

# Hypnotic Suggestion Produces Mystical-Type Experiences in the Laboratory: A Demonstration Proof

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We examined the possibility that hypnotic suggestion could be used to induce mystical-type experiences in the laboratory. Undergraduate volunteers ( $N = 113$ ) reported their experiences in responses to a suggestion for a mystical-type experience added to a standardized group-administered scale of hypnotic responsiveness (the Harvard Group Scale of Hypnotic Susceptibility, Form A; Shor & Orne, 1962). Nine percent of participants reported having had a mystical-type experience to a “great degree,” and 26% reported that they had a mystical-type experience to a “moderate degree.” Moreover, using a separate criterion proposed by Barrett, Johnson, and Griffiths (2015), 22.1% of participants reported a “complete” mystical-type experience. Individuals high in hypnotic suggestibility scored higher on a scale of mystical experience (Mystical Experiences Questionnaire [MEQ30]; Maclean, Leoutsakos, Johnson, & Griffiths, 2012; Pahnke, 1963, 1969) compared with individuals both medium and low in hypnotic suggestibility. The MEQ30 correlated significantly with objective, subjective, and involuntariness measures of hypnotic suggestibility. We found evidence for convergent validity for the MEQ30 in terms of a robust and significant association ( $r = .63$ ) between the scale and a single-item self-report measure of mystical experience in response to the mystical experience suggestion. Our findings represent a demonstration proof that hypnotic suggestion can play a viable role in inducing mystical-type experiences of varying degrees among about a third of participants in a laboratory context and support the hypothesis that the ability to experience hypnotically induced mystical-type experiences varies as a function of hypnotic suggestibility.

**Keywords:** mystical-type experience, hypnotic suggestion, hypnosis, hypnotic suggestibility

Mystical-type experiences are often fleeting yet potentially transformative experiences that often leave a lasting, even lifelong, imprint on the experiencer. Mystical-type experiences are diverse and often marked by a sense of loss of self; being one with everything; perception of the subjective nature of all things; transcending the environment, the mundane senses, and the quotidian boundaries of time and space; ineffability; peace and joy; sacredness; and a noetic

quality (Cardeña, 2005; Hood, 1975; MacLean, Leoutsakos, Johnson, & Griffiths, 2012; Stace, 1960). We favor the term *mystical-type experience* to reflect the fact that mystical experiences described in the literature encompass a diversity of experiences.

Such mystical-type experiences often have strong spiritual overtones and may have contributed to the formation of many world religions. They have been reported through the ages in association with prayer, fasting, meditation, and social isolation (Wulff, 2014). Mystical-type experiences are often manifested through the lens of different religious faiths. Christians often describe mystical experiences in terms of an awe-inspiring merging with God’s presence. In contrast, Buddhists, whose spiritual practices focus more on achieving personal enlightenment than worship of a deity, often describe mystical incidents in terms of bliss and selfless peace.

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Although shaped by learning and culture, each person's mystical experience is probably unique. As many as 35% of Americans say they have felt very close to a powerful, uplifting spiritual force at least once (Greeley, 1975). Mystical-type experiences have historically and more contemporaneously been associated with positive, life-transformative alterations in the experience of the self, others, and the world (Wulff, 2014), including when induced by psychotropic drugs (Carhart-Harris et al., 2016; Lebedev et al., 2015; Lyvers & Meester, 2012). Mystical experiences are, therefore, an important area of study in the broad domain of psychological science dedicated to understanding the full range of human experience and potential.

Unfortunately, scant experimental attention has been devoted to the study of mystical-type experiences and other exceptional and anomalous experiences (see Cardeña, Lynn, & Krippner, 2014). One might justifiably ask why this is the case with mystical-type experiences. Historically, fasting, rituals, dance, meditation, and ingesting plants with hallucinogenic properties have engendered mystical-type experiences. Nevertheless, such experiences are not only difficult, if not impossible, to produce on demand, but they are also unpredictable and fleeting, rendering them problematic to study systematically in the laboratory. Although some researchers have investigated or induced mystical-type experiences using sensory deprivation (Hood, Morris, & Watson, 1990), meditation, and recollecting past mystical experiences (Beauregard, Courtemanche, & Paquette, 2009; Beauregard & Paquette, 2006; van der Lans, 1987), laboratory methods have generally not succeeded in evoking mystical-type experiences on a reliable basis, with the exceptions of administering psychedelic substances such as psilocybin (e.g., Griffiths, Richards, McCann, & Jesse, 2006; Pahnke, 1963, 1969) and transcranial magnetic stimulation (Hill & Persinger, 2003). Nevertheless, researchers have criticized the findings derived from the latter method as attributable to demand characteristics and suggestibility in that mystical experiences were predicted by suggestibility, not by the application of transcranial weak magnetic fields (Granqvist et al., 2005). Nevertheless, the interpretation of the latter study in relation to suggestibility is ambiguous. The researchers

used a scale of absorption, which they claimed was "a widely used indicator of suggestibility" and has been studied primarily in the context of hypnosis in terms of suggestibility. Unfortunately, this measure has proven to be only weakly associated with hypnotic suggestibility in many studies, and the positive correlation often becomes insignificant or vanishes when absorption and hypnotic suggestibility is measured in independent test contexts (see Council, Kirsch, & Grant, 1996, for a review). Clearly, there is a need to study the relation between suggestibility and mystical experiences on a systematic basis, which is one of the goals of the present study.

Recently, neuroscientists have investigated mystical-type experiences in the context of a burgeoning and renewed interest in conducting studies investigating the effects of hallucinogenic drugs. For example, Griffiths and colleagues (Griffiths et al., 2011; Griffiths, Richards, Johnson, McCann, & Jesse, 2008) asked 36 participants without any personal or family history of mental illness to ingest psilocybin, a hallucinogenic drug that affects serotonin receptors and is the active ingredient in the sacred mushroom, used for centuries in religious ceremonies. At follow-up 14 months later, 58% of participants who ingested psilocybin reported a mystical experience they claimed was one of the most meaningful events of their lives. Additionally, roughly two thirds of the participants rated the experience as one of their top five most spiritually significant moments and reported increases in life satisfaction. The percentages of mystical and positive experiences were found to be much lower among participants who ingested a placebo. People who ingested psilocybin also reported increases in their ability to be open to experience (MacLean et al., 2012). Researchers have also reported long-term improvements in mood and anxiety in patients with advanced cancer (Grob et al., 2011) and complete tobacco abstinence among some smokers—particularly among those who reported mystical experiences—following psilocybin consumption (Garcia-Romeu, Griffiths, & Johnson, 2015).

