Psychology of Consciousness: Theory, Research, and Practice

A Consensus Taxonomy of Altered (Nonordinary) States of Consciousness: Bringing Order to Disarray

Etzel Cardeña, Aviva Berkovich-Ohana, Katja Valli, Pablo Barttfeld, Alex Gomez-Marin, Bruce Greyson, V. K. Kumar, Steven Laureys, Tanya Marie Luhrmann, Andrew Newberg, Katrin H. Preller, Frank W. Putnam, Enzo Tagliazucchi, Roger Walsh, Olivia Carter, and David Yaden

Online First Publication, June 12, 2025. https://dx.doi.org/10.1037/cns0000431

AMERICAN PSYCHOLOGICAL ASSOCIATION
SOCIETY OF PSYCHOLOGICAL HYPNOSIS
Psychology of Consciousness: Theory, Research, and Practice

ISSN: 2326-5523
https://doi.org/10.1037/cns0000431

A Consensus Taxonomy of Altered (Nonordinary) States of Consciousness: Bringing Order to Disarray

Etzel Cardeña[1], Aviva Berkovich-Ohana[2], Katja Valli[3], Pablo Barttfeld[4], Alex Gomez-Marin[5], Bruce Greyson[6], V. K. Kumar[7], Steven Laureys[8], Tanya Marie Luhrmann[9], Andrew Newberg[10], Katrin H. Preller[11], Frank W. Putnam[12], Enzo Tagliazucchi[13], Roger Walsh[14], Olivia Carter[15], and David Yaden[16]

[1] Department of Psychology, Center for Research on Consciousness and Anomalous Psychology, Lund University
[2] Faculty of Education, University of Haifa
[3] School of Bioscience, University of Skövde
[4] Instituto de Investigaciones Psicológicas, Universidad Nacional de Córdoba
[5] Instituto de Neurociencias, Consejo Superior de Investigaciones Científicas
[6] Division of Perceptual Studies, University of Virginia
[7] Department of Psychology, West Chester University
[8] Coma Science Group, University of Liege
[9] Department of Anthropology, Stanford University
[10] Department of Integrative Medicine and Nutritional Sciences, Thomas Jefferson University
[11] Department of Adult Psychiatry and Psychotherapy, University of Zürich
[12] Department of Psychiatry, University of North Carolina, Chapel Hill
[13] Instituto de Física del Plasma, University of Buenos Aires
[14] Department of Psychiatry and Human Behavior, University of California, Irvine
[15] Melbourne School of Psychological Sciences, University of Melbourne
[16] Department of Psychiatry and Behavioral Sciences, Johns Hopkins University

This article presents a taxonomy of altered states of consciousness, primarily based on their central phenomenological features. Following taxonomic principles and a modified Delphi methodology, a multidisciplinary, international group identified eight distinct phenomenological/behavioral states (some with subcategories): proto and transitional, delirium, minimal to no awareness, experiential detachment, enhanced physicality, altered identity, imaginary/fantasy/visionary, and unity/mystical. We hope this taxonomy

Robert G. Kunzendorf served as action editor.
Etzel Cardeña https://orcid.org/0000-0001-6775-8017
The authors dedicate this article to the memory of Charles T. Tart (1937–2025) and thank Michiel van Elk for valuable suggestions. No data, analytic methods, or study materials are publicly available to other researchers because none were generated. The authors have no conflicts of interest to declare.

Etzel Cardeña initiated and coordinated this project, and reviewed the literature, wrote, discussed, reviewed drafts, and gave final approval to the article. Aviva Berkovich-Ohana, Katja Valli, Pablo Barttfeld, Olivia Carter, Alex Gomez-Marin, Bruce Greyson, V. K. Kumar, Steven Laureys, Tanya Marie Luhrmann, Andrew Newberg, Katrin H. Preller, Frank W. Putnam, Enzo Tagliazucchi, Roger Walsh, and David Yaden reviewed the literature, wrote, discussed, reviewed drafts, and gave final approval to the article.

Correspondence concerning this article should be addressed to Etzel Cardeña, Department of Psychology, Center for Research on Consciousness and Anomalous Psychology, Lund University, Allhelgona kyrkogata 16a, 22350 Lund, Sweden. Email: etzel.cardena@psy.lu.se

will be discussed and developed further, fostering conceptual clarity and stimulating research and integration across different specializations. A nuanced discussion of different states should reveal what is common and different across different triggers and antecedents of altered states of consciousness, and encourage their phenomenological, psychological, cultural, and neuroscientific understanding. This will pave the way for an integrated understanding of different modalities of experiencing.

Keywords: altered states of consciousness, alternate states of consciousness, nonordinary states of consciousness, taxonomy, phenomenology

Biology took a giant step when Carl Linnaeus introduced a binomial structure taxonomy to name, differentiate, and classify living organisms (Cain, n.d.). His general system is now supplemented by phylogenetic (evolutionary) analyses based on genetic relatedness (e.g., Mabee et al., 2020). Biological taxa have different properties than states of consciousness, yet a systematic taxonomy of such states has the potential to move the field toward greater understanding and integration. In the study of consciousness, a generally agreed-to-classification of altered (alternate, or nonordinary) states of consciousness (ASCs) has been absent, while vague definitions and lack of testable criteria have been common. Yet, we think that ASCs can be readily characterized by their central phenomenological features and that a taxonomy of ASCs will provide a map to organize and contrast those states among themselves and with the "ordinary" waking state. We offer in this article a consensus taxonomy of ASCs, developed by a multidisciplinary (e.g., psychology, psychiatry, neurosciences, anthropology) team of experts.

The Concept of ASC

At the beginning of psychology as a scientific discipline at the end of the 19th and beginning of the 20th centuries, there was a vivid interest in states of consciousness, as exemplified by the various contributions of William James, such as his Lectures on "Exceptional Mental States" (e.g., Taylor, 1984). That interest faded with the ascent of behaviorism, which dominated psychology for decades, but it resurged in the 1960s, stimulated by the use of psychedelics and acquaintance with Asian meditation practices (Tart, 1969). Research and theory on ASCs waned after some years, partly because of the criminalization of psychedelics and excessive claims about their potential benefits, but the wheel has turned again in recent years, driven by renewed research and interest in the practical applications of psychedelics and meditation techniques.

The concept of ASC we follow here refers to a general functioning or discernible state of mind different from the ordinary waking one, not to the basal concept of "consciousness" as the capacity of being (reflectively) aware of something (cf. Natsoulas, 1983). Albeit not as widely used as "altered," *alternate*, in the sense of a state substituting another one, is arguably a more precise descriptor of *different* states of consciousness than the sense that the ordinary one is "altered" (Zinberg, 1977). There have been numerous definitions for ASCs, some critical (e.g., Revonsuo et al., 2009), others more open and neutral (e.g., Mishara & Schwartz, 2011), yet they all contrast them to a normal or ordinary state of consciousness that is (typically) temporarily and reversibly altered. We adopt a Western notion of states of consciousness as something inherent to the person but recognize that the metaphysics of other (sub)cultures interpret those changes differently. They might consider them instead as unveiling the *real* state of consciousness or as experiencing other ontological realities (cf. Locke & Kelly, 1985). Nonetheless, focusing on experiential features may make them identifiable even to those holding different metaphysical models (cf. Taves & Barlev, 2023).

A full conceptual discussion of which criteria should be used to characterize an ASC is beyond the scope of this article, but for the purpose of this taxonomy we parted from the influential definition by Tart (1975, p. 5) of a discrete ASC as a "unique, dynamic pattern or configuration or psychological structures … different from some baseline state of consciousness." This definition was clarified by Farthing (1992), who specified that ASCs are (a) not just changes in the content of consciousness, (b) nor quantitative changes in

only one psychological process (e.g., greater or less absorption); furthermore, they (c) may not be recognized by the person at the time, (d) are usually short-term and reversible, (e) differ from the individual's ordinary waking state of consciousness, and (f) refer to changes in the configuration of psychological structures, rather than to mere differences of behavior or physiology.

The notion of an ordinary, waking state of consciousness needs to be problematized, as there are important individual differences, for instance about the incidence of imagery, which may be central for some people but not for others (Hurlburt & Scwitzgebel, 2007). In addition, some phenomena such as synesthesia may be experienced by most people only during ASCs, but they are "ordinary" for strong synesthetes (Marks, 2014).

Our taxonomy was developed primarily for alterations among adult humans, but some preliminary statements are in order. Distinct behavioral (and perhaps experiential) states have been reliably identified in organisms as primitive as nematodes and are essential to human development. Understanding infant behavior requires segmenting it into discrete behavioral states defined by differences in alertness, motor activity, physiology, facial expression, and, probably, experience. Such states are transient, repeatable, and unique configurations, moving from one to the next in roughly predictable sequences, as in transitions between sleep-awake states (Putnam, 2016). There is no way to know with certainty what infants experience, but Deikman (1977) offered this perspective:

> Imagine the infant's world: shifting fields of sensations within shifting levels of sleep and waking; swirling mists of warm sleep giving way to bright colors and simple patterns, mixed with gnawing feelings, persistent and demanding; then muscle tensing and crying sounds (p. 230).

Previous Adult Taxonomies

Attempts to categorize ASCs are neither recent nor exclusive to modern science. Beginning over 2,000 years ago, such classifications arose in different cultures. The Greek philosopher Plato mapped divinely induced alterations of consciousness or *manias* according to their outcomes (e.g., creative or prophetic) in his *Phaedrus* dialog (Ustinova, 2020). In India, maps of ordinary and meditative states of consciousness, and sequences in which they arose during meditation, were developed at least in three religious-contemplative traditions: Hinduism, Jainism, and Buddhism (Feuerstein, 1998).

During the era of scientific psychology, categorizations have been mostly based on induction and/or underlying psychological dimensions. A recently published article grouped 23 "classification schemes" of ASCs into three main types (state, method, and neuro/physio based; Fort et al., 2025) that seem unclear and contradictory. For instance, Fischer's cartography, based on physiological arousal, is not situated under the physiologically based group. Our purpose here is not to offer an exhaustive list of previous classifications of ASCs, but to mention influential ones, how they can be grouped, and their uses and limitations.

The simplest categorization of ASCs uses the level or depth of a phenomenon (e.g., "light vs. deep trance" in mediumship, Sidgwick, 1915). More sophisticated models have proposed interacting dimensions, although circumscribed to a few ASCs. They include mapping of severe brain injuries (e.g., coma and locked-in syndrome) according to levels of awareness/consciousness and motor function (Laureys, 2005). Hobson (2009) developed his Activation-Input-Modulation model to differentiate waking, dreaming, and lucid dreaming, based on three dimensions of neural dynamics: activation of areas in the brain, inhibition of sensory and motor input, and modulation of neurotransmitters such as dopamine. Also centered on brain dynamics, in this case of neuronal networks, Christoff et al. (2016) analyzed daydreaming according to the influence of neuronal networks on brain regions.

