes in improving symptoms of depression (the other main change process was a shift from avoidance of emotion to acceptance of emotion). They categorized the feelings of connection into three categories: connection to self, connection to others, and connection to the world. Carhart-Harris and associates (2018) later hypothesized that connection to self "is a bedrock from which connection to others and the world can follow most naturally." Recently, Watts and others (2022) created a connectedness scale to operationalize and measure a sense of connectedness to self, others, and world. An acute measure of MTE correlated positively with post-psychedelic changes in connectedness (r = .42, p < .0001; Watts et al., 2022).

One especially important step of using MTEs to improve clinical symptoms is integration (Bathje et al., 2022; Kangaslampi, 2023). That is, in the weeks/months after their psychedelic dose-day, clients are instructed to spend time integrating the lessons learned from their MTE into their day-to-day life. Frymann and colleagues (2022) developed two scales to operationalize and measure integration. The behavioral integration scale (Frymann et al., 2022) includes behaviors like taking mental space to reconnect to their experience/MTE, spending time learning more about their experience/MTE, carrying the intentions of their experience/MTE into daily life, being more supportive of others, and making healthier life choices. Beyond behaviors, Frymann and colleagues (2022) also conceptualize integration as an experience, marked by feeling at peace about one's experience/MTE, feeling greater self-awareness, feeling a greater sense of connection in one's life, and feeling harmony between one's daily life and their experience/MTE. Making integration an intentional part of the therapeutic process is deemed important in PAP because it helps the client turn their insights into "abiding light," to borrow words from comparative religion scholar, Huston Smith. The following is an excerpt from a 2006 Johns Hopkins press release where Smith commented on Griffiths and colleagues' (2006) study into the acute and persisting effects of the psychedelic compound psilocybin:

> "In the end, it's altered traits, not altered states, that matter … It's good to learn that volunteers having even this limited experience had lasting benefits. But human history suggests that without a social vessel to hold the wine of revelation, it tends to dribble away. In most cases, even the most extraordinary experiences provide lasting benefits to those who undergo them and people around them ***only if they***

> ***become the basis of ongoing work***. That's the next research question, it seems to me: What conditions of community and practice best help people to hold on to what comes to them in those moments of revelation, converting it into abiding light in their own lives?" (Johns Hopkins, 2006; emphasis added)

Thus, simply experiencing an MTE is not enough to produce substantial or enduring psychological benefits. The individual must also integrate their MTE in their day-to-day life, and ideally be part of a supportive community.

Breathwork

MTEs occasioned by psychedelics currently comprise the majority of the published literature around MTEs because psychedelics are the most reliable method of inducing them in the sort of settings where research occurs. But certain forms of breathwork can also induce MTEs on demand (Puente, 2014), albeit at a lower rate than psychedelics. Burdick and Adinoff (2013) discussed the potential clinical utility of breathwork, placing it side-by-side with psychedelics because of breathwork's ability to induce a similar state of mind. In fact, the most researched style of breathwork – Holotropic Breathwork – was developed by Dr. Stanislav Grof and Dr. Christina Grof (2010) in response to the illegalization of psychedelics in the 1970s as a way to continue to study MTEs.

Holotropic Breathwork shares some characteristics with a few other styles of breathwork. Notably, Wilhelm Reich's (1920) Reichian Breathwork and Leonard Orr and Sondra Ray's Rebirthing Breathwork (1977). While each style tends to add additional practices to the breathing itself, the actual pattern of breath is similar across these styles. That is, practitioners are guided to breathe faster and deeper than normal, using the diaphragm, and breathing in a cyclical pattern without pause between inhale and exhale, for varying but extended amounts of time (40+

minutes). These styles of breathwork usually combine the breathing practices with music and practitioners lay on the floor, sometimes wearing a blindfold. It is worth noting that, at the start of the "psychedelic renaissance" in the early 2000's, Dr. Stanislav Grof was considered by many to be the world's foremost expert on PAP and NOSC.

Experimental Existential Psychology

The hypotheses put forth in the present research are largely derived from two theories from the field of experimental existential psychology: terror management theory (TMT) and self-determination theory (SDT).

Terror Management Theory

TMT (Greenberg et al., 1986; Routledge & Vess, 2018) is based on a tradition of existential psychodynamic theorizing regarding the role of awareness of mortality in human thought and behavior, most notably the writings of Otto Rank (e.g., 1931/1961), Ernest Becker (e.g., 1973), Robert Jay Lifton (e.g., 1979), and Irvin Yalom (e.g., 1980). The theory asserts that the uniquely human awareness of mortality elicits potentially debilitating anxiety about mortality that is managed by believing in, and living up to, a cultural worldview. One's worldview imbues life with meaning and allows people to view themselves as enduring and valuable contributors to that meaningful life, thereby earning self-esteem. Through living up to the values of their worldview, people can then view themselves as more than mere material creatures fated to obliteration upon death. This immortality project can be further bolstered when one surrounds themselves with people who believe in a similar worldview. Over the last 35 years, over 1,200 studies have shown support for hypotheses derived from these core assertions (for a review, see Routledge & Vess, 2018).

At the day-to-day level of human experience, the solution to the problem of death is to be so caught up in one's immortality strivings that there is no room in one's day for thoughts of death to creep in. Lifton (1979), psychiatrist and theorist whose work precedes TMT, identified five primary immortality strivings – or five modes of transcending death: biosocial, theological, creative, natural, and experiential. Biosocial allows a person to sense that they will live on in their children and/or social identifications (e.g. by remaining loyal to one's preferred political party and by living up to the standards of value espoused by that political party, one's concerns of death are allayed by belonging to a group that will endure beyond one's own physical death). Theological offers a belief system outlining standards of value that, when followed, often grant access to everlasting life in a desirable environment upon one's physical death. Creative transcendence works by pouring one's efforts into creative endeavors that will outlast one's physical existence and stand as a symbol that will continue to impact others. Natural transcendence offers immortality when one identifies themself as part of the physical natural world that we were all born out of and will all eventually return to. These first four modes of transcendence fit with the theoretical account offered by TMT – each mode offers literal or symbolic immortality by providing standards of value, ensconced in a cultural worldview, that one can strive to live up to on a daily basis. The fifth mode, experiential transcendence (ET), involves a fleeting experience rather than a belief system and so its mechanism for transcending death is a bit different. Lifton describes the experience of ET, "the crucial requirement for feeling ecstatic – 'outside of oneself' – would seem to be … the breakout from prosaic psychic complexities into a state of pure focus, of inner unity and harmony." In Lifton's eyes, ET "is of a different order from the other [modes of transcendence]" and is "in fact, the indicator of the other four modes" (Lifton, 1979).

ET can be charted on a continuum from extraordinary Dionysian "excess" to relatively "ordinary excess" to much quieter Apollonian moments. Lifton (1979) mentions a few methods of inducing an experientially transcendent state: drugs, starvation, sleep deprivation, imposed ordeals (e.g. cultural rites of passage, rituals), song, dance, battle, sexual love, childbirth, athletic effort, contemplation of the past, and artistic or intellectual creation. He employs the Nietzschean dualities of Dionysian ecstasy and Apollonian groundedness (Nietzsche, 1872). This distinction reveals one major difference between ET and MTEs.

MTEs are conceptualized as having four phenomenological dimensions: mystical, positive mood, transcendence of time/space, and ineffability (Barrett et al., 2015). The bulk of the MTE literature comes from clinical trials with psychedelics (Andersen et al., 2021) but, as mentioned earlier, MTEs have also been reportedly induced from breathwork (Puente, 2014), diseases, trauma, ritual, near-death-experiences, religious activity, and even spontaneously (Yaden et al., 2016). Comparing this list to Lifton's list above, we see some overlap and also a few notable methods missing in the MTE list – namely, the ones that fall on the Apollonian end of the spectrum. Thus, the scale's design (Barrett et al., 2015), especially when combined with a consideration of the activities that lead to high scores on the scale, makes it clear that MTEs are just one type of ET and fall clearly on the Dionysian end of the continuum.

Two main hypotheses from TMT are relevant to the ensuing discussion: (1) the anxiety-buffer hypothesis and (2) the mortality salience (MS) hypothesis.

From the perspective of TMT, self-esteem serves as a generalized anxiety buffer. The anxiety buffer is generalized in the sense that self-esteem gained from one aspect of life can buffer against threats to self-esteem in unrelated aspects of life. But the anxiety buffer is specific in the sense that it is always buffering against the terror that stems from one's awareness of their own inevitable mortality. So, the main assertion of the anxiety-buffer hypothesis is that the bolstering of a psychological structure that protects against death anxiety should lessen the negative reactions to death reminders.

The MS hypothesis asserts that, if worldview, self-esteem, and close relationships function to manage death-related anxiety, then reminders of death – or making mortality more salient – should lead people to increase their commitment to or striving for these psychological entities. Indeed, hundreds of experiments have supported the MS hypothesis and a meta-analysis showed it to be among the strongest effect sizes in the field of social psychology (Burke et al., 2010).

Self Determination Theory

SDT (Ryan & Deci, 2017) considers itself a meta-theory for understanding human motivation. It begins with the assumption that humans are organisms with evolved tendencies toward growth and mastery. The dialectic between the person and their environment form the basis of SDT's hypotheses. Self-growth can take place across many domains of life but a few ways the construct has been operationalized include a personal growth scale (Ryff & Keyes, 1995), a quest scale that assesses the extent to which people view their religion as an instrument of asking big life questions (Batson & Schoenrade, 1991), and exploration motivation which measures openness to exploring new and complex stimuli (Green & Campbell, 2000). Being a meta-theory, SDT covers a lot of ground, not all of which is relevant to the present discussion. The three most pertinent mini-theories from SDT are basic psychological needs theory (BPNT), goal contents theory (GCT), and Causality Orientations Theory (COT).

BPNT states that there are three basic psychological needs that are essential to psychological well-being and optimal functioning. A basic psychological need is defined as a "psychological nutrient that is essential for individuals' adjustment, integrity, and growth" (Ryan, 1995), and BPNT has nine key criteria that need to be met in order for a 'nutrient' to be categorized as a psychological *need* (for more information on the nine criteria, see Vansteenkiste et al., 2020). The three needs outlined by BPNT are autonomy, competence, and relatedness. *Autonomy* refers to volition and willingness, where one's actions, thoughts, and feelings are self-endorsed and authentic. *Competence* concerns effectiveness and mastery, where one capably engages in activities and experiences opportunities for using and extending skills and expertise. *Relatedness* is to feel connected and significant to others and is denoted by the experience of warmth, bonding, and care.

GCT posits that the contents of one's goals are important and have differential impacts on the people who hold the goals. Goals that are intrinsic afford higher psychological wellness and reduced ill-being, compared to extrinsic goals. Intrinsic goals are categorized as community, close relationships, personal growth, and physical health. Extrinsic goals are categorized as financial success, appearance, and popularity/fame.

COT identifies three different ways that people can orient themselves toward their environments and regulate behavior. The autonomy orientation is characterized by orienting oneself toward aspects of the environment that stimulate intrinsic motivation. The control orientation is a focus on rewards, deadlines, gains, and approval; people high on control orientation are more likely to be attuned to the demands of others more so than their own desires. The impersonal orientation is characterized by anxiety and the belief that outcomes are beyond one's own control. Individuals high in the impersonal orientation have little sense of being able to affect outcomes or cope with demands or change.

TMT, SDT, and Mental Health

What happens if a person's cultural worldview beliefs, self-esteem, and close relationships are not adequately managing death anxiety? And what happens if a person's psychological needs for autonomy, competence, and relatedness are not being met? Research from TMT and SDT is clear that either of these scenarios increase one's risk of developing clinical psychiatric symptoms (Ferus & Valentiner, 2012; Menzies et al., 2019; Ryan et al., 2015; Strachan et al., 2007).

TMT offers the perspective that if one's anxiety buffer is not adequately managing death anxiety it would lead to excess unmanaged death anxiety; in which case, the *potential for debilitating terror* becomes actualized, to varying extents. SDT offers the perspective that when the attainment of one's basic psychological needs is thwarted, especially autonomy, it blocks or hinders effective psychological development and functioning. One of the primary mechanisms of action SDT points to is poor emotion regulation, but only because of its strong implications for a person's sense of autonomy. Briefly, emotions are viewed as a feedback system, signaling for a person to evaluate their environment and act in accord with the evaluation that their emotions provide (Levenson, 1999). Therefore, over or under-controlled emotions lead to a reduction in autonomy because the person is less attuned to how they literally feel about their environment and/or they are less capable of acting in accord with their emotional evaluation (Ryan et al., 2006).

One more hypothesis that both TMT and SDT converge on is the impact of intrinsic versus extrinsic pursuits on mental health. Research from TMT identifies that the pursuit of intrinsically valued worldview beliefs contribute to a more durable anxiety buffer, compared to the pursuit of extrinsic worldview beliefs (Vail et al., 2010). Concordantly and all else held equal, when a person believes what they believe for intrinsic reasons, they are at a lower risk for developing psychiatric symptoms, compared to people who believe what they believe for extrinsic reasons. Similarly, research from SDT identifies that the pursuit of intrinsic goals better satisfies one's basic psychological needs, compared to the pursuit of extrinsic goals (Kasser & Ryan, 1993). Thus, the pursuit of intrinsic goals reduces one's risk of developing psychiatric symptoms more so than the pursuit of extrinsic goals.

Intrinsic Shift Hypothesis

The present work principally seeks to introduce and test the "intrinsic shift hypothesis" which posits that MTEs, when properly integrated, can elicit an intrinsic shift in a person's worldview and goals, thereby establishing more durable existential psychological resources.

The intrinsic shift hypothesis draws inspiration from a few converging perspectives: (1) contemporary psychedelic-assisted therapy practices where, in the days/weeks after the psychedelic session, therapists help the client integrate experiences and lessons-learned with their existing worldview, (2) the use of psychedelics in ancient and even modern indigenous cultures in rite of passage rituals (Pollan, 2018), (3) SDT's (Deci & Ryan, 2000; Ryan & Deci, 2006) perspective that intrinsic life goals – but not extrinsic life goals – yield adaptive personal and interpersonal effects due to their sui generis ability to satisfy basic psychological needs, and (4) the TMT literature that suggests an intrinsic orientation is more effective at managing the terror of death than is an extrinsic orientation (Jonas & Fischer, 2006; Vail et al., 2010) and that an autonomous/self-determined orientation (closely related to the concept of an intrinsic orientation) attenuates the usual defensive response to mortality salience (Vail et al., 2020).

The intrinsic shift hypothesis being put forth here is different than, but not entirely at odds with, the hypotheses put forth by Moreton and colleagues (2020). The authors argue that psychedelics reduce death anxiety through a varied combination of: (1) forced confrontations with one's mortality; (2) reducing focus on the self and its concerns; (3) shifting meta-physical beliefs; (4) amplifying religious faith; and (5) increasing feelings of connectedness. From a TMT perspective, numbers three, four, and five provide a theoretically cohesive explanation for how death anxiety is reduced for an enduring period of time after the psychedelic experience. To the extent that the person's new sentiments around meta-physical beliefs, religious beliefs, or connectedness provide better anxiety-buffering effects, they can indeed be expected to reduce death anxiety. These changes are compatible with the intrinsic shift hypothesis in that all of these sentiments are likely to be intrinsically motivated. The additional scenario that the intrinsic shift hypothesis could predict is that a person might hold the same belief pre and post MTE but hold it in a way that makes it seem more an intrinsic part of self. The intrinsic shift hypothesis would predict that such a scenario could still result in reduced death anxiety and a more effect anxiety buffer.

Moreton et al.'s (2020) numbers one and two relate to experiences that some people feel during the experience itself. Both situations could potentially lead to reduced death anxiety during the experience itself, but (1) as the authors point out, a certain receptivity or surrender to the experience is likely crucial for the reduction of death anxiety in the case of forced exposure to one's mortality (if they fight the experience, it could have the opposite effect), and (2) neither of them provide a likely reason for a persisting reduction in death anxiety.

The consequence of the intrinsic-extrinsic difference would seem to be that TMT's anxiety buffering self-esteem that is based on extrinsic pursuits likely requires validation from an external source, whereas actions caried out for intrinsic reasons provide self-esteem the moment the action is taken, regardless of what others think, because the person taking the action feels deep down that it is the right action to take in that moment. The point is that self-esteem is not just a matter of belief. It is also a matter of action. One must live up to their standards of value. Hence why integration is a crucial follow-up to having an MTE, or having experiences of ET more broadly, if the goal is to provide existential relief.

