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Mystical and Other Alterations in Sense of Self: An Expanded Framework for Studying Nonordinary Experiences

Ann Taves

Introduction

Although many researchers in psychology, religious studies, and psychiatry recognize that there is overlap in the experiences their subjects recount, disciplinary silos and the challenges involved in comparing reported experiences have left us with little understanding of the mechanisms, whether biological, psychological and/or socio-cultural, through which these experiences are represented and differentiated. Beginning with DSM-IV (American Psychiatric Association, 1994), the American Psychiatric Association recognized, for example, that hallucinations and dissociation may be a normal part of religious experience in some cultural contexts (Mezzich et al. 1999). DSM-V (American Psychiatric Association, 2013, p. 14) explicitly acknowledged that “mental disorders are defined in relation to cultural, social, and familial norms and values.” In psychology, researchers have studied disparate experiences, including lucid dreaming, out-of-body experiences, hallucinations, mental healing, past-lives, near-death experiences, mystical experiences, and alien abductions, under the rubric of anomalous experiences (Cardeña, Lynn, & Krippner, 2000, 2014). What counts as anomalous, however, is not well defined and cross cultural research on such experiences has faced much the same limitations as cross-cultural research on experiences considered religious and pathological (Maraldi & Krippner, 2019). In religious studies, scholars are well aware that virtually all religious groups and traditions valorize experiences that they view as sources of new insight and means of transforming self and world and, at the same time, disparage others that they view as idolatrous, superstitious, or simply as hindrances or distractions. Thus, most scholars of religion

(Proudfoot, 1985; Martin, 2016; Taves, 2009a) have rejected the claim that religious experience constitutes the core of religion-in-general in favor of the view that what counts as a religious experience is highly dependent on the interpretive frame that the individual, group, or tradition brings to it.¹ While scholars of religion often recognize this, they, like researchers in psychology and psychiatry, generally do not consider the implications of the resulting overlap in designing their studies.

Psychologists are clarifying some of the issues that have made it difficult to compare experiences and investigate underlying mechanisms. Philosophically oriented psychologists are insisting on careful distinctions between the self of first person awareness (the conscious, subjective sense of self) and the diverse neural components that interact to produce that awareness (S. B. Klein, 2012a, 2012b; Metzinger, 2005). Cultural psychologists, relying in increasingly sophisticated self-report measures are producing a more nuanced understanding of the interaction between culture and the sense of self (Markus & Kitayama, 2010), including the effect of religious heritage on regional differences (Vignoles et al., 2016).

In the psychology of religion, the situation is different (for an overview, see Taves, in press).² In this subfield, the leading graduate textbook has for many years made a sharp

¹ This does not necessarily hold true for philosophers of religion, some of whom still make a case for religious experience as evidence of truth claims (see, e.g., Alston, 1993; Davis, 1999).

² Taves (in press), a chapter on “Psychology of Religion Approaches to the Study of Religious Experience,” will appear in the *Cambridge Handbook of Religious Experience*, the first such handbook since Hood (1995). The chapter gives an overview of the range of experiences – sudden and gradual – discussed in the current psychological of religion literature, along with the measures used to study them, the problems with and limitations of current practice, and suggestions for moving forward. In contrast to Hood, the generally recognized expert on the psychology of religious and mystical experience, the chapter treats mystical experience under the rubric of religious experience. The present article was conceived as a companion piece that would offer a full rationale for that decision. It thus focuses on a specific kind of experience that some researchers have sheltered from comparison with other experiences, rather than on the full range of experiences studied by psychologists of religion. Finally, although the expanded framework for studying nonordinary experiences, including various alterations in sense of self, proposed in both the chapter and this article is motivated by the desire to overcome the traditional Western biases in the study of religion, both focus on the limitations of the traditional categories rather than the experiences

distinction between religious and mystical experience (Spilka et al., 1996, 2003; Hood, Hill, and Spilka, 2009, 2018). In this view, religious experience is the product of the interaction between culture, self, and underlying neural mechanisms, but mystical experience is granted an exceptional status. Thus, although the authors agree that virtually any experience can be viewed as religious based on how it is appraised, they refer to mystical experience as *sui generis*, that is, as forming a distinct “kind” that retains a recognizable form even if the experiences are named and interpreted in culturally distinct ways. As such, they maintain, it potentially constitutes a “common core” amidst acknowledged religious and cultural differences.³

Those who grant mystical experiences an exceptional status typically do so based on a narrow definition that should not be confused with the broad definitions adopted by others (for overviews, see Kelly & Grosso, 2007; Wulff, 2014). When broadly conceived, the concept may include a wide range of unusual sensory experiences, such that it is largely synonymous with “religious experience” (see, e.g., Anderson, Schjoedt, Nielbo, & Sørensen, 2014; Hollenback, 1996). When narrowly conceived, it is typically characterized as a highly positive experience in which the sense of self disappears or is absorbed into something larger. This positively-valenced alteration in the sense of self has been variously characterized as an experience of “undifferentiated unity” (Stace, 1960), “the pure consciousness experience” (Forman, 1998), or “absolute unitary being” (D’Aquili & Newberg, 1999).

valorized and cultivated by various practice traditions in Western and non-Western contexts. Interested researchers may look to other chapters in the *Cambridge Handbook* for more detail on specific traditions.

³ Debates over whether religion, religious experience, or more narrowly mystical experience is *sui generis* have a long and contentious history in religious studies with considerable disagreement over what was being affirmed or denied (Pals, 1987). Hood uses the concept to assert that mystical experiences are “real” in two very different senses: real in the sense that people do have unusual, highly transformative experiences and real in the sense that the experiences tell us something about Ultimate Reality.

In the 1970s, psychologists Ralph Hood and W. A. Richards independently operationalized Stace's narrow definition of mysticism in two widely used self-report scales: the Mysticism Scale (M-Scale; Hood, 1975) and the Mystical Experiences Questionnaire (MEQ; MacLean et al., 2012; Richards, 1975). Based on data subsequently collected with these two scales, Hood (2013) and Richards (2015) have reasserted the case for a "common core" of mystical experience masked by different interpretations, along the lines suggested by Stace. On the basis of this evidence, Hood has reiterated that "mysticism is the best candidate for a distinct, *sui generis* experience that has been recognized across diverse traditions and cultures" (Hood, Hill, & Spilka, 2018, pp. 355, 383-388; Streib, Klein, Keller, & Hood, 2020).

The question of whether mystical experiences can or should be set apart from other experiences variously deemed religious, anomalous, and pathological has significant implications. First, it raises the question of who gets to say whether, in what way, and on what grounds they are exceptional. Although individuals, groups, and traditions routinely valorize and seek to cultivate experiences they view as sacred or transcendent or otherwise connect to the spiritual path they endorse, they typically support their claims by linking the subjective character and/or the effects of the experience with claims about Ultimate Reality based on revelation and/or tradition. Scientific researchers also rely on subjective reports of experiences and evidence of the on-going effects of experiences, which they can correlate with biological, psychological, and socio-cultural observations (S B. Klein, 2015), but they have no scientific basis for making theological claims regarding the common core of all religions or the presence of an Ultimate Reality that unites them. If scientists fail to make a clear distinction between scientific claims based on empirical evidence that is in principle accessible to all and theological

claims based on revelation or tradition, they risk setting mystical experiences apart from other similar experiences on theological rather than scientific grounds.

The first two sections of the paper – “The Theoretical Basis of the Mysticism Scales” and “The Development, Validation, and Use of the Mysticism Scales” -- consider the theological premises that were built into the mysticism construct and the way they have been obscured by researchers that rely on the mysticism scales. As defined by Stace and operationalized in the scales, the mysticism construct presupposes *on theological grounds* that experiences of undifferentiated unity are inherently positive, that positive valence is part of the experience itself, and that the experience is culturally unmediated, that is, that the cultural environment does not play a significant role in constituting the positively-valenced experience as it unfolds. The claim that such experiences are “unmediated” does not consider the possibility that subjective experience is assembled through processes of “mediation” or “interpretation” that take place below the threshold of consciousness within the context of the real-time experience.