Still, even with highly selected participants and under tightly controlled and supportive laboratory conditions, 31% of subjects in one study (Griffiths et al., 2006) reported negative short-term reactions related to ingesting psilocybin,

including extreme fear and paranoia. Negative effects did not persist beyond the session. However, they, raise concerns about possible long-term and unpredictable untoward reactions in some individuals. That said, recent research offers a glimpse of the promise of studying mystical experiences in the laboratory.

Because mystical-type experiences are often positive, transformative, and could potentially be harnessed to facilitate personal growth and human potential, a need exists to both engender these experiences in ways that minimize risks to individuals and to develop ways to study mystical experiences under controlled laboratory conditions. Accordingly, the primary goal of our research is to inaugurate an innovative line of research in which investigators capitalize on hypnosis and imaginative suggestions to impose a modicum of control over the onset and nature of mystical-type experiences in the laboratory without the risks attendant with the ingestion of hallucinogens. Hypnosis carries negligible risks (Lynn, Martin, & Frauman, 1996), and it is well established that hypnotic suggestions can elicit profound changes in consciousness in some participants such as alterations in body image, visual imagery, and sense of time, which vary as a function of perceived depth of hypnotic experience and hypnotic suggestibility (Cardeña, 2005; Cardeña, Jönsson, Terhune, & Marcusson-Clavertz, 2013; Hilgard, 1968; Ludwig, 1965). Taken together, these studies imply that hypnosis can elicit phenomena similar to those reported in relation to mystical-type experiences reported in other contexts.

Some research to date has considered hypnotically induced mystical-type experiences in a treatment context (Sacerdote, 1977; Meyerson & Gelkopf, 2004). One small study ( $N = 12$ ) used posthypnotic suggestions for participants to reexperience, remember, and recall a past MDMA (Ecstasy) psychedelic drug experience (Hastings, 2006). Most participants succeeded in experiencing the effects of the suggestion for an hour, as they carried out their choice of experiential activities in suburban home locations. Our research is the first to our knowledge to examine whether hypnotic suggestion can serve as a promising tool for producing mystical-type experiences in a laboratory setting.

In this initial exploratory study we do not attempt to tease apart the independent and potentially interactive effects of an hypnotic in-

duction and an imaginative suggestion to have a mystical experience. Rather, our research seeks to provide a “demonstration proof” of the viability of using hypnosis—in conjunction with an imaginative suggestion for a mystical-type experience—to produce mystical-type experiences under well-delineated and controlled antecedent conditions. If successful, this method would provide a useful vehicle to ultimately understand the cognitive, behavioral, emotional, and neurological correlates and determinants of mystical experiences; their sequelae; and their potential to promote healthy psychological functioning across research and clinical domains.

Researchers have reported that mystical-type experiences correlate with indices of transliminality (Ghorbani, Watson, Aghababaei, & Chen, 2014; Thalbourne, Bartemucci, Delin, Fox, & Nofi, 1997; Thalbourne & Delin, 1999), which capture the extent to which cognitions cross into and out of the threshold of consciousness (Thalbourne & Houran, 2000). Moreover, transliminality also correlates highly with a scale that measures hypnosis-related experiences, but the relation between hypnotic suggestibility assessed with a standardized scale and transliminality has not, as yet, been formally assessed (Cooper & Thalbourne, 2005). We would expect a correlation between hypnotic suggestibility and mystical experiences on the grounds that hypnotic suggestibility and mystical experiences may well both be associated with the facility with which suggested cognitions, perceptions, memories, and emotions readily cross the threshold of consciousness.

We would expect to find a correlation between hypnotic suggestibility and mystical-type experiences on empirical grounds, as well: Spanos and Moretti (1988) obtained significant correlations between hypnotic suggestibility and the Hood Mysticism Scale (Hood, 1975;  $r = .36-.39$ ) across objective and subjective measures of hypnotic suggestibility. The fact that absorption correlates with both mystical experiences and hypnotic suggestibility to a small extent, as noted above (Granqvist et al., 2015), also provides an impetus to more systematically study the link between hypnotic suggestibility and mystical-type experiences. Accordingly, another goal of our research was to examine the relation between mystical-type experiences and hypnotic suggestibility with a well-standardized

scale of hypnotic suggestibility. We hypothesized that the ability of a participant to experience a hypnotic suggestion for a mystical-type experience would vary in terms of their hypnotic suggestibility as indexed by such a scale.

The ability to study mystical-type experiences in the laboratory is made feasible by the existence of scales to assay mystical experiences on a quantitative basis. A final goal of our research was to provide data relevant to the construct validity of a recently developed measure of mystical-type experiences, the Mystical Experiences Questionnaire (MEQ30; MacLean et al., 2012; Pahnke, 1963, 1969). The MEQ30 was derived from Pahnke's (1963, 1969) measure of mystical experiences and developed in the context of Maclean, Johnson, and Griffiths's (2011) research assessing mystical-type experiences in research with psilocybin. In their psychometric validation of the MEQ30, the researchers found a robust and significant correlation ( $r = .81$ ) between the Hood Mysticism Scale total score and the MEQ30 (Maclean et al., 2012). Nevertheless, validity data on this promising measure is lacking apart from research using hallucinogenic substances (Barrett, Johnson, & Griffiths, 2015; Garcia-Romeu, Griffiths, & Johnson, 2014). Our study addresses this gap in our understanding of the construct validity of this measure by examining the MEQ30 in relation to (a) a single item scale we developed to measure participants' responses to a hypnotic suggestion for a mystical experience; (b) measures of subjective and behavioral responses to hypnotic suggestions; (c) the hypnoidal state subscale of the Phenomenology of Consciousness Inventory (PCI; Pekala, 1991), which correlates with self-reported depth of the experience of hypnosis (Pekala & Maurer, 2013); and (d) the Altered Experience (AE) scale of the PCI, which indexes alterations in consciousness similar to mystical-type experiences (e.g., altered sense of time). We predicted positive and significant correlations between the MEQ30 and each of these measures.

