

Altered States of Consciousness as Paradoxically Healing: An Embodied Social Neuroscience Perspective

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Altered States of Consciousness (ASC) as Healing?

Despite the vast literature on complementary approaches to medicine and some compelling, though still modest, empirical evidence for the implicated healing mechanisms (e.g., Ospina et al., 2007), little is known as to why healers in very diverse communities in the world deliberately induce altered states of consciousness (ASC) in themselves and/or their patients and what might be the mechanisms invoked in such efforts. It is presently believed that humans for at least 5,000 years have deliberately altered their state of consciousness, presumably to heal medical complaints and mental distress (Ospina et al., 2007). The methods and procedures for inducing ASC include meditation, mindfulness, shamanistic ritual practices, narrative and narrative therapies, and psychoactive substances. We propose that these deliberately manipulated ASC are *paradoxically* healing and that the mechanisms involve networks in the brain that have been recently identified as subserving social cognition and the feelings of belonging to a community (Fiske, 2010). By relating hypnosis, which may induce ASC, and other consciousness alterations to the social brain, we are **not** reverting to the socio-cognitive-social influence theories of hypnosis (as reviewed by Lynn, Kirsch, & Hallquist, 2008; Spiegel, 2008). Such theories do not

require the presence of an ASC and therefore do not address the question of why many practitioners, both previously and currently, hold the view that deliberately inducing ASC is healing.

Altered states of consciousness comprise a wealth of diverse, loosely related experiences. In their recent review, Vaitl and coworkers (2005) include the following experiences as ASC: states of drowsiness, daydreaming, hypnagogic states, sleep and dreaming, near death experiences, extreme environmental conditions (pressure, temperature), starvation and diet, sexual activity and orgasm, respiratory maneuvers, sensory deprivation, sensory homogenization and overload, rhythm-induced states (drumming and dancing), relaxation, meditation, hypnosis, biofeedback, psychotic disorders, epilepsy, coma and vegetative state, and pharmacologically induced states. Moreover, one could easily argue for the inclusion of spiritual transcendent experiences, social and sleep deprivation (see Mishara, 2010a), and dissociative states. That is, ASC comprise a diverse range of human experiences that have been viewed as both pathological and healing [see Cardeña, this volume].

Given the scope and heterogeneity of such experiences, they are difficult to define conceptually (Revonsuo, Kallio, & Sikka, 2005; Rock & Krippner, 2007) [see Cardeña, Volume 1]. Classic definitions that require that the individual identify the experience as an ASC are inadequate "... for the simple reason that ASCs may well occur without the subject having any idea, either at the time of the experience or later" (Revonsuo et al., 2005). Although we agree with Revonsuo and colleagues' proposed redefinition of ASC as "an alteration in the informational or representational relationships between consciousness and the world," we nevertheless add the following caveat. Definitions of altered states as deviations from normal baseline consciousness, presumed to more or less "accurately" represent the world, are problematic when trying to ascertain the healing properties of ASC that may occur in meditation, hypnosis, shamanistic practices, narrative, and related therapies.

Definitions of ASC as "distortions" of our otherwise relatively "accurate" grasp of reality are unsatisfactory in that they rule out the possibility that such states may enable a heightened or expanded awareness of reality or at least "alternative reality." Philosophic phenomenology (Mishara & Schwartz, 1995, 1997) offers a means of circumventing this dilemma by proposing a neutral definition: ASC involve the suspension, disruption, or bracketing of the "natural attitude," our usual commonsense ways of constructing reality. In the everyday "natural attitude," we assume reality is "obviously" given to us. Recent findings in cognitive science/neuroscience, however, support the view that our everyday experience of a consensual reality is far from

accurate and is rather based on a host of human commonsense assumptions about accessing a consensual reality [see Windt, Volume 1].

Phenomenological approaches to the study of consciousness as subjectively constituting (i.e., “constructing”) its own reality allow for systematic distortions of accuracy in our experience as an adaptive function of keeping the person meaningfully embedded in self–world interactions (Mishara & Corlett, 2009; von Weizsäcker 1950). That is, perceptual “illusions” (Bridgeman & Hoover, 2008) and cognitive distortions (cognitive “heuristics”) are systematically integrated into our everyday experience of reality as if they were a kind of glue that holds it together. *Naïve realism* (Ramsperger, 1940), the bias that one’s own perspective on reality is objective, resembles what Husserl, the phenomenological philosopher, described as the natural attitude, the attitude we *naturally* assume in our everyday experience. The latter is shaped or informed by “common sense” as our default, everyday approach to experiencing the world. Common sense has a protective function in maintaining an unquestioned, “natural” relationship between internal experience and external “reality.” Our mental health is preserved by a certain resistance to losing common sense (Blankenburg, 2001; Mishara, 2001). An ASC deviates from the everyday naïve natural attitude of constructed-consensual reality not by misrepresenting the self-world relationship but by transforming or suspending it in its usual sense, what we later describe as a metaphoric “journey.” As noted, the very term *common sense* comprises a social factor (often supporting the status quo or habitually accepted consensus [see Whitehead, Volume 1]. As Fiske (2010) indicates, individuals tend to endorse meanings that are consensual or held by the group in order to enhance the experience of *belonging* in that group, and the sense of belonging is powerfully rewarded by the neurocircuitry underlying social experience in the human brain. Recent findings in the rapidly developing field of social neuroscience support the view that the human brain evolved to be a “social brain” (Dunbar, 1998; Weidner, 2010). It is our view that the healing effects of ASC (deliberately induced in shamanistic and the other healing practices described in this chapter) depend on the neurocircuitry of the human social brain [see Winkelman, Volume 1].