Second, isolating mysticism from other seemingly similar experiences on nonscientific grounds obscures the overlap between positive experiences of undifferentiated unity and negatively-valenced experiences of “ego dissolution” and inhibits research on the mechanisms that lead to different outcomes. The third section of the paper – “Research on Ego Dissolution and Other Alternations in Sense of Self” – frames experiences of undifferentiated unity as a form of ego dissolution in order to consider what current research on similar drug and practice-induced experiences indicates regarding the relationship between valence and alterations in sense of self. These lines of research suggest that experiences of undifferentiated unity are at type of ego dissolution; that ego dissolution takes multiple forms and can assume a positive, negative, or neutral valence; and that more refined measures, along with interviews and more precisely

analyzed self-report data, are required to better understand the processes whereby some alterations of self are experienced as transformative and others as debilitating.

Third, reliance on self-report measures, such as the mysticism scales, that isolate positive alterations in the sense of self, undercuts our ability to understand how particular types of experiences are represented, clustered, and differentiated within and between cultures. The final section – “An Expanded Framework for Study Alterations in Sense of Self” -- sketches a framework that would query a range of alterations in sense of self along with other nonordinary experiences and, in doing so, would distinguish between the basic phenomenology of the experiences and the way they are appraised in terms of valence, significance, cause, and long-term effects. Viewed in this way, alterations in sense of self can be integrated into a unified framework for studying unusual experiences, including those sometimes categorized as religious, anomalous, and/or pathological.

The Theoretical Basis of the Mysticism Scales

The theory underlying the “mysticism construct” reflects a century of debate over the relationship between mystical, religious, psychotic, and drug induced experiences that was fueled by an effort to identify the distinctive features – the ‘common core’ that ostensibly united the religions of the world – and at the same time to defend the claim that religions provide access to ultimate reality. To specify this common core, philosophers, psychologists, and theologians progressively narrowed the criteria for what should count as mystical experiences over the course of the twentieth century. In narrowing the criteria, key theorists, such as William James (1902/1985), Aldous Huxley (1945, 1954), R. C. Zaehner (1957), and W. T. Stace (1960) melded two potentially distinct reasons for doing so: (1) the identification of an underlying experience of the Divine or Real (an authentic core) that the various religious traditions elaborated and

interpreted in disparate ways and (2) the explanation of how and why phenomenologically similar experiences could give rise to different psychological outcomes (e.g., transformative or debilitating). Whereas James held the two agendas in tension, Stace abandoned the second. These efforts had two problematic consequences for measurement design. First, the quest for an authentic core generated a hierarchy of self-related phenomena that resulted in a focus on some alterations of self to the exclusion of others. Second, Stace's focus on positive outcomes built valence into the construct.

The Quest for the Core

The beginning of the twentieth century witnessed a narrowing of the definition of mystical experience from a wide-ranging collection of unusual, self-altering experiences to a putatively authentic core of religious experience. When William James criticized the contemptuous disregard with which scientists treated the “mass of phenomena generally called *mystical*” in 1890, he presupposed a widely accepted definition of mysticism that included “divinations, inspirations, demoniacal possessions, apparitions, trances, ecstasies, miraculous healings and productions of disease, and occult powers” (James, 1983, p. 248, emphasis his). A decade later, James (1902), along with Ralph Inge (1899) and Evelyn Underhill (1911), adopted a narrower definition that explicitly rejected the late-nineteenth century view. The narrow definition established a hierarchy of experiential phenomena that placed “authentic” mysticism at the apex and relegated spirit mediumship, along with other ostensibly “primitive” or “pseudo-mystical” phenomena, to the margins.

In promoting a narrow definition, James and Underhill not only freed mysticism of its occult and popular overtones, they laid the foundations for the “common core” idea by locating mysticism at the heart of religion-in-general. James (1985, p. 400-401) conceived of the common

core as a transformative process premised on an “uneasiness” that required “a solution.” The solution, he said, is “a sense that we are saved from the wrongness by making proper connection with the higher powers.” This connection is mediated by a “higher part” of oneself that the subject realizes is “conterminous and continuous with a MORE of the same quality.”

The experience of the “More” did not necessarily lead to a positive transformation, however. In his chapter on mysticism, James not only stipulated his famous four features of mysticism (ineffability, noetic quality, transiency, and passivity), he also linked such experiences with drugs, such as nitrous oxide, and acknowledged the similarities between mystical and psychopathological states. In textbooks on insanity, he said, we find the same kinds of experiences, “only this time the emotion is pessimistic: instead of consolations we have desolations; the meanings are dreadful; and the powers are enemies to life” (James, 1985, p. 337). In terms of psychological mechanism, however, both were “automatisms” that arose from the transmarginal or subliminal level of consciousness (Crabtree, 2003; Taves, 2009b)

Aldous Huxley, like James, integrated interests in drug-induced transformations of consciousness, parapsychology, mysticism, and the religions of the world. Huxley (1945, 1954) argued that all religions have a common core rooted in a transcendent experience of Reality. After taking mescaline, which he acquired from psychiatrists who were using it to study schizophrenia, he claimed that drugs could give access to this Reality. Huxley acknowledged similarities between mystical and pathological experiences and sought to make sense of them in light of the medical researchers’ efforts to treat schizophrenia with mescaline and depression and alcoholism with LSD during the 1950s (Horowitz & Palmer, 1999).

The Elision of Drugs and Psychopathology

R. C. Zaehner (1957), a specialist in Eastern Religions at Oxford, sought not only to refute Huxley's perennialism, but also his claim that mescaline-induced experiences were similar to those of classical mystics and those who suffered from schizophrenia. Stace (1960) responded with a chastened perennialism that reaffirmed a hierarchy of experiential phenomena with "authentic mysticism" at the apex (p. 38), deferred claims regarding drug-induced experiences until more research had been done (p. 29-30), and eliminated any comparisons with negatively-valenced or psychopathological experiences.

According to Stace, "The Unity, the One ... is the central experience and the central concept of all mysticism, of whichever type, although it may be more emphasized or less in different particular cases, and sometimes not even mentioned explicitly" (1960, p. 66). The core experience could take two forms (1960, p 131-132). In its extrovertive form, the distinctive characteristic was "the Unifying Vision – all things are One." In its introvertive form, the distinctive characteristic was "the Unitary Consciousness; the One, the Void; pure consciousness" (pp. 131). Stace (p. 111) referred to the latter experience as a "dissolution of individuality" in which "the boundary walls of the separate self fade away, and the individual finds himself passing beyond himself and becoming merged in a boundless and universal consciousness."

Like Zaehner, Stace drew his accounts of experiences from classical religious and philosophical texts. In doing so, however, Stace made a sharp distinction between experience and interpretation, where interpretation included "anything which *the conceptual intellect* adds to the experience for the purpose of understanding it" (p. 37, emphasis added). In a key paragraph, Stace (p. 66) made four theoretical assertions that are embedded in measures of mystical experience and often presupposed in the analysis and discussion of the data collected with them.

1. **“The unity is perceived, or directly apprehended.”** This assertion is reflected in Hood’s claim that the experience is “unmediated” (Hood, 2013), which is to say uninterpreted. The claim that the unity can be directly perceived or apprehended seems to preclude the possibility of processing below the threshold of consciousness within the context of the real-time experience that “mediates” what is eventually apprehended.

2. **“The unity may be variously interpreted, and the interpretation will as a rule largely depend on the cultural environment and the prior beliefs of the individual mystic.”**

This and the previous claim have been at the center of the debate over whether mystical experiences are *sui generis* and constitute a common core that potentially accesses “the Real.” Those advocating the “common core” claim that, while environment and prior beliefs can play a role in interpreting the experience after the fact, they do not determine the experience itself (see e.g., Hood, 2013). The neurological processes implicated in generating “the experience itself” are not explored.

3. **“The apprehension of it [the Unity, the One] in the mystic’s experience always brings a sense of spiritual exaltation, of bliss or beatitude, of nobility and supreme value.”**

Stace’s capitalization of Unity and One, like Hood’s capitalization of “the Real” (Hood 2013) signals the presence of an underlying metaphysical claim that cannot be tested. Positive experiences of unity or oneness cannot establish the ontological reality of an underlying “Oneness” or “Unity.” The desire to test the untestable has resulted in measures that conflate the experience with its valence and limited our understanding of how valence is acquired.

4. **“The emotional tone is part of the experience not the interpretation.”** This claim rests on a narrow definition that limits interpretation to conscious reflection above the threshold of consciousness. Current neuroscientific research suggests that interoceptive signals (including

sense of self) are often appraised emotionally and valence thereby attached below the threshold of awareness (see e.g., Craig, 2011; Seth, 2013).