## Method

### Participants

At Binghamton University, 113 undergraduate students volunteered in exchange for course

credit. Of these participants, 29.2% ( $n = 33$ ) were men and 63.7% ( $n = 72$ ) were women, with .9% ( $n = 1$ ) reporting "other" in terms of gender, and 6.2% ( $n = 7$ ) not reporting. With respect to ethnicity, the percentages were as follows: 7.1% ( $n = 8$ ) African American, 13.3% ( $n = 15$ ) Asian American, 3.5% ( $n = 4$ ) biracial, 61.1% ( $n = 69$ ) White (non-Hispanic), 4.4% ( $n = 5$ ) Hispanic/Latino, and 5.3% ( $n = 6$ ) some other ethnicity, with 5.3% ( $n = 6$ ) not reporting.

### Materials

Minimum and maximum scores, means, standard deviations, and Cronbach's alpha values for each measure are presented in Table 1.

**Harvard Group Scale of Hypnotic Susceptibility, Form A (HGSHS:A; Shor & Orne, 1962).** The HGSHS:A is a widely used standardized self-report instrument designed to measure hypnotic responsiveness in a group context. The scale is administered as part of a hypnosis procedure, which includes a variety of physical (e.g., arm raising, arm lowering, etc.) and subjective (e.g., hallucination of a buzzing fly and amnesia) suggestions. Objective (HGSHS:O), Subjective (HGSHS:S), and Involuntariness (HGSHS:I) dimensions of the hypnosis experience are each assessed by separate questions pertinent to each of the 12 suggestions on the HGSHS:A.

For the objective measure, items are a simple endorsement of whether or not an outsider would have observed the participant as having performed a given suggestion (e.g., "My head fell forward at least two inches" versus "My head fell forward less than two inches"). Total scores can range from 0 to 12, with higher numbers suggesting a greater degree of responsiveness. For measures of subjective and involuntary responding, we used scales patterned after Braffman and Kirsch (1999), in which items assess to what degree the participant experienced the suggestion and to what degree they believed they could have chosen to not engage in the suggestion, respectively. For this study, items were scored from 0 (*not at all*) to 3 (*to a great degree*), with total scores ranging from 0 to 36 for both scales. Varga, Farkas, and Méréő (2012) found that the HGSHS:A has acceptable levels of internal consistency at .671 for the objective items. A suggestion for a mystical

Table 1  
*Descriptive Statistics, Cronbach's Alpha Scores, and Fisher's Z Comparisons Between the MER and MEQ30 for Variables in the Study*

Measure	Minimum	Maximum	<i>M</i>	<i>SD</i>	$\alpha$	Fisher's <i>z</i>
MER	1	4	2.14	.952	—	—
MEQ30	30	154	77.25	33.18	.96	—
MEQ-M	15	80	35.27	17.28	.93	—
MEQ-P	-8.9	33	17.50	7.62	.84	—
MEQ-T	-5.36	35	19.19	8.22	.83	—
MEQ-I	.04	18	8.17	4.16	.76	—
PCI						
AE	1	5.77	3.12	1.19	.89	-3.06*
HS	1.34	8.81	5.50	1.54	—	-1.33
HGSHS:A						
HGSHS:O	0	11	6.45	2.18	.67	-.64
HGSHS:S	2	31	14.11	7.04	.85	-.60
HGSHS:I	3	32	17.67	6.89	.83	-.72
PANAS						
PANAS+	18	48	32.87	6.80	.86	.25
PANAS-	10	48	23.14	8.97	.92	.99

*Note.* MER = Mystical Experience Response; MEQ30 = Mystical Experience Questionnaire total; MEQ-M = MEQ30 Mystical; MEQ-P = MEQ30 Positive Mood; MEQ-T = MEQ30 Time/Space; MEQ-I = MEQ30 Ineffability Scale; PCI = Phenomenology of Consciousness Inventory; AE = Altered Experience subscale; HS = Hypnoidal State subscale; HGSHS:A = Harvard Group Scale of Hypnotic Susceptibility, Form A; HGSHS:O = HGSHS:A Objective scale; HGSHS:S = HGSHS:A Subjective scale; HGSHS:I = HGSHS:A Involuntariness scale; HS = Hypnoidal State score; AE = Altered Experience score; PANAS+/- = Positive and Negative Affect Schedule Positive/Negative scale.

\*  $p < .05$ , two-tailed.

experience was added to the protocol, just prior to the end of the induction.

**Mystical Experience Response (MER).** Participants scored the suggestion for a mystical experience on a single question in terms of the degree to which they had a mystical experience on a four-item scale (0 = *not at all*, 1 = *to a slight degree*, 2 = *to a moderate degree*, and 3 = *to a great degree*). These anchors paralleled those used to assess subjective and involuntary responding for the 12 suggested responses that comprise the standard HGSHS:A.

**Phenomenology of Consciousness Inventory (Pekala, 1991).** The PCI is a 53-item, self-report instrument, which assesses diverse aspects of conscious experience that range across 12 dimensions of consciousness (further broken down into subdomains; e.g., Arousal, Self-Awareness, AE). Pekala (1991) reported that internal consistency scores ranged from .70 to .91 for each major PCI dimension. Items are scaled from 0 (e.g., the absence of a phenomenon) to 6 (e.g., continued or strong presence of the phenomenon). Pekala (1991) reported alpha

coefficients for the PCI as .82 for all major dimensions combined, and .75 to .82 for the AE domain, which we analyzed in our research. Although we administered the entire PCI, we analyzed only two of the PCI subscales: AE and Hypnoidal State (HS), the score from which incorporates items from different subscales. The PCI was completed with respect to the previous activity/mystical experience suggestion.

**Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988).** The PANAS is a 20-item measure designed to ascertain present positive and negative emotional state (Watson et al., 1988). Items include emotions such as “alert” and “ashamed,” with possible degrees of endorsement ranging from 0 (*very slightly or not at all*) to 4 (*extremely*) as to how much a participant felt that emotion, with a total range of scores from 0 to 80. Higher scores on the either the positive or negative affect scales reflect the degree to which a participant is experiencing a positive or negative emotional state. The present study examined positive and negative affect for the time the scale was ad-

ministered, after the hypnosis procedure. [Watson and colleagues \(1988\)](#) found Alpha coefficients for assessing these states at the time of the survey were .89 and .85 for the positive and negative scales, respectively. Similarly, they found an alpha coefficient for .87 for both positive and negative affect for the prior few weeks.