We introduced the above caveat to counter the currently prevailing definitions of ASC as distorting “reality” because it provides a more neutral account of the altered state as deviating from the “normal,” not necessarily in a pathological sense but as possibly transcending it in a manner that could provide an alternative view of reality. The organization of self–world relationship (and the preservation of its coherence) is mediated by the *dynamic Gestalt* meaning of the perception, which is *experienced as an ongoing living connectedness* between embodied self and environment (von

Weizsäcker, 1950). Husserl had demonstrated that our everyday default attitude is a habitual, relatively limited awareness of what comprises the “reality” of this self–world relationship, the naïve realism of the natural attitude. The effectiveness of shamanic and other healing practices may be precisely to introduce ASC as a group or shared experience in a manner that runs counter to what we, as Western contemporaries, tenaciously hold onto as “common sense.” Furthermore, understanding the therapeutic effects derived from healing ritual practices that alter consciousness (whether these involve meditation, hypnosis, shamanism, or narrative therapies) requires a model that recognizes how the variety of procedures for alteration of consciousness may engage similar or overlapping neural mechanisms or networks.

The research concerning the healing practices that deliberately induce ASC, however, is burdened by methodological problems. Krippner and Achterberg (2000) caution that terms such as “healer and healing are extremely subjective, and their demonstrated effectiveness depends on the criteria used for one’s restoration to health, yet another elusive concept” (p. 360). The claim that ASC-induction (in healers and/or patients) is a primary means of healing in numerous societies relies on a definition of healing that differs from the biomedical view of being “cured” of disease. Some cultures regard healing to take place “if that person has been spiritually restored before death” (Krippner & Achterberg, pp. 359–360). This definition clearly deviates from the biomedical concept of outcomes that can be operationalized. That is, “healing events (i.e., treatment outcomes)” are different in kind from “*healing experiences* (i.e., the subjective aspects of treatment, including its attributed meanings, its ritual context, and the client’s feelings).” Although it is possible to establish correlations between patient beliefs or attributions about what they believe to be healing and actual healing outcomes, such correlations say little about the underlying processes, mechanisms or what actually contributes to healing. The researcher should be careful to define whether the outcome measures amount to what may be regarded a cure, an abatement of medical conditions, or, rather, a reduction of emotional distress. That is, ASC may enhance different types of healing. However, there are limitations to such approaches, especially with regard to claims of cure. For example, many of the studies of shamanistic healing indicate that it is effective for somatizing patients with low energy, anxiety, and depression but less effective for infections and tumors. Krippner and Achterberg (2000) remark, however, that cases of so-called “spontaneous remission” (O’Regan, & Hirshberg, 1993) resulting from such practices simply index healing processes whose mechanisms are still not understood: “When the term spontaneous remission is

used, it is with the implicit understanding that no cure is spontaneous in the sense that it lacks a causal agent but, rather, that the putative cause is unknown” (p. 358). Currently, notwithstanding these limitations, the efficacy of meditation and hypnosis are better studied than shamanism. Because the role of the social brain in the healing effects of ASC is particularly evident in shamanistic rituals, we will examine shamanism after discussing the research concerning meditation, mindfulness, and hypnosis [see Shear, Volume 1].

Meditation, Mindfulness, and Hypnosis: Healing Effects and Mechanisms

It is generally believed that meditation is a spiritual and healing practice that has been prevalent in some parts of the world for more than 5,000 years (Ospina et al., 2007). As a complementary mind–body therapeutic strategy for a variety of health-related problems, its popularity is dramatically increasing in Western countries (Horowitz, 2010). Although quite heterogeneous in methods and techniques, a common feature is a rootedness in the silence and stillness of compassionate, nonjudgmental present-moment awareness (Fortney & Taylor, 2010). Mindfulness meditation is the mental ability to focus on the monitoring of the present moment with a state of open and nonjudgmental awareness.

Apart from hypnosis, meditation is the most widely studied alternative treatment (Dakwar & Levin, 2009). In a meta-analysis commissioned by the National Center for Complementary and Alternative Medicine (NCCAM/NIH), Ospina et al. (2007) identified five broad categories of meditation practices (mantra meditation, mindfulness meditation, yoga, Tai Chi, and qigong). Nevertheless, the reviewers point out that it is difficult to find common components (and thus underlying healing mechanisms) among these different approaches. Awareness and control of breathing is universal, yet there is no single common approach to breathing. Although the control of attention is universal, how it is controlled and which components of attention are targeted varies:

Concentrative techniques involve focusing on a specific sensory or mental stimulus to the exclusion of anything else: breath, for example, or an object in space. Diffuse practices, by contrast, involve allowing thoughts, feelings, and sensations to arise while maintaining a nonjudgmental, detached, and accepting attitude to them, as well as a heightened perceptual stance attentive to the entire field of perception. (Dakwar & Levin, 2009, p. 255)

Most meditation practices are both concentrative and diffuse.

Interestingly, Ospina and coworkers (2007) observe that it is not known to what extent spirituality or belief play a role in meditation's healing effects. That is, its healing effects may be independent from spiritual belief or so-called placebo effects. However, other authors maintain that its spiritual components may be one of the vital "mechanisms of action" (Dakwar & Levin, 2009). Ospina et al. (2007) conclude that most of the studies are compromised by poor methodological quality (e.g., naturalistic, nonrandomized, without control groups, interventions and outcomes not well operationalized).

In her qualitative review, Horowitz (2010) observes that since Ospina et al.'s (2007) sobering meta-analysis, several more recent randomized-control trials have been implemented. She reports a large ($n = 201$) 5-year prospective randomized controlled trial (Schneider et al., 2009) that found that meditation is associated with meaningful reductions in blood pressure, myocardial infarction, stroke, and all-cause mortality. She also provides evidence for the association of breathing meditation with improvements in type 2 diabetes. Moreover, a study that compared the effects of mindfulness-based stress reduction (MBSR) in women breast cancer patients to an assessment-only control group found that MBSR was associated with reduced plasma cortisol levels, improved quality of life/coping ability, more enduring natural-killer (NK) cell activity, and increased cytokine production levels in breast cancer patients (Witek-Janusek, Albuquerque, Chroniak, Durazo-Arvizu, & Mathews, 2008). MBSR has also been found to reduce chronic pain in patients with arthritis, back/neck pain, and various comorbid conditions but to be less effective with patients with headache/migraine and fibromyalgia. It is effective in rheumatoid arthritis patients, women with menopausal symptoms, patients with posttraumatic stress disorder (PTSD), patients with memory loss, and improving the immune status of HIV-1 infected adults (Horowitz, 2010).

