

ECSTATIC [X]REALITY: MEDIATING ALTERED STATES OF CONSCIOUSNESS

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ABSTRACT

The practice of ecstatic ritual is as ancient as human culture. With the rise of organized religion and the rational scientific revolutions, knowledge of practices and techniques faded into myth. Ecstasy can be described as a highly charged emotional state, that is both volatile and short-lived, presenting the conscious mind with inexplicable mental visions. Contemporary Western culture eschews the value of ecstatic ritual, in favor of rational problem-solving. The ecstatic experience is personal, unfathomable, and the only outward signs of its features are in the accounts of subjects relating their experiences. The ephemeral subjectivity of ecstasy presents numerous barriers for the formal investigation of the transformation of consciousness, in both scientific credo and societal acceptance.

A person may use non-invasive mental techniques of meditation, prayer, trance, and the like, to achieve an ecstatic state of mind. Ingesting psychoactive compounds can also lead to ecstasy. Until the 20th century, these processes have been primarily held to be the domain of spiritual exploration. With parallel advances of both inorganic and organic chemistry, scientists discovered psychoactive chemicals inherent in plants reacted in the brain in unforeseen ways. Further exploration of natural compounds and fully human-made laboratory chemicals revealed the existence of neurotransmitters, demonstrating that the experience of consciousness can be directed by temporarily altering brain neurochemistry.

The ecstatic experience relates to a state of perception of self in a world of sensation. It is conceivable that that deviation from ordinary frames of reference, as shown by the recordings in the stories of shamans, religious practitioners, yogis, and scientific experimentation, is central to the benefits inherited from an altered state of mind. Evidence has shown that ecstatic ritual well-conceived can have lasting therapeutic effects for mood disorders, assist in overcoming chemical addictions, and enhance overall peace of mind.

Accepting that ecstasy is a personal voyage wherein the individual reimagines itself in an altered world, is it also possible to direct the development of strictly external sensations to assist in the development of similar outcomes? This paper will explore the use of *Cross Reality* (XR)

to craft uniquely adapted multisensory experiences. Accessing ecstasy with *Ecstatic Cross Reality* (EXR) offers hitherto unreachable features of altered state consciousness. Chief among them is the opportunity to be observed by third parties—which is to say, empirical, and to some degree, reproducible. Ecstatic Cross Reality (EXR) can be simultaneously a door to spiritual discovery, and a research tool into the workings of the conscious mind.

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LIST OF ACRONYMS

AI	Artificial Intelligence
AR	Augmented Reality
ASC	Altered State of Consciousness
BMI	Brain Machine Interface
CIIS	California Institute of Integral Studies
DMN	Default Mode Network
DMT	N,N-dimethyltryptamine
EEG	Electroencephalography
EMDR	Eye Movement Desensitization and Reprocessing
EXR	Ecstatic Cross Reality
fMRI	Functional Magnetic Resonance Imaging
GAN	Generative Adversarial Network
GPU	Graphics Processing Unit
IFAS	the International Foundation for Advanced Study
IoT	Internet of Things
LCD	liquid-crystal display
LSD	lysergic acid diethylamide
MAPS	The Multidisciplinary Association for Psychedelic Studies
MDMA	3,4-methylenedioxymethamphetamine

MR	Mixed Reality
NIH	National Institutes of Health
NO₂	nitrous oxide
OLED	organic light-emitting diode
PgGAN	Progressive Growing of GANs
SI	Synthetic Intelligence
TP	Transpersonal Psychology
VR	Virtual Reality
XR	Cross Reality

CHAPTER 1: INTRODUCTION

If the words 'life, liberty, and the pursuit of happiness' don't include the right to experiment with your own consciousness, then the Declaration of Independence isn't worth the hemp it was written on.

Terence McKenna

Throughout human social development, people have cultivated techniques for achieving ecstatic states of mind. Ecstasy may be achieved alone, or in group rituals, by temporarily altering the state of perception. Methods range between physically limiting/shaping access to external stimulation to internally altering neurochemical potential. Characteristics of the first pole resolve to practices of prayer, trance, or meditation, utilizing disciplines or techniques to reach hard to achieve brainwave states that minimize occlusion of raw sensory input. In the case of neurochemical alterations, states can be achieved via direct regulations in biochemistry. The most effective of these techniques, in terms of accessibility, intensity, and duration, are those induced by the use of powerful exogenous chemicals that radically alter sensory and cognitive processing in the mind. The effects of the methods across this spectrum have been measured in clinical studies, supporting the claim that brainwave states, and the resulting neurological data visible in cognitive processing can be temporarily altered (Carhart-Harris et al., 2012; Michael R. Hagerty et al., 2013).

While the entire range of technique is functional to achieving *Altered States of Consciousness*(ASC), the use of chemicals, characterized as *psychoactive*, or mind-altering drugs, provide the most dramatic and sudden state changes. As we well know, a drug toxicity profile can range from extremely lethal to entirely benign, and a thorough understanding of the risks should precede any use of drugs. It has been well demonstrated that long before the advent of laboratory science, the Controlled Substances Act, and the United Nations Convention on Psychotropic Substances, that many naturally-occurring psychoactive chemicals have toxicities so low, that lethal human doses have yet to be discovered. Tryptamines are biologically safer than Tylenol

by several orders of magnitude, and yet they are scheduled as the most restricted substances on Earth. However, despite the inconvenient fact that some sources for these banned chemicals spring up unbidden from the daily landscape, as open-source technology for casual harvesting, the legal status makes not only their collection and use prohibited, but also impedes the opportunity to advance scientific research.

Although psychoactive drugs can be used recreationally, the profound changes to mental state experienced are reputed to induce a type of spiritual voyage not easily dismissed as whimsy. Drugs effective at triggering conscious expansion are termed *entheogen*, Greek for “becoming divine within,” when used with this intention. Simultaneously, the same drug used in recreational applications might be colloquially termed *psychedelic*.

Entheogens are useful for establishing *Altered State of Consciousness* (ASC). A mind altered may gain access to unique inspirations and emotional insights, by temporarily disrupting ordinary sensations and perceptions and suspending preconceived notions. This results in radical *disassociation* and *ego-dissolution*. The experience can be so profound that some scientists have suggested that ritualistic ecstasy may have been integral to the development of human consciousness in proto man. The abductive Stoned Ape Hypothesis, advanced by Terence and Dennis McKenna, points out that mutagenic mushrooms discovered in the migrations of early savanna hominids would have had a range of effects on the intrepid ingester, from temporary improvements in visual acuity to full-blown conscious epiphany (McKenna, 1993).

Supporting evidence that something extraordinary was occurring with early human brains during this portion of their evolutionary timeline is present in the sudden and inexplicable doubling of *Homo sapiens*’ cranial capacity in an unprecedentedly short time. Furthermore, it is well-supported that the development of language, broad advances in tool use, and the clear development of societal hierarchical structures occurred at this juncture (McKenna, 1992).

As the term entheogen is commonly restricted to describing a class of chemicals, let us reflect on the claim that ecstatic states of mind can be captured through self-induced techniques of meditation or trance. Many veterans of ecstasy claim that it is the state of mind and the intention of the undertaking that establishes the efficacy of the entheogen, not the method used to trigger

the effect. Expressed more succinctly, it is the entire journey that evokes divinity within.

Departing from the default world—then returning. This journey is called ecstasy.

1.1 A CASE FOR ECSTASY

The *Oxford English Dictionary* defines ecstasy as, “An emotional or religious frenzy or trance-like state, originally one involving an experience of mystic self-transcendence.” For colloquial uses, especially hyperbolic ones, ecstasy is likely employed to mean “extremely happy” or “thrilled.” Etymologically, ecstasy draws from Latin meaning “to be or stand outside oneself,” and shares similar lineage with the word *existence*, “to cause to stand.”

Albert Einstein referred to ecstasy as the “mystical emotion” and spoke of it as “. . . *the finest emotion of which we are capable. . .*”. He credits the inspiration of the mysterious as the source of art and science, and that “*anyone to whom this feeling [ecstasy] is alien, who is no longer capable of wonderment and lives in a state of fear, is a dead man (Einstein, 1930).*”

Einstein’s existential sentiment for the contact with ecstasy recalls the autobiographical writings of Edward Abbey detailing his nearly monastic assignment as a park ranger in the American desert southwest in the 1960s. In his book *Desert Solitaire*, he emphasizes that the role of joy goes beyond individual utility, suggesting that it is a requisite strategy for survival of the species.

Has joy any survival value in the operations of evolution? I suspect that it does; I suspect that the morose and fearful are doomed to quick extinction. Where there is no joy, there can be no courage; and without courage, all other virtues are useless (Abbey, 1994).

There is no scientific consensus on the cause of emotion, but it is generally held to be an experience generated within the nervous system, establishing a mood or mental state. In 1913, the philosopher and psychologist Moritz Geiger, a member of the Munich phenomenological school, described the nature of emotion as “occupying the experiential side of consciousness (Mayer-Gross, 2000).”

Striving to establish practical frameworks, psychologists have developed theoretical models to attempt to classify emotional dispositions. One such model is the emotion wheel [Figure1.1]

developed by Robert Plutchik. The wheel considers eight categorical emotions arranged radially with each bipolar emotion opposed. Concentric rings of the wheel indicate three levels of intensity from mild to intense. Plutchik's wheel arranges stages of serenity with joy arriving in ecstasy.