The Present Research

The present set of studies sets out to test the hypothesis that ET (herein operationalized as MTEs) can induce intrinsic shifts in goals/worldview orientations. No prior research has reported such findings, however, a handful of previous findings corroborate and overlap with the idea of intrinsic shifts following MTEs, such as increased feelings of connectedness to self and others, reconnecting with old passions in life, sensing a deep felt connection with one's spirituality, and feeling at one with nature (Agin-Liebes et al., 2021; Carhart-Harris et al., 2018; Watts et al., 2017; 2022).

Studies 1 and 2 set out to test the hypothesis by assessing correlations between people who report having had an MTE at some point in their life and a handful of variables conceptually related to intrinsic orientations. Study 3 utilizes pre/post data collected from a music festival where attendees are known to frequently use psychedelics to test the idea that MTEs at the festival result in larger intrinsic shifts at a 1-month follow-up, compared to those who did not report having an MTE at the festival. Finally, Study 4 studies intrinsic shifts in breathwork practitioners by enlisting the help of breathwork facilitators to recruit their clients to fill out surveys before and after their breathwork experiences.

Study 1

Study 1 was designed as an initial investigation of the possibility that MTEs can elicit intrinsic shifts in people's goals or belief orientations. The foregoing analyses regarding absorption and utilizing TMT and Lifton's ideas lead to a few hypotheses regarding how people who have had an MTE may differ from people who have not. (1) MTE people should report less death anxiety and more belief in death as a passage. (2) People who have had an MTE may be more spiritual (but not more religious), exhibit a more intrinsic orientation toward their religious or spiritual beliefs, and report higher orientation toward their religion/spirituality as a means of asking questions, as well as greater motivation to explore novel activities, and interest in personal growth. (3) MTE people should report fewer mental health symptoms. (4) MTE people are expected to be higher in trait absorption. In this study, we test these hypotheses using cross-sectional convenience samples of college students. This study was approved by an institutional review board.

Study 1 – Method

Participants. In Spring 2021, 837 undergraduate students (age M = 19.76, SD = 3.51) received course extra credit for participating (588 females, 241 males, 8 non-binary; 626 selected White, 51 Black or African American, 31 American Indian or Alaska Native, 103 Asian, 8 Native Hawaiian or Pacific Islander, 81 “other”; participants could select more than one race). See *Table 1* for demographics, including a breakdown of demographics for the group that reported having an MTE.

Materials and Procedures. Participants completed the survey online on personally owned devices. After providing consent, participants responded to the items below in the order displayed, except for the MTE questions which were assessed at the end but are being displayed first here, to provide context. These materials were presented within a large departmental survey that had space constraints which required shortened versions of the materials. Response scales are Likert-type unless otherwise specified.

Mystical-Type Experience. One non-Likert-type measure (see Figure 1) assessed if participants met MTE criteria. The question included nine phenomena, developed from the Mystical Experience Questionnaire (MEQ), that commonly occur during an MTE and that seem especially memorable (Barrett et al., 2015). Notably, the validation of the MEQ had people fill it out just after a psychedelic experience, but our participants were asked to reflect on the entirety of their lives. One criticism of this approach is the fallibility of memory over time; however, the argument for the validity of this approach lies in the high level of meaning people assign to such experiences, making them especially memorable. And although the typical MEQ requires participants to complete Likert-type questions, it seemed unrealistic for them to remember their experiences at this level of detail. For this reason, as well as the survey's space constraints, we chose to list phenomena and have participants indicate if they experienced each phenomenon. Following prior research (Barrett et al., 2015; Griffiths et al., 2006), we viewed MTE as a dichotomous construct. Our operationalization reflects that by adopting the MEQ's 60% criteria, meaning participants who selected six or more phenomena were placed in the yes-MTE group. See *Figure 1* for the MTE question.

MTE Induction Activity (Categorical). See *Figure 1* for the question and *Table 1* for demographic breakdown of the yes-MTE group. See *Table 2* for MTE induction activity broken down by gender.

Measures of Mental Health. Four measures of mental health were assessed: depression (Beck Depression Inventory; 21 items; $\alpha = 0.93$), worry (Penn State Worry Questionnaire; 16 items; $\alpha = 0.94$), perseverative thinking (Perseverative Thinking Questionnaire; 15 items; $\alpha = 0.95$), and contrast avoidance (Contrast Avoidance Questionnaire; 30 items; $\alpha = 0.93$). Cumulative scores were calculated and higher scores indicate higher levels of the variable.

Personal Growth. Assessed via two items from the personal growth subscale of the psychological well-being scale (Ryff & Keyes, 1995; 6-point scale).

Death Anxiety. Five items from the death anxiety subscale of the revised Death Attitudes Profile (7-point scale; Wong et al., 1994) assessed attitudes toward death ($\alpha = 0.88$).

Death Representations. The six-item Testoni Death Representations Scale (Testoni et al., 2015) assessed whether participants view death more as a passage or as total annihilation (5-point scale). Higher scores indicate greater representation of death as annihilation, while lower scores indicate greater representation of death as a passage ($\alpha = 0.82$).

Importance of Spiritual and Religious Beliefs. The item "If you consider yourself to be spiritual, how important are your spiritual beliefs to you?" assessed spirituality (10-point scale). For religious belief, the same item was used, swapping "spiritual" for "religious." Higher scores indicate higher degree of importance.

Quest Orientation. Three items from Batson and Schoenrade's (1991) quest scale assessed the extent to which participants view their religion/spirituality as an instrument of asking big life questions (9-point scale). The alpha score was poor ($\alpha = 0.31$), so the items were dropped from analysis.

Absorption. Four items from the Tellegen Absorption Scale rated participants' "openness to absorbing and self-altering experiences" (Tellegen & Atkinson, 1974; 6-point scale; $\alpha = 0.70$).

Intrinsic Religiosity/Spirituality. Three items from Batson and Schoenrade's (1991) intrinsic religiosity scale assessed the degree to which one views their religion/spirituality as "an end in itself" (versus "a means to an end," which would be extrinsic; 9-point scale). Where the original scale read "religious beliefs" we changed it to "religious/spiritual beliefs" since the intent was to capture how much one orients their self toward their beliefs in an intrinsic manner, whether they consider the beliefs to be religious or spiritual ($\alpha = 0.91$).

Study 1 – Results

Given that the hypotheses are predicting differences on continuous outcome variables as a function of meeting MTE criteria (yes-MTE) or not (no-MTE), simple linear regressions were conducted for each outcome variable. When assumptions of homogeneity of variance were violated, especially due to the difference in group size, the outcome variable was log transformed; however, all transformations revealed the same results. Non-transformed results are maintained below. For correlations, see *Table 3*. For means and standard deviations, see *Table 4*.

Supported Predictions. The data supported the hypothesis that the yes-MTE group would be lower in death anxiety compared with the no-MTE group, $F(1, 820) = 4.13$, $p = .042$, $r^2 = .01$. Spiritual beliefs were rated as more important to the yes-MTE group than the no-MTE group, $F(1, 818) = 25.82$, $p < .001$, $r^2 = .03$. And religious beliefs were less important to the yes-MTE group compared with the no-MTE group, $F(1, 817) = 3.93$, $p = .048$, $r^2 < .01$. The yes-MTE group reported higher intrinsic religiosity/spirituality, as predicted, $F(1, 812) = 23.71$, $p < .001$, $r^2 = .03$. The yes-MTE group also reported higher personal growth orientation, $F(1, 803) = 4.28$, $p = .039$, $r^2 = .01$. Finally, absorption generated the largest difference; as expected, the yes-MTE group was much higher than the no-MTE group, $F(1, 817) = 79.31$, $p < .001$, $r^2 = .09$.

Unsupported Predictions. No between-groups difference emerged for death representation, $F(1, 772) = 1.30$, $p = .254$, $r^2 < .01$. Contrary to the hypothesis, the yes-MTE group did not score lower than the no-MTE group on any of the four mental health measures and was in fact higher in some symptoms. Worry, $F(1, 746) = 1.66$, $p = .198$, $r^2 < .01$, and depression, $F(1, 723) = 2.23$, $p = .136$, $r^2 < .01$, were no different between groups. But, the yes-

MTE group was higher in perseverative thinking, F (1, 745) = 8.14, p = .004, r^2 = .01, and contrast avoidance, F(1, 732) = 7.76, p = .005, r^2 = .01.

Study 1 – Brief Discussion

Study 1 used cross-sectional data to test four hypotheses based on the idea that MTEs can elicit changes in existential attitudes. Hypotheses 1, 2, and 4 were supported by the data with the exception of belief in death as a passage which revealed no difference. The finding of less death anxiety but no difference in death representation for yes-MTE people could be due to the fact that many factors can reduce death anxiety, and belief in death as a passage is just one. For example, lower death anxiety could be due to higher spirituality in the yes-MTE group. The third hypothesis (yes-MTE group lower in mental health symptoms) was not supported. This finding may suggest the findings from clinical psychedelic research may not be generalizable to all MTEs. This is not surprising because the induction of MTEs in clinical research uses specific settings, instructions, and therapeutic techniques, whereas these MTEs occurred across a variety of settings without those protocols. One limitation of Study 1 is that it was not pre-registered.

Study 2

Study 2 sought to replicate the findings of Study 1 with pre-registered methods, hypotheses, analyses, and a new sample. Study 2 was pre-registered on the AsPredicted website (https://aspredicted.org/FVF_Y5R); however, the mental health hypothesis was not pre-registered as those data were sent from another research lab after the survey had concluded.

Study 2 – Method

Participants. In Fall 2021, 1,086 undergraduate students (age M = 18.64, SD = 2.21) received course extra credit for participating (773 females, 296 males, 17 non-binary; 873 selected White, 63 Black or African American, 32 American Indian or Alaska Native, 116 Asian, 12 Native Hawaiian or Pacific Islander, 87 “other”; participants could select more than one race). See *Table 1* for demographics, including a breakdown of demographics for the group that reported having an MTE.

Materials and Procedure. The same materials and procedure were used as in Study 1 with one exception. Exploration motivation was added after the personal growth items. As mentioned, MTEs sometimes increase openness; so, exploration motivation was added to assess another dimension of openness that prior research, including Study 1, has not assessed. See *Table 5* for MTE induction activity broken down by gender.

Exploration Motivation. Four items were taken from the exploration index (Green & Campbell, 2000) to measure participant’s openness to exploring new and complex stimuli (8-point scale; $\alpha = 0.70$).

Alpha Scores. Death anxiety ($\alpha = 0.89$); death representations ($\alpha = 0.83$); quest orientation ($\alpha = 0.41$; dropped from analysis); absorption ($\alpha = 0.71$); intrinsic religiosity/spirituality ($\alpha = 0.93$); measures of mental health: depression ($\alpha = 0.92$), worry ($\alpha = 0.93$), perseverative thinking ($\alpha = 0.95$), and contrast avoidance ($\alpha = 0.93$).

Study 2 – Results

The same analyses were conducted as in Study 1. Log transformations followed the same patterns as Study 1. See *Table 6* for correlations and *Table 7* for means and standard deviations.

Supported Predictions. Spiritual beliefs were once again more important to the yes-MTE group than the no-MTE group, $F(1, 1{,}067) = 68.65$, $p < .001$, $r^2 = .06$. The yes-MTE group reported higher intrinsic religiosity/spirituality, $F(1, 1{,}061) = 73.92$, $p < .001$, $r^2 = .07$. The yes-MTE group also reported higher personal growth orientation, $F(1, 1{,}028) = 11.05$, $p < .001$, $r^2 = .01$. And, the yes-MTE group was much higher than the no-MTE group in absorption, *F*(1, 1,061) = 79.40, $p < .001$, $r^2 = .07$. The above findings supported initial hypotheses and replicated findings from Study 1. In addition, Study 2 supported the hypothesis that the yes-MTE group represents death as a passage more so than the no-MTE group, $F(1, 1{,}000) = 30.24$, $p < .001$, $r^2 = .03$; however, Study 1 found no difference. And the yes-MTE group was higher in exploration motivation compared with the no-MTE group, $F(1, 1{,}043) = 41.33$, $p < .001$, $r^2 = .04$.

Unsupported Predictions. Unlike Study 1, there was no between-groups difference in death anxiety, $F(1, 1{,}067) = 1.09$, $p = .298$, $r^2 < .01$. Importance of religious beliefs was hypothesized not to be higher in the yes-MTE group and Study 1 supported that hypothesis; however, Study 2 found that the yes-MTE group rated religious beliefs as more important than the no-MTE group, $F(1, 1{,}066) = 8.24$, $p = .004$, $r^2 = .01$. Contrary to the initial hypothesis once again, the yes-MTE group was higher in mental health symptoms. Worry, $F(1, 1{,}062) = 2.38$, $p = .123$, $r^2 < .01$, and contrast avoidance, $F(1, 1{,}054) = 2.11$, $p = .146$, $r^2 < .01$, were no different between groups. But, the yes-MTE group was higher in both perseverative thinking, $F(1, 1{,}062) = 4.96$, $p = .026$, $r^2 < .01$, and depression, $F(1, 1{,}038) = 9.01$, $p = .003$, $r^2 = .01$.

Study 2 – Brief Discussion

Study 2 was a pre-registered replication of Study 1 with one extension – exploration motivation. Findings from Study 1 were replicated for all variables except death anxiety, death representations, religiosity, depression, and contrast avoidance. Contrary to the hypotheses, death anxiety was no different between groups, and religiosity and mental health symptoms were higher for the yes-MTE group. The yes-MTE group reported higher scores on the three variables in this study that are theoretically most likely to be associated with lower death anxiety – spirituality, religiosity, and belief in death as a passage; so, it is curious that death anxiety was no different between groups. However, as mentioned, many factors contribute to the degree people will self-report their fear of death; confounding variables likely contributed to these differences. The shift to religion being more important for the yes-MTE group could be a result of spirituality and religiosity meaning different things to different participants. It is also possible that MTEs can indeed increase religiosity; this seems particularly likely for those who are religious prior to their MTE.

Study 3

Studies 1 and 2 offered an initial investigation into the possibility for experiential transcendence to elicit intrinsic shifts. They did so by using cross-sectional data from undergraduate students who reported having an MTE by any means of induction. Study 3 expands on Studies 1 and 2 in several ways: (1) uses data of MTEs from pre/post/one-month follow up, (2) data collected from a more diverse population, (3) focuses on psychedelic-induced MTEs, and (4) assesses participant integration post-MTE. The primary goal of Study 3 is to test the idea that MTEs can elicit an intrinsic shift, especially with proper post-MTE integration, and it does so by using pre/post data collected in a naturalistic environment – a music/art festival. Study 3 was pre-registered on the AsPredicted website (https://aspredicted.org/gm6r3.pdf).

Study 3 – Method

Participants. The researcher recruited participants by walking around the festival grounds with recruitment flyers listing study information, expectations of participants (time commitment, tasks to complete), compensation, funding, ethics approval, and information about the researcher. Demographic data was not collected in order to decrease the possibility that participant identity could be connected to their responses, due to answering questions about federally illegal activity. Participant email addresses were collected in order to send follow-up surveys, but they were collected on notecards to separate identifying information from survey responses. Data from the three time points was merged by having participants create a unique four-digit code to re-enter at the two follow-up time points. A total of 135 participants filled out the survey at Time 1 at the festival: 33 people reported being “currently under the influence” of a drug and were not able to give legal consent to participate; 74 participants did not fill out one or both of the follow-up surveys and were removed from data analysis; 2 participants entered codes that could not be matched to a code at Time 1. Final analyses were conducted with data from 26 participants. Participants who completed the final survey at Time 3 had the option to enter a raffle to win one of ten $45 Amazon gift cards by entering their email on a different survey, again to separate personally identifiable information from survey responses. Winners were selected at random and sent their gift card via email shortly after the conclusion of data collection.

Materials and Procedure. Those who agreed to participate accessed the survey by either scanning the QR code on the flyer with a personally owned device or by using a device provided by the researcher. After providing consent, participants were asked if they were 18 years of age or older and if they were currently under the influence of a psychedelic (if under 18 or currently under the influence, they were thanked for their time and the survey ended). Remaining participants were then asked if they intended to take psychedelics at some time during the festival. All participants then answered the items below in the order displayed. Response scales are Likert-type unless otherwise specified.

Time 1

Stress. One question asked “How much stress are you under at this point in your life?” (7-point scale).