Other classifications have been proposed for many or all ASCs. Fischer (1971) offered an influential cartography of "ecstatic and meditative states" based on levels of physiological arousal, positing that, at the extreme, hypo- and hyperarousal produced a similar state. A more recent and sophisticated neurophysiological model avers that cognitive states can be arranged according to levels of cortical entropy and cognitive flexibility (Carhart-Harris et al., 2014) and does not propose that opposite extreme levels produce the same state.

Considering that ASCs are multidimensional global states, having different characteristics and functional roles (e.g., Bayne et al., 2016), some taxonomies have used multiple dimensions. Metzner (2005) arranged various ASCs according

to three dimensions: arousal versus sedation, pleasure versus pain, and expansion versus contraction. A more complex model was offered by Berenbaum et al. (2000), who classified anomalous experiences according to three onset/course dimensions (level of awareness, individual volition, and individual control) and three phenomenological dimensions: subjective hedonic valence, psychical-metaphysical qualities (e.g., whether they were sensory focused), and potential involvement with some entity. Although including important elements such as level of awareness, this classification is unwieldy and does not provide actual categories. A model by Josipovic (2021) incorporated an implicit–explicit gradient of nondual awareness and a map of states including global level and phenomenal content.

In an influential article on the psychobiology of ASCs, Vaitl et al. (2005) offered an inconsistent classification based on both experiences and induction and used four basic dimensions: level of activation, awareness span, self-awareness, and sensory dynamics. Timmermann et al. (2023) advocated for a neurophenomenological framing of ASCs but proposed categories based on inductions (hypnosis, meditation, and psychedelics) rather than on the experiences themselves.

There have also been attempts to focus on proposed core aspects such as different types of self-experience. Based on Gallagher's (2000) theory, Berkovich-Ohana and Wittmann (2017) presented a typology centered on narrative or minimal senses of the self, along the dimensions of subjective time, awareness, and emotion (see also Berkovich-Ohana & Glicksohn, 2014). Yaden and Newberg (2022) proposed a taxonomy based on changes in self, time, space, and mind perception. Finally, Walsh (2007) offered a large number of dimensions to compare different states: control (ability to enter and/or control the experience), awareness of the environment, ability to communicate, concentration, mental energy/arousal, calm, affect, identity or self-sense, out-of-body experience, and content of the experience.

Also relevant has been the development of questionnaires designed to evaluate alterations of consciousness based on various dimensions, some with neutral descriptors (e.g., sense of time or self, in the Phenomenology of Consciousness Inventory, Pekala, 1991), others with complex descriptors such as "Oceanic Boundlessness" (Dittrich, 1998).

Previous categorizations of states of consciousness have had important limitations, such as mixing inducing triggers, cognitive processes, and experiences; relevance to only a few states; and lack of empirical evaluation. The most common form to characterize ASCs has been according to the stimulus, induction, or trigger preceding them, but this strategy has various problems:

- It presumes the effect homogeneity of an induction/trigger such as hypnosis or meditation even though neurophenomenological outcomes vary depending on the specific instructions and techniques used (Cardeña, 2016).
- It ignores individual experiential and/or neural differences. For instance, the effects of hypnotic induction or psychoactive substance interact with cognitive traits (e.g., Cardeña et al., 2013; Moujaes et al., 2023).
- Characterizing states by their triggers obscures common predisposing traits, such as absorption and openness to experience, predicting the responsiveness to different triggers (for psychedelics, see Aday et al., 2021; for hypnosis, see Cardeña & Terhune, 2014; Glisky et al., 1991).
- States produced by different inductions may be very similar, as in boundaryless states produced by hypnosis, drugs, or meditation (e.g., Ataria et al., 2015, for meditation; Cardeña, 2005, for hypnosis; Carhart-Harris et al., 2014, for psychedelics).
- Even for the same individual during the same context, such as a psychedelic or hypnotic experience, the experience may differ markedly across time (e.g., Cardeña, 2010; Sandilands & Ingram, 2024).

Another problem has been the use of vague and unclear terms such as "ego dissolution" or "trance" to classify different experiences (e.g., Cardeña & Krippner, 2010; Lindström et al., 2025). Conversely, different terms may refer to the same experience (Britton et al., 2021). Vague or contradictory definitions and the lack of well-defined, clear, and empirically testable criteria to evaluate ASCs have hindered a clear discourse and the integration of the subspecialties that address them. A taxonomy based on clearly defined subjective experiences (and behaviors as needed) and testable concepts can move the field forward toward such integration and offer

insights into potential neural mediators (as in the comparison of near-death experiences and psychedelic experiences, see Martial et al., 2019).

The Current Taxonomy

We decided to develop a phenomenologically based taxonomy, but we also briefly present information on related neurodynamics for further consideration. At a future point, a neurophenomenological taxonomy should be developed, combining the systematic use of naive and trained first-person subjective experiences and third-person neurophysiological measures, to integrate both types of data (cf. Lutz & Thompson, 2003). Such an approach has been used to compare daydreaming with dreaming during sleep (Fox et al., 2013), evaluate changes in states triggered by hypnosis (e.g., Cardeña et al., 2013), and discuss the effects of hypnosis, meditation, and psychedelics (Timmermann et al., 2023). However, the neurophenomenological approach to ASCs is still in its infancy (e.g., Moujaes et al., 2024), does not use agreed-to methodology, and only rarely distinguishes specific states within a longer event (cf. Jamieson et al., 2024). Thus, we believe that our approach, based on phenomenology (and behavioral observations when no first-person reports are feasible) is a cardinal step for further developments.

A taxonomy that covers a wide range of (if not all) ASCs has much to offer:

- a common language for those working in subspecialties;
- arranging disparate observations from different bodies of literature (e.g., meditation, hypnosis, psychedelics) into a coherent system;
- facilitating hypothesis-testing across subspecialties to assess underlying phenomenological and neural processes;
- revealing what is common and different across different triggers/antecedents of ASCs;
- revealing linear and nonlinear changes during a sequence of states; and
- clarifying the characteristics of transitions between states.

This taxonomy is the consensus of a multidisciplinary group of experts on alterations of consciousness. We followed a modified (in that participants were not anonymous) Delphi technique (Waggoner et al., 2016). The first author contacted recognized experts in various relevant areas (e.g., coma, sleep states, meditation, religious experiences) and from different disciplines (e.g., psychology, psychiatry, anthropology, neuroscience) and asked them if they were interested in developing a taxonomy of ASCs and, if so, whether anybody else's expertise might be needed. After initial online meetings with those wanting to discuss how to develop a taxonomy, the first author submitted a draft asking for discussion and modifications from all other coauthors, and later produced a revised draft. This process was repeated using group calls and emails until agreement on the basic categories, definitions, and literature reviewed were achieved after reviewing six previous drafts.

During this process, we discussed alternatives to the categorical taxonomy we present. The main alternative was to develop descriptions of ASC based on dimensions such as experiences of minimal self, agency, and so on. This is not a mutually exclusive strategy to the categorical one presented in this article, but we concluded that adding it to this article would detract from communicating a clear categorical taxonomy.

As for developing a data-driven rather than an expert consensus taxonomy, despite its potential such development is not feasible at this point. There are no current databases encompassing a broad spectrum of states; instead, individual efforts have focused on specific subsets of states, such as drug-induced experiences or dream reports. This heterogeneity poses challenges when comparing reports across databases, as participants may describe their experiences in varying ways, highlighting different aspects of their experiences. Furthermore, some of the largest collections of first-person reports (e.g., Erowid for psychedelic experiences) were not originally intended for scientific analysis but for users to share their experiences with the community (Friedman & Ballentine, 2024). Our taxonomy can organize and set the basis for data-driven efforts in the future and for analyses of the extant data. As a consensus article, our effort did not require an ethics review and complied with all standards for such works.

Our strategy followed four taxonomic principles that were also used in a classification of meditation methods: theoretical foundation, orthogonality, semantic lucidity, and utility (Nash & Newberg, 2023; see also Ereshefsky, 2000). The premise underpinning our taxonomy was that it must be grounded on ongoing or retrospective reports of

subjective experience. In some cases (e.g., unresponsiveness), experiences of ongoing mental occurrences might have been obtained retrospectively or inferred by observers from behavior and physiology. The principle of orthogonality means that we sought to provide categories in which a member of one category is not also a member of another category, although, in the case of states of consciousness, we are dealing with "fuzzy sets" rather than absolutely discrete, mutually exclusive sets (cf. Kosko, 1998; see also Rosch et al., 1976). Furthermore, one state may transform into another, as in simple images turning into complex ones or nonlucid dreams becoming lucid and vice versa, unlike what typically happens with biological taxa.

We concluded that other forms of categorization such as using exemplars or basing the classification on theory would not be very useful at this point. With respect to exemplars, we were more interested in describing states that are phenomenologically similar across conditions or inducers, rather than presenting examples that may be prototypical in common parlance (e.g., "trance state") that have little scientific value. As for theoretically based classifications, they can be useful within more circumscribed domains (e.g., the activation-input-modulation models, Hobson, 2009) but a taxonomy that first organizes various observations phenomenologically in distinct sets is a needed first step.

To achieve semantic lucidity, we present categories using general descriptive terms and with examples of first-person reports whenever feasible. We have sought to present states arranged by their main characteristic, avoiding overlaps and particular jargon (as in some contemplative traditions). As for utility, during the development of this article we discussed similarities across triggers that had not been contemplated before and have developed research plans to evaluate them in the future so we can present a more integrated perspective on ASCs.

Our taxonomy uses a nomenclature with the first term defining the cardinal characteristic of the state followed at times by a subcategory (e.g., mystical or unity states, with or without sensory content). Contexts/triggers/conditions in which the state has been clearly described are also mentioned, to orient the interested reader, but we abstained from categorizing states by their triggers for the reasons mentioned above. Finally, neural features related to specific states are briefly mentioned when available, as a supplement rather than as the focus of this taxonomy.

