

Sentience and Psychedelics: The Promise of New Psychotherapy Catalysts

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Abstract

Links have been found connecting psychedelic phenomena to enhanced activity of selected brain neurotransmitter systems. Cortical activation of serotonin 5HT-2A receptor subtypes produces far-ranging effects ranging from changes in the configuration of consciousness to neurogenesis. Understanding heightened neuronal network fluidity and cortical cross-connectonomic communication presents exciting opportunities for integrating psychedelics in the treatment of a spectrum of clinical challenges to the human condition.

INTRODUCTION

The new era of clinical psychedelic research is kindling a surge of new interest bordering on excitement. There is even a nascent notion that major discoveries will be made, leading to radically different ways of looking at self and humankind, maybe even piercing through one of the greatest questions facing the sciences today, namely the mind-body problem ^[1,2].

In the fifties and sixties, psychedelic usage was fueled by the promise of facile spiritual discovery. Inspired by Eastern concepts offering novel philosophies of life, psychedelics became popular as potential accelerators of personal evolution.

So I also rode this wave, as did my parents, who were meditation students of a spiritual man, Paramahansa Yogananda, author of *Autobiography of a Yogi* ^[3]. We were inspired by Aldous Huxley's "Doors of Perception" ^[4] and Alan Watts' "Joyous Cosmology" ^[5].

To illustrate the phenomena that commonly emerge during psychedelic explorations, I write on my first experience which took place in my late teens, using an established Native American recipe that called for three dried peyote cacti, while inviting a proper mindset, in a context of a supportive loving milieu. If it was time-tested by Native

Americans, I reasoned, they had paved the way, and I felt safe.

After an hour or so, the arduous visceral effects of the magic cacti evaporated. Situated near a trio of pines in the slowdown of a Sunday and with a soft breeze backdropped by a strikingly blue sky, I looked at the trees moving in the zephyr. Suddenly, I was jolted by a radically different perception. The trees, not only in their sway, but also in every branch, even down to each needle, were now registered and understood, as in a lifting fog's sudden clarity. Standing spellbound, I sensed nature's energies coursing through the tree trunks and the wonderment of passing birds in flight, all as if seen for the very first time.

My own self's perimeter was shifting as me/not-me demarcations fluidified. Sensations melded in a moving m lange that would later be understood as synesthesia. At this juncture, I realized that I had a choice to make: Either I would let things happen as they would, with acceptance and relaxation, or, feeling that these challenges could portend darker outcomes, I would now backtrack by ending my experiment, however I could. This juncture, commonly encountered during psychedelic therapies, speaks for the beneficial presence of a guide who, aware of this possible conundrum, will bolster patients' ego forces. They will then be more likely to emerge from their journeys with derived strength and aplomb.

After several hours, I welcomed returning to the familiar sense of “Me.” Nevertheless, I remained deeply humbled by the realization that one’s so-familiar state of sentience could be so fundamentally transformed by ceremonial botanicals which, in mixing with brain dynamics, could dramatically influence perception, cognition, mood, and the highest qualia of the experiencing self. I would later appreciate that these experiences expressed the hallmarks of commonly shared psychedelic peregrinations. Knowledge in working with these phenomena embodies immense psychotherapeutic promise [6].

THE FIRST PSYCHEDELIC SURGE AND THE NEW CONSCIOUSNESS ALCHEMY

As a resident physician at New York’s Bellevue Psychiatric Hospital, the late sixties were a time for witnessing a new phenomenon. Half of our admissions were brought by the police, and our acute unit, with its safety rooms for agitated patients, was rarely idle. Within a few months, we saw our emergency population beginning to shift, as the classical DSM syndromes were now mixing with new and potent poly-pharmaceutical psychedelic brews.

That era was one for free-for-all “mind-expanding” mystical molecular magic and its new psychedelic alchemy. Our patients, to our wonderment, would detail how they had mixed, smoked, brewed, distilled, imbibed, and unfortunately injected, any permutation and combination of substances said to contain life-revealing properties. Blended with psilocybin in magic mushrooms were mescaline, LSD, unknown compounds derived in rogue laboratories, morning glory seeds, hashish, ibogaine, and then-mysterious plants from the Amazon and the Far East. In this age of experimentation, even psychiatric drugs, such as Thorazine and Elavil, easily obtained in street markets, found their way into

creative concoctions. We regularly pondered, is this psychiatric emergency a case of acute schizophrenic decompensation, schizoaffective psychosis, bipolar mania, delirium, a neurological problem, an intoxication, a wild mix of the above, or simply a “bad trip?”