**Mystical Experiences Questionnaire** ([MacLean et al., 2012](#); [Pahnke, 1963, 1969](#)). The MEQ-30 is a 30-item instrument that is used to ascertain the qualities of mystical experiences following ingestion of a hallucinogen, which [MacLean and colleagues \(2012\)](#) adapted from [Pahnke's \(1963, 1969\)](#) longer scale used to assess mystical experiences. [MacLean et al. \(2012\)](#) identified four factors within the scale: a Mystical factor, Positive Mood, Transcendence of Time and Space, and Ineffability, each representing a different facet of mystical experience (see also [Barrett et al., 2015](#)). For the purposes of our research, instructions for the measure were changed to refer to participants' responses to the mystical experience suggestion, rather than the effect of any hallucinogenic drug. Items are measured on a scale of 1 (*none; not at all*) to 6 (*extreme; more than any other time in my life and stronger than 4*), and include items such as "experience of timelessness" and "feelings of peace and tranquility." Total scores on the measure can range from 30 to 180, with higher scores suggesting a stronger mystical-type experience. Following [Barrett et al. \(2015\)](#), we adopted a cutoff of at least 60% of the maximum possible score on each of the four factors/subscales of the MEQ30 to derive a "complete" mystical-type experience dichotomous score.

## Procedure

Participants volunteered to participate in this study, entitled "Hypnosis and Experiences," in exchange for course credit. They were recruited through an online system (SONA) that provides descriptions of experiments and matches student volunteers to specific studies. The Binghamton University's Human Subjects Review Board approved the research.

A male graduate student in clinical psychology trained in administering group hypnosis procedures and supervised by the first author (S. J. L.) conducted the study. As customary in

our hypnosis research, a monitor was present in the room, and no untoward reactions were observed during hypnosis or reported following hypnosis. Participants were tested in a large room, with comfortable seating, in groups that averaged 14 participants.

After participants arrived and were seated, they were presented with the PANAS first, followed by introductory comments and the 12 suggestions that comprised the HGSHS:A. After the final suggestion, immediately prior to the termination of the hypnotic induction and self-scoring of hypnosis responses, participants received the following suggestion for a mystical-type experience:

What I would like you to do is experience a mystical or peak experience today. We believe that it will be possible for you to experience most, if not all of the experiences I will suggest. Get comfortable and relax and feel this sense of calmness deepening as you sit here and do your best to experience what I am suggesting to you.

I would like you to get in touch with yourself, deeply in touch with yourself, and fully become aware of yourself in relation to your inner world, deeply in touch with your inner world and accepting of all that you experience, recognizing that you can learn to have an enhanced sense of yourself, an expanded sense of yourself . . . just let this happen. You can summon all of your senses, be in tune with all of your senses, to become more and more aware of the world within and the world without, that is, the world beyond your ordinarily limited experience of yourself, going beyond your usual self-limitations to encounter a deep connection with all that is around you, a connection that extends to plants, and animals, and all things, your gaining a deep sense of awareness of yourself and your connection with all living and nonliving things that share this world with you, this universe with you. You can get a sense of the boundaries getting smaller and smaller between yourself and the wonderful creations of all that exist in this world, this universe, consisting of stars, planets, comets, satellites, with unknown possibilities for awareness of so much beyond yourself.

Feel yourself part of a larger whole, a way of enriching your sense of being, your sense of awareness, your sense of connection, your sense of meaning in the beauty of the moment, the beauty of a sunset, the beauty of a moonrise, the rhythm of the waves, of the tides, the rhythm of your breath, the rhythm of the world spinning on its axis and moving around the sun, every day, every month, every year, time moving from the past to the present to the future, seamlessly into eternity, and you are a part of it all, a part of something so special, so mysterious, so awesome, so amazing, and you are increasingly aware of just how amazing and special your life is, each moment of your life, and you gain a special sense of merging in a safe way with a larger whole, a greater sense of being, a greater

capacity to love and feel empathy for all living things that are a part of this amazing world, a sense of all this that goes beyond words and may be difficult to even describe, you can experience this if you let this all happen. You can connect with experience on a more intuitive level, a level of greater understanding and depth, a sense of how special and sacred it is to be alive, reaching a sense of greater understanding, feeling awe in the face of a higher reality that binds all things together in a more meaningful whole—just like each part of a tapestry or beautiful painting creates a new whole, larger than any one part; a sense of yourself as part of an eternal landscape of wondrous experience of the universe, beyond any one time, any one place; a sense of timelessness, a connection with eternity, the ever-lasting presence of an enveloping universe, knowing that there is a greater reality beyond what we experience at any given moment, and you are a part of this ultimate reality, which you can experience on a higher order, a grander order, reaching new heights of appreciation for all that you can see and all that you cannot see, taste, touch, hear, and smell, and as you take on this new level of understanding, of comprehension, perhaps you can feel a sense of peace and tranquility that can extend to joy, joyful experience, of ecstasy that accompanies a sense of wonder and awe for all creation.

After this final suggestion, participants self-scored their responses to the suggestions, as described above. The scoring was followed by two waves of measures presented in a randomized order within each wave. The first wave included the MER and a second administration of the PANAS, and the second wave included the PCI, and the MEQ30. Finally, participants were debriefed regarding the procedures.

## Results

Descriptive statistics, Cronbach's alpha scores, and Fisher's  $z$  comparisons between the MEQ30 and MER are depicted in Table 1. We conducted a preliminary multivariate analysis of variance (MANOVA) to assess for possible gender effects, which was not significant,  $\lambda = .70$ ,  $F(12, 84) = 1.38$ ,  $p = .126$ ,  $\eta_p^2 = .16$ . We performed a second MANOVA to determine the effects of ethnicity on the same dependent measures. Due to unequal sample sizes, participants were combined into two groups: White ( $n = 63$ ) and non-White ( $n = 35$ ). The MANOVA was not significant,  $\lambda = .81$ ,  $F(12, 85) = 1.66$ ,  $p = .091$ ,  $\eta_p^2 = .19$ . Accordingly, subsequent analyses were collapsed across sex and ethnicity.