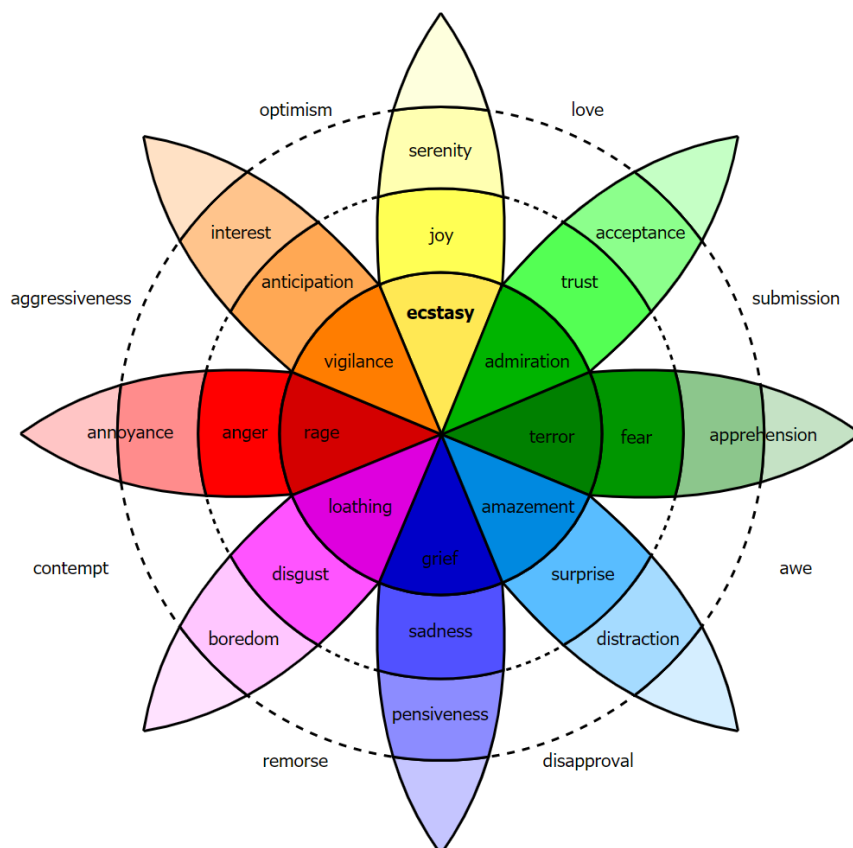


Figure 1.1: Plutchik Emotion Wheel

Similarly, the psychiatrist and philosopher Dr. Neel Burton speaks of the positive feelings of elation as states of euphoria, arriving at the pinnacle of ecstasy. He contends that ecstasy can be a route to epiphany, a sudden and striking realization, or as the Sanskrit root implies, “a rising wisdom.” (Burton, 2015)

This discussion reveals a problematic ambiguity. There is a strong association between ecstasy and happiness or joy, and this misdirects the vital impact of a truly ecstatic experience. The process of becoming ecstatic *can be* joyful, yet drawing, for example, from the emotions in the final ring of the emotional wheel, it is easy to claim that the state of ecstatic mind, as reflected in innumerable accounts, can be equally frightful, grievous, astonishing, loathsome, or fascinating.

Wilhelm Mayer-Gross, a German-born (1889) psychiatrist, wrote his doctoral thesis on the subject of heightened emotion. In his analysis, *The Phenomenology of Abnormal Emotions of Happiness*, he reviews the literature of self-reported ecstatic experiences, often religious, contrasting with the documentation of psychiatric patients in the throes of mania (Mayer-Gross, 2000). Mayer-Gross lays out what he considers six basic differences between ecstasy and abnormal happiness. The key feature repeated throughout is the observation that ecstasy can swell to displace the phenomena of an external world, to include one's own physical body, whereas happiness retains a connection to external objects and phenomena, often as the subject or source of the state of joy itself (Beer, 2000). Mayer-Gross refers to this total objective transformation as a dissolution of the self, and this is consistent with the overwhelming majority view from expert scientists, theologians, shaman, and 'ordinary' people, who contend the overall effect of the ecstatic state is *ego-dissolution*.

As it pertains to the remainder of this writing, the heightened emotional experience of ecstasy is understood as a transformation through exhilaration, of ego-dissolution, and a temporary reprise from the ordinary perceptions of the Self-in-World.

CHAPTER 2: ECSTATIC CONSCIOUSNESS



“Sacrament for the Sacred Dreamers”

... to be or stand outside oneself

As the ecstatic experience relates to an altered state of perception of Self in a world of sensation, and establishing that a departure to said state can be triggered by combinations of experimental doses of nothing (i.e., no exogenous chemicals) and doses of something (e.g., 20 micrograms of DMT¹), it has been remarked by practitioners, shamans, spiritual leaders, gurus and researchers alike, that psychoactive drugs can be training wheels for the nascent enlightenment achieved through meditation. The directionality of the reference insinuates a preference for meditation, perhaps as a more respectable, if not at least legal, action. The machinations of materialistic cultures being what they are, society prides itself on sober problem solving and is therefore willing to tolerate meditators, while shunning self-medicated drug-users (Hancock, 2009).

2.1 ALTERED STATES

The idea of “self-medicating” is worthy of further discussion. Scientific advances in biology and organic chemistry triangulate to arrive at contemporary medical practices that condition modern people with the expectation that drugs are medicine for illness. Doctors are specialists who train

¹N,N-dimethyltryptamine (DMT) is the most powerful psychoactive compound known.

in the fields of medicine, focusing in select domains or modalities. In a conventional, allopathic practice, they will analyze the complaints of patients, diagnose illness, and then select from a library of formulated solutions to manage the presumed illness, or, more frequently, merely treat the symptom. Often the solutions are pharmaceutical—medicine for sick people. These proffered formulations are rarely foods or naturally occurring plants, but instead strictly regulated synthetic drugs. Many pharmaceutical synthetics emulate natural sources that may conceivably be growing in the parking lot or could be sourced from foods known to be high in the active ingredients. However, without a personal and casual relationship with healers, recommending a carefully managed diet, changes in destructive habits, or just common-sense behavior, exposes the system to unverifiable patient compliance, and professional liabilities. With the myriad dangers of our increasingly toxic environments, stressful schedules, and unhealthy habits, it is clear to see how a powerful and impersonal prescription drug culture might inevitably arise as the dominant medical ethos. This is not to say that modern medical science and synthetic pharmaceuticals do not have remarkable life-saving outcomes. Rather, the observation is of the tendency to believe exclusively in the techniques of technology as sacrosanct, approval by trusted authority, forgoing the subtler solutions presented in the natural world, which may be ancient, forgotten, or just too weird.

The converging of these factors has a chilling effect on the public's will to explore consciousness transformation through psychoactive ritual. Most countries on Earth have made entire classes of psychoactive drugs illegal. The subject matter is effectively taboo. Returning to the academic investigation of consciousness and ecstasy, one must be cautious of falling for the societal tendency of rating the ethics between meditation and [illegal] drug-use. After all, consciousness itself appears to be agnostic to technique, and therefore any judgment regarding practice should remain subjective to individual values (and the aforementioned laws).

Let us observe that deviation from ordinary frames of reference, as shown by the recordings of ecstatic voyagers, may guide participants to beneficial states of mind. Evidence has shown altered mind states can have lasting therapeutic effects for mood disorders, assist in overcoming chemical addictions, and enhance overall peace of mind. With the postulate that the interplay of observing one's *self* in the world *unexpectedly reframed* leads to ecstatic experiences, what are

the specific ways to access “reframing”—to alter conscious state?

2.1.1 AFFECTIVE DISORDERS

Altering the state of mind is not exclusively a radical, nor is it exclusively an intentional process. Taken literally, altering state occurs at every instance of time as the conscious mind compares a persistent frame of reference from the cumulative past to perceptions of the present moment. Altering state is merely updating the present frame of reference. It is the intensity of alteration that qualifies for distinction as ecstatic. There are examples of ecstatic experiences that occur without the intentional or willing participation of the subject. Such an occurrence might be termed revelation when associated with beneficial foresight, or spiritual fervor. Often in the material and scientific world, spontaneous revelation is dismissed as psychosis.

A 1937 paper by EW Anderson, a clinician at the Cassel psychiatric Hospital in London, documents the study of four patients with a variety of affective disorders who experience bouts of ecstasy (Anderson, 1938). Anderson references E Blueler’s *Textbook of Psychiatry* to define ecstasy as a “...state of rapture” in which the outer world is completely interrupted. *“The patients see the heavens open, associate with the saints, hear heavenly music, experience wonderful odours and tastes and indescribable delight of distinct sexual colouring that pervades the entire body.”*

The patients reviewed in the paper were admitted voluntarily and suffered from mild mood or personality afflictions that made them more of a nuisance than a threat to their communities. They moved through various states of psychiatric care before being referred to the hospital. While in the care of the facility, each had one or more ecstatic interludes featuring states of extraordinary calmness, bliss, and disassociation from the normal world. One patient described:

There seemed a trembling vibration over my consciousness, a veil between me and what I should know, as if I were hovering beyond a great mystery. Then a dawning sense of exquisite harmony, without being lifted into the first state of ecstasy... Thought, space, and time dropped away.

Anderson compared the descriptions to phenomena the late 19th century psychiatrist RM Bucke called “cosmic consciousness.” He concludes that patients’ inner tranquility and harmony

with the environment was characteristically distinguishable from states of hyper mania. These were not psychotic manic episodes, but inexplicable phases of ecstatic delight. A more recent paper (1987) about a much older case, neuroscientist D Landsboroug examines biblical references to ecstatic visions ascribed to the apostle Paul. In his letters to the Corinthians, Paul describes ecstatic experiences paired with “a thorn in his flesh” that are characterized by depersonalization, a connection to heaven, and auditory revelation [Figure 2.2]. Paul writes:

I simply know that in the body or out of the body this man was caught up to paradise and heard sacred secrets which no human lips can repeat. Of an experience like that, I am prepared to boast. . . My wealth of visions might have puffed me up, so I was given a thorn in the flesh, an angel of Satan to rack me and keep me from being puffed up (Bible, 1984).



Figure 2.2: The Ecstasy of St Paul—Domenichino, 17th c.

Paul's "puffed" up could mean too prideful, or boastful, from receiving such holy ecstasy. Realizing that he could lose touch with humble piety, he accepts his "thorn" as a mortal limitation, a sin physically manifest, retaining his station in the divine order. Landsboroug postulates that both the visions and the thorn were manifestations of temporal lobe epilepsy—a brain disorder that causes seizures and periods of unusual behavior or feelings.

As can be imagined, the debate over the nature of St Paul's thorn has raged for nearly two thousand years. A more recent author, Fyodor Dostoevsky, also had epilepsy. Written in 1868, *The Idiot* tells the story of a young Russian noble returning to St Petersburg following a four-year commitment to a Swiss sanitarium for treatment of his epilepsy. Dostoevsky infuses his character with momentary ecstasy at the brink of each seizure:

... His sensation of being alive and his awareness increased tenfold at those moments, which flashed by like lightning. His mind and heart were flooded by a dazzling light. All his agitation, doubts, and worries seemed composed in a twinkling, culminating in a great calm, full of understanding. . . (Bible, 1984)

Other abnormal cognitive afflictions are known to trigger ecstatic episodes. In the article, *The Nature, Causes, and Types of Ecstasy*, MD Beer unearths several early 20th-century psychiatry trials reflecting on schizophrenic ecstasy and the resulting elation of manic episodes of disassociation, other-worldly visitations, voices, and hallucinations (Beer, 2000).