Intrinsic/Extrinsic goal aspirations. Six questions each assessed participants intrinsic and extrinsic aspirations (7-point scale). (α_{int} = .66; α_{ext} = .78)

Autonomy. Six questions assessed participant autonomy (5-point scale). (α = .38)

Openness. Ten items assessed openness (5-point scale). (α = .80)

Flourishing. Eight items assessed flourishing (7-point scale). (α = .90)

Importance of Religious and Spiritual Beliefs. Same as Studies 1 and 2.

Everlasting Soul Belief. 3 items assessing belief in an everlasting soul (9-point scale). (α = .76)

Death Anxiety. Three items from the death anxiety subscale of the revised Death Attitudes Profile (7-point scale; Wong et al., 1994) assessed attitudes toward death. (α = .90)

Absorption. 13 items (6-point scale). (α = .82)

Experience with Psychedelics (categorical). One question asked participants “I would consider myself _______ in regard to using psychedelics” with three categorical response options: “a novice (no experience)”, “moderately experienced”, or “a veteran (a lot of experience).”

Time 2

Take Psychedelics (dichotomous). Participants responded “yes” or “no” to whether they took psychedelics at the festival (LSD/acid, DMT, mushrooms/psilocybin, mescaline/Peyote/San Pedro, MDMA/molly/ecstasy, salvia, or ketamine). Participants were shown slightly different questions at Time 2 depending on their answer to this item, indicated below by (yes-Px or no-Px).

Psychedelic Usage (yes-Px; matrix response). Participants who took psychedelics were asked which psychedelics they ingested during each of the three days of the festival with the same options as listed above, plus two other options: “yes, but unsure of substance”, and “nothing.”

For the rest of the items at Time 2, yes-Px participants were instructed to answer in regard to their *psychedelic experience(s)* while the no-Px participants were instructed to answer in regard to their *festival experience*.

Mystical Experience Questionnaire (MEQ-30). Participants filled out the 30-item MEQ-30 (Barrett et al., 2015) to assess whether they had a MTE (6-point scale). The yes-Px group answered it regarding their psychedelic experience(s) during the festival (α = .98) while the no-Px group answered it regarding their experiences during the festival (α = .96).

Time 3

Intrinsic/Extrinsic goal aspirations. Fifteen questions each assessed participants’ intrinsic and extrinsic aspirations (7-point scale). (α_{int} = .88; α_{ext} = .94)

Autonomy. Fifteen questions assessed autonomy (5-point scale). (α = .79)

Openness. Same as Time 1 (α = .80).

Flourishing. Same as Time 1 (α = .91).

Importance of Religious and Spiritual Beliefs. Same as Time 1.

Everlasting Soul Belief. Same as Time 1 (α = .88).

Death Anxiety. Same as Time 1 (α = .90).

Behavioral Integration. The 12-item Integration Engagement Scale (IES; Frymann et al., 2022) assessed the degree to which participants engaged in behaviors that are known to help integrate transcendent experiences (α = .90).

Experienced Integration. The 12-item Experienced Integration Scale (EIS; Frymann et al., 2022) assessed the degree to which participants experienced internal aspects of feeling integrated ($\alpha = .93$)

Study 3 – Results

Pre-Registered Primary Analyses

Does MTE at T2 predict greater T1-T3 intrinsic shift?

Simple linear regression analyses were run to test the hypothesis that participants who met MTE criteria at Time 2 would report greater intrinsic shifts in goal aspirations between Time 1 and Time 3. A difference score was calculated for intrinsic aspirations by subtracting Time 1 intrinsic aspirations from Time 3 intrinsic aspirations, such that higher scores indicate an increase in intrinsic aspirations from Time 1 to Time 3 ($M = -0.12$, $SD = 0.35$). Participants met "full-blown (FB)" MTE criteria if they scored 60% or higher on each of the four factors on the MEQ-30 (n = 3). There was no significant difference in intrinsic aspirations between those who met FB MTE criteria and those who did not, $F\ (1, 24) = 0.15$, $p = .701$, $r^2 = .01$.

Follow-up analyses calculated a "partially-blown (PB)" MTE as those whose cumulative MEQ-30 score across all four factors was 60% of the total score (n = 13), and regression analyses were rerun. There was still no significant difference between groups, $F\ (1, 24) = 1.51$, $p = .231$, $r^2 = .06$.

Does higher integration at T3 predict greater T1-T3 intrinsic shift for reported MTEs at T2?

Regression analyses were run to test the hypothesized group (MTE vs no-MTE) X integration interaction. For both the FB MTE group, $F\ (3, 21) = 0.60$, $p = 0.624$, $r^2 = 0.08$, and the PB MTE group, $F\ (3, 21) = 1.\ 05$, $p = .392$, $r^2 = .13$, there was no significant interaction.

MTE was also coded as a continuous variable but the interaction remained non-significant, F (3, 20) = 0.91, p = 0.453, r^2 = .12.

Pre-Registered Secondary Analyses

The primary hypothesis is hypothesized to be moderated by the presence/intensity of intrinsically-relevant worldview content at T2.

Given that the primary hypothesis was not supported, this analysis was not conducted.

Three variables are hypothesized to be associated with a higher likelihood of reporting an MTE at T2: ingesting psychedelics (T2), higher trait absorption (T1), higher stress (T1).

To test the predictive power that these three variables have on inducing an MTE, two linear regression were run per variable: (1) MTE coded as dichotomous PB MTE, and (2) MTE coded as a continuous variable. Analyses with FB MTE were not run due to lack of statistical power since only three of twenty-six participants met full-blown criteria.

Ingesting psychedelics was hypothesized to be predict a greater chance of MTEs given the prior literature with psychedelics where about two-thirds of participants in clinical trials meet MTE criteria after ingestion. Results were trending significant in the hypothesized direction when MTE was coded both as PB MTE, F (1, 24) = 3.69, p = .067, r^2 = .13, and as continuous, F (1, 23) = 2.95, p = .099, r^2 = .11.

Trait absorption has been associated with a higher likelihood of having an MTE in general (Sielaff et al., 2023) and specifically after taking psychedelics (Studerus, 2012). Thus, it was hypothesized that high absorption at T1 would be associated with having an MTE at T2. Surprisingly, there was nearly zero relationship with MTE coded as both PB MTE, F (1, 24) = 0.05, p = .823, r^2 = .00, and as continuous, F (1, 23) = 0.00, p = .985, r^2 = .00.

One perspective of MTEs proposes that they serve an evolutionary function of relieving stress and are therefore more likely to occur when a person is under more stress. Therefore, higher stress was hypothesized to predict more MTEs. However this did not turn out to be the case for either PB MTE, F (1, 24) = 0.28, p = .603, r^2 = .01, nor with MTE coded as continuous, F (1, 23) = 0.00, p = .991, r^2 = .00.

Is greater experience with psychedelics predictive of higher autonomy?

As a correlational test of the hypothesis that psychedelic usage can cause people to become more self-determined, a one-way ANOVA tested the impact of psychedelic experience on T1 autonomy revealing a significant model, F(2, 22) = 3.91, p = .035. Tukey's Honestly Significant Difference (HSD) Test was used to determine that the significant difference was between the veteran psychedelics users (M = 3.95, SD = 0.47) and the moderately experienced psychedelic users (M = 3.43, SD = 0.45), p = .0337, *95% C.I.* = 0.04 – 1.02, suggesting that higher psychedelic usage is indeed associated with greater autonomy.

The yes-MTE group at T2 is hypothesized to report a greater increase in openness and autonomy from T1 to T3 (compared to no-MTE group).

To test the idea that MTEs at T2 were associated with positive shifts in openness and autonomy, regression analyses were conducted using difference variables for both openness and autonomy. The difference variables were calculated such that T1 values were subtracted from T3 values. MTE at T2 was not associated with positive shifts in openness or autonomy whether MTE was coded as dichotomous PB (openness = F (1, 24) = 2.25, p = .146, r^2 = .09; autonomy = F (1, 24) = 0.11, p = .742, r^2 = .00) or as continuous (openness = F (1, 24) = 2.74, p = .111, r^2 = .10; autonomy = F (1, 24) = 0.02, p = .885, r^2 = .00). However, with more statistical power, it would not be surprising if the trends for openness became significant.

The yes-MTE group at T2 is hypothesized to report an increase in everlasting soul beliefs, decrease in death anxiety, and an increase in importance of spirituality but not religiosity.

Paired-samples t-tests were used to test the idea that, for the 13 people who reported a PB MTE at T2, there would be an increase in everlasting soul beliefs, a decrease in death anxiety, an increase of the importance of spirituality, and no increase in the importance of religiosity between T1 and T3. Data frames were created to transform the dataset from wide format to long format before conducting the t-tests. Results revealed no significant difference for everlasting soul belief, t (12) = -0.65, p = .525, death anxiety, t (12) = 0.76, p = .460, spirituality, t (12) = -1.00, p = .337, or religiosity, t (12) = 1.51, p = .156.

Exploratory Analyses

Is greater experience with psychedelics predictive of higher intrinsic aspirations, openness, flourishing, everlasting soul belief, absorption, or lower extrinsic aspirations, stress, or death anxiety?

As a test of the broader hypothesis that psychedelic usage can lead to higher well-being, one-way ANOVAs were conducted to assess the impact of psychedelic experience (Three levels: novice n = 5; moderately experienced n = 50; veteran psychedelic user n = 42) on relevant variables. The following ANOVA models were significant (or trending toward significance) and were probed for group differences: intrinsic aspirations, F(2, 94) = 2.77, p = .068; openness, F(2, 94) = 11.92, p < .001; flourishing, F(2, 94) = 7.96, p < .001; absorption, F(2, 94) = 3.31, p = .041; stress, F(2, 94) = 3.00, p = .055; death anxiety, F(2, 94) = 4.63, p = .012. The following ANOVAs revealed no differences between groups: everlasting soul belief, F(2, 94) = 0.80, p = .451; extrinsic aspirations, F(2, 94) = 2.08, p = .130.

Post hoc tests were conducted, using Tukey's HSD Test, to determine which groups the significant differences existed between. *Table 8* shows group means and standard deviations along with Tukey's HSD p-values and 95% confidence intervals. Tukey's HSD revealed trending or non-significant differences between groups for intrinsic aspirations, absorption, and stress. Veteran psychedelic users, however, reported higher openness and flourishing than moderately experienced psychedelic users. Veteran psychedelic users, and almost the moderately experienced group, reported less death anxiety, compared to novices.

Study 3 – Brief Discussion

Due to attrition, the sample size declined from 102 respondents at T1 down to 26 participants who filled out all three timepoints. This greatly reduced statistical power and the ability to detect small to medium effect sizes. Additionally, the final sample nearly maxed out intrinsic aspirations at T1 (M = 6.49, SD = 0.51, on a 7-point scale) leaving no room for their score to increase at T3. Beyond explaining the null results from the primary analyses it also raises at least two other questions: (1) are intrinsically oriented people more drawn to experiences that induce MTEs (i.e. psychedelics), and/or (2) are festival-goers more intrinsically oriented at baseline, compared to non-festival-goers. Another consideration is the level of experience this sample had with psychedelics and, by proxy, MTEs: 14 self-reported veterans, 9 moderately experienced users, and only 2 novices (or at T1: 42, 50, & 5, respectively). So, it could still be true that MTEs and/or psychedelic usage increases intrinsic aspirations but the present sample had simply already experienced that increase prior to participating in this study. The fact that veteran psychedelic users were more autonomous, open, flourishing, and reported lowed death anxiety at T1 also supports this conclusion, although those analyses are correlational. One way to experimentally test this hypothesis would be to recruit participants with low intrinsic aspirations and little/no prior psychedelic experience, then facilitate an experience known to induce MTEs; legal and ethical considerations preclude the use of psychedelics toward this end, however, breathwork or inducing a trance-state via song and dance are also relatively reliable and legal ways to bring about MTEs.

Another limitation of Study 3 is that the sample represented a niche population of festival-goers in the Southwest United States. The high scores at T1 for intrinsic orientations may reflect festival culture more so than psychedelic usage. Festival culture may also promote the idea that psychedelics make one more intrinsically-oriented, open, or autonomous, thereby playing on the power of suggestion while under the influence to bring about increases in those variables.

Study 4

Correlational results from Studies 1 & 2 suggest MTEs might be able to elicit intrinsic shifts while Study 3’s quasi-experimental results were inconclusive on the matter. Study 3 did, however, highlight the need to recruit participants with a lower baseline intrinsic orientation in order to properly test the intrinsic shift hypothesis and/or to use a different measurement tool to assess the construct. Breathwork was chosen over psychedelics for Study 4 for three main reasons: (1) breathing is legal, (2) breathwork seems to be the next most reliable way to induce MTEs on-demand, and (3) breathwork is less stigmatized and pigeon-holed within niche subcultures. The third point is an attempt to recruit participants with lower baseline intrinsic orientations. Thus, Study 4 tests the hypothesis that more intense experiential transcendence (i.e. MTEs), as induced by breathwork practices, can lead to intrinsic shifts. Study 4 used a measure of autonomy causality orientation to assess the intrinsic shift in an attempt to use a scale more amenable to change in the course of a few weeks and that is less likely to encounter ceiling effects, compared to the aspirations scale from Study 3. This study was approved by an ethics review board at the University of Arizona and was pre-registered on the AsPredicted website (https://aspredicted.org/W9J_5WP).

Study 4 – Method

Participants. The researcher teamed up with three certified breathwork facilitators, each with their own pre-established business and clientele. Breathwork facilitators were chosen from an initial list of 15 breathwork facilitators who voluntarily filled out the researcher's interest form. Facilitators were chosen based primarily on style of breathwork and number of clients seen with the intention of reducing variance from having multiple styles of breathwork or more facilitators than necessary. All three breathwork facilitators were trained in a style called "Conscious Connected Breathwork" and reported seeing eight or more clients per week. Two facilitators were based in Denver, Colorado, USA, and one was based in Asheville, North Carolina, USA. The majority of breathwork sessions were hosted virtually over a web conferencing platform while a few sessions were hosted in person (data about in person versus virtual facilitation was not collected).

Breathwork facilitators included the research recruitment message in the email they already send to their clients 2-7 days prior to their breathwork sessions. The recruitment message listed study information, expectations of participants (time commitment, tasks to complete), compensation, funding, ethics approval, and information about the researcher. Participants were informed that this is a study to learn more about the benefits and risks of breathwork. Email addresses were collected at T1 along with the date of their breathwork session and automated emails were sent 7 days, 11 days, and 14 days post-breathwork to prompt them to fill out the follow-up survey at T2.

Between January and March of 2024, a total of 57 participants filled out the survey at T1 (pre-breathwork). Five participants failed to complete the second survey, two participants were removed after confirming with the breathwork facilitators that those two respondents were not legitimate breathwork clients, and five participants gave incorrect responses to attention check questions - all were removed listwise from final analyses. Final data analyses were conducted with the remaining 45 data points (age: M = 34.56, SD = 12.75; gender: 25 females, 18 males, 1 non-binary, 1 other gender; race: 23 White, 15 Black or African American, 4 Hispanic/Latino, 1 American Indian or Alaska Native, 2 multiracial). The three facilitators each recruited different numbers of participants (4, 11, & 30).

The 5 participants who only responded to T1 were given a $5 Amazon gift card while the remaining 52 participants, who completed both T1 and T2, received a $30 Amazon gift card.

Materials and procedures. Those who agreed to participate accessed the first survey via the link in the facilitator's email and filled it out on personally owned devices. After consenting to participate, they provided the date of their upcoming breathwork session, the name of the facilitator, and their personal email address. Survey responses were cross-verified with facilitators to ensure respondents did indeed participate in the reported breathwork session. The researcher sent automated emails 7, 11, and 14 days after their breathwork sessions with the link to fill out the second survey. All participants answered the items below in the order displayed. Response scales are Likert-type unless otherwise specified.

Time 1 (T1): Pre-breathwork

Absorption. Same abbreviated version from Study 3. (α = .75)

Causality orientations. Assessment of motivational orientations within an individual. Three subscales: autonomy (α = .58), controlled (α = .72), and impersonal (α = .61) orientations.

Eight vignettes describe a common situation and are followed by three types of questions, relating to the three orientations (7-point scale; Deci & Ryan, 1985).