Although the evidence-based practice of meditation as intervention for psychiatric disorders is still inconclusive, it has been used to reduce depression, anxiety, drug abuse, and self-injurious behaviors (Dakwar & Levin, 2009). Meditation may also contribute to health and wellness by playing a preventative role in reducing stress and burnout and increasing general abilities to cope with aversive events (Fortney & Taylor, 2010). MBSR may be useful in psychiatric conditions characterized by excessive ruminations such as obsessive compulsive disorder, anxiety disorders, alcohol dependence, and major depression (Chisea, Brambilla, & Serretti, 2010). If similar mechanisms are implicated in intrusive imagery across disorders (Brewin, Gregory, Lipton, & Burgess, 2010), then such training

may be effective by targeting the possibly related mechanisms in these disorders. Nonjudgmentally, mindfully accepting intrusive thoughts or imagery from a putative “observer” position (Brewin et al., 2010) may have healing consequences in diverse disorders characterized by intrusive symptoms (see our own account of the healing effects of narrative below).

Still, even when the evidence for meditation’s healing effects is supported by higher-quality studies, the healing mechanisms remain unclear. Because meditation, as well as many of the other practices of altering one’s own mental state discussed in this contribution, has direct effects on the physiology/neurophysiology of the practicante, there is confusion about whether the healing effects are secondary to the physiologic changes rather than the individual’s beliefs about the practice. For example, the analgesic effects of mindful states in experienced Zen meditators suggest that pain modulation is in part explained by changes in respiratory rates (Grant & Rainville, 2009). This recalls Krippner and Achterberg’s (2000) discussion of the dual approach to healing outcomes vs. subjective beliefs about the healing and whether there is some ill-defined interaction between mental and physical healing in which the patient’s beliefs may optimize already-triggered physiologic processes. This lack of clarity, however, may be an artifact of the mind-body dualism presupposed by Western biomedical approaches to healing (Mishara & Schwartz, 1997; Schwartz & Wiggins, 2010).

Furthermore, as Horowitz (2010) observes,

Practicing meditation was formerly thought to induce passive relaxation states primarily by producing changes in the autonomic nervous system. However, recent findings from electroencephalogram (EEG) and neuroimaging studies suggest that meditation is associated with active states of consciousness that involve cognitive restructuring, learning, and changes in the structure of the brain itself. (p. 264)

Moreover, by attending to phenomena in a nonevaluative way, Zen and mindfulness-based meditation effectively dampen “the automatic cascade of cognitive and emotional associations” (Dakwar & Levin, 2009, p. 264).

Some functional neuroimaging studies of mindfulness meditation (MM) and beginning phases of Zen meditation show activation of the prefrontal cortex (PFC) and anterior cingulate cortex (ACC), while other studies show increased activation in the more rostral ACC and the proximal medial prefrontal cortex (mPFC; Chisea et al., 2010). However, Farb and coworkers (2007) observed a decrease rather than an increase of the activity of the mPFC during MM. Interestingly, similarly mixed functional neuroimaging

findings are also associated with hypnosis induction, including both increased and reduced ACC activity (McGeown et al., 1999). Although ASC are heterogeneous in nature and presumably in terms of their underlying mechanisms, we believe that the mixed functional neuroimaging findings point to a fundamental but overlooked paradox of the healing effects of the induced ASC of meditation, mindfulness, and hypnosis.

Chisea and colleagues (2010) claim that the mechanisms underlying MM share similarities with other treatments, including psychotherapy and the placebo effect. They argue that all three recruit “‘top-down’ processes dependent on frontal cortical areas that generate and maintain cognitive expectancies” (p. 112). Moreover, the increased PFC activation may indicate “a higher ability to detach from negative states by engaging frontal cortical structures to dampen automatic amygdala activation” (p. 113). We believe, however, that such accounts are incomplete precisely because they do not take into account what we identify here as the paradoxically healing effects of deliberately induced ASC for the purpose of healing.

Let us examine a possible role of ACC activation during MM (Chisea et al., 2010) and hypnosis (Rainville et al., 1999). The ACC is often active in an “early search” phase for task-appropriate responses or when the task is novel and more difficult (Holroyd & Coles, 2002). ACC involvement appears to diminish when a task has become learned or automated or an effective strategy has been adopted (Mishara et al., 2006). In their computational model, Reynolds, Zacks, and Braver (2007) propose that our current context of goals and representations is largely impervious to updating until a prediction error signals the need for updating. Updating of PFC representations may be gated by phasic dopamine signals from midbrain dopamine neurons triggered by encountering unexpected rewards, or unexpected *lack* of reward, which may terminate in the ACC. The latter is “rich” in projections from the midbrain dopamine system (Paus, 2001), which putatively generates the prediction error signal (Holroyd & Coles, 2002) [see Previc, this volume]. Interestingly, Spiegel (2008) reviews evidence that trait hypnotizability in individuals “robustly” correlates with levels of homovanillic acid, a dopamine metabolite, in the cerebrospinal fluid. Although the precise role of the activation of ACC and PFC structures during MM, hypnosis, and related methods of ASC induction is not known, we propose that it reflects an initial effortful reduction of “mind wandering,” required in both the mindful returning to the present moment and attending to the current task demands of hypnotic induction. Subsequent phases of induction may require less direct control or engagement of these attentional processes. Spiegel (2008) defines hypnosis as “highly focused attention with suspension of peripheral

awareness.” It involves the “deactivation of vigilance characteristic of posterior attentional systems,” mediated by parietal/occipital areas. However, it is interesting to note that the neural correlates for attentional networks overlap with those frontal parietal networks recruited for eye movement (reviewed by Mishara, 2010a). Therefore, the reduction of peripheral awareness and reduced orienting to external environment subserved by the posterior attentional system described by Spiegel (2008) may involve the disabling of what has been described in the neurologic tradition as the “body schema” of possible movements. As elaborated below, the body schema underlies the experience of a voluntary motoric-agentive self, which includes eye movements associated with executive attention and inhibiting saccades to distracting stimuli (Mishara, in press a). In hypnosis and related ASC, the body schema then becomes detached from its preattentive binding with body image, the conscious experience of a perceptual-social self (see below; Mishara, 2007a).