While the involuntary occurrences of affective disorders may occasion an ecstatic response in persons so afflicted, it is also well understood that a voluntary engagement with ecstasy may be actively courted with the practiced discipline of meditation.

2.1.2 MEDITATION

... there is an intense delight in abandoning faulty states of mind and in cultivating helpful ones in meditation.

His Holiness The Dalai Lama, *Path To Tranquility*

Considering the features of meditation provides further insight into the mechanisms of conscious expanding ecstasy. For the sake of simplicity, meditation discussed here represents the collection of methods focused on changing state of mind through voluntary, sustained, disciplined techniques, to include controlled breathing, chanting, prayer, drumming, dancing, fasting, mindfulness, and silent retreat. Unlike affective disorders or psychoactive drugs, both of which overpower processing behavior in the central nervous system, the key to meditative ecstasy is the use of non-invasive, sustained, and intentional techniques.

Meditation may source a secular credo, but due to the influence of organized religion, and the literary nature of religious scholarship, documentation of meditation/prayer that is of religious or spiritual nature is widely available. The monotheistic lineages of the Middle East focus almost exclusively on the historical preservation of divine revelation as received by prophets and apostles. Those references are minimally useful; perhaps best as anthropological clues as to the evolving historical importance of ecstatic ritual at the cultural level.

While it is true that monotheists developed a monastic class that spend time in isolated prayer and study—prayer can be analogous to meditation—the Eastern spiritualities document a wide variety of technique for approaching ecstasy from an individual perspective. Yogic traditions drawing upon the ecstatic forms of meditation are thousands of years old. The *Yoga-Sûtra*, *Bhagavad Gita*, *Patañjali*, *Vijñânabhairava*, and *Pratyabhijñâhrdayam* are classical yoga texts describing ecstatic meditation (Waelde, 2004).

For example, tradition based on the *Vijñânabhairava*, a compendium of 112 yoga techniques delivered in verse, guides practitioners to control the mind through disciplined observation. Yogis learn to control state of mind by directing attention away from the senses by, for example,

watching the breath, repeating mantras, or evoking visualizations. Verse 104 says to achieve happiness, the yogi should reject identification with his body in favor of the inner Self.

Lest it appear that *The Vijñānabhairava* requires a practitioner merely to deny one part of reality in preference for another² consider another verse, which asks the disciple to meditate on the joy of seeing a long-missed friend, so that the mind becomes absorbed in the feeling of joy, a practical act of addition, not subtraction (Singh, 2002).

It is not necessary to rely on the stories of ancient texts and spiritual anecdotes alone. A multi-institutional case study published in 2013 demonstrated that highly trained meditation practitioners are capable of generating and sustaining self-stimulating brain states. Researchers studied a Buddhist concentration technique called jhana that induces *Altered State of Consciousness* (ASC) in a series of eight sequences [Figure 2.3]. The study methods included *Functional Magnetic Resonance Imaging* (fMRI) and *Electroencephalography* (EEG) recordings to observe a Buddhist with 17 years of meditation practice.

The research concluded five distinct features of the subject's conscious state, (1) external awareness dims, (2) internal verbalizations fade, (3) the sense of personal boundaries is altered, (4) attention is highly focused on the object of meditation, and (5) joy increases to high levels (Michael R. Hagerty et al., 2013).

Disciplines like these achieve a practical application, by freeing the individual from undesired effects of worldly phenomenon. Can we consider a skilled meditation practitioner the beneficiary of a sustained ecstatic mind?

Accepting that the disciplined intent of meditation can expand consciousness, let us consider the impact of psychoactive chemicals which portend to achieve analogous effects.

2.1.3 ENTHEOGENS

let thy food be thy medicine and thy medicine be thy food

(often credited to Hippocrates)

²The act of perceiving is a continuous process of denial, sorting through noise for signals. . .

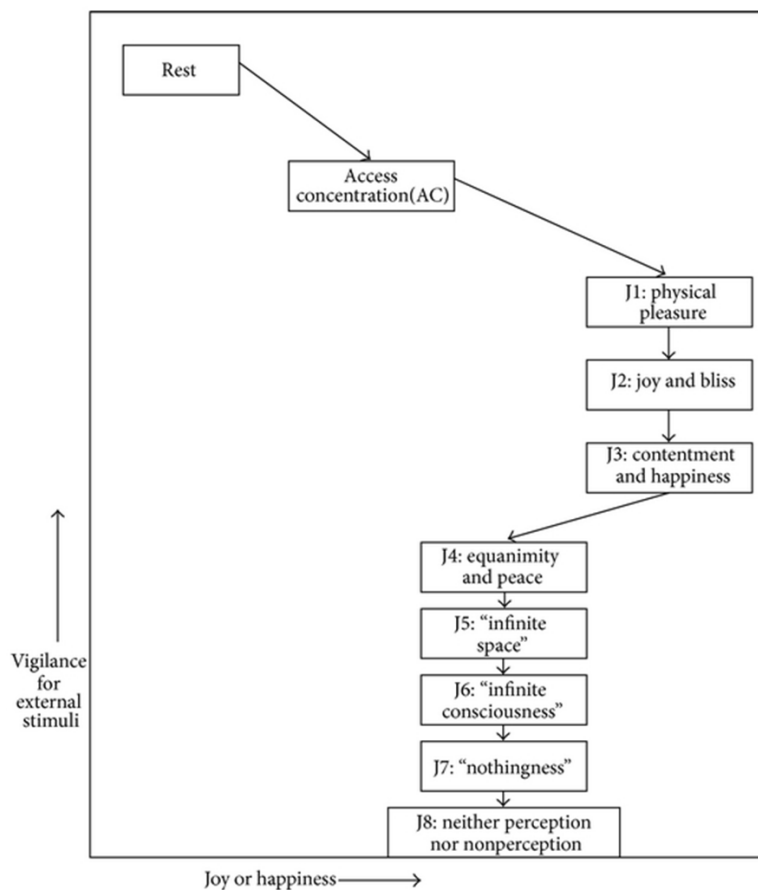


Figure 2.3: Schematic of the reported experiences in 8 jhanas relative to resting consciousness and concentration on two dimensions of interest; *joy or happiness*, and *vigilance for external stimuli*.

An entheogen is a psychoactive substance used in a spiritual or shamanic context. The term was first coined in 1979 by Ruck, Bigwood, Staples, Ott, and Wasson (Ruck et al., 1979), meaning “becoming the god within” or “becoming divine within.” Entheogens may be directly gathered from natural plant sources, as in mushrooms or cactus flowers; may be brewed from combinations of plants, as in ayahuasca; or may be wholly synthetically derived, like LSD, MDMA, and DMT³. Entheogens contain molecules closely related to endogenous neurotransmitters.

When he was sixty years old, the coincidental Father of LSD addressed the 1966 Worlds of Consciousness Conference in Heidelberg: *“Mystical experiences in [my] childhood, in which Nature was altered in magical ways, had provoked questions concerning the essence of the external,*

³lysergic acid diethylamide “acid”, 3,4-methylenedioxymethamphetamine known as “Ecstasy” or “Molly”, N,N-dimethyltryptamine the “spirit molecule”

material world, and chemistry was the scientific field which might afford insights into this.” Forty-two years later, Albert Hofmann died at his home in Switzerland, 102 years old.

Dr. Hofmann [holding LSD model kit, date unknown, figure 2.4(a)] joined the pharmaceutical-chemical department of Sandoz Laboratories in Basel as a lab chemist. He was working on synthetic derivatives of fungus ergot in 1938 when he developed a series of analogs that failed to produce the intended goals in the laboratory test animals. The formulations were abandoned for five years, until he self-initiated an informal study of one variant, LSD-25, to satisfy a lurking curiosity. In the handling of the chemicals in the lab on the day of the reboot, Hoffman incidentally absorbed compound from the crystallized tartrate salt product. He sent the following report to the head of the lab, Arthur Stoll:

Last Friday, April 16, 1943, I was forced to interrupt my work in the laboratory in the middle of the afternoon and proceed home, being affected by a remarkable restlessness, combined with a slight dizziness. At home, I lay down and sank into a not unpleasant intoxicated-like condition, characterized by an extremely stimulated imagination. In a dreamlike state, with eyes closed (I found the daylight to be unpleasantly glaring), I perceived an uninterrupted stream of fantastic pictures, extraordinary shapes with intense, kaleidoscopic play of colors. After some two hours, this condition faded away (Hofmann, 1980).

Hoffman had unintentionally become the first person on Earth to have an acid trip. His report to Professor Stoll a few days later demonstrates the well-documented occurrence of *closed-eye hallucinations*. In psychedelic drug culture, hallucinations are frequently a goal of recreational drug users. Fanciful, colorful, elaborate, the styles of visual hallucinations are the hallmark signature of psychedelic art and memorabilia.

This feature of visual sensation without any light entering the optic system opens inquiry into the nature of consciousness and perception. Famed neurologist Oliver Sacks published his penultimate book, *Hallucinations*, detailing case studies of sensory distortions triggered by fever, injury, drugs, sensory deprivation, exhaustion, and grief. One patient was completely blind, but never-the-less ‘saw’ innumerable visions, including extraordinary specific details of children in brightly colored Eastern clothing, and elves and faeries climbing the sides of her wheelchair. Sacks explains that the brain needs not only perceptual input but perceptual change,

and that the “deprivation of normal visual input can stimulate the inner eye” to produce dreams or hallucinations (Sacks, 2012).

Considering these stories of hallucination, whether triggered by bruising the brain falling down a staircase or ingesting 250 µg of LSD, one is hard-pressed to locate within a functional role for a consciousness-expanding ecstatic journey. What use is a fleeting perceptual “aberration”?

Turning back to the story of Albert Hoffman, three days following his unintended preeminent exposure, he returned to his lab to subject himself to a controlled experiment. Informing a lab assistant of his intentions, he cooked up another batch and measured out what he thought was a safe threshold dose of LSD. Today we know that threshold dosages are in the 10-20 µg range, with a “strong” dose falling between 150-400 µg. Hoffman took 250 µg.