THE CONTEMPORARY PSYCHEDELIC WAVE

This first psychedelic wave subsided after some years. Decades later and present today, however, a second wave arrived, this one derived from the cumulated rich trove of discoveries into nervous system dynamics: Advances in brain imagery, neuronal circuitry mapping, psychosurgery and deep brain stimulation, neurotransmitter chemistry, all are leading to a birthing appreciation for the secrets psychedelic research could possibly unlock [7].

Suppose impaired circuitries are putative in the creation of psychiatric pathologies. Could psychedelics, which appear to act at the very interface between brain chemistry and consciousness, be utilized to treat humankind’s psychic plagues, namely the spectrum of anxiety and trauma disorders, catastrophic depressions, thought pathologies, addictions, and end-of-life existential tribulations? Today, hundreds of psychedelics are identified, and the list is ever-growing [8]. On a more fundamental level, could the psychedelic keys that appear to open portals to the kingdom of sentience give us insights about how a palpable organ, the brain, can generate a phenomenon called *experiencing*, revealing how so many varieties of emotions can emerge from a mere physical entity? [9], [10], [11].

CONNECTONOMICS OF CONSCIOUSNESS

It has long been appreciated that the fullest expression of consciousness relies on the

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proper functioning of the cerebral cortex, in dynamic unison with subcortical arousal systems [9], [12]. Neuronal circuitries creating alertness, awareness, and attention, are referred to as the “consciousness system” [13].

Emerging from the brain stem are signals generated by billions of dense cells in net-like formations providing neural energies for ascending as well as descending signaling. The ascending reticular activating system (ARAS) is a prime provider for the tonus of alertness – indeed, lesions there lead to coma [14], [15], [16]. Several distinct arousal networks travel to the highest cortical centers via the pons, mesencephalon, thalamus and hypothalamus, each mediated by specific neurotransmitters: Glutamate, acetylcholine, GABA, norepinephrine, dopamine, serotonin, histamine, orexin and adenosine, a growing number of lesser-known neuromolecules, and even neurotransmitter gasses such as nitric oxide (NO) [17], [15]. From there, thalamocortical projections activate cortical connectomes to create the most delicate expressions of sentience [18].

The brain’s connectome is defined as the ensemble of all neurons that populate its universe [19]. Its outbound nerves eventually immerse their finest tendrils far into the substance of every bodily organ, from skin, muscle, and endocrine glands to immune networks, and back to the brain; as such, there are no clear boundaries to the brain’s connectome because it touches the intimate functions of all cells, determining the health of every organ. This principle forms the foundation for the practice of psychosomatic disciplines such as meditation and yoga, among others, that aim to harmonize all systems that contribute to our organism’s well-being.

Numerous sub-connectomes inhabit the greater brain connectome [20]. Sensory connectomes translate the constant messages of trillions of diverse bodily sensors into *experiencing*, while motor networks trace their circuitry from the elusive centers of volition, to

muscle activation. Other connectomes, visual, auditory, memory and language share space with abstract ones, as those dedicated to thinking, creativity, and the most complex, selfhood.

Although most connectomes function below the threshold of awareness, one connectome is granted special status; it could be named the “*Awareness Connectome*.” While consciousness derives from the energetic contributions of the total neuronal population, awareness expresses the ignition of selected neuronal circuits that can quickly respond to the milieu’s immediate demands. It thus embodies essential adaptation and survival value. The normal serial shifting of the mind’s attention reflects the scanning kinetics of this connectome. Fully able to center on incoming perceptions, it can also be dispatched omnidirectionally via the impetus of another connectome, one with nebulous provenance, namely volition [21]. This outgoing beam of awareness can delegate psyche into its soma, not only to expand its domain but also to influence internal bodily systems.

In Eastern perspectives, by contrast, awareness is interpreted as a form of transcendent energy. In the Tibetan Buddhist view, for example, the ultimate stuff of awareness belongs to a substance called the “subtle body” which can be conceived as belonging to a yet unidentified universal energetic dimension [22].