A critical assessment of these theoretical assertions highlights the limitations and contradictions built into Stace's theory and surfaces a competing explanation for their seemingly unmediated character, i.e., that environment (setting) and beliefs (mindset) interact with interoceptive stimuli below the threshold of awareness to produce experiences of unity that may be, but are not always, experienced as positive. Reliance on Stace's theory to operationalize mysticism embedded the limitations of his theory in the mysticism scales and undercut comparative investigation of how and why such experiences emerge.

The Development, Validation, and Use of Mysticism Scales

The two most widely used measures of mysticism -- the Mysticism Scale and the MEQ and its precursors -- operationalize Stace's definition of mysticism as a positive experience of unity or oneness. In developing the Mysticism Scale, Hood (2013, 296-297) explicitly rejected James's broad definition of mysticism, noting that "ultimately James equated mystical experience with any submarginal or subliminal state most of which are not experience[s] of unity." In contrast to the Transliminality Scale (Lange, Thalbourne, Houran, & Storm, 2000), which surveys a wide range of anomalous experiences, Hood (2013, p. 297) wanted "a measure of mysticism as a response to the Real" that would allow him to test Stace's common core hypothesis, "not a general measure of a variety of transliminal states." Hood validated the scale and, with collaborators (Chen, Hood Jr, Yang, & Watson, 2011; Hood et al., 2001; Hood & Williamson, 2000), administered it in a number of cultural contexts (the U.S., Iran, India, and China) in order to assess the prevalence of such experiences across cultures.

The MEQ was developed to evaluate individual experiences occasioned by classic hallucinogens. Pahnke (1963) created the initial version of the MEQ for his Good Friday Study; Richards (1975) later revised it for use at the Maryland Psychiatric Center, and it was further revised and validated in conjunction with the drug studies at Johns Hopkins (Griffiths et al., 2006; MacLean et al., 2012). Although Barrett and Griffiths (2017; see also, Johnson, Hendricks, Barrett, & Griffiths, 2018) rely on Stace, who they view as offering “the most definitive philosophical treatise on mystical experience,” they do not actively defend Stace’s common core hypothesis, as do Hood and Richards. Moreover, they acknowledge that “not all experiences with classic hallucinogens are mystical” and recognize the correlation between experiences of ego dissolution and unity (discussed below). Their focus is on using hallucinogens to generate the positive effects they associate with mystical experiences as defined by Stace and measured using the MEQ.

From a scientific perspective, the use of Stace’s definition to operationalize mystical experience has two major drawbacks. First, Stace’s definition, by virtue of its perennialist aims, singles out experiences of unity and isolates them from other – potentially related – alterations in sense of self. Second, his focus on positive experiences of unity has allowed researchers to avoid comparisons with negative experiences that have psychopathological associations. This helped to maintain the idea that “mystical experiences” are *sui generis* and undercut research into how and why experiences of unity can acquire both positive and negative valence. Ironically, Hood’s factor analysis of the M-Scale supports the distinction between the experience of undifferentiated unity and its valence. Moreover, a newly developed Ego Dissolution Inventory (Nour, Evans, Nutt, & Carhart-Harris, 2016) suggests that the experience of undifferentiated

unity is conceptually indistinguishable from experiences of ego dissolution in the context of drug-induced or psychotic experiences of unity.

Factor Analysis of the Mysticism Scales

In his initial factor analysis of the Mysticism Scale, Hood (1975) identified two factors. The first, he said, was “best conceived as an indicator of intense experience, not interpreted religiously and not necessarily positively.” The second factor included all the religious and noetic items (i.e., all the items related to sacrality, awe, divinity, and ultimate reality), the positive affect items (excluding the feeling that all was perfect), and absorption. Hood linked the two factors to Stace’s distinction between the phenomenology of the experience and its interpretation, concluding (p. 34) that “the M Scale identifies the report of a single core experience of ‘mysticism’ (Factor I) with a joyful, religious interpretation possible (Factor II).” It is not clear why Hood characterized the “single core experience” of undifferentiated unity as “mystical,” when, as he indicated, it was not necessarily positive nor necessarily interpreted as religious and the positive aspects loaded on a separate factor that he characterized as interpretive.

Subsequent factor analysis with larger samples in the US and Iran (Hood et al., 2001) divided the first factor into Introvertive and Extrovertive factors, while confirming the integrity of the interpretive factor (see Table 1). Based on mental health measures administered along with the M-Scale, Hood found that in both the American and Iranian samples, “the introvertive factor was a predictor of psychological dysfunction” (p. 703). Although he found this surprising in light of Stace’s description of “the introvertive experience as central to mysticism and as a source of profound bliss,” his factor analysis again indicated that all the inherently positive features loaded on the “interpretive” factor. His own evidence, thus, suggests that the experience of unity is not necessarily positive and indeed can be associated with mental dysfunction. By

referring to this experience as ‘mystical,’ when it is not necessarily experienced as emotionally positive, sacred, or as revealing anything about ultimate reality (i.e., noetic), Hood obscured the generic “unity” experience and the role that positive valence and other associations (e.g., ideas of sacrality or feelings of insight) play in constituting it as “mystical.”

Factor	Item Clusters	Items
Introverted Mysticism	<i>Ego Loss (2019)</i> Unity	<i>I have had an experience in which something greater than myself seemed to absorb me. ... in which everything seemed to disappear from my mind until I was conscious only of a void... in which my own self seemed to merge into something greater.</i>
	Timeless & Spaceless	<i>I have had an experience which was both timeless and spaceless... in which I had no sense of time or space... in which time and space were non-existent... in which time, place, and distance were meaningless.</i>
	Ineffability	<i>I have had an experience which cannot be expressed in words... which I was unable to express adequately through language... which was incapable of being expressed in words ... I have had an experience that is impossible to communicate.</i>
Extroverted Mysticism	<i>Unity (2019)</i> Unity in Diversity	<i>I have had an experience in which I realized the oneness of myself with all things... in which I became aware of a unity to all things ... in which all things seemed to be united into a single whole.</i>
	Inner Subjectivity	<i>I have had an experience in which all things seemed to be conscious ... in which I felt as if all things were alive... in which all things seemed to be aware ... in which I felt nothing is ever really dead.</i>
Interpretation	Positive Affect	<i>I have had an experience in which I felt that all was perfection at the time ... experienced profound joy ... a perfectly peaceful state ... [I was left] with a feeling of wonder.</i>
	Sacredness	<i>I have had an experience which I knew to be sacred... which seemed holy to me. ... [which I] experienced [as] ... divine ... which left me with a feeling of awe.</i>
	Noetic Quality	<i>I have had an experience in which a new view of reality was revealed to me... that I could call ultimate reality ... in which ultimate reality was revealed to me... in which deeper aspects of reality were revealed to me.</i>

Table 1. Three Factors, Item Clusters, and Items in the Hood Mysticism Scale (based on Hood et al. 2001). Items included in the new 8-Item M-Scale and relabeled item clusters are indicated in italics (based on Streib et al. 2019).

The underlying problem arises from Hood’s use of the term interpretation. Thus, although “positive affect” loads (along with noetic claims, a sense of sacredness, and ineffability) on his interpretive factor, he does not consider it “an interpretation.” Instead, following Stace, he views it “as a secondary quality, *integral to the common core experience of unity*, but on the fringe so

to speak” (Hood 2013, 298, emphasis added). He views these secondary qualities as interpretations that are integral to the common core experience, but apparently not as pre-conscious appraisals of a dramatic alteration in the sense of self, as suggested here.

In claiming that psilocybin can produce mystical-type experiences, the Johns Hopkins researchers implicitly recognize the generic character of the experience and deliberately seek to control the set and setting in order to elicit positive experiences. In validating the MEQ, researchers controlled for positive experiences, thus ensuring a factor analysis that linked the experience of unity with positive features. In the first validation study (MacLean et al. 2012), participants were recruited on-line through sites that attract individuals interested in spiritual experience and invited to complete the online survey of “psilocybin and spiritual experience,” if they had had “a profound experience with psilocybin mushrooms.” The second validation study (Barrett, Johnson, and Griffiths 2015), which was intended to replicate the first, used data from experimental studies with controlled doses of psilocybin. In these studies, participants were screened for histories of mental illness and drugs were administered in settings designed to elicit a positive experience. Under these conditions, they identified four factors (mystical, positive mood, space/time alterations, and ineffability; see Table 2). These four latent variables loaded onto a second-order latent variable, consistent, they claimed, with “an underlying (latent) unitive experience,” but only, I would add, when they selected for positive experiences in the first study and controlled for them in the second.