Within 40 minutes, feelings of anxiety, dizziness, and visual distortions began. Hofmann felt in crisis, finding it difficult to speak, but was able to communicate with the assistant that he needed an escort home. On April 17, 1943, Albert Hoffman, under the influence of powerful LSD hallucinations, rode his bicycle home. In his book published in 1979, *LSD, My Problem Child* he describes the terrifying feelings he endured during the peak of his two-hour intoxication [an illustration on blotter paper commemorates this journey, figure 2.4(b)].

Of the following day he writes,

Exhausted, I then slept, to awake next morning refreshed, with a clear head, though still somewhat tired physically. A sensation of well-being and renewed life flowed through me. Breakfast tasted delicious and gave me extraordinary pleasure. When I later walked out into the garden, in which the sun shone now after a spring rain, everything glistened and sparkled in a fresh light. The world was as if newly created. All my senses vibrated in a condition of highest sensitivity, which persisted for the entire day (Hofmann, 1980).

The dissidence of comparing fun-loving hallucinating psychedelic trips to the ecstatic experience of ritualistic entheogen trance is reflected on by Ralph Metzner, a pioneer in psychological and cross-cultural studies of consciousness expansion. He is a psychotherapist and professor emeritus at the California Institute of Integral Studies. In his 2017 publication, *Entheogens: Toward an Expanded Worldview for Our Time* he writes,

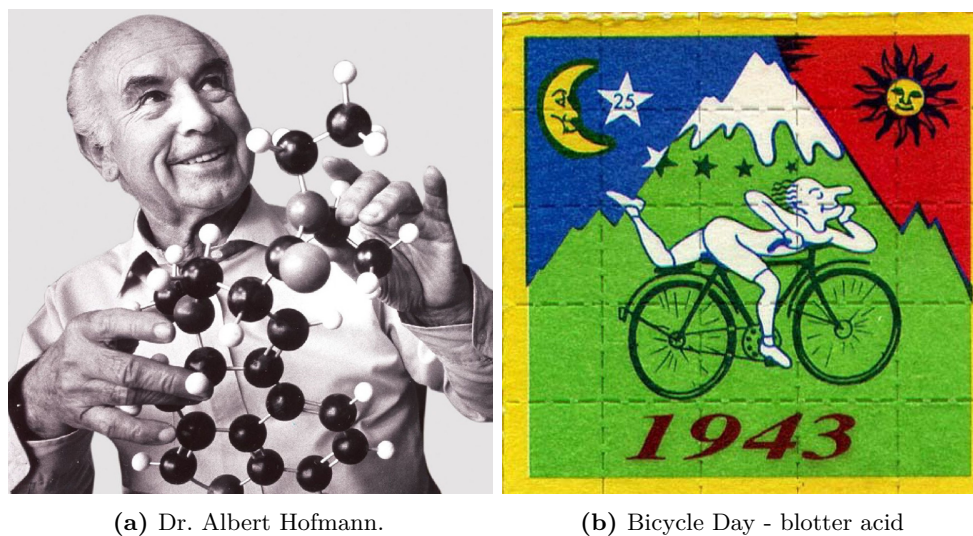


Figure 2.4: LSD: Hofmann's *"Problem Child"*

Whereas the terminology of psychedelics has acquired spurious cultural associations of 'tripping,' the historically primal concept of consciousness expansion has two advantages. One, it connects psychedelic drugs with other modes of consciousness expansion, such as meditation and creative visioning; and two, it suggests contrasting comparison with the consciousness contraction involved in concentration and focus (Metzner, 2017).

Whether drug use helps an acolyte to learn the routes to achieve ecstatic meditation, or meditation encourages or works in tandem with entheogenic drug ritual, it is not the focus of this work to take up the position on the primacy of one of these positions over another. Such debate is best left to philosophers, and while we must bear it, legal states who deem it their right to mediate.

2.2 A PSYCHOACTIVE HISTORY

From the contemporary perspective of Western Civilization, there is little to no expectation for individuals to engage states of ecstasy for beneficial personal growth. Case in point, the drug MDMA, invented by German chemists in 1912, would become popularized in the 80s as Ecstasy. Subsequently, the vernacular occurrence of the word has been dominated by the reference to the drug, not the feeling or emotional state for which it was named. To casually verify this assumption, a Google Ngram publication report from 1900-2008 shows the rise in incidence for

the term ecstasy to refer to the popular club drug over the emotional state, to eventually rank five times more frequent by the end of the 20th century. [Figure 2.5]

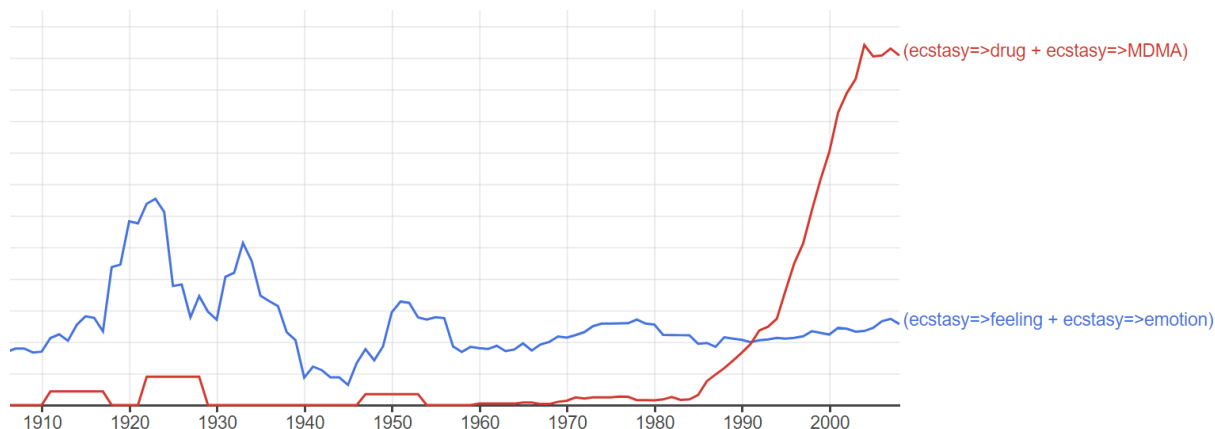


Figure 2.5: Google Ngram - ecstasy vs Ecstasy

One takes little comfort from the realization that the use of the word ‘ecstasy’ has been trumped by a drug called Ecstasy that assists the user into a *state of ecstasy*. This word ambiguity has an effect of diminishing the concept of emotional ecstasy in vernacular English language. When the reader hears the word “ecstasy” with minimal context on any given occasion, which occurrence comes to mind? Symbolic language is an imperfect tool.

Some of the first wave anthropologists, scientists, and spiritual seekers who rediscovered existing drug ecstasy cultures, or created the opportunity for entirely new ones in the laboratory, oft times reported regret for bringing casual public light to the heretofore unknown or forgotten substances. The frivolous, untrained, unserious use of mind-altering drugs, as expressed in pop culture, does involve some legitimate risk—and much skepticism.

2.2.1 DISCOVERIES

The fascinating story of Gordon R Wasson tells of one such de facto anthropologist. A New York city banker by profession, Wasson was a pharmacological nonentity with no experience in chemistry or formal anthropology. In 1955, he and a photographer named Allan Richardson mounted a mission to the Mixeteco mountains of central Mexico to track down rumors of mystical mushrooms revealed in an obscure ten-year-old botanical journal.

There they met the Mixtec people and became the first white people in known history to participate in ceremonial consumption of *divine* Psilocybe mushrooms. Wasson and his wife Valentina P Wasson, MD, would return each summer to the region, inquiring into the varieties of magic mushroom, and the rituals of their stewards.

In 1957, Life magazine published a multi-page article written by Gordon Wasson, detailing aspects of his experience. The article included several full-page photos and carefully drawn artwork depicting a variety of mushroom species. The article sparked tremendous interest in the funny ‘shrooms,’ inspiring a psychedelic tourism of hippies and beatniks seeking trippy times. The psychedelic revolution had begun.

Sadly, the onslaught of questing visitors brought the attention of the Mexican police, threatening the Mixtec rituals and way of life. The medicine woman who originally shared her secrets with the Wassons was eventually ostracized from the community, and her house was razed, presumably by her people.

In roughly the same timeframe, the psychologist Humphrey Osmond had established a hallucinogenic drug study at the Weyburn Mental Hospital in Saskatchewan. Osmond had worked for a few years with mescaline and then transitioned to treating alcoholics with LSD. Of 2000 patients treated, Osmond reported that 40-45% did not return to drinking after one year (Dyck, 2006).

Aldous Huxley, the British writer, known for the epically dystopian novel *Brave New World*, had learned of mescaline and Dr. Osmond. He established a correspondence with Osmond, then, in 1953, Osmond introduced Huxley to the substance. *The Doors of Perception* was published the following year, a 63-page philosophical essay detailing his trip.

In their subsequent friendship and correspondence, comes the birth of the term *psychedelic*. Osmond instigated a dialog with the writer in search of a name for the effect of LSD on the mind. Huxley suggested *phanerothyme*, from the Greek for “to show” and “spirit,” then promoted the term with a rhyme “*To make this mundane world sublime, Take half a gram of phanerothyme.*” Osmond countered with *psychedelic*, from the Greek *psyche* “mind” or “soul” and *deloun*, “show”,

demonstrated in the mnemonic “*To fathom Hell or soar angelic, Just take a pinch of psychedelic.*” Osmond announced the new term at the 1957 New York Academy of Sciences meeting.



(a) Delysid, brand name LSD, 0.025mg (b) Indocybin, synthetic psilocybin, 2mg

Figure 2.6: Sandoz brand drugs, physician’s samples

2.2.2 FIRST WAVE

*Psychedelic drugs cause panic and temporary insanity—
in people who have not taken them!*

Timothy Leary 1963

Wasson’s article soon attracted the attention of a notable Harvard psychologist, Dr. Timothy Leary. A colleague, Anthony Russo, confirmed the veracity of the claims, having also made the journey to Mexico. In August of 1960, Russo accompanied Leary to Cuernavaca, Mexico, where he consumed psilocybin mushrooms—his first psychoactive drug experience of any kind. Leary wrote “*It was above all and without question the deepest religious experience of my life (Lee and Shlain, 1992).*” He said he learned more about psychology in five hours of psilocybin ecstasy than he had in the preceding 15 years of academic study.