THE “ME CONNECTOME”

Within the nebulae of neurons constantly pulsating with electro-chemical flux, resides an entity known as a *person*. Is personhood a neurological entity or a spiritual presence? Our brain’s language centers give it a name: “*Me*,” manifesting as a poignant sense of *experiencing* oneself in an instant of time, namely *qualia*. Drawing on the contributions of limbic connectomes, it is imbued with

poignant feelings such as self-esteem and self-worth. This “Me” connectome, as the central experiencer and executor of mental functions, has the challenging task of negotiating all signals entering and exiting consciousness. In classical parlance, this refers to a delicate balancing act between conscious id, ego and superego forces. Could psychedelic therapies, via their propensity to assuage the usual perimeters of self, move this connectome in the direction of greater self-acceptance and self-appreciation, so commonly expressed as personal goals for psychotherapy?

PSYCHEDELIC NEUROTRANSMITTER DYNAMICS

Brain connectomes use numerous neurotransmitter molecules to activate, facilitate, modulate, and inhibit their messages [23]. Cross-communication between all connectomes ensures that no one part of the nervous system is ever isolated from the others. Studies have consistently shown that activation of selected serotonin-based networks stimulates psychedelic actions on consciousness [24], [25], [26], [27]. Fourteen serotonin receptor subtypes grouped in seven families have been identified [28]. A consensus is reached that psychedelics’ core psychic effects are mediated via the engagement of 5HT-2A cortical receptors [29], [7], [30]. These authors posit that cortical serotonin circuits are of two types. 5HT1A receptors are involved in stress modulation. Their activation - by SSRI antidepressants, for example - leads to nervous system appeasement and relaxation. 5HT2A cortical receptor activation, on the other hand, leads to the altered configuration of sentience observed in psychedelic action. How can the activation of this connectome’s extensive ramifications be putative in producing such profound alterations in the expression of qualia?

SCULPTING SENTIENT CONNECTOMES WITH MEDITATIVE THERAPIES, THE POSSIBILITY OF “AWARENESS NEURONS,” ENHANCED NEUROPLASTICITY AND NEUROGENESIS

What happens to the brain’s circuitry when meditation is consistently practiced? Considering discoveries showing the capacity of meditation-induced neuronal generation [31], [32], [33], [34], is it possible to stimulate brain awareness networks to expand their neuronal demographics? Research shows that meditation, which essentially involves the practice of directing awareness onto itself, can alter the morphology of selected brain structures [35], [36], [33], [37], [38].

How can these practices, developed by humanity for thousands of years [39], be utilized to bring about accelerated personal realization? In yogic practices, the awareness connectome is invited to forge links between high cortical functions and deep visceral systems. In this process, the *autonomic nervous system* becomes less robotic, as it is gradually invited into the domain of the sentient self. Since tapping into awareness networks via meditation increases the proliferation of neuronal cellular elements in selected brain structures, can we posit that such practices promote the genesis of specialized cell subtypes destined to produce awareness, namely neurons that, active in vast networks, could be called “awareness neurons?”

Studies point to the capacity of psychedelics to promote neuroplasticity. This is achieved by dendritogenesis, synaptogenesis, and the expression of plasticity-related genes via brain-derived neurotrophic factors. These authors privilege the prefrontal cortex and hippocampus as sites of the greatest psychedelic-induced fluidity [40].

In practices such as Zen Buddhism [41] and the “mental yogas,” as in Raja Yoga and Kriya Yoga, it becomes possible to attain

coveted states of self that distinguish awareness-content from consciousness nature. In the profound experience of such special states, there are no thoughts, emotions, or memories; there is simply the raw energy of consciousness. This state is called “Pure consciousness” [42]. Experiencers attempting to describe this phenomenon use words like *ineffable and transcendental* [43]. Western languages have not yet ascribed words to these special states of qualia. However, one can appreciate that when *experiencing* is centered on the very energy that creates it, reports will often use terms that invoke the universal, cosmic, and divine.

Variations of “pure consciousness” states are regularly encountered in psychedelic therapy sessions as they can in the deeper stages of meditative hypnosis [48]. During these times, therapist/patient communications may become substantially altered, with long pauses and silences, the use of phrases rather than completed sentences, and novel choice of words. Those episodes represent times of greatest neuro-fluidity and, therefore, offer opportunities for establishing new and lasting modifications of personal constructs.