In total, the 4.8% of item responses were missing. A Little's missing-completely-at-random test was performed,  $\chi^2(1,473) = 1,360.$

05,  $p = .983$ , and was nonsignificant, indicating that the data are missing completely at random (Little, 1988). Using criteria suggested by Scheffer (2002) and Graham (2009; i.e., less than 5% of missing data and data missing completely at random), a single imputation, expectation maximization procedure was performed using SPSS Version 22 to impute the missing data.

We set significance thresholds for correlations at  $p = .01$  (two-tailed) to establish a balance between Type I and Type II errors in an exploratory study with clear and directional predictions regarding correlations. We obtained significant correlations between the variables of interest in the study (i.e., MER; the Objective, Subjective, and Involuntariness scales of the HGSHS:A; the Mystical, Transcendent, Positive Mood, Ineffability, and total MEQ30 scores; AE; HS; and PANAS), which can be found on Table 2. The MER did correlate significantly with the MEQ30 total, ( $r = .63$ ) as well as the HGSHS:A Objective ( $r = .29$ ), Subjective ( $r = .49$ ), and Involuntariness ( $r = .49$ ) scales. The MEQ30 also correlated with the HGSHS:A Objective ( $r = .37$ ), Subjective ( $r = .55$ ), and Involuntariness ( $r = .56$ ) scales. Fisher's  $z$  scores were calculated to determine whether differences emerged in the correlations of hypnotic suggestibility and other measures assessed with regard to the two measures of mystical experiences (i.e., MER, MEQ30; see Table 1). Of the correlations compared, only the AE scale from the PCI yielded a significant difference in correlations between the measures of mystical experiences ( $r$  MER = .53,  $p < .001$  vs.  $r$  MEQ30 = .76,  $p < .001$ ). The amount of overlap in the pattern of correlations between the MER and the MEQ30 and other measures was expected, as both were designed to assess mystical experiences. We performed two regression analyses to examine the predictive value of study measures on the MER and MEQ30. We first conducted a regression analysis on the MER with the MEQ30, AE, HS, HGSHS:A, HGSHS:O, HGSHS:S, and HGSHS:I entered as predictors. The model was significant,  $F(6, 95) = 12.12$ ,  $p < .001$ , with an  $R^2$  of .43 (adjusted  $R^2 = .40$ ). Beta weights, significance values, and collinearity statistics for predictors in the regression analyses can be found on Table 3. The regression equation has the MER equal to  $.01(\text{MEQ30}) - .06(\text{AE}) + .11(\text{HS}) + .01(\text{HGSHS:I}) + .02(\text{HGSHS:S}) - .03(\text{HGSHS:O}) + .02$ . The MEQ30 emerged as the only inde-

Table 2  
Correlations Among the MER, MEQ and Other Variables

Measures	1	2	3	4	5	6	7	8	9	10	11	12	13
MER	1												
MEQ30	.63**	1											
MEQ-M	.60**	.97**	1										
MEQ-P	.61**	.90**	.81**	1									
MEQ-T	.55**	.89**	.78**	.75**	1								
MEQ-I	.62**	.92**	.86**	.84**	.77**	1							
PCI													
HS	.52**	.64**	.54**	.64**	.73**	.63**	1						
AE	.53**	.76**	.66**	.74**	.76**	.74**	.78**	1					
HGSHS:A													
HGSHS:O	.29*	.37**	.31**	.37**	.35**	.41**	.39**	.39**	1				
HGSHS:S	.49**	.55**	.46**	.53**	.58**	.56**	.56**	.47**	.66**	1			
HGSHS:I	.49**	.56**	.49**	.50**	.57**	.59**	.56**	.48**	.67**	.90**	1		
PANAS													
PANAS+	.45**	.42**	.41**	.49**	.30**	.31**	.26**	.30**	.17	.27*	.27*	1	
PANAS-	.03	-.11	-.11	-.09	-.11	-.10	-.15	-.01	.09	.09	.02	-.06	1

Note. MER = Mystical Experience Response; MEQ30 = Mystical Experience Questionnaire total; MEQ-M = MEQ30 Mystical; MEQ-P = MEQ30 Positive Mood; MEQ-T = MEQ30 Time/Space; MEQ-I = MEQ30 Ineffability Scale; AE = Altered Experience subscale; HS = Hypnoidal State subscale; HGSHS:A = Harvard Group Scale of Hypnotic Susceptibility, Form A; HGSHS:O = HGSHS:A Objective scale; HGSHS:S = HGSHS:A Subjective scale; HGSHS:I = HGSHS:A Involuntariness scale; HS = Hypnoidal State score; AE = Altered Experience score; PANAS+/- = Positive and Negative Affect Schedule Positive/Negative scale.

\*  $p < .01$ . \*\*  $p < .001$ .

pendently significant predictor from the regression analysis. We then performed a regression analysis on the MEQ30 with the MER, HGSHS:A Objective, Subjective, and Involuntariness scores, and the AE and HS scores as predictors. The model was significant,  $F(6, 95) = 46.38, p < .001$ , with

an  $R^2$  of .75 (adjusted  $R^2 = .73$ ). The regression equation that emerged was  $8.02(\text{MER}) + 20.79(\text{AE}) - 3.74(\text{HS}) + .70(\text{HGSHS:I}) + .79(\text{HGSHS:S}) - 1.47(\text{HGSHS:O}) - 13.78$ , and the sole independently significant predictor in this model was the AE scale.

Table 3  
Beta Weights for Predictors of the MER and MEQ30 in a Regression Analysis

Dependent variable	Measure	Statistic				VIF
		B	$\beta$	t	p	
MER	MEQ30	.01	.48	3.31	.001	3.52
	AE	-.06	-.08	-.46	.644	4.70
	HS	.11	.16	1.23	.222	3.00
	HGSHS:I	.01	.07	.35	.728	5.94
	HGSHS:S	.02	.15	.82	.417	5.84
	HGSHS:O	-.03	-.07	-.61	.544	1.89
MEQ30	MER	8.02	.22	3.31	.001	1.58
	AE	20.79	.71	8.36	<.001	2.72
	HS	-3.74	-.16	-1.78	.079	2.95
	HGSHS:I	.70	.14	1.15	.255	5.86
	HGSHS:S	.79	.15	1.22	.224	5.79
	HGSHS:O	-1.47	-.10	-1.45	.150	1.85

Note. MER = Mystical Experience Response; MEQ30 = Mystical Experience Questionnaire; AE = Altered Experience score; HS = Hypnoidal State score; HGSHS:O = Harvard Group Scale of Hypnotic Susceptibility, Form A (HGSHS:A) Objective scale; HGSHS:S = HGSHS:A Subjective scale; HGSHS:I = HGSHS:A Involuntariness scale.