Within the year of his preeminent ecstatic psilocybin experience, Leary and his colleague Richard Alpert, together with board member Aldous Huxley, formed the Harvard Psilocybin Project, to document the effects of psilocybin on human consciousness. Recall that in that time, neither LSD nor psilocybin were classified substances. The team ordered synthetic psilocybin from the Sandoz lab [fig 2.6(b)], where Albert Hofmann had developed the process to derive the compound synthetically (Melechi and Melechi, 1997).

With a steady supply of psychoactive potion on tap, Leary and Alpert administered the drug to volunteers from the Harvard student body, other researchers, prison inmates, and a group of divinity students. Of the last group, the famed “Good Friday” experiment, the Project researchers dosed the experimental group with psilocybin while attending a Good Friday service in a private chapel. The effect from the combined influence of the chapel environment, the ceremony, and the psychoactive neurochemicals, yielded a dramatic emotional response in the experimental group. Leary claimed that with entheogens “*spiritual ecstasy, religious revelation, and union with God were now directly accessible (Mansnerus, 1996).*”

Controversy followed the program in short order. The team’s experiments suffered from unconventional designs, such as non-random subject selection, and lacked proper control groups. More damning was the practice of the researchers taking the drugs themselves along with the subjects. Intradepartmental opponents of the project charged that the studies “resembled cocktail parties,” and that their data collection was sloppy.

The project ended in under three years. Harvard denied Leary a new contract after he failed teaching obligations, preferring to travel during that semester. Alpert was fired for giving drugs to undergrads, which was against the standing agreement with the school. Ultimately both were banned from academia. In short order, Alpert went to India to study at the Kainchi ashram, where he accepted a new name, Ram Dass, “servant of God.” Subsequently, he made a lifetime commitment to the spiritual path of non-exogenous self-induced ecstasy via disciplined meditation and yogic practice. He published a seminal yogi guidebook, *Be Here Now*, in 1971, often described as a countercultural bible. He continues to publish books and produce media content and events with the *Be Here Now Network*⁴.

⁴During the final days of editing this document, Ram Dass passed away at his home in Maui, Dec 22, 2019. “*For*



(a) 1957 - G Wasson's "Seeking the Magic Mushroom"
 (b) 1966 - "A Remarkable Mind Drug Suddenly Spells Danger"

Figure 2.7: Life Magazine mirrors America's change of heart for psychedelics

Leary followed a very different path, directing his attention to a pro-active mass counterculture of psychedelic non-conformity. In a prelude to the 1967 Summer of Love, 30,000 hippies gathered in Golden Gate Park, San Francisco, for the Human Be-In event. In a speech to the crowd, Leary delivered his now-famous phrase, "Turn on, tune in, drop out." Leary claims that Marshall McLuhan crafted the phrase and had given it to him during a lunch meeting. McLuhan spoke about the marketing power of jingles and slogans and began singing a ditty to the melody of a popular Pepsi commercial that went something like, "*Psychedelics hit the spot; Five hundred micrograms, that's a lot. Tune in, turn on, and drop out.*"

Leary also popularized the phrase "think for yourself and question authority," which he must surely have donned as a mantel, for over the two decades following his Harvard dismissal, he had been in dozens of jails on multiple continents, an escaped fugitive, and finally extradited from Afghanistan. Richard Nixon dubbed him "the most dangerous man in America." Ironically, it was not yet illegal to possess his infamous drug of choice, LSD, but the marijuana tax act of 1937 had teeth. Of two minor marijuana arrests, one he successfully defended in the Supreme

the soul, death is just another moment."



Figure 2.8: Life magazine turns to shock journalism

Court in 1969 for a clever technicality; the second landed him at Folsom Prison, where he served 5 of a 30-year sentence (Higgs, 2006).

By the mid-1960s, the tide had turned against the psychedelic tricksters. The nation was involved in a continuing unpopular armed conflict in Asia, and a de facto cultural war at home fueled by a youthful dissent. Nine years following Life’s mischievous light-hearted 1957 magic mushroom article, a new ominous cover story read *“The Exploding Threat of the Mind Drug That Got Out Of Control: LSD”* with an overleaf addition that claimed *“A Million Doses of LSD: \$5 ticket to a supreme experience? Or the madhouse? Revealing insights? Or self-destruction?”* This was a verbose sign (1966 readers had perhaps less panache for zippy cover copy than today) that the establishment had become unsympathetic to the psychedelic credo [figure 2.7 and 2.8]. In 1970, LSD, psilocybin, mescaline, peyote, DMT, and chemicals resembling DMT, were added to the US Controlled Substance Act under Schedule I, followed in 1971 by the United Nations Convention on Psychotropic Substances.



Figure 2.9: stone carving of Mayan medicine man with mushroom.

2.2.3 ODE TO THE SHAMAN

While the so-called First Wave was firmly quashed by legal edict, with Pandora's box wide open, both formal research and casual use of classified drugs went underground. Many First Wave contributors continued their work, privately, inevitably spreading the awareness and finding more and refined use-cases for mind-expanding medicines. From the short historical perspective afforded today, the Second Wave may be defined as a transitional period from 1970 to around 1995, when new academic studies began publicly surfacing again.

The chilling effect of government embargo was hardly a new chapter for psychedelics. As we recall, it was only the cautious and nearly accidental discoveries of the early 20th century, from laboratory chemistry, to hobbyist anthropologists, that brought both synthetic and naturally occurring consciousness-expanding substances into public awareness. Many ritualistic plant-medicine cultures throughout history have been violently oppressed by one oppositional moral authority or another. If a people evolved a thriving plant-based religious epoch for their edification, managing to avoid a home-grown prohibition imposed by a ruling class, they often inevitably fell prey to an invading one instead.

We need look no further for clear examples of this pattern than in colonial Mesoamerica. In what is now Mexico and Central America, peoples from the advanced pre-Columbian civilizations of the Aztec, Toltec, Maya, Olmec, Zapotec, and Mixtec shared common cultural traits of ritualism, spirituality, writing, arts, and architecture (Gallenkamp, 1959). For the Nahua people, of whom Aztec are the best known, mushrooms were called *teonanacatl*, “God’s flesh.” Gordon Wasson makes the astute observation that it must have been very uncomfortable for the visiting Christians who claim holy Transubstantiation from the ritual consumption of dry bread, to coexist in the presence of these pagan people who make a similar claim with mushrooms. To magnify the tension, where the pious Christian must rely on faith of miracle conversion of inert matter into the flesh of Christ, *teonanacatl* would reliably produce holy vision and ecstasy beyond deniability (Wasson, 1980).

With the arrival of the Spanish conquerors, came the spirit of the Inquisition. As the Catholic Europeans took control in the New World, it was inevitable that gunpowder, steel, the lust for gold, and exotic export, and the intolerance for dissenting religious perspectives, would result in a continent-wide suppression of the mushroom cults of Mesoamerica (Gallenkamp, 1959). It was the secretive mountain-dwelling Mixteca of central Mexico who managed to maintain continuity with mushroom lore for 400 years where Gordon Wasson made his discovery.

The tendency for the prohibition of intoxicants repeats throughout time, making the more dramatic claims of First-Wavers like Timothy Leary, that authority disdains independent thinking for the hoi polloi, a credible possibility. Counterculture revolutionaries find easy fuel for their revolts with claims of ruling-class domination and control [Leary: “*Civilization is unbearable, but it is less unbearable at the top.*”, “*Think for yourself and question authority.*”] Generalizations in this vein make reasonable points, however, the relationship to knowledge and power is a complex web of technology and cultural rite.

Until the religious evolution of Paganism around 12,000 years ago, the technique to access sacred knowledge was likely the domain of shamanism. Shamans were spiritual specialists who were believed to achieve powers through trance or ecstatic religious experience. The word shaman derives from the northern Siberian Tungus word *šaman*, the nominative form of the verb *ša*,



Figure 2.10: The Tassili mushroom shaman, 6000-9000 B.C.E. A shaman with the face of a bee and mushrooms sprouting from his body

meaning “to know.” A shaman is one who knows (AtHope, nd). Archaeological discoveries throughout the Eurasian continent have uncovered burial sites dating back as far as 30,000 years demonstrating preferential burial for certain people with significant power artifacts, indicating the occupant likely a shaman.

While shamanism continued to common the Eurasian continent, Australia had already been settled as many as 30,000 years earlier, likely boat people migrating through the Siamese corridor. A recent publication in *Mankind Quarterly* suggests that ice age rock art in Western Australia depicts 17,000-year-old images of shamanistic rituals, some centered around the use of the psychoactive Eucalyptus leaves (Michaelsen et al., 2000). There are in fact, countless artifacts, from 7,000-year-old cave paintings in Algeria to the few hundred surviving mushroom-headed stone totems of the Nahua [figures 2.9, 2.10].

Terence McKenna goes further, crediting Shamanism as a million year old religious technology. He says,

Shamanism is not some obscure concern of cultural anthropologist: shamanism is how religion was practiced for its first million years. Up until about 12,000 years ago, there was no other form of religion on this planet; that was how people attained some kind of access to the sacred. . . shamanism then becomes about technique (Hagerty, nd).

The work of Terence McKenna delivers a night liturgy for discussing the full spectrum of ecstatic consciousness while staying grounded in scientific inquiry. His writings and lectures offer spectacular insight into the prehistoric epochs of shamanism, and simultaneously provide a critical bridge between the psychedelic First Wave movement, through the underground Second Wave, connecting with the reemergence of tolerance for what might be considered the Third Wave. McKenna was aged ten when Wasson's 1957 *Life* magazine article made him aware of the existence of magic mushrooms. With a budding interest in psychology, he also had read Carl Jung's book *Psychology and Alchemy* that same year. He had a reputation for expertise in ethnomycology, ethnobotany, and metaphysics and received his official papers from the University of California Berkeley for degrees in ecology, shamanism, and conservation of natural resources. A prolific psychonaut, McKenna traveled the globe in search of both novel psychoactives, and the ancient cultures that employed them.

The practice of shamanic ritual demonstrates a variety of methods to make contact with the ecstatic self. Drumming, manipulation of breath, physical ordeals, and even sexual abstinence are all credible techniques for entering the trance state for shamanic work. Psychoactive plant medicines remain a dramatic and reliable source for producing ecstatic visions. They are useful for establishing altered states of consciousness wherein insights and novel points of view may be gleaned by disrupting ordinary sensations and perceptions. The benefits of naturally occurring medicines would extend beyond mere cognitive trickery. Upon discovering certain plants, our remote ancestors would discover drugs that could suppress appetite, diminish pain, supply sudden bursts of energy, and boost immunity. Ceremonially, people would have used altered states in a ritualized way to carry symbolic messages, as rites of passage, and to determine leadership roles among bands.