We therefore propose a second phase in the induction of ASC in hypnosis and related states almost antithetical to the initial phase of effortfully directing attention back on task. This is symbolized by the imagery of the death and rebirth of self, the mythological inner hero’s journey often invoked in shamanic narratives and related healing traditions. By examining the neural processes underlying hypnosis and their putative role in shamanistic healing, we find support for this hypothesis below. Moreover, this paradox reflects the fundamental, existential structure of self as a self experienced in time, a “dialectical” self that only becomes itself by giving itself up, that continually transcends itself and its current perspective (Mishara, 2007a).

Hypnosis in the Ritual Enactment of Reciprocal-Mimetic ASC Contribute to the Healing Effects of Shamanism

Shamanism is “a practice in which a person deliberately alters her consciousness for the purpose of interacting with spirits in order to serve the community in which she finds herself” (Barušs, 2003, p. 136). The most common role of shamans in their service to the community is healing, which may require soul journeys and death and rebirth experiences (Winkelman, 2004) [see Cardeña & Alvarado, Winkelman, Volume 1].

Because a self-induced ASC is central to shamanic practices, the findings concerning the neural correlates or neural activity implicated in hypnosis as an ASC, as we will see, are directly relevant to shamanistic healing. Operationally, *hypnosis* refers to a change in baseline mental activity after an induction procedure and is typically experienced at the subjective level as an increase in absorption, focused attention, disattention to extraneous

stimuli, and a reduction in spontaneous thought (Oakley, 2008). There is a “becoming absorbed and allowing suggestions or spontaneous subjective phenomena to affect experience” (Cardena, 2008, p. 252).

Benham and Younger (2008) caution with regard to the empirical findings of the healing effects of hypnosis:

For while hypnosis has been examined in relation to immune, cardiovascular, integumentary, digestive, nervous and endocrine systems, the scope of questions asked and the array of methodologies used to investigate them have resulted in an assortment of studies that fail to advance the field systematically (p. 422)

In demonstrating the role of the social brain in the hypnotic ACS of healing, we propose a theory of narrative enactment or dramatic performance: Narrative, that is, any act of narration (e.g., storytelling), may be characterized as *the ability to frame imaginary time within real time* (Mishara, 1995, 2010a). In this model, the narrator actually induces an ASC by focusing and narrowing the audience’s as well as the narrator’s own attention on *scenes* in imaginary time. *The act of narrating requires an ongoing shifting between internal and external perspectives or reference frames with regard to the experience of one’s own body.* In fact, narrative framing, or entrancement (i.e., absorption, or “attentional captivation,” in what is portrayed or presented) is common to the arts, even when language is not the primary experience [see Zarrilli, Volume 1]. Performance and visual arts also require a “framing” that involves a suspending or “bracketing” of the current “actual” environment (Mishara, 2010a). Notably, responsiveness to proprioceptive stimulation and ability to shift reference frames is greater in high responders to hypnosis (Carli, Manzoni, & Santarcangelo, 2008), a point to which we will return when giving an account of shamanistic healing as an expression of the social brain.

Regarding this capacity for ASC absorption in narrative framing, Donald (1991) had conjectured that a capacity for “using the whole body as a communication device” had emerged prelinguistically during the period of *homo erectus* by means of what he calls “mimetic culture,” *the ability to tell stories* through gesture and dance. Whether the details of Donald’s account of cognitive evolution turn out to be correct is not critical to the current argument. We wish only to emphasize the *human body’s ability to “double” itself in mimetic narrative* as both the current body expressing *and* the symbolic (pantomimed) content it refers to (e.g., one’s own body crawling like the snake or the panther). Furthermore, this occurs in the context of the

narrative and is an early form of experiencing the embodied self from both internal and external viewpoints, as doubled. When we speak or gesture, we hear our own voice and partially see our bodily gestures. That is, we take an external, doubled perspective on ourselves to communicate with others (Mishara, 2009, 2010a) [see Cousins, Volume 1]. As we indicate below, the shamanic symbolism of rebirth reflects *the structure of human self* as socially embodied.

The anthropologist Levi-Strauss (1963) describes the shaman's practice of placing a tuft of down into his mouth, biting his own tongue and then spitting out the bloody feather as if it were the pathological "foreign body" extracted from the patient. To cure the patient, he must somehow believe his own "performance" to be convincing. Cardaña and Cousins (2010) observe that the "sleight of hand" or trickery often found in shamanic healing is nevertheless "an illusion that becomes real for the self and the audience." It is one component of a triad that includes the "acting" body of the shaman (as if in a theatrical performance) and the importance of the presence of other people.

One example of such mutual hypnotic-trance induction between the shaman and audience is found among the nomadic Rabaris in western India. The shaman (bhopa or bhopi) acts as a means of communication between the Rabaris and the Mataji or mother goddess. After a period of listening to intense drumming, the shaman starts to shake, and, as a result, falls over (sometimes fainting), and is caught by members of the audience, indicating a possessed state [see Fachner, Sluhovsky, St John, Volume 1]. Another indication of such transformed mental state is when the shaman starts to unravel (in a *distracted* manner) his brightly red turban or chiri. Not only is the shaman the only member of the community permitted to wear such a red turban, but also removal of the turban is considered to break the modesty code. It is here tolerated to indicate the exceptionality of the shaman's state as it is displayed to the community. The unraveled chiri may function as a physical link between the everyday, mundane world and the realm of the goddess that the bhopa thereby accesses, perhaps in a temporary form of axis mundi. To further facilitate the ASC, the bhopa may use the chiri as a sort of flail to whip himself and ingest opium water quaffed from the palm of the hand of an attendant Rabari (Dr. Eiluned Edwards, Nottingham Trent University, personal communication). We interpret such practices to indicate the shaman's use of a mimetic, hypnotic state induction in self and audience as a means of optimizing the brain's healing powers. That is, the mimetic performative function is central to the healing mechanisms of the human brain as it has evolved to become a social brain.