Factor	Cluster	Items
Mystical	Internal Unity	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. Experience of pure being and pure awareness (beyond the world of sense impressions). Experience of oneness in relation to an “inner world” within. Experience of the fusion of your personal self into a larger whole. Experience of unity with ultimate reality. Feeling that you experienced eternity or infinity.
	External Unity	Experience of oneness or unity with objects and/or persons perceived in your surroundings. Experience of the insight that “all is One”. Awareness of the life or living presence in all things.
	Noetic Quality	Gain of insightful knowledge experienced at an intuitive level. 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. 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).
	Sacredness	Sense of being at a spiritual height. Sense of reverence. Feeling that you experienced something profoundly sacred and holy.
Positive Mood		Experience of amazement. Feelings of tenderness and gentleness. Feelings of peace and tranquility. Experience of ecstasy. Sense of awe or awesomeness. Feelings of joy.
Space-Time		Loss of your usual sense of time. Loss of your usual sense of space. Loss of usual awareness of where you were. Sense of being “outside of” time, beyond past and future. Being in a realm with no space boundaries. Experience of timelessness.
Ineffability		Sense that the experience cannot be described adequately in words. Feeling that you could not do justice to your experience by describing it in words. Feeling that it would be difficult to communicate your own experience to others who have not had similar experiences.

Table 2. Four Factors of the MEQ30 with corresponding items (based on Barrett et al. 2015). All the items in the Mystical factor load together; Barrett uses the cluster headings to organize the Mystical items, presumably to show their relationship to Stace’s criteria.

There are noteworthy differences in the factors derived for the M-Scale and the MEQ30 despite their mutual reliance on Stace’s criteria. Although both distinguish between a “mystical” factor and a positive emotional factor, the factor analysis of the M-Scale placed Sacredness and Noetic Quality along with Positive Affect in the Interpretive factor. In the factor analysis of the MEQ, items related to Sacredness and Noetic Quality clustered along with items related to Internal and External Unity in one large Mystical factor, while Space-Time and Ineffability, which clustered along with Ego Loss in the Introvertive Mysticism factor of the M-Scale, appeared along with Positive Mood as three separate factors. Differences in the factor analysis

may be due to differences in the wording of the items, differences in the interpretation of similarly worded items within or between samples, and/or differences in the experiences of the sampled groups. In the absence of common items validated at the item level to ensure that respondents understand them as intended, it is difficult to account for the different factor analysis patterns.

Although the theories that inform the mysticism scales have western intellectual roots, theories derived from eastern traditions are also being used to create measures with a similar limitations. Thus, in constructing their new Nondual Awareness Dimensional Assessment (NADA) based on Buddhist philosophical teachings, Hanley, Nakamura, & Garland (2018) operationalized a positively-valenced (i.e., blissful) state of nondual awareness (NADA), which they characterize as “a field of awareness that is unified, immutable, and empty of mental content.” Although they acknowledge that NADA can be experienced “as unsettling and emotionally distressing” and may be impacted by “personal beliefs about the nature of the self” derived from cultural factors or personal interests (pp. 1626-27), they nonetheless query only positive experiences of NADA. Not surprisingly, this allowed them to isolate two factors (a self-transcendence dimension and a bliss dimension) that were positively correlated (p. 1628; see Table 3). It is not clear, however, why we need another narrowly conceived scale (NADA) whose chief feature – an alteration in boundaries between self and world – is measured by items largely drawn from measures of ostensibly *different* constructs, some equally circumscribed (i.e., mystical experience [M-Scale, MEQ] and meditative experience [DME, Osis, Bokert, & Carlson, 1973; EOM, Reavley & Pallant, 2009]), and others more inclusive (Altered States of Consciousness [OAV]; Studerus, Gamma, & Vollenweider, 2010) or generic (Ego Dissolution Inventory [EDI]; Nour et al., 2016).

Factor	Source	Items
Transcendence	M	I have had an experience in which I felt myself to be absorbed as one with all things.
	M	I have had an experience in which all things seemed to be unified into a single whole.
	OI	I have had an experience in which the boundaries of my self dissolved.
	EDI	I have experienced all notion of self and identity dissolve away.
	DME	I have experienced a feeling of oneness in which the boundaries between what is me and what is not me has dissolved.
	MEQ	I have experienced the insight that “all is One.”
	OI	I have had an experience in which my mind expanded into space.
	DME	I have experienced a melting or merging with the others; I became others and they became me.
	OAV	It has seemed to me that my environment and I were one.
Bliss	OAV	I have experienced an all-embracing love.
	EOM	I have felt a sense of awe and wonder.
	M	I have experienced a perfectly peaceful state.
	OI	I have been surrounded and filled with a blissful warmth or energy.

Table 3. Three Factors of the Nondual Awareness Dimensional Assessment-Trait with corresponding items and the source from which they were drawn (based on Hanley et al. 2018). M = Mysticism Scale; OI = original items; EDI = Ego-Dissolution Inventory; DME = Dimensions of Meditative Experience Questionnaire; MEQ = Mystical Experiences Questionnaire; OAV = Altered States of Consciousness Rating Form; EOM = Effects of Meditation Scale.

More Inclusive Measures

In contrast to the mysticism scales, which select for the features Stace identified as mystical, researchers using hallucinogens to investigate medical and psychiatric disorders have generally relied on the APZ (Abnormal States Questionnaire [Dittrich, 1998]) and its subsequent improved versions -- the OAV and 5D-ASC (Studerus et al., 2010) -- to assess altered states of consciousness more broadly.⁴ Dittrich’s goal in developing the APZ was to identify altered

⁴ Altered states of consciousness, like anomalous experiences, encompass a wide range of experiences that are loosely defined as nonordinary based on subjective and/or statistical criteria. Such experiences

states with features in common regardless of their means of induction, i.e., hallucinogens, sensory deprivation, or sensory overload. Analysis of altered states that recurred under each of these conditions resulted in three factors (Dittrich, 1998): two ego dissolution clusters, one with a positive valence (“oceanic boundlessness”) and the other with a negative valence (“dread of ego dissolution”), and a visionary cluster (“visionary restructuralization”). In the wake of improvements to the APZ (now 5D-ASC), Studerus, Gamma, & Vollenweider (2010) reanalyzed the factor structure using more sophisticated statistical methods. The analysis identified eleven lower level factors that they felt were better suited to assess drug-induced altered states. As with the M-Scale and the MEQ, the experience of unity clustered independent of the emotion items. In this case, however, the negative emotion items were included in the measure as well.

If we analyze the items included in each of the eleven factors, six factors were comprised of sensation items, two factors contained emotion items (positive and negative), and the other three contained associated features, i.e., spirituality, insight, and meaning (see Table 4).

Type	Factor	Sample Item(s)
Sensations	Experience of Unity	Everything seemed to unify into an oneness. It seemed to me that my environment and I were one. Conflicts and contradictions seemed to dissolve.
	Disembodiment	I had the feeling of being outside my body.
	Complex Imagery	I saw scenes rolling by in total darkness or with my eyes closed.
	Elementary Imagery	I saw regular patterns in complete darkness or with closed eyes. I saw lights or flashes of light in total darkness or with closed eyes.
	Audio-Visual Synesthesiae	Noises seemed to influence what I saw. The shapes of things seemed to change by sounds and noises.
	Impaired Cognition and Control	I felt like a marionette. I had difficulty making even the smallest decision. I felt as though I were paralyzed.
Emotional Valence	Blissful State	I enjoyed boundless pleasure. ... profound peace ... all-embracing love.
	Anxiety	I was afraid without being able to say why. I felt threatened.

may or may not be appraised as religious, spiritual, or mystical depending on the nature of the experience and the perspective used to frame it. For overviews of the current state of research, see (Moreira-Almeida & Lotufo-Neto, 2017; Schmidt & Berkemeyer, 2018).

Other Associated Features	Spiritual Experience	I had the feeling of being connected to a higher power. I experienced a kind of awe. My experience had religious aspects.
	Insightfulness	I felt very profound. I gained clarity ... I had very original thoughts.
	Changed Meaning of Percepts	Everything gained a special meaning. Objects around me engaged me emotionally much more than usual.