Our classification (Figure 1) follows these guidelines. It:

- discusses states experienced by adult humans, although at least some (e.g., dreaming, drug-induced states) are present at all ages and in other species;
- focuses on the main characteristic of the experience (e.g., identity alteration) rather than on peripheral but related alterations, such as changes in the sense of time;
- seeks to achieve a basic or species level of categorization, which is the most cognitively efficient one (cf. Rosch et al., 1976);
- addresses substantial ("qualitative") and recognizable state changes from the ordinary state, rather than subtle variations from it;
- adopts the term phenomenology in a "thin," general sense of referring to subjective experience rather than in a narrow, "thick" sense of following a specific methodology or philosophy (Berkovich-Ohana et al., 2020; for reviews of research methods of subjective experience, see Cardeña & Pekala, 2014: Kitson et al., 2020);
- centers on discrete states rather than on complex experiences that may include sequentially a number of them;
- avoids labels that seem evaluative (e.g., spiritual) to focus on the experience as lived, regardless of different cultural interpretations or positive or negative outcomes;
- indicates that most of the categories (except for delirium and some unresponsive states) describe states that may have clinical *and* nonclinical presentations, so no assumption of pathology or increasing or decreasing levels of development is assumed.

No data, analytic methods, or study materials are publicly available to other researchers because none were generated.

Categories

Proto and Transitional States

In both childhood and adulthood, unstable proto or transitional states lasting seconds to minutes occur between stable states (for simulation of brain state transitions, see Deco et al., 2019). Case studies of individuals with dissociative identity

Figure 1

A Phenomenological Taxonomy of Altered States of Consciousness

Note. See the online article for the color version of this figure.

disorders (DID) have found changes in diverse brain regions when switching from one identity state to another (Lebois et al., 2023), but studies with groups are needed to obtain a clearer picture. Other transitional states include:

1.1 "Auras"/prodromal phenomena that may precede organic and functional neurological seizures. They cover hunches ("a funny sensation"), negative emotions such as fear, somatic sensations such as tingling, impaired vision, and feeling dream-like, distant, or confused (Cardeña et al., 2020), while maintaining overall memory and perception (Lüders et al., 2014). Auras may also precede migraines and include visual disturbances (e.g., bright lights and blurred vision) and somatic phenomena (e.g., anesthesias and paresthesias; Viana et al., 2017).

1.2 Transitory states of dizziness, confusion, or lack of equilibrium found in descriptions of going into or out of ritual trance or spirit possession (reviewed in Cardeña et al., 2023). Emic (from the culture) examples include *saoulé* (inebriation) or spirit touch in *Vodou* (Schaffler et al., 2016), and *irradiación* in Afro-Brazilian religions (Frigerio, 1989).

1.3 Transitory stages going into or coming out of sleep (i.e., hypnagogic and hypnopompic stages). Common phenomena include sounds, somatosensory sensations such as falling down, short, bizarre, and geometric imagery (e.g., "the blood turned into what looked like … cocktail sauce that's served with shrimps, and then … little shrimps started appearing," Foulkes & Vogel, 1965, p. 239). There is also sleep paralysis, which is a mixture of reflective consciousness (typical of wakefulness) combined with muscle paralysis and occasional hallucinations (typical of rapid eye movement [REM] sleep). Here is an example: "I was sleeping … and couldn't move. … There was a terrifying figure looming over me" (Solomonova, 2018, p. 435). Neurochemically, shifts between wake and sleep are related to changes in the discharge of cholinergic and aminergic groups of nuclei in the brain stem and pontine region (Hobson, 1994)

Delirium

Delirium is characterized by cognitive (e.g., inability to communicate or focus attention)

and behavioral (e.g., agitated movements) disorganization. It may occur in the context of neurological and/or psychiatric disorders, and postoperative reactions. They present in two main forms that may alternate (Ross et al., 1991):

2.1 Activated, characterized by agitated behavior, hallucinations, delusions, and illusions (e.g., in tonic-clonic seizures, Viarnés, 2007)
2.2 Somnolent, involving confusion and unresponsive or slow-to-react behaviors (e.g., catatonic schizophrenia involving lack of responsiveness, withdrawal, and automatic/repetitive behaviors and verbalizations; Ungvari et al., 2009).

States With Minimal or No-Awareness of/Disconnected From the Environment

These states involve very limited or no conscious awareness of perceptual stimuli, sometimes accompanied by lack of responsiveness to stimuli. Unresponsiveness does not necessarily mean unawareness or unconsciousness, though, as the person may not respond because of inability to speak (aphasia), amnesia, paralysis, lack of motivation, or absorption in nonperceptual experiences (Gloor, 1986; Sanders et al., 2012). It is important to mention that in ordinary and ASCs, there can be nonconscious registration and even learning of stimuli (cf. Kihlstrom, 2022). We identified the following subtypes:

3.1 No awareness of/disconnected from environmental stimuli, without ongoing subjective experience, including coma states (apparent unawareness and unresponsiveness with eyes closed, as in some brain-dead and coma presentations), as well as unresponsive wakefulness with eyes open.
Decreased arousal/subjective experience is related to lower frequency brain wave oscillations (Annen et al., 2023; Rusalova, 2006). Unresponsive brain seizures show decreased default mode network activity (Danielson et al., 2011) and unresponsiveness in general is related to decreased connectivity across brain regions (Demertzi et al., 2019) and overall brain states stability (Perl et al., 2023; Sanz Perl et al., 2021).

3.2 Minimal or no awareness of stimuli/uncertainty about ongoing subjective experiences. Some coma patients seem to have minimal awareness (Noirhomme & Laureys, 2011) and present similar brain activity to those with minimal awareness (Thibaut et al., 2021), as happens in some seizure presentations (Detyniecki & Blumenfeld, 2014). This category also includes "minimally conscious states" during neurological conditions, in which patients may show purposeful behaviors, can follow simple commands, respond gesturally, and produce intelligible verbalizations, but it is uncertain whether they have spontaneous, ongoing subjective experience (Noirhomme & Laureys, 2011).
3.3 Minimal or no awareness of external stimuli/ongoing subjective experiences. Most lightly anesthetized individuals and those reporting immediately from REM or non-REM sleep do not seem to have much if any conscious awareness of external stimuli or behavioral responsiveness but retrospectively report dreams or dream-like experiences (Scheinin et al., 2021; Siclari et al., 2017; Valli et al., 2023).
With respect to sleep, we can distinguish between two main types:

3.3.a Dreaming sleep, nonlucid. This is the most common type of dreaming experience, involving an immersive, hallucinated reality experienced as real, involving a more or less coherent narrative and varying in richness and detail. Although there is a first-person perspective and almost always a dream self that experiences the dream event, that self may be a reduced version of the narrative, reflective self of waking life. There are various types of dreams, some closely reflecting waking experiences, others predominantly fantastic and/or symbolic (Hunt, 1989).
Although reports of dreaming-type experiences have been mostly associated with REM sleep, they may occur in other sleep stages as well (Picard-Deland et al., 2023). Compared with nondreaming sleep, dreaming sleep is characterized by lower amplitude and higher frequency oscillations (Siclari et al., 2017). Compared with daydreaming, REM dreaming involves greater activation of the medial prefrontal cortex, medial temporal lobe structures, and posterior cingulate, with

deactivation of various prefrontal cortex executive regions (Fox et al., 2013).

3.3.b Dreaming sleep, lucid. This type of dreaming includes awareness that the person is dreaming, with access to episodic memory, a sense of will, and occasional control of the dream experience. LaBerge (2014) described the phenomenon and provided examples such as: "I dreamed that I was standing on the pavement outside my home … on glancing casually at stones [I noticed that] they had seemingly all changed position. … Then the solution flashed upon me. … I was dreaming" (p. 149). Occasionally in an experimental setting, awareness of external stimuli can be present, allowing two-way communication between the lucid dreamer and experimenter (Konkoly et al., 2021). Greater reflective self-awareness in dreams relates to higher activation of the dorsolateral prefrontal cortex and precuneus (Dresler et al., 2012), which are involved in self-reflective thinking.

During the very rare phenomenon of witnessing, or conscious dreamless sleep, experients mention transitioning from lucid dreaming into nonimaginal experiences such as "a space of nowhere" that later might include visuals or other phenomena more akin to dreaming (Alcaraz-Sanchez, 2021).

Experiential Detachment States

This classification covers experiences of partial or complete detachment from aspects of the self (e.g., the body, sensations, emotions) and/or the environment, with the individual's sense of identity typically remaining the same.

4.1 Sensations of detaching, floating, being outside of the body, and flying sometimes precede imaginal states (see below). They have been described in various contexts including intense exertion (Morgan, 1993), spontaneous reports of highly hypnotizable person in a hypnotic context, or "deep hypnosis" henceforth (e.g., "floating," "flying," "mind leaving the body," Cardeña, 2005, p. 47), psychedelic reports ("separation of the self from the body," Preller & Vollenweider, 2018), situations of danger (Cardeña & Spiegel, 1993), near-death (e.g., "I was out of my body at once and on the ceiling of the operating room looking down, watching them work on a body … the person I was viewing was me!," Greyson, 2021, p.68), and shamanic experiences (the "magical" or "soul flight" is a trademark of shamanism, Eliade, 1995).

Ketamine and other dissociative substances can give rise to these experiences (e.g., "It was like floating out of your body", Breeksema et al., 2023, p. 1551). Experiences of body detachment have been related to slow brain-wave activity, particularly at the temporoparietal junction (Blanke & Arzy, 2005).

4.2 Experiences of disconnection/estrangement from body sensations, emotions, thoughts, etc., but without the self being located outside of the body. Reduced sensorial experience can be induced by hypnosis in responsive individuals (e.g., Spiegel et al., 1985) and may also occur as transient reactions to traumatic events ("I felt totally estranged from all things and people. … I felt dazed and detached," Cardeña & Gleaves, 2007, p. 473). They are present in depersonalization (e.g., "It's like glass over my eyes, a visual fog"; Simeon & Abugel, 2006, p. 9), and may occur during epileptic seizures and functional neurological disorder (Cardeña et al., 2020).

A review of biomarkers of pathological dissociation (Roydeva & Reinders, 2021) found alterations in prefrontal and frontal regions, anterior cingulate, posterior association areas, and basal ganglia. A study that could identify precisely when the experiential detachment occurred corroborated some of those findings (Jamieson et al., 2024).

Enhanced Physicality States

States of qualitatively distinct enhanced physicality or hyper-embodiedness involving sensations or physical abilities have been discussed for a long time (James, 1907; Murphy, 1992). They may lead to transcendent experiences but occur on their own. There seem to be at least two types:

5.1 Enhanced perception and agility experiences, such as sensory intensity during the amplification and orgasm stages of the sexual response (Maliszewski et al., 2011); increase

in acuity during peak sports as in a golf hole suddenly looking "as big as a wash tub" (Murphy, 1992, p. 65); and in agility during acting training "climbing with an assurance and speed I had not experienced before" (Cardeña, 2019, p. 215). Enhanced sensations and abilities have also been reported in bipolar disorder (Parker et al., 2017).