Cardena's (2008) proposal that emotions are transpersonal systems whereby hypnosis involves emotional contagion processes lends support to this view. Cardena, Terhune, Löff, and Buratti (2009) found significant correlations between emotional contagion (the propensity to automatically imitate the emotional expressions of others) and hypnotizability. These findings support the view that the hypnotic ASC employed in shamanic ritual performance may in part have its healing effects by appealing to the powerful feelings of belonging to a community during ritual enactment. This whole process triggers the neural circuitry of reward in the human social brain. As Abram (2005) observes, however, the feeling of solidarity in shamanic ritual is not merely a connectedness with the surrounding human community but also with "the more than human earth" (p. 172), that is, a deep connectedness between one's own embodied being and all other life. Interestingly, highly hypnotizable individuals, in contrast with those less hypnotizable, report during hypnosis "a sense of being connected with everything and having very positive emotions" (Cardena, 2008).

These observations resonate with psychotomimetic drug studies that attempt to model the phenomenology of schizophrenic psychosis in healthy individuals by establishing common denominators between drug-induced ASC and the endogenous psychotic experiences of patients with schizophrenia (Vollenweider & Geyer, 2000). Psychoactive drugs (e.g., indoleamine hallucinogens, such as LSD or psilocybin, and dissociative anesthetics, such as ketamine) are administered to healthy individuals in acute challenge studies. The following dimensions are found to be present in the ASC of the drug-challenged healthy individuals and acutely psychotic patients: (1) feelings of "oceanic boundlessness" whereby the boundaries between self and universe are experienced to dissolve, an experience that is associated with positive emotions; (2) "dread of ego dissolution," whereby, in contrast to "oceanic boundlessness," the loss of self-boundaries is associated with "arousal, anxiety, and paranoid feelings of being endangered"; (3) "visionary restructuralization," which refers to "auditory and visual illusions, hallucinations, synaesthesias, and changes in the meaning of various percepts." Moreover, these dimensions have been validated cross-culturally. Neuroimaging experiments using FDG-PET during the psychotomimetic challenge vs. placebo control in healthy individuals indicate that the first dimension is associated with changes in metabolic activity in the frontal-parietal areas, occipital cortex, and striatum. The second is associated with changes in the thalamus and the third with changes as in "oceanic boundlessness," but with additional activity in temporal cortex (Vollenweider & Geyer, 2001; Vollenweider, Leenders, Øye, Hell, & Angst, 1997) [see Bearegard, Presti, this volume]. These findings

parallel similar metabolic activity in acutely psychotic schizophrenic patients and are particularly interesting for the present analysis because these dimensions are associated with ASC in the shamanic initiation and ritual healing. As we will discover, the dissolution of self (i.e., “oceanic boundlessness” coupled with “visionary restructuring”) paradoxically leads to greater integration as expressed by the rebirth imagery as a “symbol of transformation,” often invoked during the shamanic rituals. Moreover, this “transformation” engages the “deepest” levels of self-processing (Jung, 1969).

Our claim is that the ASC involved in shamanic healing effects do not merely involve hypnosis but rather that the hypnotic induction involves a group experience in which symbolic meanings well-known to the community (i.e., both healer and patient) are invoked and engaged.

The healer attaches the patient’s emotions to the transactional symbols particularized from the general myth and then manipulates these symbols to emotionally transform the patient. More specifically, patients’ subjective states including emotions and bodily sensations become symbolically “objectivized” and are incorporated into pre-existing cultural patterns. (Lee, Kirmayer, & Groleau, 2010, p. 59)

Furthermore, this symbolic meaning is embodied in the community ritual performance.

To the extent to which the symbols employed invoke shared mythical narratives (Dow, 1986; Lee et al., 2010; Levi-Strauss, 1963), they mobilize unconscious processes of healing, which are comparable to more contemporary healing processes found in Depth Psychological and experiential individual and group psychotherapies (Safran & Muran, 2000).

It is the ritual performance itself as a communal act that allows its suggestive healing power to enter the individual and the other audience participants precisely as a group experience. By casting this complex phenomenology and implicated neural processes under the simplifying “placebo effect,” both a service and disservice are accomplished. This terminology should not deflect from the careful phenomenology of the subjective experience of the implicated ASC as a transformative experience of embodied self in terms of the spatial, temporal, agentic, and intersubjective dimensions of experience during the healing process (Mishara & Schwartz, 1997) [see Dieguez and Blanke, this volume].

Cardeña (2005) conducted a phenomenological study of “depth” of hypnosis in very high hypnotizables. Depth correlated with experiences of changes in embodiment (e.g., “floating out of the body,” “flying”), time sense (“time becoming ‘still’ or ‘slowing down’”), and agency (“diminished

self-awareness in motor activity”). In the last case, the finding that “repetitive activity does not have to be attended . . . once the whole organism becomes attuned to the specific rhythm and then maintains residual unreflective awareness” (pp. 47, 52) has direct relevance for ritual shamanic mimetic healing. We believe that a similar phenomenological investigation of the experience of ASC of the healer and audience would help elucidate the cognitive and neural mechanisms of shamanic healing.

In summary, we claim that the healing mechanisms of the shamanic ASC as mimetically induced hypnotic state involve a collective group experience. These mechanisms cannot be reduced to any one single factor (e.g., parasympathetic relaxation, symbolic meaning, or group processes), but rather, all these factors contribute in concert to healing. This is so precisely because the human brain has evolved both in its cognitive architecture and its underlying neural circuitry to be an “embodied” social brain.