Watts connectedness scale (WCS). Three subscales measuring factors pertaining to a felt connection to 'self', 'others' and 'world.' Improvements on WCS are correlated with improved mental health post-psychedelic therapy. (19 items; 0-100 visual analog scale; Watts et al., 2022). (α = .84)

Satisfaction with Life. A scale assessing global cognitive judgments of one's life satisfaction. (Five items; 7-point scale; Diener, et al., 1985; α = .87)

Social desirability (Marlowe-Crowne Social Desirability Scale – Short Form). Scale assessing the degree to which respondents tend to fill out surveys with answers they believe are the 'socially desirable' response rather than their true beliefs/attitudes. (13 items; True/False response scale; Fischer & Fick, 1993).

Demographics. General demographic questions plus prior breathwork experience and experience with complementary practices.

Gift Card. Participants had the option to enter their email address in the event that they failed to complete the second survey so they could still receive the $5 Amazon gift card.

Time 2 (T2): Post-Breathwork

Mystical Experience Questionnaire (MEQ-30). Same as Study 3, except scored as continuous instead of dichotomous. (α = .96)

Causality orientations. Same as T1. (autonomy: α = .74; controlled: α = .83; impersonal: α = .71)

Watts connectedness scale (WCS). Same as T1. (α = .87)

Behavioral integration. Same as Study 3 (α = .86).

Experienced integration. Same as Study 3 (α = .86). (combined with behavioral integration to form the second independent variable; α = .91)

Satisfaction with Life. Same as T1. (α = .83)

Gift Card. Participants had the option to enter their email address to receive the $30 Amazon gift card.

Study 4 – Results

See *Table 9* for means, standard deviations, and correlations. Notably, scores of socially desirable responding were not correlated with any of the predictor or outcome variables (*r's* = -.21 - .22).

Testing for "Experimenter" (Breathwork Facilitator) Effects

To determine whether any of the three breathwork facilitators had significantly differing effects on the relevant variables, one-way ANOVAs were conducted. No significant differences were discovered on the following variables: autonomy orientation shift, control orientation shift, impersonal orientation shift, connectedness shift, MTE, or integration (*F's*(1, 43) = 0.00 – 1.699, *p's* = .199 – .994).

Pre-Registered Primary Analyses

Do mystical experience or integration predict a positive shift in autonomy orientation?

A multiple regression was run to predict shift in autonomy orientation from MTE and integration. Autonomy shift was calculated by subtracting T1 autonomy orientation from T2 autonomy orientation. Outliers on autonomy shift were identified as responses that were 1.5 times above or below the interquartile range (Tukey, 1977); two outliers were identified and removed. The overall multiple regression model was not significant, $F(2, 40) = 0.626$, $p = .540$,

$r^2 = .03$, where neither MTE ($t = .695$, $p = .491$) nor integration ($t = .168$, $p = .867$) were predictive of autonomy shift.

Follow-up analyses excluded 17 “non-responders” to the breathwork from data analysis (identified as participants who scored below 70% on MTE). This model was also non-significant, $F(2, 25) = 0.795$, $p = .463$, $r^2 = .06$.

Pre-Registered Secondary Analyses

Does the main effect remain significant when controlling for social desirability?

Given that the primary hypothesis was not supported, this analysis was not conducted.

Does mystical experience interact with prior breathwork experience or complementary practices when predicting autonomy causality shift?

Regression analyses were run to test the hypothesized MTE X prior breathwork experience and MTE X complementary practices interactions. MTE did not interact with prior breathwork experience, $F(3, 39) = 0.573$, $p = .637$, $r^2 = .04$, or complementary practices, $F(3, 39) = 1.282$, $p = .294$, $r^2 = .09$.

Do mystical experience or integration decrease controlled and/or impersonal causality orientations?

Multiple regression analyses were run to predict shift in controlled and impersonal orientations from MTE and integration. Controlled and impersonal shift variables were calculated by subtracting T1 from T2. Two outliers were identified and removed for control orientation and one outlier was removed for impersonal orientation. The overall multiple regression model was not significant for control orientation shift, $F(2, 39) = 0.007$, $p = .993$, $r^2 = .00$, or for impersonal orientation shift, $F(2, 40) = 0.814$, $p = .450$, $r^2 = .04$.

Exploratory Analyses

Given the dearth of existing research with breathwork, especially Conscious Connected Breathwork, a handful of exploratory analyses sought to explore this dataset to potentially inform future research directions.

Do mystical experience or integration predict a positive shift in satisfaction with life?

A multiple regression model regressing MTE and integration onto satisfaction with life yielded a nonsignificant model, $F(2, 35) = 0.474$, $p = .627$, $r^2 = .03$.

Does trait absorption predict mystical experience?

Following the work of Studerus (2012), this analysis sought to expand upon findings that showed absorption to predict likelihood of having an MTE after ingesting psychedelics. Absorption was regressed onto MTE, revealing that trait absorption does indeed predict having a more transcendent MTE during breathwork, $F(1, 43) = 4.40$, $p = .042$, $r^2 = .09$, with every one unit increase in absorption predicting a 12.14 unit increase in MTE.

Do mystical experience or integration predict a positive shift in feelings of connectedness?

Following research and hypotheses from Watts and colleagues (Carhart-Harris et al., 2019; Watts et al., 2017; 2022), the following analyses sought to test the relationship between mystical experiences, integration, and feelings of connectedness. A multiple regression was run to predict shift in general connectedness from MTE and integration. Connectedness shift was calculated by subtracting T1 from T2. There were no outliers for general connectedness. The overall multiple regression model was significant, $F(2, 42) = 3.524$, $p = .038$, $r^2 = .14$, with every one unit increase in integration predicting a 14.28 unit increase in connectedness ($t = 2.48$, $p = .017$), while MTE did not predict changes in connectedness ($t = -0.99$, $p = .326$), potentially speaking to the importance of post-ET integration. Due to a high correlation between the two predictors in the above model, the following analyses probing this effect only include integration as a predictor variable.

Social desirability was added to the model as a covariate, regressing both integration and social desirability onto general connectedness revealing a model still approaching significance, $F(2, 42) = 3.130$, $p = .054$, $r^2 = .13$, where integration remained significant ($t = 2.50$, $p = .016$) and social desirability was not ($t = 0.54$, $p = .589$). Follow-up analyses assessed the relationship between integration and the three separate components of connectedness. Simple linear regressions assessed the potential for integration to predict connection to self, $F(1, 39) = 0.00$, $p = 1.00$, $r^2 = .00$, connection to others, $F(1, 40) = 7.97$, $p = .007$, $r^2 = .17$, and connection to world, $F(1, 38) = 2.46$, $p = .125$, $r^2 = .06$. Since the connection to self and connection to world models were not significant, follow-up analyses were only conducted with connect to others.

Given the multicollinearity between behavioral integration and experienced integration ($r = .68$, $p < .001$), the two variables were not included in the same multiple regression model. Separately, however, both behavioral integration, $F(1, 40) = 4.71$, $p = .036$, $r^2 = .11$, and experienced integration, $F(1, 40) = 9.72$, $p = .003$, $r^2 = .20$, were significant, with a one unit increase in each form of integration predicting a 10.88 and 18.52 unit increase in connection to others, respectively.

The foregoing analyses suggest that integration of one’s experientially transcendent experience, regardless of how transcendent, can improve one’s feeling of connectedness, especially with other people but not necessarily with oneself or the world at large.

Does prior experience with breathwork predict mystical experience or T1 causality orientations?

Prior breathwork experience was regressed onto MTE, revealing no relationship, $F(1, 43) = 0.26$, $p = .612$, $r^2 = .01$. A significant regression model was found, where every one unit increase in breathwork experience was associated with a 0.19 unit increase in T1 autonomy causality orientation, $F(1, 43) = 6.06$, $p = .018$, $r^2 = .12$. Control orientation was trending toward significance where every one unit increase in breathwork experience was associated with a 0.24 unit decrease in control orientation, $F(1, 43) = 3.17$, $p = .082$, $r^2 = .07$. Impersonal orientation was not associated with prior experience, $F(1, 43) = 2.24$, $p = .142$, $r^2 = .05$.

Age was added as a covariate to the prior experience and autonomy regression. The overall model remained significant, $F(1, 42) = 3.27$, $p = .048$, $r^2 = .13$, with each one unit increase in breathwork experience predicting a 0.17 unit increase in T1 autonomy orientation while age was not predictive, $\beta = .01$, $t(42) = 0.73$, $p = .468$. This analysis suggests that it is indeed breathwork experience, and not just simply life experience due to being older, that predicts greater autonomy orientation.

Are the autonomy orientation shift or connection shift hypotheses significant or more pronounced for breathwork novices?

Study 3 revealed that experienced psychedelic users maxed out intrinsic orientations at T1 which raises the question of whether novices to psychedelics (or breathwork) might experience greater shifts on variables like intrinsic orientations, autonomy, or connectedness. The multiple regressions investigating the effects of MTE and integration on autonomy shift and connectedness were repeated with only breathwork novices (defined as those who answered “1” on the breathwork experience question; $n = 24$). Neither analysis yielded significant models (autonomy shift: $F(2, 21) = 0.71$, $p = .503$, $r^2 = .06$; connection: $F(2, 21) = 1.50$, $p = .246$, $r^2 = .13$).

Were there any gender differences in MTE or integration?

One way ANOVAs tested the relationship between gender, MTE, and integration. No significant differences emerged (MTE: $F(1, 43) = 0.00$, $p = .993$; integration: $F(1, 43) = 0.20$, $p = .658$), suggesting that MTE and integration were similar across gender.

Study 4 – Brief Discussion

All primary and secondary pre-registered hypotheses were not significant, which might suggest the null hypothesis is correct. If it is a false negative, however, there are a few factors that could be contributing which further research could clarify: (1) self-selection bias, (2) unknown/uncontrolled instructions from breathwork facilitators, and (3) the primary dependent variable is thought to be fairly stable across time. All participants self-selected to practice breathwork and felt drawn to it enough that they sought out a facilitator and were willing to pay to be guided through the practice. There could be confounding variables in people who seek out breathwork (i.e. preconceptions about what breathwork may or may not accomplish, pre-existing ailments they are seeking help for, or perhaps higher trait autonomy given that breathwork is generally outside the cultural norm and therefore requires more agency to seek out). Since the researcher teamed up with breathwork facilitators with established businesses and clientele, there was no room to control (or always know) the instructions given to participants before and after the breathwork sessions, whether across facilitators or across breathwork sessions. The primary dependent variable, the general causality orientations scale, is also believed to measure relatively enduring aspects of personality, meaning that scores are unlikely to change over time. This was a known factor when choosing the scale, but it was chosen anyways because (1) it was less likely to encounter ceiling effects like the intrinsic aspirations scale from Study 3, (2) the questions on the scale ask participants to indicate hypothetical behavior in hypothetical scenarios which were believed to be more amenable to change in the course of one week, compared to scales that ask more directly about one's personality (or about major life goals, like the aspirations index from Study 3), and (3) MTEs are espoused as a powerful experience capable of eliciting psychological changes not normally seen.

While the study population did not hit the ceiling of the autonomy causality orientation scale, they were approaching it and were much higher at T1 in autonomy orientation (*M* = 5.87; *SD* = 0.62) than controlled (*M* = 3.79; *SD* = 1.04) or impersonal (*M* = 3.20; *SD* = 0.92) orientations. It could be interesting for future research with breathwork or ET to study people lower in autonomy and higher in controlled or impersonal orientations (or lower in intrinsic and higher in extrinsic aspirations), to see if the autonomy/intrinsic shift happens when the starting point is lower. One way to accomplish this could be through recruiting breathwork-naïve participants and randomly assigning them to conditions, although the researcher may want to consider more than one breathwork session since breathwork may have practice effects.

Study 4 replicated and extended Studerus' (2012) finding that trait absorption is highly predictive of people having an MTE from breathwork as well as psychedelics. Future research seeking to elicit MTEs, perhaps for therapeutic purposes, may benefit from having their participants engage in practices that increase trait absorption first.

Perhaps of most interest from Study 4 are the exploratory findings with connection. Integration, not MTE, predicted a shift in connection to others, but not to self or the world; and that effect remained significant after controlling for socially desirable responding. As mentioned in the introduction, many researchers in psychedelic therapy assert the importance of integration (Bathje et al., 2022), and perhaps the current finding supports that assertion. It is surprising, however, that MTE did not predict the same effect, especially given the moderately strong correlation between MTE and integration. Most participants scored pretty high on MTE (in fact, if MTE were scored dichotomously, like in studies 1-3, 78% of participants would have met the cutoff criteria). So, perhaps after a certain point, the effects of an MTE reach a plateau and then integration becomes more important. If it had been a significant and positive shift in connection to self, that would have lent some credence to the intrinsic shift hypothesis since connection to self is a related construct. However, participants only reported feeling more connected to others after, compared to before, breathwork. Not knowing what participants did during the intervening week after breathwork and before filling out the T2 survey we can only speculate, but perhaps breathwork (or ET more broadly) increases connection in a non-specific way and the specific domain of connection is moderated by environmental factors. It could be that participants simply spent more time around other people during that week rather than spending time alone (connection-to-self) or in nature (connection-to-world), for example.

There are also likely differences in outcomes from breathwork versus psychedelics. Notable differences between the two include typical duration (psychedelics can last 4-12 hours whereas conscious connected breathwork is closer to 40 minutes); breathwork is also a more controllable experience since the participant can simply start breathing normally and any intense phenomenological effects will start to subside almost immediately whereas taking a psychedelic is more of a commitment; Relatedly, breathwork requires constant attention and effort whereas psychedelics only require ingestion. While it is hard to see how any of these differences could lead to differences in causality orientations or connectedness, it is certainly possible. Integration, on the other hand, offers a stronger explanation and also has more variables to manipulate to get differing outcomes.

General Discussion

The current line of research was inspired by research with psychedelics in a therapeutic environment where MTEs and integration have been identified as pivotal components of the therapeutic process (Bathje et al., 2022; Kangaslampi, 2023). Psychedelic science is a relatively new field of study, so researchers are still searching for better models and explanations of how psychedelics and MTEs are helping people reduce symptoms from such a wide range of mental health diagnoses. The present research is founded on the hypothesis that MTEs with proper integration have the potential to help clients establish the psychological resources to manage core existential concerns. More precisely, the present research hypothesized that MTEs can reveal to a person what is intrinsically meaningful to them in life, whether it be through goal aspirations, causality orientations, or the pursuit of greater competence through self-growth and openness. If a person then integrates those intrinsically meaningful insights into the way they live their lives, then they would be more effectively managing existential concerns. The implicit assumption behind this hypothesis is that possessing intrinsic worldviews and goals reduces one's risk of psychiatric symptoms, which prior research supports (Kasser & Ryan, 1993; Vail et al., 2010).

Each of the four studies above provide correlational data supporting the intrinsic shift hypothesis. However, Studies 3 and 4 provide quasi-experimental data that is inconclusive about intrinsic shifts. Studies 1 and 2 showed that having an MTE at some point during one's life is positively associated with intrinsic spirituality (but not with extrinsic religiosity), personal growth orientation, and exploration motivation. Study 3 showed that prior experience with psychedelics was associated with higher autonomy and openness at T1. Study 4 showed that prior experience with breathwork was associated with higher autonomy causality orientation at T1. On the other hand, Study 3 did not support the hypothesis that psychedelic-induced MTEs can contribute to greater intrinsic aspirations. And Study 4 did not support the hypothesis that breathwork-induced MTEs contribute to greater autonomy orientation.

An open question is whether the null findings of Studies 3 and 4 are indeed accurate findings or false negatives. Supporting the latter, both studies had methodological limitations that could explain the null findings; namely, study samples/recruitment methods and the measurement scales chosen to assess outcome variables. Recruiting participants in naturalistic environments who were already planning to take psychedelics or practice breathwork introduces confounds. Most relevant to the intrinsic shift hypothesis, it seems probable that the populations in Studies 3 and 4 had higher than average intrinsic/autonomous orientations when they entered the study, leaving less room for them to increase. It is possible to imagine a more extrinsically oriented person attending a music/art festival, perhaps to get photos to share on social media to bolster their image, but festivals are inherently intrinsically enjoyable events that the average festival-goer seeks out to attend with friends and to feel a sense of community; perhaps even to experience self-growth through awe and wonder. It is also unlikely for someone to sign up and pay to practice breathwork for extrinsic reasons since breathwork does not bring wealth, fame, or image. However, breathwork is commonly advertised as a practice that can aid intrinsic aspirations like health, personal growth, and, as data from Study 4 revealed, relationships (via connection with others). Therefore, Studies 3 and 4 may have been methodologically flawed in ways that contribute to finding a false negative. Future research investigating the intrinsic shift hypothesis would benefit from studying breathwork in a more controlled lab environment with breathwork-naïve participants and random assignment to condition.