5.2 Sensations of intense energy/heat. Often related to the Hindu practice of kundalini, they have been reported in other contexts. Examples include experiencing that the body was on fire or charged (Woollacott et al., 2021; see also Cooper et al., 2021) from a "kundalini" experience, and "[in] the body … there's pure crackling, surging, grinding, burning energy" (Wade, 2001, p. 115) from a sexual context. Christianity contains descriptions of burning sensations or *incendium amoris* such as "in the coldest days of winter it was necessary … to open the windows … to moderate the great heat [of Saint Philip Neri]" (Thurston, 1952, p. 210). The San of the Kalahari describe *N/um* as a boiling energy that makes them tremble and is hot during their dancing ritual (Katz, 1982).

The experience of meditation generated *Tumo* heat has been found to parallel measured increases in temperature in various parts of the body (Benson et al., 1982). Whether enhanced physicality shares similar brain dynamics with the more common "flow" experience (e.g., Dietrich, 2004: Harris et al., 2017) remains to be investigated.

Altered Identity States

These states are marked by qualitative alterations in identity, sometimes accompanied by amnesia. Rather than an absolute distinction, the level of identity substitution and amnesia may vary from instance to instance even among those who claim absolute identity substitutions and amnesia.

6.1 Alteration in the usual sense of identity, or what is often referred to as "trance" in anthropology (cf. Rouget, 1985). It involves enacting ritual behaviors with alteration or loss (but not substitution) of the usual sense of identity with a decreased or absent narrative self, narrow or selective awareness of the environment, and decreased sense of self-agency (Cardeña et al., 2023). An excerpt of an anthropologist's experience during an Afro-Caribbean religious ceremony is a good illustration: "I cannot clearly discern when … the surrounding scene started to vanish … the sensation of a force invading me. … I was not dancing: I was danced" (Halloy & Servais, 2014, pp. 490–491).

6.2 In co-consciousness, as described in the literature on mediumship and channeling, the person is conscious of more than one co-occurring identity. Long transcriptions of sessions in which a medium interacted with an intermediary or "control" reputedly communicating simultaneously with deceased individuals are found in Gauld (1982); here is a quotation from a "channeler": "They often tell me that they are sending me information in the form of frequency" (Barzilay, 2012, p. 63). In the clinical condition known as dissociative identity disorder (DID, previously known as "multiple personality"), the person may experience different selves communicating with the ordinary, presenting identity (Ross, 1989, pp. 126–127).

6.3 Substitution of the usual by another identity occurs in ritual spirit possession, some mediumship/channeling experiences, and DID, in which one or more different identities (and body images) substitute the person's usual identity. An example of the former comes from Uganda: "The daughter of a father who was killed started to talk with his voice 'bring my cigarettes'" (Van Duijl et al., 2005, p. 231). The asymmetrical memory and contrasting features across different identity states in DID are exemplified by what a patient told one of the authors (FP), "I'm tired of coming to work in the morning and finding out that I quit in a huff the day before." Periods of apparent unawareness or "blackout" are reported as well: "I looked at the clock and it was 9:00 a.m. Then I looked again and it was 2:30" (Loewenstein, 1991, p. 573).

Studies using different brain imaging techniques have found varying brain activity in the identity states of patients with DID, depending on the task evaluated (Lebois et al., 2023) and have reported greater differences among the identities of people with DID than among people simulating it (Reinders et al., 2012).

Imaginal/Fantasy/Visionary States

In this category, imaginal experiences (mostly visual but potentially involving other senses) are central. The referent of the image may be something akin to what is found in perceptual experiences, diverge from it, or be a combination of both. We identified these types:

> 7.1 Simple imagery, which occurs by itself or before more complex imaginal experiences. It consists of geometric/kaleidoscopic visual images (e.g., lattice forms, kaleidoscopes), or other simple visual images and sounds. It has been reported in the literature on the transition between being awake and asleep (Waters et al., 2016), drug intoxication (Siegel, 1977), and "deep hypnosis" (e.g., "geometric shapes, like a grid thing," Cardeña, 2005, p. 48). This or more complex imagery may include cross-modal imagery and synesthesias (e.g., in psychedelic experiences, Preller & Vollenweider, 2018; and in "deep hypnosis," "Lines of different colors, making music," Cardeña, 2005, p. 48).
> 7.2 Complex imagery is described in various contexts including pathological disorders and nonpathological conditions such as shamanism, psychedelic experiences, religious experiences, "near-death experiences," and "visionary experiences."

Pathological hallucinations are often auditory but can be multisensory, as in this example: "I see all the dead, I see my relatives. They fly on a white cloud to me, where I am, and communicate with me. They are not visible to all" (Altman et al., 2023). A nonclinical example, bearing some resemblance to the previous one, comes from a Sioux shaman, who recounted his experience thus: "I saw a man coming toward me, he seemed to have no feet, he just floated toward me out of a mist. He held two *wagmuha*, two rattles" (Halifax, 1980, p. 85). A vision transformed the life of a drug addict about to jump from a bridge: "In front of me I saw the outline of a face. Was I hallucinating again? … And I heard a voice, so soft and fatherly loving, as I had never heard before" (Geels, 2011, p. 267). Here is an excerpt from a near-death experience: "I found myself in a lush meadow of wildflowers. There, welcoming me with open arms, were my mama and papa." (Greyson, 2021, p. 15). Finally, a quotation from a case study involving sensory deprivation: "there was this spaceship that was carrying me around the universe. … I saw several corridors that lead me to several doors" (Glicksohn & Ben-Soussan, 2020, p. 4).

Intense, vivid visual hallucinations are a hallmark of serotononergic psychedelic-induced experiences (Preller & Vollenweider, 2018). In psychedelic-induced states, visual experiences are associated with increased cerebral blood flow (Carhart-Harris et al., 2016) and decrease in alpha power over posterior parieto-occipital brain areas, signaling an increase in the excitability of visual pathways (Vollenweider & Preller, 2020). Higher gamma and beta, as well as greater brain omega complexity (less synchronization) related to imagery during hypnosis (Cardeña et al., 2013), and occipital gamma was associated with imagery in a case study with an artist meditator (Luft et al., 2019).

Unity/Mystical States

This category encompasses experiences (not only an intellectual conviction) of being united/merging with something larger than the self, be it a transcendent realm and/or the whole of reality, accompanied by reduced or absent self-importance (hypo-egoism; Yaden et al., 2017). These states occur in various contexts. Marshall (2019) lists 13 potential triggers including hallucinogen intoxication, hypnosis, meditation, and closeness to death ("I … might be shot. … So what? … Then I was floating on my back on a river of peace. … Then there was no river and no I," Koestler, 1954, p. 350, on what he experienced when he thought he would be shot the following day).

Unity experiences are characterized by among others, an awareness of oneness and unity, boundarylessness, an apprehension of ultimate reality, and a transcendence of time and space (e.g., Nave et al., 2021; Preller & Vollenweider, 2018). They are often accompanied by awe, wonder, and euphoria (for psychedelics, see Preller & Vollenweider, 2018; for "deep hypnosis," Cardeña, 2005, p. 99: "All the feelings that are good just surround me").

These states can be divided into those occurring with sensory experiences, or extrovertive, and those without sensory experiences, or

introvertive (Stace, 1960). Although very positive emotions are typically present, a minority of individuals find them dysphoric (Wulff, 2014). Following are examples of both types:

> 8.1 With sensory experiences, such as enhanced perception of stimuli, imaginal synesthetic (i.e., cross-modal) percepts, and a very bright light, as in this example from "deep hypnosis" "merging with pure light or energy" and "being one with everything" (Cardeña, 2005, p. 48). A meditator described it thus: "I became absorbed into the background, meaning the whole world without any separate entity" (Ataria et al., 2015, p. 141). And an example from a near-death experience: "As soon as the Light became present, I felt as if I was merging. The Light became my wholeness" (Greyson, 2021, p. 157).
> 8.2 A sense of pure consciousness without sensory experience has manifested in various contexts (cf. Metzinger, 2024). A high hypnotizable stated: "for a while I was just total nothing" (Cardeña, 2005, p. 48) and a meditator in a "deep" state: "there was no sense of my physical body, no thought" (Gifford-May & Thompson, 1994, p. 125).

Research on the neural correlates of unity states is far from unequivocal (cf. Cardeña & Lindström, 2021). Nonetheless, some patterns can be discerned. Changes in the activity within the default mode network (related to self-related processes) and its connectivity with the task-positive network have been related to "ego disintegration or dissolution" (Carhart-Harris et al., 2016), along with decreases in oscillation power in some brain areas (Dor-Ziderman et al., 2013), and greater neural complexity (Cardeña et al., 2013). Episodes of contentless "nonduality" of meditators have been related to increases in low frequencies (Berman & Stevens, 2015), and increases in very fast (gamma) synchronization (Berkovich-Ohana, 2017).

Discussion

The study of altered states of consciousness has suffered from lack of conceptual clarity and not having a commonly accepted classification. We propose here an eight-categories taxonomy as an initial point to discuss and compare commonalities and differences across various contexts: proto and transitional, delirium, minimal to no awareness, experiential detachment, enhanced physicality, altered identity, imaginary/fantasy/visionary, and unity/mystical. A common reaction among the authors during the development of this taxonomy was that our understanding of each one's special area of interest grew in depth and clarity as we struggled with how to best categorize these complex phenomena.

The taxonomy we present is a "work in progress" and expect that our categories and subcategories will be defined more precisely as we evaluate them more thoroughly and that other transitional states will be described. Also, testing our level of description cross-culturally will inform us whether this or another level of classification is ideal (cf. Taves & Barlev, 2023). We are cognizant that taxonomies are heuristics whose value depends on the questions asked by theoreticians and researchers, so authors with different goals than ours might use other classifications more suited to their purposes, while ideally contrasting them with the classification we provide here.

In our enterprise, we have sought to arrive at "pure" types of phenomena such as disembodiedness, without considering the context in which they happen, such as in an episode of depersonalization or the beginning of a near-death experience. The comparison of these different contexts has clinical implications as they may identify which features (if any) are specifically related to pathology. It is also of great clinical important that for many categories examples can be provided from pathological and nonpathological contexts, underlining the importance of not assuming that unusual states (and more complex experiences) are necessarily indicative of a disorder (see also Cardeña et al., 2014).