Brain Connectivity, Hypnosis, and the Healing Effects of Shamanic ASC

Using EEG measurements with a hypnotic virtuoso volunteer, Fingelkurts, Fingelkurts, Kallio, and Revonsuo (2007) found alterations in local and remote functional connectivity between brain areas. That is, the “number of remote functional connections among different cortical areas was significantly lower during hypnosis than during the baseline [which] . . . is consistent with transient hypofrontality and left-hemisphere inhibition” (p. 1460).

Interestingly, the authors comment, “a similar picture of disrupted functional connectivity (estimated by the same method of EEG structural synchrony) has been found in subjects with schizophrenic disorders” (p. 1460). In the previous section, we described Vollenweider and Geyer’s (2001) findings that (1) feelings of dissolution of the self’s boundaries (e.g., oceanic boundlessness) and (2) “visionary restructuralization” are present both in acute psychosis and in healthy individuals during psychoactive drug challenge. We believe that these dimensions are not only associated with ASC in psychotomimetic drug models of acute psychosis but are also present in the healing effects of ASC in shamanic ritual enactments.

Fingelkurts et al. (2007) interpret their findings to mean that “separate cognitive modules and subsystems may be temporarily incapable of communicating with each other normally” (p. 1452). This recalls cognitive definitions of dreaming. Dreaming has been characterized as “single-minded” (Rechtschaffen, 1978). In waking consciousness, we usually are able to reflect on, compare, or recall experiences or thoughts apart from the current one we are experiencing. It is not that these processes are completely

excluded during dreaming—a counterexample is lucid dreaming. It is rather that they are massively attenuated so that dreaming is isolated from other capacities or functions of consciousness. One finds a similar inability to transcend one's current perspective, to reflect on, monitor, or consider alternative views during the acute psychosis of schizophrenia. As in dreaming, one is trapped in the "now" (Mishara, 1995; 2007b; 2010b; 2010). Moreover, recent evidence of functional and structural abnormalities and reductions in large-scale cortical connectivity in schizophrenia may be reflected phenomenologically in the "delusional dreamlike" states of acute psychosis (Mishara, 2010c). But how does this help us understand the ASC of shamanic and other kinds of healing?

Randal, Geekie, Lambrecht, and Taitimu (2008) write:

During shamanic initiation crisis, some trance states could be seen by Western psychiatric discourse as psychotic states with extreme distress. For example, a Tamang shamanic apprentice in Nepal who is possessed by voices will shake convulsively, be confused, not eat, have distorted visions and seek solitude. (p. 337)

However, in contrast to the auditory verbal hallucinations associated with schizophrenic psychosis, which is largely an experience of being removed socially (Hoffman, 2007), the

true ancestral voices [in shamanic initiation] would be those which in the eyes of the community are accurate, for example, in helping find herbs and lost cattle, or in diagnosing and healing illnesses. The shamanic crisis is . . . similar to a spiritual emergency, a "mystical experience with psychotic features," a "hero's journey." (Randal et al., 2008, pp. 338–339)

Just as there is apparent similarity to psychosis, there is a close relationship between dream experiences and shamanistic practices (Law & Kirmayer, 2005).

In sleep and anesthetics, there is a reduction of consciousness associated with a breakdown of cortical connectivity and thus of integration of information (Alkire, Hudetz, & Tononi, 2008). Tononi (2008) defines this breakdown as a reduction in "the ability of different cortical regions to interact effectively" (p. 232). Presumably, such reduced cortical connectivity also occurs in hypnosis, as suggested by Fingelkurts and coworkers (2007) and, as we propose here, in the ASC of shamanic healing. The Rabari shamanic ritual fainting reported above, for example, supports this view.

In describing their “integrated information theory” of consciousness, Tononi and Laureys (2008) write:

... you lie in bed with eyes open and experience pure darkness and silence ... the informativeness of what you just experienced lies in not how complicated it is to describe but in how many alternatives you have ruled out ... whether you think or not of what was ruled out (and you typically don't) you actually gained access to a large amount of information. This point is so simple that its importance has been overlooked. (pp. 402–403)

Each conscious experience generates a large amount of information by ruling out alternatives.

Interestingly, the phenomenological psychiatrist Wyss (1973) made a similar observation. By being aware of the actual present, one “suppresses” alternatives. Although “wakefulness” is not a copy of reality, it is a current shaping (*Gestaltung*) in which perceiving, imagining, remembering, and thinking modalities of experience are able to be kept separate from one another. It is only when consciously controlled, effortful processing is reduced that consciousness turns inward (disconnecting from the actual current external environment) in a loss of perspective (*Aperspektivität*). Wyss connects inner experience with a boundless loss of perspectivity in which the possible overwhelms the actual:

The inner appears to wakeful awareness as the inter-weaving of thoughts, volition, moods, images, feelings which penetrate one another and are experienced as lacking independence, but somehow, everything is interconnected with everything else—on the basis of the aperspectival structure of interweaving of what is possible. (p. 188, our translation)

Nir and Tononi (2010) observe: “The most obvious difference between dreaming and waking consciousness is the profound disconnection of the dreamer from their current environment” (p. 100). However, this disconnection, the aperspectival, the overwhelming of the actual by the inner (Wyss, 1973) with an attendant confusion between experiential modalities (e.g., perceiving, remembering, imagining) are also found during acute drug intoxication, psychosis, hypnotic narrative framing (Mishara, 1995), and—as we argue here—in shamanic healing. The shamanic metaphoric “hero’s journey” during initiation (Randal et al., 2008) is a temporary suspending of current reality to undertake a confrontation with the inner world. Here there is an overwhelming of the actual by the boundless

possibilities of inner experience, where perceiving, imagining, remembering, and thinking no longer remain separate experiential modalities. The discovery of the inner as boundless and dangerous is also reflected in Jung's (1969) work in which the self comes to terms with this inner boundlessness by means of a metaphoric journey of rebirth. The journey to the interior of the self as descent to an underworld or endless journey is also suggested by Kafka's stories (Mishara, 2010a).