This set of four studies adds a few novel findings to existing literature. While prior research using psychedelics showed that MTEs can elicit desirable changes on measures of death attitudes in a therapeutic environment (Agin-Liebes et al., 2020; Ross et al., 2016), Studies 1 and 2 add that MTEs outside of therapeutic contexts may also contribute to existentially adaptive attitudes toward death. Prior research has established a positive relationship between MTEs and the personality trait of openness (Erritzoe et al., 2018), and Studies 1 and 2 extended that farther to include a positive relationship between MTEs and exploration motivation and personal growth too. Prior research found that psychedelic therapy sessions led to insights in self-identity (Noorani et al., 2018) and feelings of connection to self (Watts et al., 2017), and Study 3 adds a direct positive, albeit correlational, relationship between psychedelic usage and autonomy. Prior research found trait absorption to be highly predictive of people having an MTE after taking psychedelics (Studerus, 2012), and Study 4 now adds that trait absorption also predicts having an MTE during a session of Conscious Connected Breathwork. In fact, there appears to only be one other empirical study (Bahi et al., 2023) involving Conscious Connected Breathwork in specific. It was an EEG and mood study, finding that Conscious Connected Breathwork reduced anger, tensions, confusion, and depression while increasing esteem. So, Study 4 adds to this that Conscious Connected Breathwork may also increase feelings of connectedness with others, if the practitioner engages in integration practices.

The absorption-MTE relationship may be pointing to a variable (absorption) researchers can target for interventions to dovetail with PAP, and perhaps eventually breathwork-assisted psychotherapy. If we increase the client's absorption prior to dose day in PAP, there is reason to believe the client would have better outcomes. One adjacent line of research in nursing concluded that high absorbers are more responsive to mind-body interventions (Menzies et al., 2008). Perhaps a similar relationship can be found in PAP with MTEs operating as a mediator more so than a moderator, as it is often currently conceived. If MTEs during dose-day are the best predictor of symptom reduction and if absorption is the best predictor of having an MTE, then future research can and should answer the question of how to increase a person's level of absorption prior to dose day.

Some research has pursued this question, albeit for other reasons. A period of Antarctic isolation increased absorption scores for male scientific personnel, from before and after their trip to Antarctica (Barabasz et al., 1983). In the cultural underground of psychedelic therapy, retreats often take place in environments immersed in nature with varying levels of isolation from society. Nature immersion and/or a degree of social isolation (excluding therapists and perhaps other clients undergoing therapy together) could be studied as means of increasing absorption. If effective at increasing absorption, nature immersion and relative isolation could be employed in the days/weeks prior to PAP.

Another line of inquiry shows that marijuana is a promising means of increasing absorption. When participants are instructed to fill out the Tellegen Absorption Scale while thinking of times they were under the influence of marijuana, scores increase, compared to filling it out while explicitly instructed to think of times when they were not under the influence (Fabian & Fishkin, 1981). Weil (2004) described marijuana as a sort of 'active placebo' and Nelson (1994, p. 54) said that marijuana "facilitates a free-floating *absorptive* state which favors engagement in spatial-metaphoric cognitive styles of the *here and now* style of consciousness." Marijuana comes with additional considerations like eating versus smoking it (due to cardio-pulmonary risks associated with smoking and differences in duration of effects), plus potential memory encoding deficits (which matters if combined with psychedelics since memories tend to be clear and vivid after PAP, which may play a role in therapeutic outcomes and one's ability to integrate experiences). A major difference between nature immersion and isolation compared to marijuana is the time it takes to increase absorption. Ingesting marijuana is quick-acting whereas it may take days or weeks for nature immersion or isolation to increase absorption.

Researchers have also studied the relationship between absorption and mindfulness. Perhaps contrary to intuition, some research shows that mindfulness and absorption share a negative relationship (Leppanen & Kim, 2021; Sheldon et al., 2015). But other research shows a positive relationship (Grant et al., 2013). The nuances are likely mediated by the different ways of measuring mindfulness and the various dimensions of mindfulness. Sheldon and colleagues (2015) say absorption is about losing self-awareness while mindfulness is about maintaining self-awareness. Leppanen and Kim (2021) add that absorption was predicted by engaging in self-reflection without gaining insights into those reflections while mindfulness was predicted by more insightful self-reflection. The absorption versus mindfulness debate is a ripe area for future research to pursue, especially since mindfulness practices have practical benefits above and beyond marijuana or traveling to Antarctica, assuming the mindfulness practices can indeed increase absorption. However, there is one important consideration to add for researchers wanting to pursue that research question.

Mindfulness meditation practices are often espoused as health-promoting and beneficial but they can have serious negative consequences, and self-focus is theorized to play a pivotal role for outcomes (Dourron et al., 2022; Lindahl et al., 2017). Lindahl and colleagues (2017) replicated and reiterated prior research that it is possible for meditation to contribute to the onset of psychosis, depersonalization, or mania. Dourron and others (2022) point out that NOSC are characterized by a state of entropic processing, but so is psychosis. The authors clear up the seeming paradox by arguing that the main difference as to whether the entropic state leads to positive enduring psychological and behavioral changes versus psychosis comes down to whether the person engages in self-focus or not, during the entropic state. Dourron and colleagues (2022) say, “psychosis is marked by an increase in self-focus, including hyperreflexivity, or an extreme form of self-consciousness of internal experiences, as well as a tendency to interpret tacit stimuli as self-relevant, which may facilitate delusions,” all buttressed with a feeling of disconnection from the world and people around them. The authors say the more beneficial form of entropic processing is marked by a decrease in self-focus, “creating a hyporeflexive processing style, where internal experiences are observed with less self-consciousness, and feelings of merger with the environment and a sense of connection to others are prevalent.”

Limitations and Future Directions

Many theorists since the inception of the scientific discipline of psychology have talked about NOSC with a relative dearth of empirical research on NOSC, no doubt due to the challenge of studying NOSC in lab environments. Psychedelics and now breathwork offer unique opportunities to change that, but they come with unique challenges that researchers are still learning to overcome.

A handful of limitations in the present work offer ideas for future research. The bulk of the significant findings are correlational, and quasi-experimental designs were employed twice with limited success. Let us first consider reverse causal pathways for correlations. Studies 1 and 2 found MTEs predictive of higher personal growth, exploration motivation, and intrinsic spirituality. But, it could be that these three variables constitute a type of person who is more likely to do the sorts of things that would induce an MTE, and perhaps the MTE did not change their growth or exploration orientations. Wanting to grow as a person and explore new things, especially if wanting to explore one’s spirituality in greater depth, all seem like potential precursors to engaging in activities like taking psychedelics, attending a spiritual retreat, or saying ‘yes’ to trying out the sensory deprivation tank that the local yoga studio just installed.

It also may be that among people who take psychedelics, perhaps personality traits like openness to experience and intrinsic spirituality lend themselves to the sort of receptivity one needs in order for their psychedelic experience to reach the requisite levels of “mysticality” and awe. Indeed, a more closed-minded or dogmatic disposition may contribute to a psychedelic experience that is more subdued, making an MTE less likely. To the extent that these reverse causal pathways might be true, future research could implement protocols that increase personal growth orientations and willingness to explore during the preparation phase before PAP. Similarly, Studies 3 and 4 found that prior experiences with psychedelics or breathwork were correlated with higher openness and autonomy orientations, respectively. The same reverse causal path deductions could be assumed, where more autonomous and open people are more likely to try psychedelics or breathwork.

More controlled research environments with random assignment would yield more reliable and meaningful data. Controlled research with breathwork would benefit from employing a trained breathwork facilitator who is naïve to study hypotheses to guide participants. Controlled research with psychedelics is currently limited to clinical applications and would thus require collaborations with a psychiatrist. In such a collaboration, psychiatrists and clinical psychologists developing those studies could add measures of intrinsic aspirations to their studies. Given that the intrinsic shift hypothesis suggests that MTEs are capable of eliciting changes in a construct generally thought to be an enduring aspect of personality, true longitudinal study designs may be more suited to test the hypothesis since it is perhaps unrealistic to expect the change to happen in the course of a single day, week, or even month.

Intrinsic Shift Hypothesis: Theoretical Development. The intrinsic shift hypothesis has more clinical application than the present manuscript suggests. A fuller theoretical account with an explicitly therapeutic emphasis could integrate the intrinsic shift hypothesis into the therapeutic process with potential to yield a host of testable hypotheses. Moreton and colleagues (2020) began that effort, but there is much room for refining, developing, and integrating the concepts with clinical research.

The clinical application of the intrinsic shift hypothesis could also explain why Studies 3 and 4 yielded non-significant quasi-experimental results. At the outset of these studies, the researcher assumed MTEs increase intrinsic motivation without qualifying that it would only happen for certain populations. Therefore, these studies were conducted with a general population even though the hypothesis applies to a population with diagnosable mental health symptoms. What the present research may be telling us is that the intrinsic shift hypothesis needs to be tested on clinical populations to more properly test its validity. In other words, the hypothesis needs to more clearly define who it applies to and who it does not.

Instead of simply stating that MTEs increase intrinsic motivation writ large, future research should test the hypothesis that the increase in intrinsic motivation only occurs for people who go into the MTE from a specific starting point. That starting point can be clarified by future research but is likely a combination of mental health symptoms plus either low intrinsic motivation, or high extrinsic motivation, or a combination of the two. Future research will have to keep in mind that intrinsic and extrinsic motivation are not mutually exclusive; for example, one can pursue intrinsic goals like health and social connectedness while also pursuing extrinsic goals like fame and wealth, as those goals are defined by SDT.

Further complicating the issue, what starts as an intrinsic interest can later turn extrinsic; for example, a person who enjoys creating art may turn that interest into a job and a means of income which can change the motivation to create art from personal interest to wealth accumulation. This fact has implications for the long-term sustainment of mental health vis-à-vis intrinsic motivation. The push-pull dynamics between defending oneself from fears of death and expanding oneself to grow and self-actualize, which TMT and SDT respectively address, have been discussed in depth by Psyczcynski and colleagues (2012) and should be taken into account in future theorizing and especially when measuring outcomes for longitudinal studies assessing shifts in intrinsic motivation.

To repeat an important part of the intrinsic shift hypothesis, this is all posited in the context of the crucial qualifier that the sociocultural context where the MTE occurs has a large impact on the outcomes. The person having the experience can have the intention for an intrinsic shift to occur and the experience itself could be very transcendent, but if the social environment exerts too much top-down control over their experience and/or thwarts that person from integrating their intrinsic insights, the benefit will not be reaped.

Breathwork Future Directions. During Study 4's developing stages, 15 breathwork facilitators filled out an initial interest survey sent by the researcher. In that survey, one of the questions asked the facilitators what questions they have about breathwork that they would like to see research address. The following are research questions developed from those breathwork facilitators. (1) Can breathwork be added to psychotherapeutic interventions (e.g. mindfulness-based stress reduction, acceptance and commitment therapy, cognitive behavioral therapy) to amplify therapeutic benefit? (2) Can stretching or bodywork from a licensed professional (e.g. yoga, massage, chiropractic, reiki) during breathwork interact in order to bring added benefit to clients? (3) How long do the benefits of breathwork typically last and/or how frequently would one have to practice breathwork to maintain its benefits? (4) Can a variety of breathwork protocols be developed to help clients looking to achieve specific therapeutic goals (e.g. reducing generalized anxiety, improving heart-rate variability, improving symptoms from asthma, reduce cravings from addiction withdrawal, improve emotion differentiation/regulation)? (5) Could breathwork help pregnant mothers during the act of childbirth? (6) Could breathwork be employed to ease distress at end-of-life for the dying or the bereaved? (7) What are the pros and cons of breathwork that is facilitated in-person versus remotely? A facilitator expressed concern that some clients may need more support than others and that remote facilitation may be unsafe for those clients, so perhaps research could identify individual differences and/or clinical diagnoses that require additional support. (8) What is the role of music in breathwork and/or will different genres of music lead to differing outcomes for breathers?

Adding to the above list, the findings from Study 4 suggest that future research should investigate how breathwork might increase feelings of connectedness. Study 4 found that integration after breathwork predicted feeling more connected with others, but it is unclear why and a number of factors could have contributed since a week of time passed in between breathwork and the follow-up survey where connectedness was reported. Further research could test the idea that breathwork increases connection in a non-specific way by randomly assigning participants to one of four integration groups: connection to self, others, world, or a control group.

Conclusion

The findings from the present research contribute to the mounting evidence that MTEs can bring myriad benefits, particularly for one’s existential well-being and sense of connection.

These findings provide initial support for a new line of research with potentially broad implications for mental health and cultural practices that involve NOSC/ET. Future research can test the validity of the intrinsic shift hypothesis and its application in psychotherapy. While the research with psychedelics, breathwork, and MTEs is exciting and promising, it is not without its risks and so a word of caution is in order. The experiences that come with psychedelics and breathwork have a small potential to be destabilizing, and researchers are just beginning to understand the preconditions and risk factors. Researchers, professionals guiding these experiences, and people looking to have these experiences would be wise to stay abreast of new research and to indulge in moderation.

Appendix A: Study 1 Materials

Mystical-Type Experience

Please read the list of phenomena below first. If you have ever had a single experience that exhibited one or more of these phenomena, please select all that apply **for that one experience**. (Note: If you have had multiple experiences that exhibited these phenomena, just focus on the one experience that exhibited the phenomena most strongly.)

- ☐ feel that the experience cannot be described adequately in words
- ☐ felt a unity or bond with what was felt to be greater than your personal self
- ☐ feeling that you experienced "eternity" or "infinity"
- ☐ felt that you gained insightful knowledge experienced at an intuitive level
- ☐ loss of your usual sense of space
- ☐ loss of your usual sense of time
- ☐ felt like your sense of perception was originating from somewhere outside of your body
- ☐ strong feeling of peace or tranquility
- ☐ experience of the insight that "all is One"
- ☐ none of the above

MTE Induction Activity

What activity were you engaging in when you experienced the phenomena you selected above? (Select any/all that apply to that one single experience you were thinking of above.)

- ☐ did not experience the above phenomena
- ☐ adventurous sport or hobby
- ☐ meditation or prayer
- ☐ at an event surrounded by people/friends
- ☐ artistic expression
- ☐ near-death-experience (NDE) or out-of-body-experience (OBE)
- ☐ under the influence of an ingested substance
- ☐ other ____
- ☐ prefer not to say

Personal Growth

Response options: 1 – strongly disagree; 2 – 5; 6 – strongly agree

1. For me, I would like life to be a continuous process of learning, changing, and growth.
2. When I look at my life up to this point and the paths my life could potentially take in the future, I am pleased with it all.

Death Anxiety

Response options: 1 – strongly disagree; 2; 3 – neither disagree nor agree; 4; 5 – strongly agree

1. Death is no doubt a grim experience.
2. The uncertainty of not knowing what happens after death worries me.
3. I am disturbed by the finality of death.
4. The subject of life after death troubles me greatly.
5. The fact that death will mean the end of everything as I know it frightens me.

Death Representations

Response options: 1 – strongly disagree; 2; 3 – neither disagree nor agree; 4; 5 – strongly agree

1. Death is only a passage. After I die, I will continue to exist and will remember this life's experiences.
2. Death is a definitive annihilation. After I die, I will not exist anymore, so I will not experience anything.
3. Death is a radical change. After I die, I won't be aware of my own self anymore.
4. Death is a definitive annihilation. After I die, even though others will remember me, I won't remember anything.
5. Death is only a passage. After I die, I will continue to exist and therefore have new experiences.
6. Death is a radical change. After I die, I will experience things that have nothing to do with my present life.

Importance of Spiritual and Religious Beliefs

Response options: 0 – I am not spiritual/religious; 1 – not at all important; 2 – 8; 9 – extremely important

Spiritual: "If you consider yourself to be spiritual, how important are your spiritual beliefs to you?"

Religious: "If you consider yourself to be religious, how important are your religious beliefs to you?"

Quest Orientation

Response options: 1 – strongly disagree; 2 – 8; 9 – strongly agree

1. I do not expect my spiritual/religious beliefs to change in the next few years.
2. Questions are far more central to my spiritual/religious experience than are answers.
3. I have been driven to ask spiritual/religious questions out of a growing awareness of the tensions in my world and in my relation to my world.

Absorption

Response options: 1 – seldom/never; 2 – 5; 6 – very often/always

1. I sometimes "step outside" my usual self and experience a completely different state of being.
2. Textures - such as wool, sand, wood - sometimes remind me of colors or music.
3. I think I really know what some people mean when they talk about mystical experiences.
4. Some music reminds me of pictures or changing patterns of color.