Experiencing “pure consciousness” can be as impactful as it is transformative because it teaches that notions of selfhood derived from a lifetime of family and social interactions may no longer satisfy the quest for personal *meaning*. Self-concepts emerging after experiencing “pure consciousness” connect to a seemingly more immutable base. The experience is therapeutic in the sense that it couples the sense of self to a more fundamental essence, namely personal *primal life energies*, which, at their foundation, remain perennially positive.

PSYCHEDELICS IN PSYCHOTHERAPY AND THEIR AUGMENTATION WITH PSYCHOSOMATIC TECHNIQUES

Psychotherapy seeks to assist in the transformation of states of being from “lesser” subjective states to “higher” ones. Lesser states are usually ones of psychic malaise and existential pain, dysphoria in myriad forms, from persistent depressions and paralyzing anxieties to distressful self-image issues. On the contrary, the coveted states of consciousness imply relief and emancipation from these painful states.

As a technique of personal change, psychoanalysis undoubtedly holds the record for its tolerance for time in achieving coveted transformations. Its invaluable discoveries, however, opened portals leading to the understanding of the unconscious mind’s fascinating, complex mechanisms [45]. Modern psychotherapies have worked to become more quickly productive. While novel therapies claim faster improvements, the quest for transformative therapeutic results spawns poignant questions: What actualizes systemic personal change? Furthermore, in the context of new insights into neurodynamics, can the revelations gleaned from psychedelic clinical research assist in this task?

To accelerate therapeutic results, innovative approaches are integrating the assistance of augmenting therapies such as medical hypnosis [46], meditation, yoga, and Autogenic Training. These facilitators of well-being and therapeutic change become important in preparing patients for the full potential of their psychedelic experience.

ON PREPARING PATIENTS FOR PSYCHEDELIC-ASSISTED THERAPY

Preparation for psychedelic therapy greatly enhances successful outcomes. In the context of understanding the patient’s psychodynamics and sources of psychic distress, a clear delineation of therapeutic objectives is agreed upon in a collaborative patient/therapist

dyad. Indeed, patients encountering psychedelic-induced confusion, who were then gently refocused on their goals, were invariably returned to calmer, more productive states.

Prior to embarking on psychedelic assistance, it is suggested that patients receive training in a selected mind-body discipline, may it be self-hypnosis^[47], yoga, meditative breathing, progressive relaxation, meditation, even Tai Chi and Qigong.

Herewith also suggested is *Autogenic Training*, sometimes called “Western Yoga,” which offers advantages for the fact that it has quantifiable progress objectives. Developed by European clinical researchers more than a century ago, *Autogenics* initially sought to replicate the phenomena observed in deep hypnosis, without the assistance of a hypnotist^[49]. Deep autonomic nervous system relaxation is a priority goal for this practice, but like other yoga systems of personal growth, it ultimately develops higher ego-syntonic experiences of self^[50].

A calm-down may be needed during a psychedelic experience. The therapist, familiar with the patient’s chosen relaxation method, may suggest that it be practiced during the session. The therapist may also propose guided imagery, or a hypnotically induced calming trance state. Very effective are physiological breathing techniques; they, too, will need to be learned by the patient before exploring psychedelic therapy.

CONCLUSION

Acting at the interface of the physical body and its consciousness, psychedelic agents embody unique properties to modulate perception, cognition, mood, and importantly, the experiential configuration of self. Via activation of 5-HT_{2A} cortical circuitries and their subcortical ramifications, psychedelics link to the elaboration of sentience. Mounting evidence suggests that the therapeutic effects of psychedelics are connected to their

capacity to stimulate neuroplasticity. The mind-body problem remains unsolved, but the opportunities for its elucidation are ever increasing.

Psychological manifestations of activated 5-HT_{2A} circuitry in cortical connectomes manifest as fluidities of selfhood that offer opportunities for accelerated therapeutic transformations. Techniques that develop heightened entente between mind and body easily complement psychedelic psychotherapies. Examples include medical hypnosis, meditation, progressive relaxation, yoga, mindful breathing, and Autogenics.

Psychedelic psychotherapies require planning. An understanding of patients’ psychodynamics and a clarification of objectives increase their productivity and successful outcomes. Embracing the promise of these therapies represents a dynamic movement toward an enlightened vision for their therapeutic promise.

A successful psychedelic experience will be expressed by beneficial ripple effects on several dimensions of functioning in a context of calmer and stronger qualia, all beckoning a brighter, more joyous personal cosmology.

AUTHOR INFORMATION

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