In our account of the healing factors of ACS in shamanism, we find ourselves confronted with the following paradox. How can what appears as a loss of cortical large-scale integration in hypnosis (Fingelkurts et al., 2007), which we propose to be also central to shamanic healing, lead to psychological integration, that is, the incorporation of new symbolic material and positive suggestions, that contribute to both mind and body healing? How can a reduction in cortical neural integration lead to the increased integration of symbolic mental and physical healing?

Self and Narratives in ASC

In shamanic ritual, the self and its attendant feelings of control and agency as understood in our Western commonsensical views are temporarily suspended, given up in a process of healing, symbolized by the hero's journey as confronting the inner realm of the possible (Wyss' loss of loss of perspective (*Aperspektivität*)) in a rebirth of self. Jung's (1969) observations about the symbolism of self as a process of rebirth overlap with the phenomenologic-existential view of self as ongoing self-transcendence or self-displacement of one's current perspective. Jung's contemporary, Viktor von Weizsäcker, neurologist, phenomenologist, sense physiologist, and celebrated founder of psychosomatic medicine in Germany, writes that we only come to awareness of self not as a prereflective given but reflectively:

We only first really notice our own subjectivity when it is threatened to dissolve in crisis. . . . The subject is not a firm possession but must be acquired anew at each moment to "possess" it. . . . The *unity* of the subject is only first constituted in its ongoing incessant reestablishing itself in crisis and its own infirmity. (von Weizsäcker, 1950, p. 173, our translation)

Mishara (2010a) describes a similar symbolism of rebirth as metaphoric inner journey in Kafka's writings: *The self, which comes to expression*

in symbolic hypnagogic or dream images, is at once a self-transcendent and a self-regenerating process. The evolving “structure of human self” (Mishara, 2010 a) is reflected in the “rebirth” symbolism.¹ During the narration,

The self simultaneously takes on the roles of the narrator and the narrated self of the traumatic event. The process of separating these selves, letting go, and sense of completion is still under way. . . .Straus, a phenomenological psychiatrist, wrote that we experience distance not in terms of objective space but in terms of our own momentary ability for movement. It is for this reason that we have no distance in the dream because the dream landscape moves with us and encloses us within its horizon. We are always in the present in the dream, enveloped within the immanence of our own bodies, in a private universe. (Mishara, 1995, p. 188)

The ability to seamlessly shift frames between a narrating subject who somehow stands outside the narrative, shaping its course, and one that is embedded within the development of unfolding scenes may have its neural basis in the opposition body schema/body image, that is, *being* a body subject and *having* a body experienced by others.² To narrate about oneself

¹Integrating classical philological scholarship and archaeology, Knight (1936) traces the history (and prehistory) of the labyrinthine symbol beginning with the spiral shapes carved into stone before and inside prehistoric burial caves in which the dead were placed in fetal position to indicate a journey of rebirth after death. Mishara (2010a) describes how the labyrinth later serves as a symbol of “rebirth” of the human self in Kafka’s writings [see Ustinova, volume 1].

²The neurologic opposition of body schema vs. body image (originally proposed by Head, 1920; Head & Holmes, 1911) is not easy to grasp. Consider the following exercise: Ask a friend to close his eyes and draw the face of a clock on his forehead, the hands of which say 3 o’clock from your perspective. Ask him what time it is. He may respond either 3 or 9 o’clock depending on whether he reports from your (external) or his (internal) perspective (see Mahoney & Avenier, 1977). What is of interest is the ambiguity of the situation; your friend may report his bodily experience either from your or his perspective. The two systems, kinesthetic (9 o’clock from his perspective) and perceptual, are organized in terms of two different reference frames or coordinate systems. The first, body schema, is egocentric, or body centered, and the second, body image, is computed from an allocentric or object-centered frame of reference. These two attitudes correspond roughly to “being a body self,” a body schema, or “I,” and having a body, a body image or social self as “me” (discovering that my body has an outside perceived by others precisely by empathizing with their perspective). The duality of both being/having a body-self is required for social roles. “The fact that we are able to take *both* an internal-vital (i.e., proprioceptive-vestibular-interoceptive) and external (exteroceptive, social-objectifying) relationship to our own bodies is the precondition for any vulnerability to the disruption of self-experience in neuropsychiatric disorders and anomalous conscious states” (Mishara, 2010b, p. 621).

is an act of self-transcendence because one experiences oneself as *both* active narrating subject *and* narrated object (as if seen from others' point of view). This reflects a fundamental paradox of human existence that we articulated above: I can only become myself by letting myself go, by transcending what I just was (von Weizsäcker, 1950).

The act of narrating requires an ongoing shifting between internal and external perspectives or reference frames with regard to one's own body. The narrating I is egocentric in that, like movement, the next steps in a narrative are computed in egocentric coordinates, like considering chess moves or an anticipated route in advance. However, the narrator narrates a self already embedded in scene-based allocentric coordinates and becomes entranced like his audience in the unfolding of these scenes from the standpoint of the protagonist. The narrator must shift back and forth from being absorbed in the narrative unfolding of his/her own story to quick decision processes of "where" to go next, which narrative path to take. The latter process occurs in terms of what we have been referring to as the egocentric reference frame of an on line body schema.

Recently, the first-person perspective has gained considerable attention in neuroscience without its advocates being able to state exactly how first-person awareness is supported by the complex circuitry underlying the social brain, or if it has components that can be fractionated and mapped onto the brain in functional neuroimaging studies (Mishara, 2007b). What is often missing from these discussions is the role of narrative autobiographic remembering. Such remembering is not a direct awareness of an already first-person engaged or embedded perspective (an initial viewpoint dependency first computed in an egocentric coordinate system), but rather the ability to shift perspectives to empathically imagine how others experience the "self," a shifting away from the default, viewpoint-dependent "egocentric" frame of reference (Byrne, Becker, & Burgess, 2007). Similarly, Decety (2007) writes, "people are fundamentally egocentric and have difficulty going beyond their own perspective when anticipating what others are thinking or feeling" (p. 258; recall the definition of naive realism as our default reality, above). Remembering requires a shifting to an allocentric, viewpoint-independent frame of reference that situates one's own embodied self in relation to a community of others, whether these be living, dead, spirits, or totemic. This leads to the controversial conclusion that what is uniquely human is not a putative first-person perspective, a hypothetical prereflective self-awareness somehow present (to itself) in engaged agency (a body schema, that, as we know, contra claims of reflective access to prereflective self-awareness [see Mishara, 2010a] occurs largely unconsciously) but rather the ability

to reflect on ourselves, to narrate our experience to others and thus transcend our temporary current online perspective. It is also this ability that, we contend, leads to shamanic use of ASC during ritual enactment as healing.