Intrinsic Religiosity/Spirituality

Response options: 1 – strongly disagree; 2 – 8; 9 – strongly agree

1. It is important for me to spend periods of time in private religious/spiritual thought and meditation.
2. I try hard to carry my religion/spirituality over into all my other dealings in life.
3. My religious/spiritual beliefs are what really lie behind my whole approach to life.

Appendix B: Study 2 Additional Materials

Exploration Motivation

Response options: 1 – does not describe me at all; 2 – 7; 8 – very much describes me

1. I would like to explore someplace that I have never been before.
2. I would like to explore the ideas of foreign cultures.
3. If given the chance, I would enjoy exploring unusual ideas or theories.
4. I would strike up a conversation with a stranger on a bus or airplane and open up to the person.

Appendix C: Study 3 Additional Materials

Stress (T1)

How much stress are you under at this point in your life?

Response options: 1 - very little stress ; 4 - moderate stress ; 7 - extreme stress

Intrinsic / Extrinsic Aspirations (T1)

Everyone has long-term Goals or Aspirations. These are the things that individuals hope to accomplish over the course of their lives. In this section, you will find a number of life goals, presented one at a time, and we ask you: How important is this goal to you? Indicate your answer using the scale provided.

Response options: 1 - not at all; 4 - moderately; 7 - very

1. Life-goal: To be a very wealthy person. How important is this to you?
2. Life-goal: To grow and learn new things. How important is this to you?
3. Life-goal: To have my name known by many people. How important is this to you?
4. Life-goal: To have good friends that I can count on. How important is this to you?
5. Life-goal: To successfully hide the signs of aging. How important is this to you?
6. Life-goal: To work for the betterment of society. How important is this to you?
7. Life-goal: To have many expensive possessions. How important is this to you?
8. Life-goal: At the end of my life, to be able to look back on my life as meaningful and complete. How important is this to you?
9. Life-goal: To be admired by many people. How important is this to you?
10. Life-goal: To share my life with someone I love. How important is this to you?
11. Life-goal: To have people comment often about how attractive I look. How important is this to you?
12. Life-goal: To assist people who need it, asking nothing in return. How important is this to you?

Autonomy (T1)

Below is a collection of statements about your general experiences. Please indicate how true each statement is of your experiences on the whole. Remember that there are no right or wrong answers. Please answer according to what really reflects your experience rather than what you think your experience should be.

Response options: 1 - not at all true; 5 - completely true

1. My decisions represent my most important values and feelings.
2. I am deeply curious when I react with fear or anxiety to events in my life.
3. I do a lot of things to avoid feeling ashamed.
4. My whole self stands behind the important decisions I make.
5. I am interested in why I act the way I do.
6. I often pressure myself.

Openness (T1)

Here are a number of characteristics that may or may not apply to you. Please indicate the extent to which you agree or disagree with each statement.

Response options: 1 - strongly disagree; 2; 3 - neither agree nor disagree; 4; 5 - strongly agree

1. Is original, comes up with new ideas
2. Is curious about many different things
3. Is ingenious, a deep thinker
4. Has an active imagination
5. Is inventive
6. Values artistic, aesthetic experiences
7. Prefers work that is routine
8. Likes to reflect, play with ideas
9. Has few artistic interests
10. Is sophisticated in art, music, or literature

Flourishing (T1)

Response options:

1 - strongly disagree
2 - disagree
3 - slightly disagree
4 - mixed or neither agree nor disagree
5 - slightly agree
6 - agree
7 - strongly agree

1. I lead a purposeful and meaningful life.
2. My social relationships are supportive and rewarding.
3. I am engaged and interested in my daily activities.
4. I actively contribute to the happiness and well-being of others.
5. I am competent and capable in the activities that are important to me.
6. I am a good person and live a good life.
7. I am optimistic about my future.
8. people respect me.

Everlasting Soul Belief (T1)

Response options: 1 - not at all true; 2 – 8; 9 - definitely true

1. After I die, my soul will continue to live on.
2. There is no such thing as an everlasting soul that continues after death.
3. Each human has a soul that is separate from the physical body that has eternal life.

Death Anxiety (T1)

INSTRUCTIONS: Please indicate your agreement using the scale provided.

Response options:

1 - strongly disagree
2 - disagree
3 - somewhat disagree
4 - neither agree nor disagree
5 - somewhat agree
6 - agree
7 - strongly agree

1. I am disturbed by the finality of death.
2. The fact that death will mean the end of everything as I know it frightens me.
3. The uncertainty of not knowing what happens after death worries me.

Absorption (T1)

INSTRUCTIONS: This questionnaire consists of questions about experiences that you may have had in your life. We are interested in how often you have these experiences. It is important, however, that your answers show how often these experiences happen to you when you are not under the influence of alcohol or drugs.

Response options: 1 - Seldom/Never; 6 - Very often/Always

1. Sometimes I feel and experience things as I did when I was a child.
2. While watching a movie, a T.V. show, or a play, I may become so involved that I forget about myself and my surroundings, and experience the story as if it were real and as if I were taking part in it.
3. Sometimes I feel as if my mind could envelop the whole world.
4. I think I really know what some people mean when they talk about mystical experiences.
5. I can often somehow sense the presence of another person before I actually see or hear her/him.
6. I can wander off into my thoughts so completely while doing a routine task that I actually forget what I am doing and a few minutes later find that I have finished it.
7. I can sometimes recall certain past experiences so clearly and vividly that it is like living them again.
8. Things that might seem meaningless to others often make sense to me.
9. I am often delighted by small things (like the colors in soap bubbles and the five- pointed star shape that appears when you cut an apple across the core).
10. Some music reminds me of pictures or changing patterns of color.
11. I often know what someone is going to say before he or she says it.
12. I find that different smells have different colors.
13. I can be deeply moved by a sunset.

Experience with Psychedelics (T1)

I would consider myself ___________ in regard to using psychedelics.

1 - a novice (no experience)

2- moderately experienced

3 – a veteran (a lot of experience)

Psychedelic Usage (T2)

Did you take psychedelics at June Jam?

Definition - For the purposes of this study, the term “psychedelic” refers to:
-LSD/acid
-DMT
-mushrooms/psilocybin
-mescaline/Peyote/San Pedro
-MDMA/molly/ecstasy
-salvia
-ketamine

Response options: yes; no

Mystical Experience Questionnaire (MEQ30) (T2)

INSTRUCTIONS (for yes-psychedelics participants):
Looking back on the entirety of your psychedelic experience(s) at June Jam, please rate the degree to which at any time you experienced the following phenomena. Answer each question according to your feelings, thoughts, and experiences **during your psychedelic experience(s).**

INSTRUCTIONS (for no-psychedelics participants):
Looking back on the entirety of your psychedelic experience(s) at June Jam, please rate the degree to which at any time you experienced the following phenomena. Answer each question according to your feelings, thoughts, and experiences **during the festival.**

Response options: 0 – none; not at all; 1 – so slight cannot decide; 2 – slight; 3 – moderate; 4 – strong (equivalent in degree to any other strong experience); 5 – extreme (more than any other time in my life and stronger than 4)

1. Loss of your usual sense of time.
2. Experience of amazement.
3. Sense that the experience cannot be described adequately in words.
4. Gain of insightful knowledge experienced at an intuitive level.
5. Feeling that you experienced eternity or infinity.
6. Experience of oneness or unity with objects and/or persons perceived in your surroundings.
7. Loss of your usual sense of space.
8. Feelings of tenderness and gentleness.
9. Certainty of encounter with ultimate reality (in the sense of being able to "know" and "see" what is really real) at some point during your experience.
10. Feeling that you could not do justice to your experience by describing it in words.
11. Loss of usual awareness of where you were.
12. Feelings of peace and tranquility.
13. Sense of being "outside of" time, beyond past and future.
14. Freedom from the limitations of your personal self and feeling a unity or bond with what was felt to be greater than your personal self.
15. Sense of being at a spiritual height.
16. Experience of pure being and pure awareness (beyond the world of sense impressions).
17. Experience of ecstasy.
18. Experience of the insight that "all is One".
19. Being in a realm with no space boundaries.
20. Experience of oneness in relation to an "inner world" within.
21. Sense of reverence.
22. Experience of timelessness.
23. You are convinced now, as you look back on your experience, that in it you encountered ultimate reality (i.e., that you "knew" and "saw" what was really real).
24. Feeling that you experienced something profoundly sacred and holy.
25. Awareness of the life or living presence in all things.
26. Experience of the fusion of your personal self into a larger whole.

27. Sense of awe or awesomeness.
28. Experience of unity with ultimate reality.
29. Feeling that it would be difficult to communicate your own experience to others who have not had similar experiences.
30. Feelings of joy.

Intrinsic/Extrinsic Goal Aspirations (T3)

INSTRUCTIONS: Everyone has long-term Goals or Aspirations. These are the things that individuals hope to accomplish over the course of their lives. In this section, you will find a number of life goals, presented one at a time, and we ask you how important the goal is to you. Please use the following scale in answering the questions.

Response options: 1 - not at all; 2 – 3; 4 - moderately; 5 – 6; 7 - very

1. Life-goal: To be a very wealthy person. How important is this to you?
2. Life-goal: To grow and learn new things. How important is this to you?
3. Life-goal: To have my name known by many people. How important is this to you?
4. Life-goal: To have good friends that I can count on. How important is this to you?
5. Life-goal: To successfully hide the signs of aging. How important is this to you?
6. Life-goal: To work for the betterment of society. How important is this to you?
7. Life-goal: To have many expensive possessions. How important is this to you?
8. Life-goal: At the end of my life, to be able to look back on my life as meaningful and complete. How important is this to you?
9. Life-goal: To be admired by many people. How important is this to you?
10. Life-goal: To share my life with someone I love. How important is this to you?
11. Life-goal: To have people comment often about how attractive I look. How important is this to you?
12. Life-goal: To assist people who need it, asking nothing in return. How important is this to you?
13. Life-goal: To be financially successful. How important is this to you?
14. Life-goal: To choose what I do, instead of being pushed along by life. How important is this to you?
15. Life-goal: To be famous. How important is this to you?
16. Life-goal: To have committed, intimate relationships. How important is this to you?
17. Life-goal: To keep up with fashions in hair and clothing. How important is this to you?
18. Life-goal: To work to make the world a better place. How important is this to you?
19. Life-goal: To be rich. How important is this to you?
20. Life-goal: To know and accept who I really am. How important is this to you?
21. Life-goal: To have my name appear frequently in the media. How important is this to you?
22. Life-goal: To feel that there are people who really love me, and whom I love. How important is this to you?
23. Life-goal: To achieve the "look" I've been after. How important is this to you?
24. Life-goal: To help others improve their lives. How important is this to you?
25. Life-goal: To have enough money to buy everything I want. How important is this to you?
26. Life-goal: To gain increasing insight into why I do the things I do. How important is this to you?
27. Life-goal: To be admired by lots of different people. How important is this to you?
28. Life-goal: To have deep enduring relationships. How important is this to you?

29. Life-goal: To have an image that others find appealing How important is this to you?
30. Life-goal: To help people in need. How important is this to you?

Autonomy (T3)

Instructions: Below is a collection of statements about your general experiences. Please indicate how true each statement is of your experiences on the whole. Remember that there are no right or wrong answers. Please answer according to what really reflects your experience rather than what you think your experience should be.

Response options: 1 – not at all true; 5 – completely true

1. My decisions represent my most important values and feelings.
2. I do things in order to avoid feeling badly about myself.
3. I often reflect on why I react the way I do.
4. I strongly identify with the things that I do.
5. I am deeply curious when I react with fear or anxiety to events in my life.
6. I do a lot of things to avoid feeling ashamed.
7. I try to manipulate myself into doing certain things.
8. My actions are congruent with who I really am.
9. I am interested in understanding the reasons for my actions.
10. My whole self stands behind the important decisions I make.
11. I believe certain things so that others will like me.
12. I am interested in why I act the way I do.
13. I like to investigate my feelings.
14. I often pressure myself.
15. My decisions are steadily informed by things I want or care about.

Behavioral Integration (T3)

Please state your level of agreement with the following statements, considering the time period since your psychedelic experience at the festival. Answer as honestly as possible. There are no right or wrong answers.

Response options: 1 - strongly disagree; 2 – 4; 5 - strongly agree)

1. I've given myself mental space to reconnect to the experience.
2. I've read, viewed, or listened to informative content relevant to my experience.
3. I've gained insight on my experience through talking with supportive people.
4. I've spent time in silent contemplation of my experience.
5. I've spent time in nature to nurture my experience.
6. I've followed up on my experience with focused attention practice (meditation, mindfulness, mantra, journaling, visualization, etc.)
7. I've applied learnings from my experience to my life.
8. I've found ways to carry the intentions I had for my experience into my daily life.
9. Because of my experience, I've prioritized my overall wellness.
10. I've spent time in environments that help me stay attuned to the lessons following from my experience.
11. I've been supportive of others as a result of my experience.
12. I've made healthy life choices for myself because of my experience.

Experienced Integration (T3)

Please state your level of agreement with the following statements, considering the time period since your psychedelic experience at the festival. Answer as honestly as possible. There are no right or wrong answers.

Response options: 1 - strongly disagree; 2 – 4; 5 - strongly agree)

1. I feel at peace with my experience.
2. I feel more balanced since my experience.
3. I have a continued sense of open-minded curiosity about my experience.
4. I feel harmony between the experience and my inner being.
5. I feel harmony between my daily life and my experience.
6. I feel a sustained connection to my experience.
7. I feel more connection in my life because of my experience.
8. I have a deep feeling of connection between nature and my experience.
9. I feel greater self-awareness since my experience.
10. I feel the benefit from my experience expressed in my life.
11. I feel the positive effect of the way I interpret my experience.
12. I've felt the benefit of my experience extending past myself into my community.

Appendix D: Study 4 Additional Materials

Info about breathwork session (pre breathwork)

Today's date: MM/DD/YY

Scheduled date of breathwork session: MM/DD/YY

Name of breathwork facilitator: <drop down list of facilitators>

Your email address: ______________

(NOTE: your email address will only be used to send you the second survey for this research project one week after your breathwork session)

Causality Orientations

INDIVIDUAL STYLES QUESTIONNAIRE

These items pertain to a series of hypothetical sketches. Each sketch describes an incident and lists three ways of responding to it. Please read each sketch, imagine yourself in that situation, and then consider each of the possible responses.

Think of each response option in terms of how likely it is that you would respond that way. If the response is **very unlikely** for you, circle “1 or 2.” If it is **moderately likely** for you, circle “3, 4, or 5,” and if it is **very likely** for you, circle “6 or 7.”

Response options:

1 – very unlikely
2
3
4 – moderately likely
5
6
7 – very likely

1. You have a school-age daughter. On parents' night the teacher tells you that your daughter is doing poorly and doesn't seem involved in the work. You are likely to:

a) Talk it over with your daughter to understand further what the problem is.
b) Scold her and hope she does better.
c) Make sure she does the assignments, because she should be working harder.

2. You had a job interview several weeks ago. You just received an email which states that the position has been filled. It is likely that you might think:

a) It's not what you know, but who you know.
b) I'm probably not good enough for the job.
c) Somehow they didn't see my qualifications as matching their needs.

3. You are a supervisor and have been charged with the task of allotting coffee breaks to three workers who cannot all break at once. You would likely handle this by:

a) Telling the three workers the situation and having them work with you on the schedule.
b) Simply assigning times that each can break to avoid any problems.
c) Find out from someone in authority what to do or do what was done in the past.

4. A close friend of yours has been moody lately, and a couple of times has become very angry with you over "nothing." You might:

a) Share your observations with them and try to find out what is going on for them.
b) Ignore it because there's not much you can do about it anyway.
c) Tell them that you're willing to spend time together if and only if they make more effort to control themself.

5. You have just received the results of a test you took, and you discovered that you did very poorly. Your initial reaction is likely to be:

a) "I can't do anything right," and feel sad.
b) "I wonder how it is I did so poorly," and feel disappointed.
c) "That stupid test doesn't show anything," and feel angry.

6. You have been invited to a large party where you know very few people. As you look forward to the evening, you would likely expect that:

a) You'll try to fit in with whatever is happening in order to have a good time and not look bad.
b) You'll find some people with whom you can relate.
c) You'll probably feel somewhat isolated and unnoticed.