Of interest to this writing is the relationship developed between shamanic plant doctors and their patients, for it is often the shaman, the doctor, who takes the medicine, not the patient

(Eliade, 2004). This pattern repeatedly emerges throughout cultures and times, including with the First Wave scientists, who, against the common practice of their creed, also take the drugs. This seems odd to a modern pharmaceutical culture such as present in the Western industrialized world. If a patient has hypertension, her doctor may prescribe a daily maintenance drug, perhaps an angiotensin II receptor blocker; by no means would anyone expect the doctor to take it. Similarly, SSRI drugs⁵, popular in psychiatry for treating mood disorders, are not taken by the pharmacists who produce them to benefit the patients who request them.

This is not to say that ingesting medicines was the exclusive domain of the shamans. Drugs were taken by initiates, given to the sick and dying, and used in individual and group ceremonies. Shamans maintain not only the practical knowledge of how to harvest plants and prepare brews but also the expertise to guide her clan in and through the ceremonies. They functioned much like a psychotherapist in this way—again calling to mind the patter witnessed in psychedelic psychotherapy as practiced in the 20th century.

A deep view of shamanism is far beyond the scope and intention of this writing. The primary takeaway from the discussion herein is three-fold. One, that humans have always sought personal commune with the divine unknown, no-more exemplified in the embrace of consciousness free-fall into ecstatic altered mind. Secondly, that connection is a path of transpersonal procession; from the defiantly confident ego, through uncertainty, and into a reference world simultaneously subjective and objective, shared and unknown. Thirdly, the shaman serves as a knowledgeable expert and guide, shaping and directing the course of the ecstatic journey.

2.3 ECSTATIC NOVELTY

The quest to explore ecstatic consciousness finds growing market support in the 21st century. A National Institutes of Health (NIH) survey of US adults over 18 reveals that 14.3% of respondents practice yoga, and 14.2% meditate. Comparing data from 2012 to 2017, the 2017 figures are up five and ten points, respectively. The use of psychedelics is on the rise as well. LSD use increased 175% among younger users in England and Wales between 2013 and 2015 (Gayle and

⁵which owe in large part their development to the discovery of natural-occurring psychoactive chemicals

Pegg, 2015), and A 2004 population study in the US show over 30 million people living in the USA have used LSD, psilocybin, or mescaline (Krebs and Johansen, 2013).

Jules Evans, a writer, philosopher, and research fellow for the Center for the History of Emotions, finds this intersection of interests bearing on the ideas represented by *Transpersonal Psychology* (TP). A stoic philosopher, he never-the-less pens his second book publication, *The Art of Losing Control: A Guide to Ecstatic Experience*, Evans succinctly states, “*I have decided that Western culture has a problematic relationship with ecstasy, and this narrows and impoverishes our experience of reality.*”

A school of psychology integrating spiritual and transcendent human experience with a modern psychology framework, the field was established by turn of the century thinkers William James, Carl Jung, Abraham Maslow, and Roberto Assgili. The transpersonal is defined as experiences in which the sense of identity or self extends beyond (trans) the individual or personal to encompass wider aspects of humankind, life, psyche, or cosmos (Calijornia, 1993).

The ecstatic gateway to the transpersonal proposes an interesting relationship with the self. What begins as a uniquely subjective experience, exhilarates the perceiver beyond her boundaries, into an unfamiliar state beyond the self. The transpersonal is a liminal state between subjectivity and objectivity. Seeking ecstasy is a path beyond self, embracing the transpersonal.

2.3.1 ACCEPTING THE UNKNOWN

Mass culture conditions individuals to be wary of deviation from the norm. While this is a clear tautology, it is nevertheless a useful note when questioning how public policy can prohibit an individual’s right to eat something growing in the front yard. Terence McKenna has a few words to say about the flamboyant hubris of cultural authority:

Culture is not your friend. Culture is for other peoples’ convenience and the convenience of various institutions, churches, companies, tax collection schemes, what have you. It is not your friend. It insults you. It disempowers you. It uses and abuses you. None of us are well-treated by culture. [...] It fetishizes objects. It creates consumer mania. It preaches endless forms of false happiness, endless forms of false understanding in the form of squirrely religions and silly cults. It invites people to diminish themselves and dehumanize themselves by behaving like machines.

McKenna's contentious notions aside, there are volumes of studies on the possible roles played by culturally transmitted conformity, in evolutionary biology as well as social psychology. If a member of your migrating band eats a strange plant along the trail, then keels over dead, perhaps negative reinforcement avoidance is a good starting point for your would-be cultural heritage.

It is well accepted that the astonishing advances of human knowledge owe many tributes to the sometimes dangerous exploration of the unknown. Simultaneously, there exists ample anecdote of cultural knowledge that is simply disregarded due to prejudice or ignorance. How much have non-Western cultures, historical and concurrent, already known about the mind, the self, and the possible trans-selves? Modern man is arguably prone to conceit and ethnocentrism, especially when addressing anything that appears to belong to the realm of material science.

William James (1842-1910), one of the architects of Transpersonal Psychology (TP), made his mark at Harvard, helping to establish the psychology department in the late 19th century. James is a colorful character in the history of psychology. First a student of painting, he later enrolled at Harvard to study chemistry and anatomy. The discipline of psychology was not discrete, but his interest in behavior lead him to study the mind and the nascent emergent field. "*This is no science; it is only the hope of science,*" he wrote in his 1892 survey, *Psychology: Briefer Course*.

To the psychedelic researcher, his 1901 book, *The Varieties of Religious Experience: A Study in Human Nature*, provides much-cited prose for the abstract handling of human consciousness.

Our normal waking consciousness... is but one special type of consciousness, whilst all about it, parted from it by the filmiest of screens, there lie potential forms of consciousness entirely different... No account of the universe in its totality can be final which leaves these other forms of consciousness quite disregarded (James, 1961).

James' sentience about the possible fractal nature of mind was not the result of a lucid waking divinity. James had learned from the chemist and inventor Humphry Davy to use nitrous oxide (NO₂) to produce unexpected visions and insight into his consciousness⁶. Based in part on his experiences huffing NO₂, James developed a four-point guide for defining mystical encounters

⁶Commonly used by dentists, NO₂, or "laughing gas", slows down brain/body response. It can cause feelings of euphoria, relaxation and calmness, fits of giggles, and laughter.

(Popova, 2018):

Ineffability: Inexplicable, defying expression and language. Requires direct experience

Noetic quality: True and deep insight, revelation, full of significance. *“People feel they have been let in on a deep secret of the universe, and they cannot be shaken from that conviction.”*

Transiency: Fleeting in duration; difficult to recall in detail, but recognizable in subsequent revelation

Passivity: The mystical state may be established voluntarily, but once it begins, the mystic is held beyond volition

Neuroscience has come a long way since the James 1901 publication, but his mystical roadmap still makes handy short-shrift for wayfinding in even the most rigorous psychedelic research today.

Michael Pollan’s recent book, *How To Change Your Mind: What the New Science of Psychedelics Teaches Us About Consciousness, Dying, Addiction, Depression, and Transcendence*, references James’ contributions often. From the contemporary research scene, Pollan speaks to the head of psychedelic research at Imperial College, Robin Carhart-Harris, who likens the taking of psychedelics to “shaking a snow-globe” to free the brain from traveling in the ruts of aged conditioning.

Carhart-Harris explains that current models for understanding cognition support a feature of the brain called the default mode network. The *Default Mode Network* (DMN) appears to be involved in this rut-like behavior—when anxious, insecure, or self-absorbed, the brain shows less potential activity, traveling well-established and potentially fruitless connections. A study using psilocybin on subjects with *Functional Magnetic Resonance Imaging* (fMRI) imaging published in 2014 concluded, *“the effect of psilocybin is to relax the constraints on brain function, ascribing cognition a more flexible quality.”* The imaging discovered [see figure 2.11] that the DMN shuts down almost entirely.

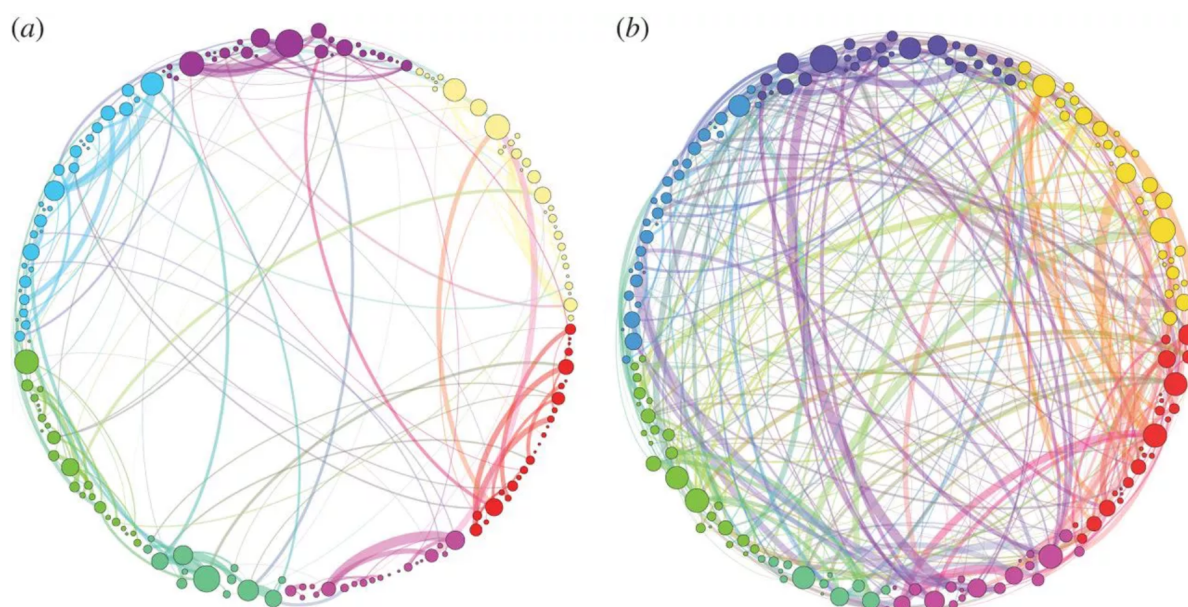


Figure 2.11: Brain activity measured by fMRI: (a) subject using placebo, (b) subject using psilocybin

2.3.2 BEST PRACTICES

Today, a young man on acid realized that all matter is merely energy condensed to a slow vibration—that we are all one consciousness experiencing itself subjectively, there’s no such thing as death, life is only a dream, and we’re the imagination of ourselves.