To examine the effects of hypnotic suggestibility across three (i.e., low, medium, high) levels of suggestibility, we performed a MANOVA (low, medium, and high) on the MER, MEQ30, AE, and HS. All post hoc tests were performed using a Bonferroni correction. Scores on the HGSHS:A objective scale were separated into low (0–3;  $n = 11$ ), medium (4–8;  $n = 72$ ), and high (9–12;  $n = 19$ ) suggestibility based on the number of suggestions passed. This cutoff is most commonly/conventionally used in studies that classify participants into high, medium, and low suggestible in the hypnotic context (Green, Lynn, & Carlson, 1992). Researchers typically distinguish among high, medium, and low suggestible participants, as relatively high suggestibility may be prerequisite to experience certain cognitively demanding suggestions, such as for a hallucination and perhaps a mystical-type experience suggestion. The MANOVA was significant,  $\lambda = .77$ ,  $F(4, 192) = 3.41$ ,  $p = .001$ ,  $\eta_p^2 = .12$ . For the MER,  $F(2, 102) = 3.53$ ,  $p = .044$ ,  $\eta_p^2 = .06$ , individuals high in hypnotic suggestibility ( $M = 2.53$ ,  $SD = .94$ ) were more likely to report having a mystical-type experience to a greater degree compared with individuals low in hypnotic suggestibility ( $M = 1.64$ ,  $SD = 1.03$ ). Participants who score in the medium range of hypnotic suggestibility ( $M = 2.19$ ,  $SD = .93$ ) were indistinguishable from highs and lows. Similarly, for the MEQ30,  $F(2, 99) = 7.50$ ,  $p = .001$ ,  $\eta_p^2 = .13$ , individuals high in hypnotic suggestibility ( $M = 107.38$ ,  $SD = 36.31$ ) were more likely to report aspects of mystical-type experiences than individuals medium ( $M = 78.07$ ,  $SD = 32.09$ ) and low ( $M = 65.36$ ,  $SD = 33.63$ ) in hypnotic suggestibility. Participants who were medium in hypnotic suggestibility, in turn, reported more mystical-type experiences than individuals low in hypnotic suggestibility.

Additionally, for the AE,  $F(2, 99) = 9.59$ ,  $p < .001$ ,  $\eta_p^2 = .16$ , individuals high in hypnotic suggestibility reported stronger alterations in conscious experience ( $M = 4.08$ ,  $SD = 1.19$ ) than participants at medium ( $M = 3.13$ ,  $SD = 1.09$ ) and low ( $M = 2.32$ ,  $SD = 1.05$ ) levels of hypnotic suggestibility, although mediums and lows did not differ from each other. Finally, for HS,  $F(2, 99) = 11.25$ ,  $p < .001$ ,  $\eta_p^2 = .185$ , we found that individuals high in hypnotic suggestibility ( $M = 6.72$ ,  $SD = 1.04$ ) were more likely to score higher on this index of a hypnoidal state

than medium ( $M = 5.57$ ,  $SD = 1.39$ ) in hypnotic suggestibility, who, in turn, scored higher than individuals low ( $M = 4.33$ ,  $SD = 1.56$ ) in hypnotic suggestibility. These findings support our hypothesis and suggest that hypnotic suggestion is a viable means of inducing a mystical-type experience.

We also performed regression analyses on each of the Objective, Subjective, and Involuntariness scores of the HGSHS:A. Beta weights, significance values, and collinearity statistics for predictors in these regression analyses can be found on Table 4. For the HGSHS:O, with the HS, AE, MEQ30, and MER scores as predictors, the model was significant,  $F(4, 97) = 5.15$ ,  $p = .001$ , with an  $R^2$  of .18 (adjusted  $R^2 = .14$ ). The equation for the regression was  $.36(\text{HS}) + .17(\text{AE}) + .01(\text{MEQ30}) + .14(\text{MER}) + 2.58$ ; however, no predictor emerged as independently significant.

For the HGSHS:S, with the HS, AE, MEQ30, and MER as predictors, the model was significant,  $F(4, 98) = 17.88$ ,  $p < .001$ , with an  $R^2$  of .42 (Adjusted  $R^2 = .40$ ). The equation for the regression was  $2.07(\text{HS}) - 1.88(\text{AE}) + .08(\text{MEQ30}) + 1.10(\text{MER}) + 15.42$ , with the HS, AE, and MEQ30 as independently significant predictors. Finally, for the HGSHS:I, with the HS, AE, MEQ, and MER as predictors, the model was significant,  $F(4, 98) = 17.66$ ,  $p < .001$ , with an  $R^2$  of .42 (adjusted  $R^2 = .40$ ). The resulting equation was  $1.79(\text{HS}) - 1.27(\text{AE}) + .09(\text{MEQ30}) + 1.07(\text{MER}) + 11.37$ , with the HS and MEQ30 emerging as independently significant predictors.

We also examined the frequencies of participants who reported different degrees of mystical experience based on the MER, with the distribution as follows: not at all (score 0;  $n = 32$ ; 28.31%), slight (score 1;  $n = 39$ ; 34.51%), moderate (score 2;  $n = 29$ ; 25.66%), and great (score 3;  $n = 10$ ; 8.85%). Using the 60% threshold for a complete mystical-type experience, 22.12% ( $n = 25$ ) of participants met the criterion.