Looking at our categories in the context of the whole experiences in which they occur (e.g., a long meditation or psychedelic session) may allow us to investigate whether some ASCs usually precede others, such as sensations of floating preceding more visual experiences, as seems to occur in shamanic, "deep hypnosis," and near-death experiences. Evaluating states sequences will allow us to better theorize about them, rather than just taking complex, multi-categories events such as "psychedelic experiences" and mixing all of various recognizable states into a hybrid one.

We hope that our taxonomy will not only be used but challenged so that it can be further developed and improved. For instance, we are pursuing the empirical testing of this classification based on linguistic analysis of extant data, and we will develop a dimensional classification that will supplement, rather than substitute, the current taxonomy.

It is also important to obtain more precise information on the states using a variety of methods, including mixed (e.g., Lindström et al., 2025) and purely phenomenological methods (e.g., Petitmengin et al., 2019), and large-scale linguistic analyses (e.g., Martial et al., 2019), rather than relying on vague constructs and measures. Furthermore, a neurophenomenology of ASCs matching specific experiences to brain dynamics has barely begun, with attempts to characterize neural correlates of clearly specified states being rare. A more precise ASC phenomenology will inform a more precise future neurophenomenology and vice versa.

Some of the questions that remain for the future include: (a) whether any central phenomenological features of ASCs are missing in this taxonomy, (b) testing the orthogonality of the categories, (c) evaluating quantitatively whether the phenomenology of the categories is coherent and specific, for instance by using natural language analysis, (d) presenting a map of the development of specific states across complex events such as psychedelic intoxication, (e) testing the cross-cultural value of the taxonomy by addressing how translatable our concepts are across different traditions, (f) comparing the categories along dimensions such as aspects of the self and controllability of the experience, and (g) creating an even more comprehensive taxonomy that also includes variations within the "ordinary state." We offer this taxonomy with the goal of stimulating further research and theory, to expand our understanding of states that form an intrinsic part of who we are as humans.

References

Aday, J. S., Davis, A. K., Mitzkovitz, C. M., Bloesch, E. K., & Davoli, C. C. (2021). Predicting reactions to psychedelic drugs: A systematic review of states and traits related to acute drug effects. *ACS Pharmacology & Translational Science*, *4*(2), 424–435. https://doi.org/10.1021/acsptsci.1c00014

Alcaraz-Sanchez, A. (2021). Awareness in the void: A micro-phenomenological exploration. *Phenomenology and the Cognitive Sciences*, *22*(4), 867–905. https://doi.org/10.1007/s11097-021-09743-0

Altman, M. G. G., Kuzmina, S. V., Irkabaeva, A. B., Mason, D. P., & Luhrmann, T. M. (2023). Hearing voices among Russian patients with schizophrenia. *Transcultural Psychiatry*. Advance online publication. https://doi.org/10.1177/13634615231191980

Annen, J., Frasso, G., van der Lande, G. J. M., Bonin, E. A. C., Vitello, M. M., Panda, R., Sala, A., Cavaliere, C., Raimondo, F., Bahri, M. A., Schiff, N. D., Gosseries, O., Thibaut, A., & Laureys, S. (2023). Cerebral electrometabolic coupling in disordered and normal states of consciousness. *Cell Reports*, *42*(8), Article 112854. https://doi.org/10.1016/j.celrep.2023.112854

Ataria, Y., Dor-Ziderman, Y., & Berkovich-Ohana, A. (2015). How does it feel to lack a sense of boundaries? A case study of a long-term mindfulness meditator. *Consciousness and Cognition*, *37*, 133–147. https://doi.org/10.1016/j.concog.2015.09.002

Barzilay, S. (2012). *"Being-a-channeler-in-the-world" A phenomenological research* [Doctoral dissertation, University of Haifa].

Bayne, T., Hohwy, J., & Owen, A. M. (2016). Are there levels of consciousness? *Trends in Cognitive Sciences*, *20*(6), 405–413. https://doi.org/10.1016/j.tics.2016.03.009

Benson, H., Lehmann, J. W., Malhotra, M. S., Goldman, R. F., Hopkins, J., & Epstein, M. D. (1982). Body temperature changes during the practice of g Tum-mo yoga. *Nature*, *295*(5846), 234–236. https://doi.org/10.1038/295234a0

Berenbaum, H., Kerns, J., & Raghavan, C. (2000). Anomalous experiences, peculiarity and psychopathology. In E. Cardeña, S. J. Lynn, & S. Krippner (Eds.), *Varieties of anomalous experience: Examining the scientific evidence* (pp. 25–46). American Psychological Association. https://doi.org/10.1037/10371-001

Berkovich-Ohana, A. (2017). A case study of a meditation-induced altered state: Increased overall gamma synchronization. *Phenomenology and the Cognitive Sciences*, *16*(1), 91–106. https://doi.org/10.1007/s11097-015-9435-x

Berkovich-Ohana, A., Dor-Ziderman, Y., Trautwein, F. M., Schweitzer, Y., Nave, O., Fulder, S., & Ataria, Y. (2020). The hitchhiker's guide to neurophenomenology—The case of studying self boundaries with meditators. *Frontiers in Psychology*, *11*, Article 1680. https://doi.org/10.3389/fpsyg.2020.01680

Berkovich-Ohana, A., & Glicksohn, J. (2014). The consciousness state space (CSS)—A unifying model for consciousness and self. *Frontiers in Psychology*, *5*, Article 341. https://doi.org/10.3389/fpsyg.2014.00341

Berkovich-Ohana, A., & Wittmann, M. (2017). A typology of altered states according to the Consciousness State Space (CSS) model. *Journal of Consciousness Studies*, *24*(3–4), 37–61.

Berman, A. E., & Stevens, L. (2015). EEG manifestations of nondual experiences in meditators. *Consciousness and Cognition*, *31*, 1–11. https://doi.org/10.1016/j.concog.2014.10.002

Blanke, O., & Arzy, S. (2005). The out-of-body experience: Disturbed self-processing at the temporo-parietal junction. *The Neuroscientist*, *11*(1), 16–24. https://doi.org/10.1177/1073858404270885

Breeksema, J. J., Niemeijer, A., Kuin, B., Veraart, J., Vermetten, E., Kamphuis, J., van den Brink, W., & Schoevers, R. (2023). Phenomenology and therapeutic potential of patient experiences during oral esketamine treatment for treatment-resistant depression: An interpretative phenomenological study. *Psychopharmacology*, *240*(7), 1547–1560. https://doi.org/10.1007/s00213-023-06388-6

Britton, W. B., Desbordes, G., Acabchuk, R., Peters, S., Lindahl, J. R., Canby, N. K., Vago, D. R., Dumais, T., Lipsky, J., Kimmel, H., Sager, L., Rahrig, H., Cheaito, A., Acero, P., Scharf, J., Lazar, S. W., Schuman-Olivier, Z., Ferrer, R., & Moitra, E. (2021). From self-esteem to selflessness: An evidence (gap) map of self-related processes as mechanisms of mindfulness-based interventions. *Frontiers in Psychology*, *12*, Article 730972. https://doi.org/10.3389/fpsyg.2021.730972

Cain, A. J. (n.d.). *The Linnaean system.* https://www.britannica.com/science/taxonomy/The-Linnaean-system

Cardeña, E. (2005). The phenomenology of deep hypnosis: Quiescent and physically active. *International Journal of Clinical and Experimental Hypnosis*, *53*(1), 37–59. https://doi.org/10.1080/00207140490914234

Cardeña, E. (2010). Anomalous experiences during deep hypnosis. In M. D. Smith (Ed.), *Anomalous experiences* (pp. 93–107). McFarland.

Cardeña, E. (2016). Towards a comprehensive neurophenomenological research in hypnosis and meditation. In A. Raz & M. Lifshitz (Eds.), *Hypnosis and meditation: Towards an integrative science of conscious planes* (pp. 281–301). Oxford University Press.

Cardeña, E. (2019). What the Taller de Investigación Teatral revealed to me. In N. Núñez (Ed.), *Anthropocosmic theatre* (pp. 215–218). University of Huddersfield Press.

Cardeña, E., & Gleaves, D. (2007). Dissociative disorders. In M. Hersen, S. M. Turner, & D. Beidel (Eds.), *Adult psychopathology and diagnosis* (5th ed., pp. 473–503). Wiley.

Cardeña, E., Jönsson, P., Terhune, D. B., & Marcusson-Clavertz, D. (2013). The neurophenomenology of neutral hypnosis. *Cortex*, *49*(2), 375–385. https://doi.org/10.1016/j.cortex.2012.04.001

Cardeña, E., & Krippner, S. (2010). The cultural context of hypnosis. In S. J. Lynn, S. J. W. Rhue, & I. Kirsch (Eds.), *Handbook of clinical hypnosis* (2nd ed., pp. 743–771). American Psychological Association. https://doi.org/10.2307/j.ctv1chs5qj.34

Cardeña, E., & Lindström, L. (2021). The light and the bulb: The psychology and neurophysiology of mystical experience. In A. Moreira-Almeida, B. Paz Mosqueiro, & D. Bhugra (Eds.), *Spirituality and mental health across cultures* (pp. 95–113). Oxford University Press.

Cardeña, E., Lynn, S. J., & Krippner, S. (Eds.). (2014), *Varieties of anomalous experience: Examining the scientific evidence*. American Psychological Association.

Cardeña, E., & Pekala, R. J. (2014). Researching states of consciousness and anomalous experiences. In E. Cardeña, S. J. Lynn, & S. Krippner (Eds.), *Varieties of anomalous experience: Examining the scientific evidence* (2nd ed., pp. 21–56). American Psychological Association. https://doi.org/10.1037/14258-002

Cardeña, E., Pick, S., & Litwin, R. (2020). Differentiating psychogenic nonepileptic from epileptic seizures: A mixed-methods, content analysis study. *Epilepsy & Behavior*, *109*, Article 107121. https://doi.org/10.1016/j.yebeh.2020.107121

Cardeña, E., Schaffler, Y., & Van Duijl, M. (2023). The other in the self: Possession, trance, and related phenomena. In M. J. Dorahy, S. N. Gold, & J. A. O'Neill (Eds.), *Dissociation and the dissociative disorders: Past, present, future* (2nd ed., pp. 421–432). Routledge. https://doi.org/10.4324/9781003057314-31

Cardeña, E., & Spiegel, D. (1993). Dissociative reactions to the Bay Area Earthquake. *The American Journal of Psychiatry*, *150*, 474–478. https://doi.org/10.1176/ajp.150.3.474

Cardeña, E., & Terhune, D. B. (2014). Hypnotizability, personality traits, and the propensity to experience alterations of consciousness. *Psychology of Consciousness: Theory, Research, and Practice*, *1*(3), 292–307. https://doi.org/10.1037/cns0000026

Carhart-Harris, R. L., Leech, R., Hellyer, P. J., Shanahan, M., Feilding, A., Tagliazucchi, E., Chialvo, D. R., & Nutt, D. (2014). The entropic brain: A theory of conscious states informed by neuroimaging research with psychedelic drugs. *Frontiers in Human Neuroscience*, *8*, Article 20. https://doi.org/10.3389/fnhum.2014.00020

Carhart-Harris, R. L., Muthukumaraswamy, S., Roseman, L., Kaelen, M., Droog, W., Murphy, K., Tagliazucchi, E., Schenberg, E. E., Nest, T., Orban, C., Leech, R., Williams, L. T., Williams, T. M., Bolstridge, M., Sessa, B., McGonigle, J., Sereno, M. I., Nichols, D., Hellyer, P. J., … Nutt, D. J. (2016). Neural correlates of the LSD experience revealed by multimodal neuroimaging.