7. You are embarking on a new career. The most important consideration is likely to be:

a) Whether you can do the work without getting in over your head.
b) How interested you are in that kind of work.
c) Whether there are good possibilities for advancement.

8. A woman who works for you has generally done an adequate job. However, for the past two weeks her work has not been up to par and she appears to be less actively interested in her work. Your reaction is likely to be:

a) Tell her that her work is below what is expected and that she should start working harder.
b) Ask her about the problem and let her know you are available to help work it out.
c) It's hard to know what to do to get her straightened out.

Watts Connectedness Scale

Reflecting on how you have felt since your breathwork session, please rate the following items on a scale from "Not at all" to "Entirely" according to how you have felt over this time period. Please answer every item, even if you are unsure or feel the item is unclear or poorly worded. Drag the indicator to a position on the scale that shows how much you agree of disagree with each of the following statements.

Response options: 0-100 visual analog scale (0 = not at all; 100 = entirely)

1) My mind has felt connected to my heart/emotions.
2) I have felt connected to my senses (touch, taste, sight, smell, hearing).
3) I have felt connected to a range of emotions.
4) If I had chosen to, I could have 'sat with' painful memories.
5) I have felt connected to my body.
6) I have been able to fully experience emotion, whether positive or negative.
7) I have felt trapped in my mind.
8) I have felt alone.
9) I have felt connected to friends and/or family.
10) I have felt connected to a community.
11) I have felt unwelcome amongst others.
12) I have felt separate from the world around me.
13) I have felt connected to all humanity.
14) I have felt connected to a purpose in life.
15) I have felt connected to nature.
16) I have felt connected to a spiritual essence (in the secular or religious sense).
17) I have felt connected to a source of universal love.
18) I have seen things from a broad perspective, 'the bigger picture'.
19) I have felt that everything is interconnected.

Connectedness to self: Items 1-6
Connectedness to others: Items 7-12
Connectedness to world: Items 13-19

Satisfaction With Life

INSTRUCTIONS: Using the 1 - 7 scale below, indicate your agreement with each item. Please be open and honest in your responding.

Response options:

1 - Strongly disagree
2 - Disagree
3 - Slightly disagree
4 - Neither agree nor disagree
5 - Slightly agree
6 - Agree
7 - Strongly agree

1. In most ways my life is close to my ideal.
2. The conditions of my life are excellent.
3. I am satisfied with my life.
4. So far I have gotten the important things I want in life.
5. If I could live my life over, I would change almost nothing.

Social desirability

Personality Assessment

Listed below are a number of statements concerning personal attitudes and traits. Read each statement and decide whether it is TRUE or FALSE as it pertains to you personally.

Response options: True / False

1. It is sometimes hard for me to go on with my work if I am not encouraged.
2. I sometimes feel resentful when I don't get my way.
3. On a few occasions, I have given up doing something because I thought too little of my ability.
4. There have been times when I felt like rebelling against people in authority even though I knew they were right.
5. No matter who I'm talking to, I'm always a good listener.
6. There have been occasions when I took advantage of someone.
7. I'm always willing to admit when I've made a mistake.
8. I sometimes try to get even, rather than forgive and forget.
9. I'm always courteous, even to people who are disagreeable.
10. I have never been irked when people express ideas different from my own.
11. There have been times when I was quite jealous of the good fortune of others.
12. I am sometimes irritated by people who ask favors of me.
13. I have never deliberately said something that hurt someone's feelings.

Behavioral Integration

Please state your level of agreement with the following statements, considering the time period since your breathwork session. Answer as honestly as possible. There are no right or wrong answers. At any given time your responses will naturally vary between lower and higher scores.

Response options:

1 – strongly disagree
2 – disagree
3 – neither agree nor disagree
4 – agree
5 – strongly agree

1. I've given myself mental space to reconnect to the experience.
2. I've spent time in silent contemplation of my experience.
3. I've applied learnings from my experience to my life.
4. I've found ways to carry the intentions I had for my experience into my daily life.
5. Because of my experience, I've prioritized my overall wellness.
6. I've spent time in environments that help me stay attuned to the lessons following from my experience.
7. I've made healthy life choices for myself because of my experience.

Experienced Integration

Please state your level of agreement with the following statements, considering the time period since your breathwork session. Answer as honestly as possible. There are no right or wrong answers. At any given time your responses will naturally vary between lower and higher scores.

Response options:

1 – strongly disagree
2 – disagree
3 – neither agree nor disagree
4 – agree
5 – strongly agree

1. I feel more balanced since my experience.
2. I have a continued sense of open-minded curiosity about my experience.
3. I feel harmony between my daily life and my experience.
4. I have a deep feeling of connection between nature and my experience.
5. I feel greater self-awareness since my experience.
6. I feel the benefit from my experience expressed in my life.
7. I feel the positive effect of the way I interpret my experience.

Figure 1. Questionnaire items assessing Mystical-Type Experience – Studies 1 & 2

1) Please read the list of phenomena below first. If you have ever had a single experience that exhibited one or more of these phenomena, please select all that apply **for that one experience**. (Note: If you have had multiple experiences that exhibited these phenomena, just focus on the one experience that exhibited the phenomena most strongly.)

- feel that the experience cannot be described adequately in words
- felt a unity or bond with what was felt to be greater than your personal self
- feeling that you experienced "eternity" or "infinity"
- felt that you gained insightful knowledge experienced at an intuitive level
- loss of your usual sense of space
- loss of your usual sense of time
- felt like your sense of perception was originating from somewhere outside of your body
- strong feeling of peace or tranquility
- experience of the insight that "all is One"
- none of the above

2) What activity were you engaging in when you experienced the phenomena you selected above? (Select any/all that apply to that **one single experience** you were thinking of above.)

- did not experience the above phenomena
- adventurous sport or hobby
- meditation or prayer
- at an event surrounded by people/friends
- artistic expression
- near-death-experience (NDE) or out-of-body-experience (OBE)
- under the influence of an ingested substance
- other ______________________
- prefer not to say

Table 1. Demographics and Induction Activity Statistics for yes-MTE group

	Study 1 N = 124 / 837 (yes-MTE / Total)		Study 2 N = 162 / 1086 (yes-MTE / Total)	
Demographics				
Female	84 / 588	(14.29%)	94 / 773	(12.16%)
Male	38 / 241	(15.77%)	63 / 296	(21.28%)
Non-Binary	2 / 8	(25.00%)	5 / 17	(29.41%)
White	101 / 626	(16.13%)	134 / 873	(15.35%)
Black / African American	8 / 51	(15.69%)	10 / 63	(15.87%)
American Indian / Alaska Native	4 / 31	(12.90%)	9 / 32	(28.13%)
Asian	11 / 103	(10.68%)	15 / 116	(12.93%)
Hawaiian / Pacific Islander	0 / 8	(0.00%)	1 / 12	(8.33%)
Other	8 / 81	(9.88%)	10 / 87	(11.49%)
MTE Induction Activity				
at an event surrounded by people/friends	64	(51.61%)	95	(58.64%)
meditation or prayer	59	(47.58%)	84	(43.75%)
under the influence of an ingested substance	47	(37.90%)	51	(31.48%)
adventurous sport/hobby	44	(35.48%)	57	(35.19%)
near-death or out-of-body experience	34	(27.42%)	46	(28.40%)
artistic expression	23	(18.55%)	40	(24.69%)
other	11	(8.87%)	17	(10.49%)
prefer not to say	9	(7.26%)	12	(7.41%)

Table 2. MTE Induction Method by Gender – Study 1

Variable	Men (n = 38)	Women (n = 84)	Non-Binary (n = 2)
at an event surrounded by people/friends	16 (42%)	47 (56%)	1 (50%)
meditation or prayer	18 (47%)	40 (48%)	1 (50%)
under the influence of an ingested substance	19 (50%)	26 (31%)	2 (100%)
adventurous sport/hobby	14 (37%)	30 (36%)	0 (0%)
near-death or out-of-body experience	14 (37%)	20 (24%)	0 (0%)
artistic expression	5 (13%)	17 (20%)	1 (50%)
other	3 (8%)	8 (10%)	0 (0%)
prefer not to say	2 (5%)	7 (8%)	0 (0%)

Table 3. Descriptive Statistics and Correlations – Study 1

Variable	M	SD	1	2	3	4	5	6	7	8	9	10
1. Personal Growth	5.24	0.82	-									
2. Death Anxiety	3.90	1.59	-.06	-								
3. Death Repr.	2.87	0.83	-.11 **	.13 ***	-							
4. Imp. of Spirituality	5.36	3.14	.18 ***	-.08 *	-.40 ***	-						
5. Imp. of Religiosity	4.96	3.25	.10 **	-.06	-.50 ***	.51 ***	-					
6. Absorption	2.70	1.13	.13 ***	-.02	-.13 ***	.25 ***	.01	-				
7. Intrinsic Rel/Spir	3.93	2.36	.19 ***	-.16 ***	-.48 ***	.62 ***	.60 ***	.25 ***	-			
8. Depression	14.88	11.19	-.11 **	.06	.14 ***	-.03 *	-.13 ***	.16 ***	-.08 *	-		
9. Worry	55.88	14.70	.03	.16 ***	.07 *	.07 *	-.02	.03	-.01	.50 ***	-	
10. Persev. Thinking	46.56	12.65	-.01	.19 ***	.11 **	.08 *	-.06	.16 ***	-.01	.63 ***	.68 ***	-
11. Contrast Avoid.	79.71	22.11	-.02	.14 ***	.09 *	.09 *	-.03	.20 ***	.00	.54 ***	.59 ***	.67 ***

* $p < .05$
** $p < .01$
*** $p < .001$

Table 4. Means and Standard Deviations – Study 1

Variable	**MTE** *M* (*SD*)	**no-MTE** *M* (*SD*)	***F* value** (*p*)
Personal Growth	5.43 (0.68)	5.28 (0.73)	4.28* (.039)
Death Anxiety	3.63 (1.67)	3.94 (1.57)	4.13* (.042)
Death Representations	2.71 (0.65)	2.79 (0.71)	1.30 (.254)
Importance of Spirituality	6.66 (2.71)	5.13 (3.15)	25.82*** (< .001)
Importance of Religiosity	4.43 (3.30)	5.06 (3.24)	3.93* (.048)
Absorption	3.50 (1.11)	2.56 (1.08)	79.31*** (< .001)
Intrinsic Religiosity/Spirituality	4.88 (2.24)	3.78 (2.34)	23.71*** (< .001)
Depression	15.40 (10.40)	13.80 (9.74)	2.33 (.136)
Worry	57.9 (14.90)	56.10 (13.60)	1.66 (.198)
Perseverative Thinking	49.90 (12.50)	46.50 (11.60)	8.14** (.004)
Contrast Avoidance	84.70 (20.00)	79.00 (19.90)	7.76** (.005)

* $p < .05$
** $p < .01$
*** $p < .001$

Table 5. MTE Induction Method by Gender – Study 2

Variable	Men (n = 63)	Women (n = 94)	Non-Binary (n = 5)
at an event surrounded by people/friends	31 (49%)	60 (64%)	4 (80%)
meditation or prayer	33 (52%)	49 (52%)	2 (40%)
under the influence of an ingested substance	22 (35%)	25 (27%)	4 (80%)
adventurous sport/hobby	24 (38%)	32 (34%)	1 (20%)
near-death or out-of-body experience	17 (27%)	28 (30%)	1 (20%)
artistic expression	12 (19%)	26 (28%)	2 (40%)
other	6 (10%)	10 (11%)	1 (20%)
prefer not to say	5 (8%)	6 (6%)	1 (20%)

Table 6. Descriptive Statistics and Correlations – Study 2

Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11
1. Personal Growth	5.24	0.90	-										
2. Explor. Motivation	6.17	1.23	.39 ***	-									
3. Death Anxiety	3.99	1.62	-.03	-.01	-								
4. Death Repr.	2.87	0.80	-.06 *	-.08 *	.11 ***	-							
5. Imp. of Spirituality	5.21	3.11	.14 ***	.22 ***	-.07 *	-.49 ***	-						
6. Imp. of Religiosity	4.87	3.29	.03	.07 *	-.03	-.50 ***	.57 ***	-					
7. Absorption	2.64	1.10	.07 *	.23 ***	-.04	-.10 ***	.30 ***	.10 ***	-				
8. Intrinsic Rel/Spir	3.83	2.42	.11 ***	.17 ***	-.17 ***	-.51 ***	.66 ***	.66 ***	.30 ***	-			
9. Depression	13.05	10.01	-.22 ***	-.01	.11 ***	.13 ***	-.07 *	-.15 ***	.10 **	-.10 ***	-		
10. Worry	55.87	13.93	-.06 *	-.01	.20 ***	.06	-.03	-.03	.00	-.07 *	.51 ***	-	
11. Persev. Thinking	45.57	12.16	-.11 ***	.03	.18 ***	.07 *	-.01	-.08 *	.14 ***	-.03	.62 ***	.66 ***	-
12. Contrast Avoid.	78.75	21.07	-.12 ***	.02	.16 ***	.01	.00	-.05	.17 ***	-.04	.53 ***	.58 ***	.65 ***

* p < .05
** p < .01
*** p < .001

Table 7. Means and Standard Deviations – Study 2

Variable	MTE *M* (*SD*)	no-MTE *M* (*SD*)	*F* value (*p*)
Personal Growth	5.52 (0.64)	5.30 (0.77)	11.05*** (< .001)
Exploration Motivation	6.76 (1.05)	6.15 (1.11)	41.33*** (< .001)
Death Anxiety	3.86 (1.75)	4.01 (1.60)	1.09 (.298)
Death Representations	2.53 (0.77)	2.86 (0.64)	30.24*** (< .001)
Importance of Spirituality	7.01 (2.78)	4.88 (3.05)	68.65*** (< .001)
Importance of Religiosity	5.54 (3.38)	4.74 (3.27)	8.24** (.004)
Absorption	3.33 (1.10)	2.52 (1.05)	79.40*** (< .001)
Intrinsic Religiosity/Spirituality	5.30 (2.41)	3.58 (2.33)	73.92*** (< .001)
Depression	14.30 (9.25)	12.00 (8.79)	9.01** (.003)
Worry	54.60 (14.60)	56.40 (13.40)	2.38 (.123)
Perseverative Thinking	47.70 (12.40)	45.40 (11.80)	4.96* (.026)
Contrast Avoidance	80.80 (19.60)	78.30 (20.10)	2.11 (.146)

* p < .05
** p < .01
*** p < .001

Table 8. Results of Tukey's HSD Test for Exploratory Analyses – Study 3

Variable	Group	M	SD	Sig. Comparisons	p	95% C.I. lower	95% C.I. upper
Intrinsic Aspirations	1 2 3	6.07 6.27 6.56	0.77 0.78 0.45	3-2	.100	-0.04	0.61
Openness	1 2 3	4.12 3.97 4.44	0.72 0.52 0.34	3-2	< .001 ***	0.24	0.70
Flourishing	1 2 3	5.98 5.72 6.30	0.92 0.79 0.52	3-2	< .001 ***	0.23	0.92
Absorption	1 2 3	3.88 4.18 4.55	0.70 0.89 0.69	3-2	.072	-0.03	0.77
Stress	1 2 3	3.20 4.42 3.81	1.10 1.47 1.47	3-2	.117	-1.34	0.12
Death anxiety	1 2 3	5.33 3.45 2.96	1.39 1.75 1.65	2-1 3-1	.052 .011 *	-3.77 -4.28	0.01 -0.46

* p < .05
** p < .01
*** p < .001

Group 1 – Novices
Group 2 – Moderately Experienced
Group 3 – Veterans

Table 9. Descriptive Statistics and Correlations – Study 4

Variable	M	SD	1	2	3	4	5	6	7	8
1. Absorption	3.95	0.69	-							
2. Autonomy Or. Shift	0.06	0.81	-.10	-						
3. Control Or. Shift	-0.12	0.81	-.19	.27	-					
4. Impersonal Or. Shift	-0.22	0.79	-.11	.18	.27	-				
5. Connectedness Shift	7.19	13.18	-.03	.45**	.05	-.06	-			
6. Satisfaction w/Life Shift	0.44	0.96	-.16	.19	-.05	-.01	.38**	-		
7. MTE	125.33	27.46	.30*	.19	.04	-.17	.14	-.08	-	
8. Integration	4.06	0.45	.36*	.22	.06	.01	.35*	.06	.68***	-
9. Social Desirability	4.91	1.82	-.06	.10	.14	.22	.00	-.08	-.13	-.21

* $p < .05$
** $p < .01$
*** $p < .001$

References

Agin-Liebes, G., Ekman, E., Anderson, B., Malloy, M., Haas, A., & Woolley, J. (2021). Participant reports of mindfulness, posttraumatic growth, and social connectedness in psilocybin-assisted group therapy: An interpretive phenomenological analysis. *Journal of Humanistic Psychology*, 00221678211022949.