Hence, what is uniquely human may not be, as many assume, the ability to say “I,” but the ability to reflectively access a “me,” an external relationship to my own bodily self as the precondition of a social relationship to others. What is generally neglected in the literature is that any claims about self must be made from a reflective perspective that requires that the experience be retrospectively mediated by a change of reference frame, whether the experience be held in working memory or already converted into an episodic memory, what Husserl called the “retention” of the just past experience (Mishara, 2007a, 2010a, 2010b).

In the phenomenologist Plessner’s (1965; 1980–1985) terms, what is uniquely human is not the so-called “I” (centric being) but the ec-centric relation to bodily self, being able to experience one’s bodily self from outside, as others might experience it, the foundations of uniquely human social cognition (Mishara, 2009). It is also this ability to consider oneself from an observer’s perspective that enables conscious episodic memory, the ability to narrate one’s experience, the “time travel” of auto-noetic episodic remembering, the ability to have explicit retrospective and prospective episodic memories (Tulving, 2002). The neuroscience that supports being able to be both a centered self and the ability to envision oneself from an ec-centric (allocentric) perspective is complex and implicates ongoing transformation of reference frames between a motoric body schema and a perceptually based body image.

While online egocentric representations are continuously updated by self-motion, allocentric representations play a role in spatial memory even over very short delays and distances (Burgess, Becker, King, & O’Keefe, 2001). It is not possible to reflect on, narrate, or impart an experience (even if it be through nonverbal performance in a prelinguistic mimetic culture as in Donald’s [1991] theory of cognitive evolution) without displacing our initially centric experience, by taking up a position that situates the embodied self in a *shared community experience, which implies many viewpoints different from my own*. That is, an initially egocentric, viewpoint orientation (Brewin et al., 2010; Byrne et al., 2007; Decety, 2007) must be translated into an allocentric frame of reference. Although the “hippocampus is specifically involved in storing allocentric (or viewpoint-independent) representations,” an “imageable egocentric representation is then produced in the precuneus via translation in the posterior cortex, making use of current head direction” (Burgess et al.,

2001, p. 1499). That is, the body-centered or egocentric coordinates of an online, short-lived body schema, mediated by the parietal cortex (the intraparietal sulcus subserving the “translation” between reference frames), may “update” head direction cells providing “point of view” to recollected scenes otherwise mapped in allocentric coordinates (Byrne et al., 2007; Mishara, in press b). Speculatively, out-of-body experiences may involve the lack of coordination between vestibular sensations (presumably mediated by the putative vestibular cortex in humans), head direction cells, and their spatial mapping in the allocentric space of remembered or constructed scenes (Mishara, 2010b).

Narrative as Model for the ASC in Shamanistic Healing

But how can reduced cortico-cortical connectivity heal through experiences of body-self symbolized by death-rebirth journey symbolism, a journey between worlds populated by spirits? We have already indicated that responsiveness to proprioceptive stimulation and ability to shift reference frames is greater in high responders to hypnosis (Carli et al., 2008). As in narrative or other kinds of mimetic performance in social contexts, the deliberate employment of ASC in shamanic healing requires a shift of embodied perspectives in both the shaman-healer and the patient. Such experiences involve disengaging the motoric self from the perceptual self, the body schema from the body image (Mishara, 2010a, 2010b). That is, shamanism heals paradoxically or in terms of a dialectic of three stages: (1) effortful, mindful directing attention back on task; (2) a temporary loss or reduction of consciousness, an interrupting of the human ability to transcend-integrate current experience, only to (3) optimize this same ability in subsequent reflective awareness. This process is symbolized in the shamanic death and rebirth of the socially embodied self. The mutual ASC induction between shaman and patient (not unlike the much weaker form of the joint absorption of the storyteller and audience) requires not only a shift in embodied perspectives but also utilization of the networks of the brain that enable social cognition, the ability to empathize and exchange perspectives with others fundamental to healthy functioning (Blankenburg, 2001). The shamanic narrative of the self as an inner journey of rebirth is the healing movement of self-transcendence.

Although the analogy may at first not seem obvious, giving into a narrative absorption as an ASC resembles the lapse of embodied control during laughter as Plessner describes it: “Paradoxically, we are brought closer to our physical-body, and yet severed from internal connection or

control, as if a bystander who must endure while the bodily automatism compulsively runs its 'opaque' (*undurchsichtig*) course" (Plessner, 1970, p. 25). By giving way, the person "at once forfeits the relation to his body and reestablishes it" (Plessner, 1970, p. 66). Here, the regaining of control with regard to one's bodily self precisely through giving it up resembles the dialectical-paradoxical movement of ASC in medical and psychological healing.

Conclusions

We have described diverse ways that healing and ASC are associated and have examined healing and shamanic practices, meditation, mindfulness, hypnosis, acute psychosis and its psychomimetic drug models, narratives, community rituals through the lens of the social brain, and social neuroscience. One achieves integration in mental and physical healing paradoxically through first yielding to its loss in a temporary dissolution of embodied self and the feeling of being in control in the ASC. The phenomenological psychiatrist, Wyss (1973) connects inner experience, especially when controlled processing decreases as in ASC, with a boundless and sometimes dangerous loss of perspectivity in which the possible overwhelms the actual. The shamanic metaphors of inner journey and rebirth refer to the paradoxical healing power of the ASC and may help elucidate the structure of the human self and how the self may play a role in its own healing in meditation, mindfulness, hypnosis, and narrative.

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