Proceedings of the National Academy of Sciences of the United States of America, *113*(17), 4853–4858. https://doi.org/10.1073/pnas.1518377113

Christoff, K., Irving, Z. C., Fox, K. C., Spreng, R. N., & Andrews-Hanna, J. R. (2016). Mind-wandering as spontaneous thought: A dynamic framework. *Nature Reviews Neuroscience*, *17*(11), 718–731. https://doi.org/10.1038/nrn.2016.113

Cooper, D. J., Lindahl, J. R., Palitsky, R., & Britton, W. B. (2021). "Like a vibration cascading through the body": Energy-like somatic experiences reported by Western Buddhist meditators. *Religions*, *12*(12), Article 1042. https://doi.org/10.3390/rel12121042

Danielson, N. B., Guo, J. N., & Blumenfeld, H. (2011). The default mode network and altered consciousness in epilepsy. *Behavioural Neurology*, *24*(1), 55–65. https://doi.org/10.1155/2011/912720

Deco, G., Cruzat, J., Cabral, J., Tagliazucchi, E., Laufs, H., Logothetis, N. K., & Kringelbach, M. L. (2019). Awakening: Predicting external stimulation to force transitions between different brain states. *Proceedings of the National Academy of Sciences of the United States of America*, *116*(36), 18088–18097. https://doi.org/10.1073/pnas.1905534116

Deikman, A. (1977). The missing center. In N. Zinberg (Ed.), *Alternate states of consciousness: Multiple perspectives on the study of consciousness* (pp. 230–241). Free Press.

Demertzi, A., Tagliazucchi, E., Dehaene, S., Deco, G., Barttfeld, P., Raimondo, F., Martial, C., Fernández-Espejo, D., Rohaut, B., Voss, H. U., Schiff, N. D., Owen, A. M., Laureys, S., Naccache, L., & Sitt, J. D. (2019). Human consciousness is supported by dynamic complex patterns of brain signal coordination. *Science Advances*, *5*(2), Article eaat7603. https://doi.org/10.1126/sciadv.aat7603

Detyniecki, K., & Blumenfeld, H. (2014). Consciousness of seizures and consciousness during seizures: Are they related? *Epilepsy & Behavior*, *30*, 6–9. https://doi.org/10.1016/j.yebeh.2013.09.018

Dietrich, A. (2004). Neurocognitive mechanisms underlying the experience of flow. *Consciousness and Cognition*, *13*(4), 746–761. https://doi.org/10.1016/j.concog.2004.07.002

Dittrich, A. (1998). The standardized psychometric assessment of altered states of consciousness (ASCs) in humans. *Pharmacopsychiatry*, *31*(Suppl. 2), 80–84. https://doi.org/10.1055/s-2007-979351

Dor-Ziderman, Y., Berkovich-Ohana, A., Glicksohn, J., & Goldstein, A. (2013). Mindfulness-induced selflessness: A MEG neurophenomenological study. *Frontiers in Human Neuroscience*, *7*, Article 582. https://doi.org/10.3389/fnhum.2013.00582

Dresler, M., Wehrle, R., Spoormaker, V. I., Koch, S. P., Holsboer, F., Steiger, A., Obrig, H., Sämann, P. G., & Czisch, M. (2012). Neural correlates of dream lucidity obtained from contrasting lucid versus non-lucid REM sleep: A combined EEG/fMRI case study. *Sleep*, *35*(7), 1017–1020. https://doi.org/10.5665/sleep.1974

Eliade, M. (1995). *El vuelo mágico* [The magical flight]. Siruela.

Ereshefsky, M. (2000). *The poverty of the Linnaean hierarchy: A philosophical study of biological taxonomy*. Cambridge University Press. https://doi.org/10.1017/CBO9780511498459

Farthing, G. W. (1992). *The psychology of consciousness*. Prentice-Hall.

Feuerstein, G. (1998). *The yoga tradition: Its history, literature, philosophy and practice*. Hohm Press.

Fischer, R. (1971). A cartography of the ecstatic and meditative states. *Science*, *174*(4012), 897–904. https://doi.org/10.1126/science.174.4012.897

Fort, L. D., Costines, C., Wittmann, M., Demertzi, A., & Schmidt, T. T. (2025). Classification schemes of altered states of consciousness. *Neuroscience & Biobehavioral Review*. Advance online publication. https://doi.org/10.1016/j.neubiorev.2025.106178

Foulkes, D., & Vogel, G. (1965). Mental activity at sleep onset. *Journal of Abnormal Psychology*, *70*(4), 231–243. https://doi.org/10.1037/h0022217

Fox, K. C. R., Nijeboer, S., Solomonova, E., Domhoff, G. W., & Christoff, K. (2013). Dreaming as mind wandering: Evidence from functional neuroimaging and first-person content reports. *Frontiers in Human Neuroscience*, *7*, Article 412. https://doi.org/10.3389/fnhum.2013.00412

Friedman, S. F., & Ballentine, G. (2024). Trajectories of sentiment in 11,816 psychoactive narratives. *Human Psychopharmacology: Clinical and Experimental*, *39*(1), Article e2889. https://doi.org/10.1002/hup.2889

Frigerio, A. (1989). Levels of possession awareness in Afro-Brazilian religions. *AASC Quarterly*, *5*, 5–11.

Gallagher, I. (2000). Philosophical conceptions of the self: Implications for cognitive science. *Trends in Cognitive Sciences*, *4*(1), 14–21. https://doi.org/10.1016/S1364-6613(99)01417-5

Gauld, A. (1982). *Mediumship and survival: A century of investigations*. Paladin.

Geels, A. (2011). Altered consciousness in religion. In E. Cardeña & M. Winkleman (Eds.), *Altering consciousness multidisciplinary perspectives, volume 1*: *History culture and the humanities* (pp. 255–276). Praeger.

Gifford-May, D., & Thompson, N. L. (1994). "Deep states" of meditation: Phenomenological reports of experience. *Journal of Transpersonal Psychology*, *26*, 117–138.

Glicksohn, J., & Ben-Soussan, T. D. (2020). Immersion, absorption, and spiritual experience: Some preliminary findings. *Frontiers in Psychology*, *11*, Article 2118. https://doi.org/10.3389/fpsyg.2020.02118

Glisky, M. L., Tataryn, D. J., Tobias, B. A., Kihlstrom, J. F., & McConkey, K. M. (1991). Absorption, openness to experience, and hypnotizability. *Journal*

of Personality and Social Psychology, *60*(2), 263–272. https://doi.org/10.1037/0022-3514.60.2.263

Gloor, P. (1986). Consciousness as a neurological concept in epileptology: A critical review. *Epilepsia*, *27*(Suppl. 2), S14–S26. https://doi.org/10.1111/j.1528-1157.1986.tb05737.x

Greyson, B. (2021). *After: A doctor explores what near-death experiences reveal about life and beyond*. St. Martin's Press.

Halifax, J. (1980). *Shamanic voices: The shaman as seer, poet and healer*. Pelican. https://doi.org/10.1016/S0012-3692(16)34892-9

Halloy, A., & Servais, V. (2014). Enchanting Gods and dolphins: A cross-cultural analysis of uncanny encounters. *Ethos*, *42*(4), 479–504. https://doi.org/10.1111/etho.12065

Harris, D. J., Vine, S. J., & Wilson, M. R. (2017). Neurocognitive mechanisms of the flow state. *Progress in Brain Research*, *234*, 221–243. https://doi.org/10.1016/bs.pbr.2017.06.012

Hobson, J. A. (1994). *The chemistry of conscious states*. Little, Brown and Company.

Hobson, J. A. (2009). REM sleep and dreaming: Towards a theory of protoconsciousness. *Nature Reviews Neuroscience*, *10*(11), 803–813. https://doi.org/10.1038/nrn2716

Hunt, H. T. (1989). *The multiplicity of dreams: Memory, imagination, and consciousness*. Yale University Press. https://doi.org/10.2307/j.ctt1xp3sfz

Hurlburt, R. T., & Scwitzgebel, E. (2007). *Describing inner experience? Proponent meets skeptic*. MIT Press. https://doi.org/10.7551/mitpress/7517.001.0001

James, W. (1907). The energies of men. *Science*, *25*(635), 321–332. https://doi.org/10.1126/science.25.635.321

Jamieson, G., Cardeña, E., & de Pascalis, V. (2024). A spontaneous dissociative episode during an EEG experiment. *Brain and Cognition*, *174*, Article 106121. https://doi.org/10.1016/j.bandc.2023.106121

Josipovic, Z. (2021). Implicit-explicit gradient of nondual awareness or consciousness as such. *Neuroscience of Consciousness*, *2021*(2), Article niab031. https://doi.org/10.1093/nc/niab031

Katz, R. (1982). *Boiling energy: Community healing among the Kalahari Kung*. Harvard University Press.

Kihlstrom, J. (2022). Consciousness, the unconscious and the self. *Psychology of Consciousness: Theory, Research, and Practice*, *9*(1), 78–92. https://doi.org/10.1037/cns0000285

Kitson, A., Chirico, A., Gaggioli, A., & Riecke, B. E. (2020). A review on research and evaluation methods for investigating self-transcendence. *Frontiers in Psychology*, *11*, Article 547687. https://doi.org/10.3389/fpsyg.2020.547687

Koestler, A. (1954). *The invisible writing*. Macmillan.