## Discussion

In this study, we sought to determine whether it is possible to elicit mystical-type experiences in the laboratory. To do so, we administered a standardized scale of hypnotic responsiveness followed by a suggestion for a mystical-type experience. We assessed (a) the base-rate of

Table 4  
Beta Weights for Predictors of the HGSHS:O, HGSHS:S, and HGSHS:I in a Regression Analysis

Dependent variable	Measure	Statistic				VIF
		<i>B</i>	$\beta$	<i>t</i>	<i>p</i>	
HGSHS:O	HS	.36	.22	1.47	.145	2.66
	AE	.17	.08	.43	.669	4.41
	MEQ30	.01	.12	.69	.492	3.48
	MER	.14	.05	.45	.656	1.72
HGSHS:S	HS	2.07	.46	3.64	<.001	2.73
	AE	-1.88	-.34	-2.05	.043	4.53
	MEQ30	.08	.44	3.02	.003	3.55
	MER	1.10	.15	1.52	.133	1.74
HGSHS:I	HS	1.79	.38	2.95	.004	2.73
	AE	-1.27	-.21	-1.30	.196	4.53
	MEQ30	.09	.43	2.94	.004	3.55
	MER	1.07	.14	1.39	.169	1.74

*Note.* MER = Mystical Experience Response; MEQ30 = Mystical Experience Questionnaire; AE = Altered Experience score; HS = Hypnotic State score; HGSHS:O = Harvard Group Scale of Hypnotic Susceptibility, Form A (HGSHS:A) Objective scale; HGSHS:S = HGSHS:A Subjective scale; HGSHS:I = HGSHS:A Involuntariness scale.

response to the latter suggestion; (b) the role that hypnotic suggestibility plays in the facilitation of mystical-type experiences; and (c) the relations among measures of hypnotic responsiveness, mystical experiences, and altered consciousness. We hypothesized that reports of mystical experience would vary with hypnotic responsiveness, that we would accrue further support for the construct validity of measures of mystical experience, and that we would obtain evidence linking reports of the experience of an altered state during hypnosis to posthypnotic reports of a mystical-type experience. We found support for each of these hypotheses, as we elaborate in the discussion that follows.

Perhaps most importantly, we succeeded in providing a demonstration proof of the potential value of hypnosis in the study of mystical-type experiences. More specifically, we obtained support for the viability of hypnosis as a vehicle for inducing mystical experiences, particularly among participants who possess a relatively high degree of hypnotic suggestibility. Given the potential of negative effects of using psilocybin as a pharmacological intervention to produce mystical experience (Griffiths et al., 2006), in contrast with the negligible risks of hypnosis (Lynn et al., 1996), our preliminary findings bode well for the use of hypnotic suggestion as a tool for examining mystical-type experiences in the laboratory.

Still, our research suggests that a minority of individuals will experience a hypnotically facilitated mystical-type experience under these circumstances. That is, less than 10% (8.85%) of participants reported that they experienced the suggestion for a mystical experience (MER scale) to a “great degree,” and slightly more than a quarter of participants (26.66%) experienced the suggestion to a “moderate degree.” Moreover, 22.1% of participants experienced a “complete” mystical experience based on the criterion proposed by Barrett et al. (2015), which was found to predict positive outcomes of mystical-type experiences, such as increased openness to experience (MacLean et al., 2011). Accordingly, more than a third of our sample experienced the mystical experience suggestion to a great or moderate degree.

Although our findings do provide initial support for using hypnosis to elicit mystical-type experiences, much more work is called for. For example, we did not obtain detailed reports of participants’ mystical experiences, and the comparability between mystical-type experiences elicited in response to our suggestion and mystical experiences that arise in other contexts has yet to be determined.

As we predicted, hypnotic suggestibility was correlated with mystical-type experiences, thereby replicating Spanos and Moretti’s (1988) earlier results. More specifically, we obtained

significant correlations between the multifactorial MEQ30 and hypnotic suggestibility in terms of measures of objective ( $r = .37$ ), subjective ( $r = .55$ ), and involuntary ( $r = .56$ ), responding. Relatedly, the single item MER scale also correlated significantly with objective ( $r = .29$ ), subjective ( $r = .49$ ), and involuntary ( $r = .49$ ) responding. Further research that explores the potential moderating and mediating role of transliminality in the relation between hypnosis and mystical-type experiences is called for.

We also examined mystical-type experiences as a function of hypnotic suggestibility in multivariate analyses. We determined that individuals classified as highly suggestible reported a greater degree of mystical-type experience (based on the MER scale) following a hypnotic suggestion for a mystical experience, compared with individuals low in hypnotic responsiveness, but not individuals with medium hypnotic suggestibility.

The MEQ30 index of mystical experiences was even more successful in discriminating individuals across hypnotic suggestibility levels. That is, individuals high in hypnotic suggestibility reported more elements of mystical experiences compared with participants both medium and low in hypnotic suggestibility, and those individuals with a medium degree of suggestibility reported more elements compared with those low in hypnotic suggestibility. These findings extend prior research with the MEQ30 administered in an online sample to assess past mystical experiences induced both during the administration of psilocybin (Maclean et al., 2012) and immediately following experimental sessions in which psilocybin was administered (Barrett et al., 2015).

Our findings further demarcate the borders of the construct of mystical experience as encompassing hypnotic responsiveness. Our study also suggests that the MEQ30 may be more sensitive in assessing mystical experiences, at least in a hypnotic context, than the single question (MER) regarding the degree of response to the mystical experience hypnotic suggestion.

Hypnotic scores followed a pattern similar to that of MEQ30 scores. More specifically, and as expected, highly suggestible participants reported higher hypnotic state scores than individuals both medium and low in suggestibility, with medium suggestible participants scoring

higher than low suggestible individuals. These findings support the use of the HS as an index of hypnotic responsiveness, although it is not clear whether the HS, if administered in a nonhypnotic setting, would retain its value as a measure of hypnotic responsiveness. Highly suggestible participants reported higher AE scores than did their medium and low suggestible counterparts, although mediums and lows did not differ from each other, once again providing support for an association between hypnotic suggestibility and alterations of consciousness. We also examined the ability of the HS, AE, MER, and MEQ30 to predict each of the three dimensions of hypnotic suggestibility (i.e., objective, subjective, involuntariness). Our analyses revealed that in the case of HGS: A objective/behavioral scores, none of the measures of mystical-type or hypnosis-related or altered experiences emerged as independent predictors. In contrast, the HS, AE, and MEQ30 succeeded in predicting the subjective response to hypnosis, whereas the HS and MEQ30 succeeded in predicting involuntary responses to hypnosis. That is, although participants' reports of mystical-type and hypnotic state experiences did not predict behavioral displays of hypnotic responsiveness, their reports did predict subjective and involuntariness-related experiences of hypnosis. These findings support the use of the HS and the PCI as indices of subjective phenomenological experiences consistent with hypnosis and also highlight the particular relevance of subjective experiences, such as mystical-type experiences, as predictors of subjective dimensions of hypnotic responsiveness.