Here’s Tom with the weather.

Fantasy news report by comedian Bill Hicks

The 1970 Controlled Substances Act became federal law, making illegal the possession and consumption of the classic psychedelics psilocybin, LSD, mescaline, peyote, and DMT, shutting down some 60 active research programs across North America, and marking the end of the Psychedelic First Wave. At the time of the law’s passing, 27 years had passed since Hofmann’s fateful bicycle ride, an era in which thousands of scientifically valid reports accounting for tens of thousands of human subjects had published promising therapeutic uses. Psychiatric researchers had positively demonstrated incomparable benefits for certain mental illness and addiction disorders.

Despite these undeniable successes, social tolerance for these medicines was nullified. In the public mind, psychedelics became associated with “narcotics”, dangerous, toxic drugs, a fact made more ironic when realizing that the classic narcotics, opiates and opioids⁷ are classified with less restriction under Schedule II. The public was led to believe fallacious mythologies, like LSD could cause permanent genetic damage, make its victims “burn their eyes out looking at the sun”, or inspire lustful homicide (Roberts, 2014).

Schedule I [see figure 2.12] maintains that these class of drugs have “no *current legal* medical use, high potential for addiction, and high risk of abuse” [emphasized to call attention to the clever tautology]. Meanwhile, acetaminophen (Tylenol), an unscheduled over-the-counter drug, is the leading cause for calls to Poison Control Centers, at over 100,000 per year (Lee, 2004). One might argue that being more accessible makes for a higher incidence of accidental overdose. While this can be true, the most vital feature which distinguishes the difference between any of the classic psychedelics and most pharmaceutical drugs, is the *therapeutic index*, which, simplified, is the ratio of the lethal dose to the effective dose—small numbers mean the drug is highly toxic. The psychedelics don’t have a measurable lethal dose, and the effective dose is extremely small; infinity divided by a small number is infinity. Tylenol’s lethal dose is 10,000mg, while the maximum daily dose is 4,000mg, making Tylenol’s therapeutic index as low as 2.5 (Bloom, 2017). If someone took 3 times the daily recommended threshold, that person could end up in the hospital or dead.

Another argument could be made that psychedelics “impair judgment”, and that a high person might do crazy things, crash their cars into other people, or become violent. Again, examine the Schedule I chart, locate the profile for alcohol, then compare it again to Schedule I drugs. The CDC estimates that 29 people die every day in the United States Alone due to motor vehicle accidents that involve an alcohol-impaired driver (Traffic Safety Facts, 2012), and according to the National Council on Alcoholism and Drug Dependence, the Bureau of Justice Statistics shows that two-thirds of victims of spousal violence report that the perpetrator had been drinking (Greenfeld, 1998).

⁷morphine, heroin, codeine, and the infamously abusive drugs oxycodone and fentanyl

For the final refutation, against the possibility of addiction, there are no experimental studies finding classic psychedelics as physically or psychologically addictive. Meanwhile, it's easy and unsurprising to find experiments demonstrating laboratory rats preferring cocaine over food, but more devastating are the experiments concluding that refined sugars surpass the cocaine reward (Lenoir et al., 2007). The FDA does not classify sugar as a controlled substance, yet diabetes is on the rise, and heart disease, which is heavily influenced by the glycemic index (Brand-Miller et al., 2002), is the United States' number one killer.

Without a doubt, science and the associations of government with scientists, have a responsibility for providing guidelines for drug research and the ultimate distribution to the public for medical use. In the early 60s the FDA reacted quickly to prevent an experimental nausea drug for pregnant mothers, thalidomide, from reaching patients in the United States. Sadly, some 10,000 children in over 46 countries where the drug was allowed were born with birth defects, many of which were lethal (Lupkin, 2012).

However, the pendulum swings both ways, and the reader is not alone in noticing that something might have gone astray in the categorical legislation of certain drugs by the United States federal government. Not only are many of the Schedule I drugs clearly erroneously persecuted (opinion of the author and countless others), but the punitive damage wrought on the market place (users and distributors alike) is nothing short of tragic. The United States is known as the nation with the highest per capita prison population⁸, and according to federal reports, in 2016 around 15 percent of the incarcerated population had as their most serious offense a drug related charge (Drugwarfacts.org, 2016). The data do not reflect what portion of those crimes are psychedelic drug users, but the criminal justice system is broken when it comes to minor possession of 'elicit' substances, causing a revolving door of injustice.

... QUIET AT THE FRONT

While the Second Wave remained a quiet underground movement in response to the sudden prohibition of the necessary research materials, much good work continued from the 70s until today. In the late 80s, Dr. Rick Doblin conducted his undergrad psychology studies on a 25-year

⁸exclusions allowed for excessive authoritarian states that do not truthfully compile and disclose such data

Classification	Description	Drug Examples
Schedule 1	No current legal medical use High potential for physical and/or psychological dependence High risk for addiction/abuse	<ul style="list-style-type: none"> • Heroin • GHB • LSD • Marijuana • MDMA/Ecstasy • Mescaline • Methaqualone • Peyote • Psilocybin
Schedule II	Restrictive legal medical use High potential for physical and/or psychological dependence High risk for addiction/abuse	<ul style="list-style-type: none"> • Adderall • Cocaine • Codeine • Crystal Meth • Demerol • Morphine • Opium • OxyContin • PCP • Percocet
Schedule III	Accepted legal medical use Low/Moderate potential for physical dependence Moderate/High potential for psychological dependence Moderate risk for addiction/abuse	<ul style="list-style-type: none"> • Anabolic Steroids • Ketamine • Lorcet • Aspirin (w/codeine) • Testosterone • Vicodin
Schedule IV	Accepted legal medical use Low potential for physical and/or psychological dependence Low risk for addiction/abuse	<ul style="list-style-type: none"> • Ambien • Atvian • Equanil • Rohypnol • Talwin • Xanax • Valium
Schedule V	Accepted legal medical use Limited potential for physical and/or psychological dependence Low risk for addiction/abuse	<ul style="list-style-type: none"> • Codeine-based cough medicines (Robitussin) • Cannabidiol (CBD) - 2018 Update
Schedule VI (Unscheduled)	Over-the-counter availability Legal without a prescription	<ul style="list-style-type: none"> • Alcohol • Aspirin • Caffeine • Nitrous Oxide • Nyquil • Tobacco

Figure 2.12: Drug Schedule Chart defined by the U.S. Controlled Substances Act

follow up of the famed Good Friday Experiment of Timothy Leary's Harvard project. Even before receiving his psychology degree, he founded The Multidisciplinary Association for Psychedelic Studies (MAPS), a membership-based 501(c)(3) non-profit focused on raising awareness for psychedelics. One of MAPS primary missions is to work closely with government regulatory agencies worldwide to help scientists design, fund, and obtain approval for psychedelic studies.

With all the fuss on the legality and potential medical uses of psychedelics⁹, it can be easy to miss the bigger story. Ecstatic Altered States of Consciousness are technologies for expanding the mind. The beneficial use of psychedelics is not restricted to the sick or ailing. Healthy users confirm enhanced creative performance and breakthrough insight unlocked by psychedelic ecstasy. Much in the way vitamin supplements, special dietary formulations, and brain nootropics¹⁰ may be used by anyone seeking an edge, the ecstatic arts are a demonstrative tool for augmenting the cognitive and the emotional capabilities of all persons.

Stanislov Grof, a proponent of "healthy normals" embarking on the occasional transpersonal

⁹meditation is also an ecstatic art, lest we forget

¹⁰a popular wonder drug called *caffeine* is said to help with alertness

voyage, is a First Wave Czech psychiatrist with over 60 years of experience in non-ordinary states of consciousness, and one of the founders of TP. Stan and his wife Christina (1941-2014) were resident scholars at Esalen Institute, Big Sur, where they developed an experiential psychotherapy called *Holotropic Breathwork*¹¹. Rick Doblin was one of the first to study at Esalen under the Grof's and received a certification as a Holotropic breather.

Eighty-eight years old, Grof currently works with California Institute of Integral Studies (CIIS) in the Department of Philosophy, Cosmology, and Consciousness. In his book, *LSD Psychotherapy*, he describes psychedelics as “nonspecific amplifiers,” meaning, the effects are not limited to a set pharmacological range, but instead augment the intention at hand. This is reminiscent of Wasson and Ott's rebranding effort, when they suggested that even the terminology applied should depend on use—a psychoactive drug can be just a hallucinogen, or it can be an entheogen, depending on the discipline and intention of the practitioner. In this way, psychedelics approach analogy to what researchers call an “active placebo”, as Andrew Weil suggested in his book, *The Natural Mind* (Weil, 1972).

Multi-purpose adaptability was a most intriguing feature to the early First Wavers. What may look like, from afar, merely a scattered attempt by the early researchers to find some utility for the newly discovered chemical compounds¹², may have been an accurate exploration of fruitful application.

If entheogens were truly nonspecific multipliers, a Swiss Army knife for cognitive exploration, then some controls must be devised to fly the spaceship. One of the earliest explorers of LSD's many splendors, Al “Captain” Hubbard, was bequeathed the moniker “Johnny Appleseed of LSD” for reputedly introducing more than 6000 people to the drug. Hubbard was an enigmatic man with possibly the broadest network connections, from a purported friendship with Richard Nixon and professional ties to Timothy Leary, and possibly all the mid-century researchers. Early on, Hubbard noticed the ambivalent nature of psychedelic ecstasy and made a direct study of how the intentions of the users, as well as the environment where sessions were to be conducted,

¹¹Like many First Wave researchers, when the federal laws embargoed their work with drugs, Grof turned toward meditation and yogic technology.

¹²Developed in 1879, Listerine was sold as a surgical antiseptic, a floor cleaner and a cure for gonorrhea for 16 years before finally being marketed as a mouthwash—marketers ‘invented’ bad breath in 1920.

helped to direct the course of the conscious journey.