Konkoly, K. R., Appel, K., Chabani, E., Mangiaruga, A., Gott, J., Mallett, R., Caughran, B., Witkowski, S., Whitmore, N. W., Mazurek, C. Y., Berent, J. B., Weber, F. D., Türker, B., Leu-Semenescu, S., Maranci, J. B., Pipa, G., Arnulf, I., Oudiette, D., Dresler, M., … Paller, K. A. (2021). Real-time dialogue between experimenters and dreamers during REM sleep. *Current Biology*, *31*(7), 1417–1427.e6. https://doi.org/10.1016/j.cub.2021.01.026

Kosko, B. (1998). *Fuzzy thinking: The new science of fuzzy logic*. Hyperion.

LaBerge, S. (2014). Lucid dreaming: Paradoxes of dreaming consciousness. In E. Cardeña, S. J. Lynn, & S. Krippner (Eds.), *Varieties of anomalous experience: Examining the scientific evidence* (2nd ed., pp. 145–173). American Psychological Association. https://doi.org/10.1037/14258-006

Laureys, S. (2005). The neural correlate of (un) awareness: Lessons from the vegetative state. *Trends in Cognitive Sciences*, *9*(12), 556–559. https://doi.org/10.1016/j.tics.2005.10.010

Lebois, L. A. M., Kaplan, C. S., Palermo, C. A., Pan, X., & Kaufman, M. (2023). A grounded theory of dissociative identity disorder. In M. J. Dorahy, S. N. Gold, & J. A. O'Neill (Eds.), *Dissociation and the dissociative disorders: Past, present, future* (pp. 392–408). Routledge.

Lindström, L., Stålhammar, S., & Cardeña, E. (2025). The core of me is that which observes: A mixed-methods study of trait-level sense of self. *Psychology of Consciousness: Theory, Research, and Practice*, *12*(1), 1–18. https://doi.org/10.1037/cns0000377

Locke, R. G., & Kelly, E. F. (1985). A preliminary model for the cross-cultural analysis of altered states of consciousness. *Ethos*, *13*(1), 3–55. https://doi.org/10.1525/eth.1985.13.1.02a00010

Loewenstein, R. J. (1991). An office mental status examination for complex chronic dissociative symptoms and multiple personality disorder. *Psychiatric Clinics of North America*, *14*(3), 567–604. https://doi.org/10.1016/S0193-953X(18)30290-9

Lüders, H., Amina, S., Bailey, C., Baumgartner, C., Benbadis, S., Bermeo, A., Carreño, M., Devereaux, M., Diehl, B., Eccher, M., Edwards, J., Fastenau, P., Fernandez Baca-Vaca, G., Godoy, J., Hamer, H., Hong, S. B., Ikeda, A., Kahane, P., Kaiboriboon, K., … Tsuji, S. (2014). Proposal: Different types of alteration and loss of consciousness in epilepsy. *Epilepsia*, *55*(8), 1140–1144. https://doi.org/10.1111/epi.12595

Luft, C. D. B., Zioga, I., Banissy, M. J., & Bhattacharya, J. (2019). Spontaneous visual imagery during meditation for creating visual art: An EEG and brain stimulation case study. *Frontiers in Psychology*, *10*, Article 210. https://doi.org/10.3389/fpsyg.2019.00210

Lutz, A., & Thompson, E. (2003). Neurophenomenology: Integrating subjective experience and brain dynamics in the neuroscience of consciousness. In A. Jack & A. Roepstorff (Eds.), *Trusting the subject?* (Vol. 1, pp. 31–52). Imprint Academic.

Mabee, P. M., Balhoff, J. P., Dahdul, W. M., Lapp, H., Mungall, C. J., & Vision, T. J. (2020). A logical model of homology for comparative biology. *Systematic Biology*, *69*(2), 345–362. https://doi.org/10.1093/sysbio/syz067

Maliszewski, M., Vaughan, B., Krippner, S., Holler, G., & Fracasso, C. (2011). Altering consciousness through sexual activity. In E. Cardeña & M. Winkelman (Eds.), *Altering consciousness. A multidisciplinary perspective. Volume II. Biology and clinical sciences* (pp. 189–209). Praeger.

Marks, L. E. (2014). Synesthesia: A teeming multiplicity. In E. Cardeña, S. J. Lynn, & S. Krippner (Eds.), *Varieties of Anomalous experience: Examining the scientific evidence* (2nd ed., pp. 79–108). American Psychological Association. https://doi.org/10.1037/14258-004

Marshall, P. (2019). *The shape of the soul. What mystical experience tells us about ourselves and reality*. Rowman & Littlefield.

Martial, C., Cassol, H., Charland-Verville, V., Pallavicini, C., Sanz, C., Zamberlan, F., Vivot, R. M., Erowid, F., Erowid, E., Laureys, S., Greyson, B., & Tagliazucchi, E. (2019). Neurochemical models of near-death experiences: A large-scale study based on the semantic similarity of written reports. *Consciousness and Cognition*, *69*, 52–69. https://doi.org/10.1016/j.concog.2019.01.011

Metzinger, T. (2024). *The elephant and the blind: The science of pure consciousness*. MIT Press. https://doi.org/10.7551/mitpress/15196.001.0001

Metzner, R. (2005). Psychedelic, psychoactive, and addictive drugs and states of consciousness. In M. Earleywine (Ed.), *Mind-altering drugs: The science of subjective experience* (pp. 25–48). Oxford University Press. https://doi.org/10.1093/acprof:oso/9780195165319.003.0002

Mishara, A. L., & Schwartz, M. A. (2011). Altered states of consciousness as paradoxically healing: An embodied social neuroscience perspective. In E. Cardeña & M. Winkelman (Eds.), *Altering consciousness: A multidisciplinary perspective. Volume II*: *Biological and psychological perspectives* (pp. 327–353). Praeger.

Morgan, W. P. (1993). Hypnosis and sport psychology. In J. W. Rhue, S. J. Lynn, & I. Kirsch (Eds.), *Handbook of clinical hypnosis* (pp. 649–670). American Psychological Association. https://doi.org/10.1037/10274-028

Moujaes, F., Preller, K. H., Ji, J. L., Murray, J. D., Berkovitch, L., Vollenweider, F. X., & Anticevic, A. (2023). Toward mapping neurobehavioral heterogeneity of psychedelic neurobiology in humans. *Biological Psychiatry*, *93*(12), 1061–1070. https://doi.org/10.1016/j.biopsych.2022.10.021

Moujaes, F., Rieser, N. M., Phillips, C., de Matos, N. M. P., Brügger, M., Dürler, P., Smigielski, L., Stämpfli, P., Seifritz, E., Vollenweider, F. X., Anticevic, A., & Preller, K. H. (2024). Comparing neural correlates of consciousness: From psychedelics to hypnosis and meditation. *Biological Psychiatry*, *9*(5), 533–543. https://doi.org/10.1016/j.bpsc.2023.07.003

Murphy, M. (1992). *The future of the body: Explorations into the further evaluation of human nature*. Jeremy P. Tarcher.

Nash, J. D., & Newberg, A. B. (2023). An updated classification of meditation methods using principles of taxonomy and systematics. *Frontiers in Psychology*, *13*, Article 1062535. https://doi.org/10.3389/fpsyg.2022.1062535

Natsoulas, T. (1983). Concepts of consciousness. *Journal of Mind and Behavior*, *4*(1), 13–59.

Nave, O., Trautwein, F.-M., Ataria, Y., Dor-Ziderman, Y., Schweitzer, Y., Fulder, S., & Berkovich-Ohana, A. (2021). Self-boundary dissolution in meditation: A phenomenological investigation. *Brain Sciences*, *11*(6), Article 819. https://doi.org/10.3390/brainsci11060819

Noirhomme, Q., & Laureys, S. (2011). Altering consciousness and neuropathology. In E. Cardeña & M. Winkelman (Eds.), *Altering consciousness multidisciplinary perspectives, volume 2*: *Biological and psychological perspectives* (pp. 263–278). Praeger.

Parker, G., Paterson, A., Romano, M., & Graham, R. (2017). Altered sensory phenomena experienced in bipolar disorder. *The American Journal of Psychiatry*, *174*(12), 1146–1150. https://doi.org/10.1176/appi.ajp.2017.16121379

Pekala, R. J. (1991). *Quantifying consciousness*. Plenum. https://doi.org/10.1007/978-1-4899-0629-8

Perl, Y. S., Pallavicini, C., Piccinini, J., Demertzi, A., Bonhomme, V., Martial, C., Panda, R., Alnagger, N., Annen, J., Gosseries, O., Ibañez, A., Laufs, H., Sitt, J. D., Jirsa, V. K., Kringelbach, M. L., Laureys, S., Deco, G., & Tagliazucchi, E. (2023). Low-dimensional organization of global brain states of reduced consciousness. *Cell Reports*, *42*(5), Article 112491. https://doi.org/10.1016/j.celrep.2023.112491

Petitmengin, C., van Beek, M., Bitbol, M., Nissou, J. M., & Roepstorff, A. (2019). Studying the experience of meditation through micro-phenomenology. *Current Opinion in Psychology*, *28*, 54–59. https://doi.org/10.1016/j.copsyc.2018.10.009

Picard-Deland, C., Konkoly, K., Raider, R., Paller, K. A., Nielsen, T., Pigeon, W. R., & Carr, M. (2023). The memory sources of dreams: Serial awakenings across sleep stages and time of night. *Sleep*, *46*(4), Article zsac292. https://doi.org/10.1093/sleep/zsac292

Preller, K. H., & Vollenweider, F. X. (2018). Phenomenology, structure, and dynamic of psychedelic states. *Current Topics in Behavioral Neurosciences*, *36*(1), 221–256. https://doi.org/10.1007/7854_2016_459

Putnam, F. W. (2016). *The way we are: How states of mind influence our identities, personality and potential for change*. Ipbooks.

Reinders, A. A., Willemsen, A. T., Vos, H. P., den Boer, J. A., & Nijenhuis, E. R. (2012). Fact or factitious? A psychobiological study of authentic and simulated dissociative identity states. *PLOS ONE*, *7*(6), Article e39279. https://doi.org/10.1371/journal.pone.0039279

Revonsuo, A., Kallio, S., & Sikka, P. (2009). What is an altered state of consciousness? *Philosophical Psychology*, *22*(2), 187–204. https://doi.org/10.1080/09515080902802850

Rosch, E., Mervis, C. B., Gray, W. D., Johnson, D. M., & Boyes-Braem, P. (1976). Basic objects in natural categories. *Cognitive Psychology*, *8*(3), 382–439. https://doi.org/10.1016/0010-0285(76)90013-X

Ross, C. A. (1989). *Multiple personality disorder: Diagnosis, clinical features, and treatment*. Wiley Interscience.