Table 4. Grouping of the Eleven Factors of the 5D-ASC by Item Type (based on Studerus et al. 2010)

Given the more inclusive character of the 5D-ASC, we can ask what the MEQ is actually identifying. Is it revealing a distinctive experience of the sort that Stace described or a set of factors extracted from something more complex and variable? The latter appears to be the case, since, when researchers gave participants in the 2006 Johns Hopkins study the APZ, they reported slightly more visionary effects (VUS factor = 8.87) than positive unitary effects (OCE factor = 8.00) (Griffiths, Richards, McCann, & Jesse, 2006, p. 276, Table 2). Moreover, although the rating on the positive unity factor was higher, the rating on the negative unity factor (“dread of ego dissolution”) was not negligible (AIA factor = 5.03). The use of the MEQ30 rather than a broad questionnaire such as 5D-ASC thus perpetuates the idea of a distinct mystical experience conceived along the lines proposed by Stace by extracting it from the other experiences that often accompany it and holding it – in James’s phrase – “true to type.”

Unity and Ego Dissolution at the Level of Self-Report

The narrowing of the research focus to a specific feature or features would not be a problem -- indeed it could be a good research strategy -- if it was explicitly acknowledged as a feature of interest. Robin Carhart-Harris and his team have taken this approach to “ego dissolution,” which researchers have hypothesized overlaps with the unitive experience, but which, as Nour et al. (2016, p. 4) note, had not been tested. Nour et al. (2016, p. 4) developed a 16-item Ego Dissolution Inventory (EDI) containing eight items related to ego-dissolution and eight related to ego-inflation, which they gave to 691 participants on-line (see Table 5).

Factor	Items
Ego Dissolution	I experienced a dissolution of my “self” or ego
	I felt at one with the universe
	I felt a sense of union with others
	I experienced a decrease in my sense of self-importance
	I experienced a disintegration of my “self” or ego
	I felt far less absorbed by my own issues and concerns
	I lost all sense of ego
	All notion of self and identity dissolved away

Table 5: Items loading on the Ego Dissolution factor of the Ego Dissolution Inventory (adapted from Nour et al. 2016).

They were asked to answer the queries in relation to up to four specific drug experiences: their ‘most intense’ psychedelic experience, a ‘typical’ psychedelic experience, a ‘typical’ cocaine experience, and a ‘typical’ alcohol experience. Those who reported experiences with psychedelics answered seven additional questions that loaded on the “mystical” factor in the MEQ30, all of which related to “the so called ‘unitive’ experience.” In light of the strong positive correlation between the ego-dissolution items and the unitive items from the MEQ30, Nour et al. conclude:

This suggests that experiences of ego-dissolution, unity and dissolved boundaries may be conceptually inseparable (Federn, 1952; Savage, 1955; Fishman, 1983), occurring together during ‘peak’ psychedelic experiences. Consistent with this hypothesis, the [EDI] item ‘I felt at one with the universe’ loaded particularly strongly on the ‘ego-dissolution’ factor (0.830), together with [the EDI] items explicitly referring to ‘dissolution’ and ‘disintegration’ of self or ego (0.883 and 0.897, respectively). (Nour et al., 2016, p. 9)

The correlations between experiences of unity in the sense of dissolved self-boundaries and ego dissolution reinforce the idea of a generic experience in which the boundaries of the self are

blurred or dissolved, which can take on a positive, negative, or neutral valence and have different long term effects. Although these correlations indicate a relationship between experiences of unity and ego dissolution, other research suggests the need to refine the concept of ego dissolution and specify the various ways in which the sense of self can be disrupted.

Research on Ego Dissolution and Other Alterations in Sense of Self

Research on drug and practice induced alterations in sense of self indicate that the blurring or dissolution of self-boundaries is one of the ways that the sense of self can be disrupted. Research with psychoactive drugs, such as DXM, DMT, ketamine, and psilocybin, indicate that they produce different subjective experiences that can be distinguished using the 5D-ASC (Studerus, Gamma, & Vollenweider, 2010; Carbonaro, Johnson, Hurwitz, & Griffiths, 2018; Vollenweider & Kometer, 2010). Although both psilocybin and ketamine often lead to experiences of unity, especially at higher doses, the most prominent effects associated with psilocybin are visual and the most prominent effect associated with ketamine is disembodiment (Vollenweider & Kometer, 2010, p. 644). The most prominent effect associated with DXM is also disembodiment, but, in contrast to psilocybin and ketamine, DXM does not typically lead to experiences of unity (Carbonaro et al., 2018, Table 3). In all cases, the intensity of the effects correlates with dosage.

Modelling an Interactive Process

In addition to dosage, researchers have long been aware that the effects are highly sensitive to variations in “set and setting,” that is, in response to the mindset (personality, preparation, expectation, and intentions) of the experiencer and the physical, social and cultural setting in which the drug is ingested (Hartogsohn, 2017). Psychologist Timothy Leary coined the phrase “set and setting” to refer to this interaction in the context of the Harvard Psilocybin

Project in the early sixties. The role that specifically religious settings can play has been evident since Pahnke (1963, 1966) conducted his famous Good Friday experiment at Boston University's Marsh Chapel under the auspices of Leary's project (Richards, 2015).

Although researchers acknowledge the importance of non-pharmacological factors (for overviews, see Preller & Vollenweider, 2016; Carhart-Harris et al., 2018), the challenge is to understand how they interact. Carhart-Harris and Nutt (2017) have proposed an “extra-pharmacological model” (see Figure 1) to describe how individual differences (traits), mind set (pre-state), and setting (environment) interact with drug dose to predict the subject's acute real-time experience (state) and how these factors, including the subject's acute experience, interact to predict the long-term outcome (see also Preller & Vollenweider [2016] for a similar list). We can specify each of the variables more fully.

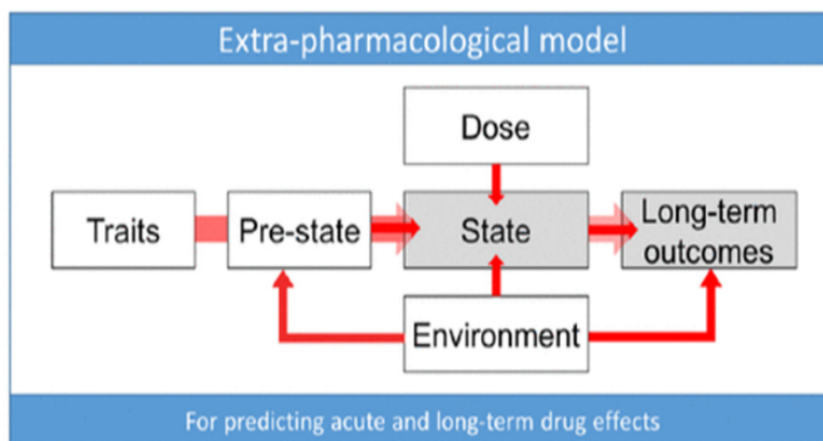


Figure 1: Interaction of Set, Setting, and Dose on State (Subjective Experience) and Long Term Outcome (Carhart-Harris et al., 2018)

Traits and pre-state. Traits refer to individual differences related to personality and mental health. Traits known to effect the acute experience include absorption (Ott, Reuter, Hennig, & Vaitl, 2005), hypnotizability (Adams, 2008), and suggestibility (Halligan & Oakley, 2014), all of which tend to heighten the experience and make it more vivid. Psychosis

researchers (Peters et al., 2016; Underwood, Kumari, & Peters, 2016a; Underwood, Kumari, & Peters, 2016b), seeking to understand why some people who have unusual experiences seek clinical treatment and others do not, indicate that some who seek help may have an unconscious tendency to appraise situations negatively, whether or not they are prone to unusual experiences. The pre-state includes emotions, expectations, and assumptions the subject brings to the event, often in the form of embodied cultural knowledge.

Environment. The drug trials routinely pay close attention to the immediate context (Carhart-Harris et al., 2018). This not only includes psychologically preparing participants, but also conducting the trials in a special setting that typically includes “low lighting, carefully selected music playlists, aesthetically pleasing décor and implicit as well as explicit priming,” along with access to “guides,” i.e., mental health professionals who prepare participants for the experience, support them through it, and “help them integrate its content and meaning afterwards” (p. 726).