Our research afforded the opportunity to evaluate the construct validity of our two measures of mystical experiences. In addition to the relations we established between measures of hypnotic suggestibility and the single item MER, we ascertained that the latter scale correlated highly with the MEQ30 total score ( $r = .63$ ), reflecting substantial convergence between these measures of mystical experience. This finding might imply that very brief measures, such as the MER, might prove useful in assaying mystical-type experiences, although additional research is required to support this possibility.

We derived support for the construct validity of our measures of mystical experiences from additional analyses. For example, regression

analyses revealed that the best and sole predictor of subjective report of a mystical-type experience following a hypnotic suggestion (MER scale), was the MEQ30 measure, suggesting that endorsement of more items related to timelessness and spacelessness, positive affect, ineffability, and other experiences with a mystical quality covaried with ratings of the subjective degree of response based on the MER scale in reference to the suggested mystical-type experience. Given that the MEQ30 was expressly designed to assess mystical experiences, our study provides additional support for the construct validity of the MEQ30. Similarly, the MER and AE significantly predicted scores on the MEQ30, suggesting that the subjective degree of mystical experience following hypnosis, as well as reports of altered or unusual experiences, covaried with reports of experiences that typify a mystical experience. Although none of the HGSHS scales (Objective, Subjective, or Involuntariness) significantly predicted either the MER or the MEQ30 in the regression analysis, the variance inflation factor for each variable indicated a high degree of multicollinearity across regression analyses, such that these findings should be interpreted with caution.

The MER and the MEQ30 also exhibited a similar pattern of significant correlations with other measures, providing further evidence of construct validity for both measures. Examination of the Fisher's  $z$  of correlations among study variables and the MER and MEQ30 reveal a significant overlap between the two measures. That is, the only correlations that differed statistically between the two measures of mystical-type experience following hypnosis, vis-à-vis other measures, was in relation to the AE scale. Nevertheless, both correlations were highly significant, in excess of  $r = .50$ . The single item MER, in contrast with the multidimensional MEQ30, may well fail to capture the richness of experience, which would account for why the two measures differ with respect to the AE scale, which assays the degree and quality of altered consciousness (e.g., distorted sense of body image, time, perception, and meaning).

A number of other findings are noteworthy. Given that the suggestion for mystical-type experiences called for alterations in consciousness and increased positive affect, it is not surprising that responses to the MER scale were signifi-

cantly correlated with measures of altered experience and positive affect. Relatedly, the MEQ30 also correlated highly and significantly with measures of altered consciousness (AE:  $r = .76$ ; HS:  $r = .64$ ). Although the MEQ30 total score ( $r = .42$ ) and MEQ30 Positive Mood scale ( $r = .49$ ) both correlated significantly with positive affect, the Positive Affect scale, embedded in the MEQ30, may account for the significant link between positive affect (PANAS) and the MEQ30 total score.

Researchers have derived four distinct factors/subscales based on MEQ30 items (MacLean et al., 2012). The PANAS's positive affect scale significantly correlated with all MEQ30 scales. Further, all four factors of the MEQ30 correlated with the MER, HS, AE, and Harvard hypnotic suggestibility scales. Inspections of correlations in Table 2 reveals that the pattern of correlations of the total MEQ30 score with the latter measures closely traced the pattern of the correlations of the subscale scores with these measures. There was no significant correlation between negative affect and the MEQ30 subscales or total score, or any other measure in the study, with exception of a negative relation with the AE scale. Significant correlations between the AE scale and the Objective ( $r = .39$ ), Subjective ( $r = .47$ ), and Involuntariness ( $r = .48$ ) scales of hypnotic suggestibility support Cardeña's (2005) findings linking hypnotic responsiveness with altered experiences.

Our findings imply that the use of a hypnosuggestive approach may present researchers with a viable pathway to studying mystical experiences in the laboratory. This approach may provide an alternative to or supplement the study of mystical-type experiences elicited by pharmacological and other interventions. Still, the current study was limited to investigating whether hypnosis, combined with a mystical experience suggestion, could generate a mystical-type experience. Future investigations will need to examine the independent and potentially interactive effects of (a) an hypnotic induction and (b) of providing imaginative suggestions for a mystical experience on the report of mystical-type experiences. That is, it will be important for researchers to tease apart the role of defining the situation as hypnosis (i.e., hypnotic induction) from the role of imaginative suggestions for mystical experiences in produc-

ing mystical experiences. Relaxation and placebo control conditions (e.g., an inert pill to “produce mystical experiences”), as well as conditions in which participants are not actually hypnotized, but are instructed to simulate hypnosis and the report of mystical-type experiences, are viable candidates for inclusion in research designs that follow-up on our preliminary findings. It will also be important to determine the role that situational cues, expectancies, nonhypnotic suggestibility, compliance, and demand characteristics play in the report of mystical-type experiences in the laboratory and to exploit brain imaging techniques to study mystical experiences instigated by hypnotic suggestion and other methods (Carhart-Harris et al., 2016). Moreover, future research will be needed to: (a) determine the comparability of hypnotically elicited and pharmacologically elicited mystical-type experiences and mystical experiences induced by other “natural” means (e.g., fasting, meditation); (b) examine the long-term impact, if any, of hypnotically induced mystical experiences on measures of positive functioning, adjustment, and psychopathology; and (c) address the question of whether induced mystical-type experiences are anything more than the creative use of imagination by examining the relation of mystical-type experiences to a variety of measures of imaginative involvement and imagery vividness, along with indices of emotions and attributions associated with mystical-type experiences.

There is a pressing need for concerted research on mystical-type experiences in a variety of domains of investigation. Nevertheless, in the current study, we garnered preliminary evidence for the potential to employ hypnotic suggestion to induce potentially replicable mystical-type experiences under controlled, time-bound laboratory conditions. We hope that our research stimulates much needed research on the topic of mystical experiences with vast possibilities to enrich and expand our understanding of largely uncharted dimensions of human experience and potential.

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