Agin-Liebes, G.I., Malone, T., Yalch, M.M., Mennenga, S.E., Ponté, K.L., Guss, J., Bossis, A. P., Grigsby, J., Fischer, S., & Ross, S. (2020). Long-term follow-up of psilocybin-assisted psychotherapy for psychiatric and existential distress in patients with life-threatening cancer. *Journal of Psychopharmacology*, *34*(2), 155–166.

Andersen, K.A., Carhart-Harris, R., Nutt, D.J., & Erritzoe, D. (2021). Therapeutic effects of classic serotonergic psychedelics: A systematic review of modern-era clinical studies. *Acta Psychiatrica Scandinavica*, *143*(2), 101–118.

Bahi, C., Irrmischer, M., Franken, K., Fejer, G., Schlenker, A., Deijen, J.B., & Engelbregt, H. (2023). Effects of conscious connected breathing on cortical brain activity, mood and state of consciousness in healthy adults. *Current Psychology*, 1-12.

Barabasz, M., Barabasz, A.F., & Mullin, C.S. (1983). Effects of brief Antarctic isolation on absorption and hypnotic susceptibility—Preliminary results and recommendations: A brief communication. *The International journal of clinical and experimental hypnosis*, *31*(4), 235-238.

Barrett, F., Johnson, M., & Griffiths, R. (2015). Validation of the revised mystical experiences questionnaire in experimental sessions with psilocybin. *Journal of Psychopharmacology*, *29*(11), 1182-1190.

Bathje, G.J., Majeski, E., & Kudowor, M. (2022). Psychedelic integration: An analysis of the concept and its practice. *Frontiers in Psychology*, *13*, 824077.

Batson, D., & Schoenrade, P. (1991). Measuring religion as quest: 2) Reliability concerns. *Journal for the Scientific Study of Religion*, *30*(4), 430-447.

Becker, E. (1973). *The denial of death*. Free Press.

Burdick, B.V., & Adinoff, B. (2013). A proposal to evaluate mechanistic efficacy of hallucinogens in addiction treatment. *The American journal of drug and alcohol abuse*, *39*(5), 291-297.

Burke, B.L., Martens, A., & Faucher, E.H. (2010). Two decades of terror management theory: A meta-analysis of mortality salience research. *Personality and Social Psychology Review*, *14*(2), 155-195.

Carhart-Harris, R., Erritzoe, D., Haijen, E., Kaelen, M., & Watts, R. (2018). Psychedelics and connectedness. *Psychopharmacology*, *235*, 547-550.

Carhart-Harris, R., & Friston, K. (2019). REBUS and the anarchic brain: Toward a unified model of the brain action of psychedelics. *Pharmacological Reviews*, *71*, 316-344.

Deci, E.L., & Ryan, R.M. (1985). The general causality orientations scale: Self-determination in personality. *Journal of Research in Personality, 19,* 109-134.

Deci, E.L., & Ryan, R.M. (2000). The “what” and “why” of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, 11(4), 227–268.

Diener, E., Emmons, R.A., Larsen, R.J., & Griffin, S. (1985). The Satisfaction with Life Scale. *Journal of Personality Assessment*, 49, 71-75.

Dourron, H.M., Strauss, C., & Hendricks, P.S. (2022). Self-entropic broadening theory: Toward a new understanding of self and behavior change informed by psychedelics and psychosis. *Pharmacological Reviews, 74*(4), 984-1029.

Erritzoe, D., Roseman, L., Nour, M., MacLean, K., Kaelen, M., Nutt, D., & Carhart- Harris, R. (2018). Effects of psilocybin therapy on personality structure. *Acta Psychiatrica Scandinavica*, *138*, 368–378.

Fabian, W.D., & Fishkin, S.M. (1981). A replicated study of self-reported changes in psychological absorption with marijuana intoxication. *Journal of Abnormal Psychology, 90*(6), 546.

Fergus, & Valentiner. (2012). Terror management theory and scrupulosity: An experimental investigation. *Journal of Obsessive-Compulsive and Related Disorders, 1*(2), 104-111.

Fischer, D.G., & Fick, C. (1993). Measuring social desirability: Short forms of the Marlowe-Crowne social desirability scale. *Educational and Psychological measurement, 53*(2), 417-424.

Freud, S. (1927). *The future of an illusion*. Hogarth Press, London.

Frymann, T., Whitney, S., Yaden, D.B., & Lipson, J. (2022). The Psychedelic Integration Scales: Tools for Measuring Psychedelic Integration Behaviors and Experiences. *Frontiers in Psychology*, *13*, 863247.

Garcia-Romeu, A., Griffiths, R., & Johnson, M. (2014). Psilocybin-occasioned mystical experiences in the treatment of tobacco addiction. *Current drug abuse reviews*, *7*(3), 157–164.

Garcia-Romeu, A., & Richards, W.A. (2018). Current perspectives on psychedelic therapy: Use of serotonergic hallucinogens in clinical interventions. *International Review of Psychiatry*, *30*(4), 291–316.

Gattuso, J.J., Perkins, D., Ruffell, S., Lawrence, A.J., Hoyer, D., Jacobson, L.H., ... & Sarris, J. (2023). Default mode network modulation by psychedelics: a systematic review. *International Journal of Neuropsychopharmacology*, *26*(3), 155-188.

Grant, J.A., Duerden, E.G., Courtemanche, J., Cherkasova, M., Duncan, G.H., & Rainville, P. (2013). Cortical thickness, mental absorption and meditative practice: possible implications for disorders of attention. *Biological psychology, 92*(2), 275-281.

Green, J.D., & Campbell, W.K. (2000). Attachment and exploration in adults: Chronic and contextual accessibility. *Personality and Social Psychology Bulletin*, *26*(4), 452–461.

Greenberg, J., Pyszczynski, T., & Solomon, S. (1986). The causes and consequences of a need for self-esteem: A terror management theory. In R. F. Baumeister (Ed.), *Public self and private self* (pp. 189-212). New York: Springer-Verlag.

Griffiths, R., Johnson, M., Carducci, M., Umbricht, A., Richards, W., Richards, B., Cosimano, M., & Klinedinst, M. (2016). Psilocybin produces substantial and sustained decreases in depression and anxiety in patients with life-threatening cancer: a randomized double-blind trial. *J Psychopharmacol*. (30), 1181–1197.

Griffiths, R., Richards, W., McCann, U., & Jesse, R.. (2006) Psilocybin can occasion mystical-type experiences having substantial and sustained personal meaning and spiritual significance. *Psychopharmacology (Berl)*, *187*, 268–292.

Grof S. (1979). *Realms of the human unconscious: Observations from LSD research*. Souvenir Press, London.

Grof, S., & Grof, C. (2010). *Holotropic breathwork: A new approach to self-exploration and therapy*. SUNY Press.

Hood, R.W., Jr., Hill, P.C., & Spilka, B. (2018). *The psychology of religion: An empirical approach*. Guilford Press.

James, W. (1902). *The varieties of religious experience*. New York: Penguin.

Johns Hopkins. (2006). *Griffiths Psilocybin*. Hopkins Medicine Press Releases. https://www.hopkinsmedicine.org/Press_releases/2006/GriffithspsilocybinQ

Jonas, E., & Fischer, P. (2006). Terror management and religion: Evidence that intrinsic religiousness mitigates worldview defense following mortality salience. *Journal of Personality and Social Psychology*, 91, 553-567.

Kangaslampi, S. (2023). Association between mystical-type experiences under psychedelics and improvements in well-being or mental health: A comprehensive review of the evidence. *Journal of psychedelic studies*, 7(1), 18-28.

Kasser, T., & Ryan, R.M. (1993). A dark side of the American dream: correlates of financial success as a central life aspiration. *Journal of personality and social psychology*, *65*(2), 410.

Leppanen, M.L., & Kim, K. (2021). Absorption and mindfulness reflect distinct patterns of attentional control and self-related processing. *Journal of Individual Differences.*

Levenson, R.W. (1999). The intrapersonal functions of emotion. *Cognition & Emotion*, *13*(5), 481-504.

Lifton, R.J. (1979). *The broken connection: on death and the continuity of life*. Simon & Schuster, New York.

Lindahl, J.R., Fisher, N.E., Cooper, D.J., Rosen, R.K., & Britton, W.B. (2017). The varieties of contemplative experience: A mixed-methods study of meditation-related challenges in Western Buddhists. *PloS one*, *12*(5), e0176239.

Maslow A. (1964). *Religions, values, and peak-experiences*. The Viking Press: Penguin Books Ltd.

Menzies R., Sharpe L., & Dar-Nimrod I. (2019). The relationship between death anxiety and severity of mental illnesses. *Br J Clin Psychol*, *58*(4), 452–467.

Menzies, V., Taylor, A.G., & Bourguignon, C. (2008). Absorption: An individual difference to consider in mind–body interventions. *Journal of Holistic Nursing*, *26*(4), 297-302.

Moreno, F., Wiegand, C., Taitano, E., & Delgado, P. (2006). Safety, tolerability, and efficacy of psilocybin in 9 patients with obsessive-compulsive disorder. *J Clin Psychiatry*, (67), 1735-1740.

Moreton, S.G., Szalla, L., Menzies, R.E., & Arena, A.F. (2020). Embedding existential psychology within psychedelic science: reduced death anxiety as a mediator of the therapeutic effects of psychedelics. *Psychopharmacology*, 237(1), 21-32.

Nelson, P.L. (1994). Cannabis amotivational syndrome and personality trait absorption: A review and reconceptualization. *Imagination, Cognition and Personality*, *14*(1), 43-58.

Nietzsche, F. (1872). 1968. The Birth of Tragedy. *Basic writings of Nietzsche*, 15-144.

Noorani, T., Garcia-Romeu, A., Swift, T.C., Griffiths, R.R., & Johnson, M.W. (2018). Psychedelic therapy for smoking cessation: Qualitative analysis of participant accounts. *Journal of Psychopharmacology*, *32*(7), 756-769.

Orr, L., & Ray, S. (1977). *Rebirthing in the new age*. Celestial Arts. Millbrae, CA, USA.

Palitsky, R., Kaplan, D.M., Peacock, C., Zarrabi, A.J., Maples-Keller, J.L., Grant, G.H., ... & Raison, C.L. (2023). Importance of integrating spiritual, existential, religious, and theological components in psychedelic-assisted therapies. *JAMA psychiatry, 80*(7), 743-749.

Pollan, M. (2018). *How to change your mind: The new science of psychedelics*. Penguin Books Limited, London.

Puente, I. (2014). Effects of holotropic breathwork in personal orientation, levels of distress, meaning of life and death anxiety in the context of a weeklong workshop: A pilot study. *Journal of Transpersonal Research*, *6*(1), 49–63.

Pyszczynski, T., Greenberg, J., & Arndt, J. (2012). Freedom versus fear revisited: An integrative analysis of the dynamics of the defense and growth of self. In M.R. Leary & J.P. Tangney (Eds.), *Handbook of self and identity* (2nd ed., pp. 378–404). The Guilford Press.

Reich, W. (1920). *Wilhelm Reich papers, 1920-1952*. Manuscript Division, Library of Congress, Washington, DC Library of Congress.

Ross, S., Bossis, A., Guss, J., Agin-Liebes, G., Malone, T., Cohen, B., & Schmidt, B.L. (2016). Rapid and sustained symptom reduction following psilocybin treatment for anxiety and depression in patients with life-threatening cancer: A randomized controlled trial. *Journal of Psychopharmacology*, *30*, 1165–1180.

Rank, O. (1931/1961). *Psychology and the soul*. Perpetua Books.

Routledge, C., & Vess, M. (2018). *Handbook of terror management theory*. Academic Press.

Ryan, R.M. (1995). Psychological needs and the facilitation of integrative processes. *Journal of personality*, *63*(3), 397-427.

Ryan, R.M., & Deci, E.L. (2006). Self-regulation and the problem of human autonomy: Does psychology need choice, self-determination, and will? *Journal of Personality*, *74*(6).

Ryan, R.M., & Deci, E.L. (2017). *Self-determination theory: Basic psychological needs in motivation, development, and wellness*. Guilford Publications.

Ryan, R.M., Deci, E.L., Grolnick, W.S., & La Guardia, J.G. (2015). The significance of autonomy and autonomy support in psychological development and psychopathology. *Developmental psychopathology: Volume one: Theory and method*, 795-849.

Ryff, C.D., & Keyes, C.L.M. (1995). The structure of psychological well-being revisited. *Journal of Personality and Social Psychology*, *69*, 719-727.

Sheldon, K.M., Prentice, M., & Halusic, M. (2015). The experiential incompatibility of mindfulness and flow absorption. *Social Psychological and Personality Science*, *6*(3), 276-283.

Sielaff, A., Horner, D.E., & Greenberg, J. (2023). Differences in Existential Perspectives as a Function of Having a Mystical-Type Experience. *Journal of Humanistic Psychology*, 00221678231158679.

Stace, W. (1960). *Mysticism and Philosophy*. New York: MacMillan Press.

Strachan E., Schimel J., Arndt J., Williams T., Solomon S., Pyszczynski T., & Greenberg J. (2007). Terror mismanagement: Evidence that mortality salience exacerbates phobic and compulsive behaviors. *Personal Soc Psychol Bull*, *33*, 1137–1151.

Studerus, E. (2012). *Tolerability, assessment, and prediction of psilocybin-induced altered states of consciousness* (Doctoral dissertation). University of Zurich, Switzerland.

Tellegen, & Atkinson. (1974). Openness to absorbing and self-altering experiences ("absorption"), a trait related to hypnotic susceptibility. *Journal of Abnormal Psychology*, *83*, 268-277.

Testoni, Ancona, & Ronconi. (2015). The ontological representation of death: A scale to measure the idea of annihilation versus passage. *Journal of Death and Dying*, *71*(1), 60-81.

Turner, V. (1969). Liminality and Communitas. In V. Turner, R. Abrahams, & A. Harris (Eds.), *The ritual process: Structure and anti-structure* (pp. 94-113). New York: Routledge. 9781315134666

Vail III, K.E., Conti, J.P., Goad, A.N., & Horner, D.E. (2020). Existential threat fuels worldview defense, but not after priming autonomy orientation. *Basic and Applied Social Psychology*, *42*(3), 150-166.

Vail, K., Rothschild, Z., Weise, D., Solomon, S., Pyszczynski, T., & Greenberg, J. (2010). A terror management analysis of the psychological functions of religion. *Personality and Social Psychology Review*, *14*(1), 84-94.

Vansteenkiste, M., Ryan, R.M., & Soenens, B. (2020). Basic psychological need theory: Advancements, critical themes, and future directions. *Motivation and emotion*, *44*(1), 1-31.

Watts, R., Day, C., Krzanowski, J., Nutt, D., & Carhart-Harris, R. (2017). Patients' accounts of increased "connectedness" and "acceptance" after psilocybin for treatment-resistant depression. *Journal of Humanistic Psychology*, *57*(5), 520-564.

Watts, R., Kettner, H., Geerts, D., Gandy, S., Kartner, L., Mertens, L., ... & Roseman, L. (2022). The Watts Connectedness Scale: a new scale for measuring a sense of connectedness to self, others, and world. *Psychopharmacology*, *239*(11), 3461-3483.

Weil, A. (2004). *The natural mind: A revolutionary approach to the drug problem*. Houghton Mifflin Harcourt.

Wong, P., Reker, G., & Gesser, G. (1994). The death attitude profile revised: A multidimensional measure of attitudes towards death. *Death Anxiety Handbook*. Taylor & Francis.

Yaden, D.B., Eichstaedt, J.C., Schwartz, H.A., Kern, M.L., Le Nguyen, K.D., Wintering, N.A., Hood, R.W., Jr., & Newberg, A.B. (2016). The language of ineffability: Linguistic analysis of mystical experiences. *Psychology of Religion and Spirituality*, *8*(3), 244–252.

Yaden, D.B., Haidt, J., Hood, R.W., Vago, D.R., & Newberg, A.B. (2017). The varieties of self-transcendent experience. *Review of General Psychology*, *21*(2), 143–160.

Yalom, I.D. (1980). *Existential psychotherapy*. Basic Books.