It is important to distinguish between the interaction of factors within the context of the event itself and the environmental factors that affect the pre-state and the long-term outcome. As Carhart-Harris (2018, p. 726) indicates, “a cultural feedback loop ... contribute[s] to ‘set’ and thus, the nature of an acute psychedelic experience and its consequent longer-term outcomes.” Thus, positive reports of the effects of drug trials “feed back into cultural context via media reporting which subsequently affects public opinion, thus influencing the expectations and preconceptions of individuals who intend to take a psychedelic – and so perpetuating the process.” Negative press can have an inverse effect, as was the case in the 1950s and 60s, when conservative media highlighted the perceived dangers of psychedelic drugs and helped justify restrictions on research. The perennialists’ claim that Stace-type experiences of unity are at the

core of the world's religions is part of this larger cultural feedback loop. The claim primes participants to anticipate the potentially transformative effects of such experiences and to view what they experience in relation to ultimate questions of meaning and significance.

Dose. Although traits, pre-state, and environment highlight the role of “set and setting” in drug-induced experiences of ego dissolution, the differential effects of both type and dose of psychedelics on participants clearly establish that the subject's experience is not simply the result of these factors. Thus, in response to the “common core” debate, it is clear that set and setting do affect the subjective experience, but, as the perennialists rightly assert, it does not explain the source of the sensation itself.

Alterations in Sense of Self in Drug-Induced Experiences

There has been a flurry research in recent years using both neuroimaging and experimental methods to investigate the neural correlates of experiences induced by psychoactive drugs, including ego dissolution (for in-depth reviews of this body of research, see (dos Santos, Osório, Crippa, & Hallak, 2016; Halberstadt, 2015; Kyzar, Nichols, Gainetdinov, Nichols, & Kalueff, 2017; Preller & Vollenweider, 2016). Recent reviews of this research have attempted to make sense of the findings in light of discussions of the self in philosophy (Letheby, 2019; Letheby & Gerrans, 2017; Millière, 2017) and research on meditation (Millière, Carhart-Harris, Roseman, Trautwein, & Berkovich-Ohana, 2018).

In his review, Millière (2017, pp. 11-12) indicates that researchers have generally converged on a distinction between two levels of self: a basic sense of self, referred to as the “minimal” or “core” or “embodied” self, that emerges in conjunction with low-level bodily associated with the salience network and a more elaborated sense of self, often referred to as the “narrative self,” constituted through high-level reflective processes involving introspection and

autobiographical memory. Based on his review of the neuroimaging studies, he concludes that it is not yet clear whether drug-induced ego dissolution (DIED) should be interpreted as “a mere disruption of the ‘narrative self’ involving high-level processes linked to personal identity, or as a disruption of the ‘minimal self’ rooted in bodily and sensorimotor processes. ... DIED is a multifaceted experience, and may plausibly disrupt *both* narrative and embodied aspects of selfhood” (emphasis in original). In their review, Letheby & Gerrans (2017, p. 7) suggest that the variability in results may be due to the limitations of the self-report scales, including the new EDI (Nour et al. 2016), none of which are fine-grained enough to distinguish between alterations in different aspects of sense of self. Both they and Milliére indicate that this limitation might be overcome through the use of microphenomenological interviews (Petitmengin, 2006).

Since it is known that the action of the serotonergic hallucinogens (LSD, psilocybin, and mescaline) is mediated in humans and other animals via a particular serotonin receptor (5-HT_{2A}; Halberstadt, 2015), other studies have sought to understand the effects of these drugs by investigating their neuropharmacological action. Summarizing the research to date, Halberstadt, 2015, p. 111) notes that “one of the most characteristic properties of hallucinogens is how unpredictable their effects can be.” Citing the role of set and setting in generating a broad range of experiences, he indicates that there is nonetheless “a great deal of similarity between the effects of different hallucinogens.”

More recent studies are explaining these effects in terms of an increase in primary process thinking, suggestibility, and neurological “plasticity.” Kraehenmann et al. (2017a) tested the hypothesis that LSD increases primary process thinking and that primary process thinking depends on 5-HT_{2A} receptor activation in a placebo-controlled, experimental study using a

formal measure of primary process thinking along with the 5D-ASC.⁵ They found that LSD increased primary process thinking and that the effects were blocked by pre-treatment with a 5-HT_{2A} receptor antagonist. Using a similar study design to test the hypothesis that LSD produces dream-like effects mediated by the 5-HT_{2A} receptor, Kraehenmann, et al. (2017b) found that LSD produced mental imagery comparable to that reported in dreams, primarily via activation of the 5-HT_{2A} receptor and subjective effects related to loss of self-boundaries and cognitive control, but not to visual hallucinations.” In light of these studies, Kraehenmann et al (2017b) find it “plausible to assume that 5-HT_{2A} receptor activation by psychedelics induces dreamlike imagery which is related to primary process thinking, emotion activation, and alterations in the sense of self and body.”

In another study of this sort, Carhart-Harris et al. (2015) investigated whether LSD enhanced suggestibility as measured with the Creative Imagination Scale (CIS; Barber & Wilson, 1978). They found that LSD robustly enhanced suggestibility even at moderate doses and that those who scored highest on trait conscientiousness were most effected. They inferred from this that “LSD facilitates suggestibility by temporarily suspending the (very human) drive to maintain control of one’s mind and environment” (p. 793). In discussing their findings, they make the following crucial observation (p. 790):

[A]lthough it would be unfair to discount reports of phenomena such as ‘ego dissolution’ and personal and philosophical insights as mere products of suggestion, it is important to

⁵ Kraehenmann et al. (2017a) characterize primary process thinking as “lower-level, automatic, motivation- and emotion-driven” in contrast to higher-level secondary process thinking, which is reflective and rule bound. Carhart-Harris (2014, p. 6) defines it similarly as “a regressive, pre-ego style of consciousness characterized by unconstrained brain dynamics and cognition.”

consider how the *interpretation* or *framing* of these experiences is influenced by suggestion. Similarly, the influence of suggestion in reports of psychedelic-induced mystical or religious experiences should be further investigated since the same neurobiological state may be subjectively interpreted as profound yet secular by one individual but mystical by another. (emphasis in original)

As noted above, however, without more nuanced self-report data, we will not be able to distinguish between appraisals (personal and subpersonal) made in the context of the experience and appraisals of experiences made after the fact.

As Kraehenmann et al. (2017a) recognize, these findings are in keeping with the entropic brain theory advanced by Carhart-Harris et al. (2014), which links primary process thinking with increased entropy and secondary process thinking with the constraint of entropy. However, in light of their finding that LSD increased primary process thinking but did not have a statistically significant effect on secondary processing, they suggest that psychedelics states may be more like lucid dreaming than ordinary dreaming. In their words, “psychedelic states may be best conceptualized as hybrid states of consciousness which share features of both dreaming and waking consciousness.” The maintenance of secondary thinking alongside enhanced primary process thinking means – in their words – that “they [psychedelic states] are not just ‘epiphenomena’ of underlying neuronal oscillations, but rather induce conscious learning experiences that promote self-knowledge and psychological insight” (p. 6).

Letheby & Gerrans (2017) offer a promising way to think about ego dissolution, as well as the emergence of the self, in this general theoretical framework. Linking the research on cognitive binding as it relates to a sense of self with the research on ego dissolution, they propose that experiences of ego dissolution involve the removal (unbinding) of self-related labels (I, me,

mine) from a self-representation that emerges in the cortical midline nodes that link the DMN and SN. They view the “binding problem,” that is the question of how bottom-up inputs coalesce into representations, through a predictive processing lens to suggest that a “self-model” is a top-down inference that binds information “into a representation ... of the world as it matters to the organism” (p. 3).

Alterations in Sense of Self in Practice-Induced Experiences

As Carhart-Harris and others are well aware, psychoactive drugs are not the only stimuli that can trigger disruptions in the sense of self. Although several lines of research -- on meditation, near death experience (Greyson, 2014; Timmermann et al., 2018), ecstatic seizures (Gschwind & Picard, 2016; Picard & Craig, 2009), and schizophrenia (Parnas & Henriksen, 2016)) – stand out in this regard, the research on meditation offers the most apt and least explored comparison.