Ross, C. A., Peyser, C. E., Shapiro, I., & Folstein, M. F. (1991). Delirium: Phenomenologic and etiologic subtypes. *International Psychogeriatrics*, *3*(2), 135–147. https://doi.org/10.1017/S1041610291000613

Rouget, G. (1985). *Music and trance: A theory of the relations between music and possession*. Chicago University Press.

Roydeva, M. I., & Reinders, A. A. T. S. (2021). Biomarkers of pathological dissociation: A systematic review. *Neuroscience and Biobehavioral Reviews*, *123*, 120–202. https://doi.org/10.1016/j.neubiorev.2020.11.019

Rusalova, M. N. (2006). Frequency–amplitude characteristics of the EEG at different levels of consciousness. *Neuroscience and Behavioral Physiology*, *36*(4), 351–358. https://doi.org/10.1007/s11055-006-0024-x

Sanders, R. D., Tononi, G., Laureys, S., Sleigh, J. W., & Warner, D. S. (2012). Unresponsiveness ≠ unconsciousness. *Anesthesiology*, *116*(4), 946–959. https://doi.org/10.1097/ALN.0b013e318249d0a7

Sandilands, O., & Ingram, D. M. (2024). Documenting and defining emergent phenomenology: Theoretical foundations for an extensive research strategy. *Frontiers in Psychology*, *15*, Article 1340335. https://doi.org/10.3389/fpsyg.2024.1340335

Sanz Perl, Y., Pallavicini, C., Pérez Ipiña, I., Demertzi, A., Bonhomme, V., Martial, C., Panda, R., Annen, J., Ibañez, A., Kringelbach, M., Deco, G., Laufs, H., Sitt, J., Laureys, S., & Tagliazucchi, E. (2021). Perturbations in dynamical models of whole-brain activity dissociate between the level and stability of consciousness. *PLOS Computational Biology*, *17*(7), Article e1009139. https://doi.org/10.1371/journal.pcbi.1009139

Schaffler, Y., Cardeña, E., Reijman, S., & Haluza, D. (2016). Traumatic experiences and somatoform dissociation among spirit possession practitioners in the Dominican Republic. *Culture, Medicine and Psychiatry*, *40*(1), 74–99. https://doi.org/10.1007/s11013-015-9472-5

Scheinin, A., Kantonen, O., Alkire, M., Långsjö, J., Kallionpää, R. E., Kaisti, K., Radek, L., Johansson, J., Sandman, N., Nyman, M., Scheinin, M., Vahlberg, T., Revonsuo, A., Valli, K., & Scheinin, H. (2021). Foundations of human consciousness: Imaging the twilight zone. *The Journal of Neuroscience*, *41*(8), 1769–1778. https://doi.org/10.1523/JNEUROSCI.0775-20.2020

Siclari, F., Baird, B., Perogamvros, L., Bernardi, G., LaRocque, J. J., Riedner, B., Boly, M., Postle, B. R., & Tononi, G. (2017). The neural correlates of dreaming. *Nature Neuroscience*, *20*(6), 872–878. https://doi.org/10.1038/nn.4545

Sidgwick, E. (1915). A contribution to the study of the psychology of Mrs. Piper's trance phenomena. *Proceedings of the Society for Psychical Research*, *28*, 1–657.

Siegel, R. K. (1977). Hallucinations. *Scientific American*, *237*(4), 132–140. https://doi.org/10.1038/scientificamerican1077-132

Simeon, D., & Abugel, J. (2006). *Feeling unreal. Depersonalization disorder and the loss of self*. Oxford University Press. https://doi.org/10.1093/oso/9780195170221.001.0001

Solomonova, E. (2018). Sleep paralysis: Phenomenology, neurophysiology, and treatment. In K. C. R. Fox & K. Christoff (Eds.), *The Oxford handbook of spontaneous thought: Mind-wandering, creativity, and dreaming* (pp. 435–456). Oxford University Press.

Spiegel, D., Cutcomb, S., Ren, C., & Pribram, K. (1985). Hypnotic hallucination alters evoked potentials. *Journal of Abnormal Psychology*, *94*(3), 249–255. https://doi.org/10.1037/0021-843X.94.3.249

Stace, W. T. (1960). The teachings of the mystics. *American Libraries*.

Tart, C. T. (1969). *Altered states of consciousness*. Wiley.

Tart, C. T. (1975). *States of consciousness*. Dutton.

Taves, A., & Barlev, M. (2023). A feature-based approach to the comparative study of "nonordinary" experiences. *American Psychologist*, *78*(1), 50–61. https://doi.org/10.1037/amp0000990

Taylor, E. (1984). *William James on exceptional mental states*. University of Massachusetts Press.

Thibaut, A., Panda, R., Annen, J., Sanz, L. R. D., Naccache, L., Martial, C., Chatelle, C., Aubinet, C., Bonin, E. A. C., Barra, A., Briand, M. M., Cecconi, B., Wannez, S., Stender, J., Laureys, S., & Gosseries, O. (2021). Preservation of brain activity in unresponsive patients identifies MCS Star. *Annals of Neurology*, *90*(1), 89–100. https://doi.org/10.1002/ana.26095

Thurston, H. (1952). *The physical phenomena of mysticism*. Henry Regnery.

Timmermann, C., Bauer, P. R., Gosseries, O., Vanhaudenhuyse, A., Vollenweider, F., Laureys, S., Singer, T., Antonova, E., Lutz, A., & the Mind and Life Europe (MLE) ENCECON Research Group. (2023). A neurophenomenological approach to non-ordinary states of consciousness: Hypnosis, meditation, and psychedelics. *Trends in Cognitive Sciences*, *27*(2), 139–159. https://doi.org/10.1016/j.tics.2022.11.006

Ungvari, G. S., Goggins, W., Leung, S. K., Lee, E., & Gerevich, J. (2009). Schizophrenia with prominent catatonic features ('catatonic schizophrenia') III. Latent class analysis of the catatonic syndrome. *Progress in Neuro-Psychopharmacology & Biological Psychiatry*, *33*(1), 81–85. https://doi.org/10.1016/j.pnpbp.2008.10.010

Ustinova, Y. (2020). *Divine mania: Alterations of consciousness in Ancient Greece*. Routledge.

Vaitl, D., Birbaumer, N., Gruzelier, J., Jamieson, G. A., Kotchoubey, B., Kübler, A., Lehmann, D., Miltner, W. H. R., Ott, U., Pütz, P., Sammer, G., Strauch, I., Strehl, U., Wackermann, J., & Weiss, T. (2005). Psychobiology of altered states of consciousness. *Psychological Bulletin*, *131*(1), 98–127. https://doi.org/10.1037/0033-2909.131.1.98

Valli, K., Radek, L., Kallionpää, R. E., Scheinin, A., Långsjö, J., Kaisti, K., Kantonen, O., Korhonen, J., Vahlberg, T., Revonsuo, A., & Scheinin, H. (2023). Subjective experiences during dexmedetomidine- or propofol-induced unresponsiveness and non-rapid eye movement sleep in healthy male subjects. *British Journal of Anaesthesia*, *131*(2), 348–359. https://doi.org/10.1016/j.bja.2023.04.026

Van Duijl, M., Cardeña, E., & De Jong, J. T. (2005). The validity of DSM-IV dissociative disorders categories in south-west Uganda. *Transcultural Psychiatry*, *42*(2), 219–241. https://doi.org/10.1177/1363461505052666

Viana, M., Sances, G., Linde, M., Ghiotto, N., Guaschino, E., Allena, M., Terrazzino, S., Nappi, G., Goadsby, P. J., & Tassorelli, C. (2017). Clinical features of migraine aura: Results from a prospective diary-aided study. *Cephalalgia*, *37*(10), 979–989. https://doi.org/10.1177/0333102416657147

Viarnés, C. (2007). Cultural memory in Afro-Cuban possession: Problematizing spiritual categories, resurfacing "other" histories. *Western Folklore*, *66*(1–2), 127–159.

Vollenweider, F. X., & Preller, K. H. (2020). Psychedelic drugs: Neurobiology and potential for treatment of psychiatric disorders. *Nature Reviews Neuroscience*, *21*(11), 611–624. https://doi.org/10.1038/s41583-020-0367-2

Wade, J. (2001). Mapping the courses of heavenly bodies: The varieties of transcendent sexual experience. *Journal of Transpersonal Psychology*, *32*, 103–122. https://www.atpweb.org/jtparchive/trps-32-00-02-103.pdf

Waggoner, J., Carline, J. D., & Durning, S. J. (2016). Is there a consensus on consensus methodology? Descriptions and recommendations for future consensus research. *Academic Medicine*, *91*(5), 663–668. https://doi.org/10.1097/ACM.0000000000001092

Walsh, R. (2007). *The world of shamanism: New views of an ancient tradition*. Llewelyn.

Waters, F., Blom, J. D., Dang-Vu, T. T., Cheyne, A. J., Alderson-Day, B., Woodruff, P., & Collerton, D. (2016). What Is the link between hallucinations, dreams, and hypnagogic–hypnopompic experiences? *Schizophrenia Bulletin*, *42*(5), 1098–1109. https://doi.org/10.1093/schbul/sbw076

Woollacott, M. H., Kason, Y., & Park, R. D. (2021). Investigation of the phenomenology, physiology and impact of spiritually transformative experiences—Kundalini awakening. *EXPLORE: The Journal of Science and Healing*, *17*(6), 525–534. https://doi.org/10.1016/j.explore.2020.07.005

Wulff, D. M. (2014). Mystical experiences. In E. Cardeña, S. J. Lynn, & S. Krippner (Eds.), *Varieties of anomalous experience: Examining the scientific evidence* (2nd ed., pp. 369–408). American Psychological Association. https://doi.org/10.1037/14258-013

Yaden, D. B., Haidt, J., Hood, R. W., Jr., Vago, D. R., & Newberg, A. B. (2017). The varieties of self-transcendent experience. *Review of General Psychology*, *21*(2), 143–160. https://doi.org/10.1037/gpr0000102

Yaden, D. B., & Newberg, A. B. (2022). *The varieties of spiritual experience: 21st century research and perspectives*. Oxford University Press. https://doi.org/10.1093/oso/9780190665678.001.0001

Zinberg, N. E. (Ed.). (1977). *Alternate states of consciousness: Multiple perspectives on the study of consciousness*. Free Press.

Received December 5, 2024
Revision received April 17, 2025
Accepted April 18, 2025 ■