Recently, Millière teamed up with Carhart-Harris and collaborators (Millière, et al., 2018) to produce a comprehensive overview of similarities and differences between psychedelic and meditation induced experiences with a particular focus on alterations in the sense of self, which they refer to both as “ego dissolution” and “self-loss.” They stress that there is no simple, uniform notion of self-loss or ego dissolution. Instead, they propose a multidimensional construct that can take several forms. In keeping with the research just discussed, they offer a two-dimensional model that locates narrative (DMN-linked) self-loss on one axis and multisensory (SN-linked) self-loss on the other, and “total self-loss” in the presence of both. They stress, however, that this crude model does not allow us to distinguish between different types of meditative and drug-induced experiences. To capture these differences, they recommend locating experiences within a multi-dimensional state space. To illustrate, they

contrast ordinary wakeful consciousness with two psychedelic and two meditational states on six independent dimensions (frequency of self-related thought, access to semantic autobiographical information, phenomenal richness, self-location, bodily awareness, and body ownership). This allows them to distinguish psychedelic experiences, which tend to be phenomenologically rich, but may or may not involve a sense of self-loss from two types of meditation experiences: (1) “a typical meditative state with increased bodily awareness (via attentional focus on the breath), slightly decreased overall phenomenal richness (via visual-auditory deprivation) and decreased frequency of self-related thoughts” and (2) “a ‘selfless’ state described by experienced meditators, with a cessation of self-related thought, a loss of body ownership, agency and self-location, and significant reductions in bodily awareness and phenomenal richness” (see their chart, p. 17).

A multi-sensory approach to self-loss / ego dissolution dramatically expands the range of unusual self-experiences that can be considered alongside experiences in which the boundaries of the self are blurred or dissolve. *Changes in body ownership* allows us to consider experiences in which it seems to the subject as if their body, voice, or hand were not their own. Religious traditions have valorized such experiences as possession by positive or negative spirits, glossolalia (speaking in tongues), and automatic (spirit-controlled) writing. Psychiatry has characterized them as dissociative experiences. *Changes in self-location*, particularly out-of-body experiences, are associated with sleep paralysis and so-called near death experiences. Various practice traditions cultivate out-of-body experiences as a means of journeying to other realms (e.g., astral travel, journeys to heaven) and contacting spirits (e.g., shamanistic healing).

Locating experiences within a multi-dimensional state space allows us to consider a wide range of unusual sense of self experiences, including those that Stace and others wanted to

dismiss as “inauthentic” in their quest for the “common core.” Although they most likely did not have this range of experiences in mind, Millière et al. (2018) accurately note the absence of tools to investigate these dimensions in a fine grained way and indicate that future questionnaires should include items related to disruptions of narrative self (i.e., self-related thoughts and mental time travel) and items related to body ownership, bodily awareness, and self-location.

In discussing practice-induced experience, however, most of the literature tacitly assumes that experiences that occur in the religious or spiritual contexts are inherently positive. Recent efforts to document and analyze distressing experiences that arise in the context of meditation practice indicate that negatively-valenced changes in sense of self are not uncommon. In a mixed-methods study of 60 Western Buddhist meditators who had challenging meditation-related experiences, Lindahl, Fisher, Cooper, Rosen, & Britton (2017) reported that 75% of the subjects experienced changes in their sense of self. Working from their interview data, Lindahl et al. classified the changes along lines that are similar, but not identical, to those proposed by Millière et al. In their dataset, they found that the most common experience (53%) involved changes in self-other or self-world boundaries. The affect associated with this experience ranged from “neutral curiosity, to bliss and joy, to fear and terror” (p. 20). Other self-related findings included changes in narrative self (25%), loss of sense of agency (25%), changes in sense of embodiment (22%), and loss of sense of ownership (18%). Moreover, a quarter of the practitioners “felt like they no longer existed at all or that they would disappear or be invisible to others,” which the researchers interpreted as disruption of the basic or minimal self (p. 20).

In their interviews, Lindahl et al. (2017) asked participants to recall what they experienced during mediation, how they interpreted it, what they thought caused it, and how they addressed the difficulties. In doing so, they sought to tease apart the interpretive process and,

thus, to lay the groundwork for explaining how experiences acquire valence in and through real-time and post-hoc appraisals. In a more recent paper (Lindahl & Britton, 2019), they indicate that distress and impairment were predicted by the number of changes in sense of self that their interviewees reported. The more global the change in sense of self (across various categories and/or levels of selfhood), the more likely interviewees were to report self-specific impairments. Other factors such as practice tradition, gender, practice intensity, and psych and trauma history did not predict distress or impairment.

From these studies, it is clear that there is still much that we do not know about how and why alterations in sense of self acquire their valence either in the context of the experience or after the fact. Reviewing the literature on valence, Carhart-Harris and Nutt (2017, p. 1101) highlight the importance of distinguishing between the acute and long-term effects of psychedelics. Although there is considerable evidence of long-term positive effects of psychedelics administered under controlled conditions, they stress that the acute effects are “marked by emotional arousal and *lability* ... rather than positive mood per se” (emphasis in original). They conclude that “the acute state produced by 5-HT_{2A}R agonist psychedelics does not directly modulate the valence of mood, i.e. it does not directly promote either positive or negative mood” (see also Millière [2017] for a similar overview). In light of the variability of the acute effects and the potential for emotionally challenging experiences, both the context in which the experience takes place and the way people process the experience after the fact may have a crucial effect on the long-term outcome. But, as both the drug and meditation-induced experiences indicate, we need more sophisticated measures that do not posit an intrinsic association between the alterations in sense of self and valence to understand how alterations in the sense of self acquire their valence in the real-time context of the experience and after the fact.

An Expanded Framework for Studying Alterations in Sense of Self

If our goal is to understand the mechanisms through which the sense of self is formed and altered, we need to be able to compare similarities and differences in real time subjective experiences regardless of set, setting, or mode of induction. If we want to explain how and why phenomenologically similar alterations can give rise to different interpretations and outcomes, we need to be able to track the process of interpreting (or appraising or inferring) the meaning and significance of what is happening as it unfolds in real-time, as well as how it is assessed after the fact. To do this, we need more fine-grained measures and more precise methods for analyzing first person accounts.

Sense of Self

We need more refined characterizations of the ways in which the self can be altered. As noted, Milliére et al. (2018) and Lindahl and Britton (2019) suggest an overlapping set of distinctions. In a related review, Yaden, Haidt, Hood, Vago, & Newberg (2017) discuss “self-transcendent experiences” (STE’s), which they define as “transient mental states of decreased self-salience and/or increased feelings of connectedness” and locate on a continuum of intensity that ranges from relatively ordinary experiences of absorption to peak or mystical experiences. We have used their proposals to refine and evaluate the self-related items that we drew from extant measures of anomalous, religious, and pathological experiences, as well as from traditions that valorize and seek to cultivate alterations in sense of self, when constructing our Inventory of Nonordinary Experiences (INOE, in development).⁶

⁶ The INOE was co-authored by Taves, Michael Kinsella, and Michael Barlev. The validation team includes Taves, Melissa Gordon Wolf, Elliott Ihm, and Maharshi Vyas, plus a technical assistant and coders. The validation and further testing is funded by a grant from the John Templeton Foundation. For further information, see Taves (2019).

Experience and Appraisals

Measures should distinguish between generically described experiences and appraisals of valence, significance, cause, and long term effects. Experiences should be queried in generic language that is not biased toward particular appraisals, i.e., without privileging those that are positively valorized by religious traditions or negatively valorized by psychiatric diagnostic traditions. The Appraisals of Anomalous Experience Interview (AANEX, Brett et al., 2007) and the Survey of Anomalous Experiences (SAE, Irwin, Dagnall, & Drinkwater, 2013) provide important models for how this can be done, although neither contains the range of disruptions of sense of self discussed here. The INOE builds on their efforts by first asking respondents to whether they have had a wide range of unusual experiences. If they report having had an experience, they receive follow up queries regarding the frequency, context, real-time valence, significance, and long-term effects of the experience as well as their assessment of what caused the it and why it occurred.

The AANEX and the SAE have been administered to English-speakers in the US and UK, the former as an interview and the latter as a questionnaire. The INOE is designed to test whether and/or to what extent we can create generic experience items that can be recognized across cultures and traditions and, if so, to investigate the extent to which culturally acquired schemas effect the frequency with which such experiences are reported and the way they are appraised at the population level.

To test the concept, we generated approximately 75 items. Many were extracted from existing measures, consolidated as appropriate, and revised to eliminate appraisals; others were developed based on our own and others knowledge of specific traditions and cultures. We pilot-tested the concept with English-speaking participants on MTurk in the US (n=843) and India

(n=721). We have since translated the Inventory into Hindi and are now in the process of validating it at the item level in order (1) to ensure that the items are understood as we intend and (2) to assess whether items can be translated and understood in roughly the same way in both contexts.

Validation

Whatever other evidence of validation is offered, item level validation is necessary in order to ensure that items are understood as researchers intend by the populations where the instrument is administered (Maul, 2017). Since, in the case of the INOE, each item is its own construct, this is the primary evidence of validity. To validate the items, we are using on-line meta-surveys in which we ask people to paraphrase the items, indicate how they would respond, and give actual or hypothetical examples of the experience (Wolf et al., in press). We code their responses as understood, sort of understood, or not understood based on our definitional criteria. We collect five responses at a time in English and in Hindi, so that we can compare the responses from both contexts simultaneously and adjust the wording immediately if we identify problems. With a few exceptions, we consider an item validated when the final wording is understood by at least 85% of twenty consecutive respondents in both cultures.

Of the nine self-related items in the INOE, we were able to validate two items easily (Absorbed, OBE) and three others after two to four iterations, i.e., changes in the wording (Another Self in Body, Diminished Self, and Connectedness [Others]). The remaining five, which were derived from the mysticism scales, have posed more significant challenges (see Table 6). Generally speaking, the difficulties arose due to the phenomenological overlap between items on the mysticism scales and the relative infrequency with which such experiences occur in the general population. Thus, for example, when we clarified the meaning of Animated

Life by inserting “everything living and nonliving,” participants’ responses, when they made any sense at all, resembled what we expected from the Unity item. The initial wording of the Unity item, which read “I have had an experience in which it seemed as if I became one with a greater whole,” elicited examples of becoming one with a group or organization as well as with everything. As a result of the overlap, we decided to eliminate the Animated Life item and continue to work with the Unity item. In our next iteration of the Unity item, we are giving “the experience of oneness or unity” more prominence to see if that better conveys our intended meaning.

Nickname	Item Wording	Iterations	Status
Absorbed	I have had an experience in which I was completely absorbed in what I was doing and unaware of the passage of time.	1	Validated
	Mujhe aisa anubhav hua jaise mei kisi karya mei puri tarah se jud gaya tha/gayi thi ki mujhe samay beetne ka ehsas hi nahi hua.	1	Validated
OBE	I have had an experience in which it seemed as if I had left my physical body.	1	Validated
	Muje aisa anubhav hua hai jahan muje laga ki mei apne bhautik sharir se juda ho chuka hun.	1	Validated
Another Self in Body	I have had an experience in which it seemed like there was another self or being in my body	3	Validated
	Muje aisa anubhav hua jaise mere andar mere sivaay koi anya atma ya jeev hai.	2	Validated
Diminished Self	I have felt small or insignificant <u>relative to something vast or powerful.</u>	3	Validated
	Maine kuch vishal ya shaktishali ke samne chhota ya mahatvaheen mahsoos kiya hai.	3	Validated
Connectedness (Others)	I have had an experience in which I became one with everyone at a large group event and lost my sense of individuality.	4	Validated
	<u>Jab kisi ek sammelan/utsav mei logo ke bade samooh ke saath muje aisa anubhav hua hai jaise mein us samooh ke saath ek-ras ho gaya/gayi hun aur meri khudki pahchan meet gayi hai.</u>	3	Validated
Items Adapted from Mysticism Scales			
Connectedness (All)	I have had an experience in which the boundary or separation between myself and everything else dissolved.	3	In Progress
	Muje aisa anubhav hua hai jaise mere aur baki sab chijo ke bich bhed ya bhinnata mit chuki hai aur sab kuch ek hi tatva ban gaya hai.	4	In Progress

Unity	I have experienced a sense of oneness or unity with something greater than myself.	2	In Progress
	Aisa kuch jo mujse bahut bada ya mahan ho usse maine gahri ekta ka anubhav kiya hai.	2	In Progress
Animated Life	I have experienced the whole world (everything living and nonliving) as if it were alive or conscious.	2	Deleted
	Maine aisa anubhav kiya hai ki yah poora bhautik jagat (sari sajeev aur nirjiv srishti) jivant aur jinda hai.	2	Deleted
NotExisting	I have felt as if I no longer existed.	1	Suspended
	Muje anubhav hua hai jaise mera apna astitva hi nahi raha.	1	Suspended

Table 6: Self-related items in the INOE in English and Hindi listed in order of difficulty validating the item. Each iteration reflects an adjustment of the wording in order to better convey the intended meaning.

We had similar difficulties with the Connectedness item, which we eventually decided to divide into two. With Connectedness (Others), we are capturing the effect of large group events on the sense of self in light of Durkheim’s (1995, pp. xl-xliii) notion of “collective effervescence” and research on crowd psychology (Reicher, 2001). With Connectedness (All), we are attempting to capture the sense of self dissolving into a larger whole, but we are still working on how to convey this in Hindi where “self” back translates as “identity.” Finally, we have suspended the NonExisting item, which attempts to capture the most basic changes in sense of self and one of the meanings of nonduality, until we decide if we want to include items that are so rare that virtually no one understands them.⁷

Narratives

To more clearly understand what people experience subjectively, we need narrative reports. To understand the process of interpretation, we need narrative reports (oral or written) elicited immediately after the event and at later intervals. Careful analysis of continuity and change in the accounts will allow us to reconstruct the interpretive process as the experience is

⁷ Although we are currently validating items in order to collect data from the general population in the U.S. and India, we may also attempt to validate items with targeted populations of intensive practitioners, analogous to the way the MEQ and EDI were developed with psychedelic drug users.

recounted over time. Although we have access to the real-time experience only through post-hoc accounts that inevitably change it, interviews that probe the initial process of putting the experience into words may enable us to make plausible inferences regarding the real-time experience. This kind of data, coupled with more objective measures, will allow us to more fully investigate the interactions between these frames.

Our validation procedure illustrates one way of doing this. It not only asks people to paraphrase our items, but also to give a brief description of the experience, if they have had it, or an example, if they have not. These short narrative accounts, which allow us to determine if they understand the item in the way we intend, also allow us to investigate the range of culture specific instantiations of the generic experience. This in turn will help us to interpret differences in the reported frequency, clustering, and appraisal of the items when we administer the survey.

The Diminished Self item offers a window on such differences. The item, which reads “I have felt small or insignificant relative to something vast or powerful,” elicited examples of feeling small or insignificant in relation to things that were vast, and things that were powerful, in both the US and India. The examples offered by Americans, however, were more often related to something vast (e.g., natural world, the sky), while the examples offered by Indians were more often related to something powerful (e.g., people, animals). We considered splitting the item into two, but decided to leave it as is, because, when appraised religiously, it may be associated with deities that are both vast and powerful. In documenting this and other items for use by other researchers, we will need to supply both the intended interpretation and note differences that emerged in validating it in these two linguistic groups. Although the procedure we are using may appear cumbersome and time consuming to scientists and superficial to ethnographers used to lengthy interviews, these sorts of procedures are required if we want to

work at the interface between subjective experience, population level cultural differences, and underlying cognitive schemas.

Conclusion

Stace's definition of mystical experience was driven by quest to identify an unassailable 'common core' of the various religions: a pure experience that allegedly gives access to Reality. Scales that operationalize his criteria have a number of limitations. They isolate the features Stace viewed as authentic and overlook the potentially more widespread presence of others that he viewed as less authentic, e.g., dissociative and sensorily rich experiences. Most crucially, in undercutting comparison between positive and negative experiences, they limit our understanding of how alterations in the sense of self acquire their valence.

At the same time, it is clear that experiences elicited by psychedelics and other practices can lead to transformative mental "resets" and new ways of seeing things under supportive conditions. This capacity is not culture-specific and may have had adaptive value especially in crisis situations. These and other unusual experiences are mediated by the brain and, thus, by psychological processes. In so far as religious traditions have sought such transformative effects, we should not be surprised to learn that they have cultivated such experiences in various forms and privileged them to varying degrees. In an increasingly globalized world, it is common for people to extract practices from traditions and cultivate them in new contexts. Widespread borrowing and cultivation of self-altering practices in new contexts makes it all the more imperative that we recognize that such experiences can be debilitating as well as beneficial.

A framework that includes a wide range of alterations in sense of self instead of privileging experiences that researchers view as potentially more authentic will allow us to investigate the interaction between alterations in sense of self, population level cultural

differences, and underlying cognitive schemas. In doing so, it promises to help us to better understand the mechanisms through which experiences are represented and differentiated.

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