It was Timothy Leary who formalized the features in the pattern, coining it *Set and Setting*. He writes in his 1964 book, *The Psychedelic Experience: A Manual Based on the Tibetan Book of the Dead*,

Of course, the drug dose does not produce the transcendent experience. It merely acts as a chemical key—it opens the mind, frees the nervous system of its ordinary patterns and structures. The nature of the experience depends almost entirely on set and setting. *Set* denotes the preparation of the individual, including his personality structure and his mood at the time. *Setting* is physical—the weather, the room’s atmosphere; social—feelings of persons present towards one another; and cultural—prevailing views as to what is real. . . (Leary et al., 1964)

Considering how the environment might affect the outcome of a ‘drug’, is not something that pharmaceutical medical science is often prone to do. If a patient complains to a doctor about stiff joints, she may receive a prescription to a daily maintenance drug, as per the doctor’s best advice. The drug’s efficacy is not expected to change based on the Set or Setting during its administration. She may take it on a relaxing beach in Tahiti, or in a three-hour line at the DMV with crying children. The former option is probably the preferred Setting for a threshold dose of LSD. . .

In the mid-50s, Hubbard “became a doctor” by purchasing a degree in biophysiology from a Tennessee diploma-mill (Russwurm, 2010), and then proceeded to help found and advise several research institutions across North America. He made a key connection to the intelligentsia of the Silicon Valley, where the potential for LSD to play a role in shaping the technology of the next century met a new advocate, Myron Stolaroff. Stolaroff, an enthusiastic administrator at Ampex, one of the first tech companies in the Bay Area, learned of the work being done at Hollywood Hospital in Vancouver, under the guidance of “Dr. Hubbard.” He sought out and received a personal LSD trip with Hubbard.

With Hubbard’s guidance, and his LSD, of which he is known to have secured great quantities, Stolaroff established the International Foundation for Advanced Study (IFAS) in 1961 with the intent to explore the potential of LSD to enhance human personality and creativity. The

foundation would proceed to administer LSD to artists, engineers, architects and scientists who were stymied by some process in their current work (Pollan, 2019). Here is where Hubbard's (and Leary's) key idea about Set and Setting would be vetted in the most challenging applications. An IFAS researcher states, "*[we used] every manipulation of set and setting in the book. . . [telling subjects] they would be fascinated by their intellectual capacities and would solve problems as never before*".

LSD became a super tool, helping engineers visualize complex spatial problems like circuit design, in a time before such computer-aided technology existed. A late-comer to the foundation decided that "everybody in the community [Bay Area tech crowd] was taking LSD" (Pollan, 2019). IFAS disbanded in 1966 when the first federal prohibitions against LSD were implemented, prior to the 1970 control act.

It is this feature of mind-manifesting ecstasy that finds the most active potential for electronic mediation in a well-designed Ecstatic Cross Reality. Reality virtualization tools are well-suited to create profound, responsive, immersive settings. Perhaps EXR will find welcome collaboration in the Third Wave.

2.3.3 THIRD WAVE

“It’s a poor sort of memory that only works backwards,” the Queen remarked.

Through the Looking Glass

Dear Mr. Steve Jobs,

Hello from Albert Hofmann. I understand from media accounts that you feel LSD helped you creatively in your development of Apple computers and your personal spiritual quest. I’m interested in learning more about how LSD was useful to you. I’m writing now, shortly after my 101st birthday, to request that you support Swiss psychiatrist Dr. Peter Gasser’s proposed study of LSD-assisted psychotherapy in subjects with anxiety associated with life-threatening illness. This will become the first LSD-assisted psychotherapy study in over 35 years. I hope you will help in the transformation of my problem child into a wonder child.

Sincerely,

A. Hofmann

When New York Times reporter John Markoff interviewed Steve Jobs for his 2005 book, *What the Doormouse Said: How the Sixties Counterculture Shaped the Personal Computer*, he likely already knew that Jobs had publicly admitted to using LSD. Even so, it might have been unexpected, to the rest of the world, if not to Markoff, when Jobs said, *“Doing LSD was one of the two or three most important things I have done in my life (Markoff, 2005).”* Perhaps that story caught Rick Doblin’s attention over at MAPS, for in 2007 he requested of Albert Hofmann to solicit the Apple founder to donate for a LSD research project in proposal by Swiss psychiatrist Peter Gasser.

It appears that Hofmann’s fundraising effort paid no dividends from Mr. Jobs¹³, but with funds from MAPS and the Swiss Medical Society for Psycholytic Therapy, and with the permission of both the Swiss Federal Office for Public Health and the USFDA, Gasser conducted a two month trial of LSD assisted psychotherapy for anxiety associated with life-threatening disease. Gasser published his findings in 2014 in the *Journal of Psychology*, concluding a significant reduction in

¹³... much like Apple stock for around 20 years...

anxiety [STAI, State-Trait Anxiety Inventory] with no adverse events. A 12-month follow-up concluded the STAI reductions had been sustained (Gasser et al., 2015).

Glasser's trial, a small study with only 12 subjects, was the first controlled study of LSD-assisted psychotherapy in more than 40 years.

Other cracks in the prohibition of psychedelic drug therapy had been appearing throughout the 90s, making the point of demarcation between Second and Third Wave movements difficult to pinpoint. Of those transitional cases, the most well-known was conducted by Dr. Rick Strassman at the University of New Mexico in 1995, in a study using DMT.

He recruited a medicinal chemist, Dr. Dave Nichols, to consult for the chemistry, who ultimately had to synthesize the treatment drug, unsurprisingly, for lack of existing suppliers. He also involved a well-respected American psychiatrist from UCLA, Daniel Freeman, who had conducted psychedelic research of his own during the First Wave. Freeman provided perhaps the most critical advice for Strassman's experimental design, cautioning him to stay away from any hint of psychotherapy. "Do simple basic measurements," he told him, meaning, just capture measurable physiological responses, "you won't get into any trouble doing that (Ginkgo Biloba, 2016)."

It took Strassman two years to clear regulatory hurdles and receive permission to proceed with the trials. He recruited 60 experienced psychedelic volunteers administering intravenous DMT in four closely spaced threshold doses, in what he called a "tolerance study," testing for subjects' tolerance to repetitive exposures. As per the study design, Strassman kept the official report strictly aligned to physiological results, pulse, blood-pressure, durations—nothing provocative; nothing about recipients' minds. Meanwhile, the subjects had terrifying, thrilling, ecstatic voyages, "blasted out of my body," "shattering into the cosmos." Nearly all felt that the sessions were among the most profound experiences of their lives (Strassman, 1995, 2000). The clinical team took down detailed transcripts from subjects' accounts of their journeys, which became the material for the 2000 publication of *DMT: The Spirit Molecule*. "*This book is essential reading for anyone with an interest in the mind, philosophy, the nature of reality, and spirituality.*—Karl Jansen, M.D., Ph.D."

Strassman's DMT experiment was a significant flagpole in the bleak research landscape. Other contemporary studies were coming from independent researchers, but perhaps because the size and duration (five years) of the project, "Human psychopharmacology of N,N-dimethyltryptamine" seemed to coincide with an uptick of academic acceptance for the embattled psychedelic fields.

Today the landscape is quite optimistic. In April 2019, The Imperial College of London launched the world's first Centre for Psychedelic Research. Just months later that same year, Johns Hopkins University School of Medicine announced the opening of The Center for Psychedelic and Consciousness Research. In a statement issued by Roland Griffiths, the Hopkins center director and a professor of behavioral biology, "*The center's establishment reflects a new era of research in therapeutics and the mind through studying this unique and remarkable class of pharmacological compounds.*"

Looking at the Hopkins Center's website, they list 66 academic publications dating back to 2006, demonstrating a lineage in research that predates the official masthead. The preeminent study anchoring the list stands out on the timeline to one aware of the history. Michael Pollan makes special note of this study in his thorough and excellent review, *How To Change Your Mind: What the new science of psychedelics teaches us about consciousness, dying, addiction, depression, and transcendence*. The title of the Hopkins research publication, *Psilocybin can occasion mystical-type experiences having substantial and sustained personal meaning and spiritual significance (Griffiths et al., 2006)*.

Pollan makes clear the significance of the study for a combination of factors. First, the principal investigator, Roland Griffiths, was (still is) a hugely respected scientist in psychiatry and neuroscience. His authorship gave the study immense credibility with his reputation for scientific rigor. Second, the work was conducted at Johns Hopkins, a top tier research institution (R1) with high visibility. And thirdly, the research intentionally dove into the most provocative characteristic (for scientists) of ecstatic psychedelia—spirituality. "*The fact that psychedelic research was being done at Hopkins—considered the premier medical center in the country—made it easier to get it approved here. It was an amazing study, with such an elegant design. And it opened up the field (Pollan, 2019).*"

In a 2014 study, researchers at the University of Wisconsin, Madison, pressed on, looking into the effects of increasingly higher doses of psilocybin over three sessions (Brown et al., 2017). The final dose at 0.6 mg/kg (pharmaceutical grade concentrate) is roughly double Terence McKenna's heroic 5 grams of dried Psilocybe¹⁴. For a detailed account of a heroic mushroom trip, read Steve E.'s journal of his heroic mushroom trip at University of Wisconsin, posted at Psymposia.com, an online journal of stories and blogs about psychedelia¹⁵.

For a useful overview of the psychedelic-assisted psychotherapy ecosystem, we look to the Nielson Lab at the University of Minnesota. The lab conducts multidisciplinary research in the fields of neurobiology, psychiatry, and informatics to treat trauma. Dr. Jessica Nielson's team researches neurological mechanisms of altered states of consciousness and their role in promoting neuroplasticity and wellness in healthy subjects (Nielson Lab, University of Minnesota). The network graph [see figure 2.13] is a model of overlapping symptoms of trauma, and various psychedelic therapies that have published research suggesting a therapeutic benefit.

Tolerance of psychedelics for treatment and personal development is leading to changes in both law enforcement and drug policy. In recent years, the *California Institute of Integral Studies* (CIIS) has offered a certificate program in Psychedelic-Assisted Therapies and Research. CIIS provides public education about psychedelic research and the use of psychedelics in psychotherapy, as well as teaching on topics such as creativity enhancement, consciousness studies, comparative mysticism, well-being enrichment, and harm reduction (Center for Psychedelic Therapies and Research, nd).

With the moral objection to psychoactive chemical technologies thawing and renewed interest in transcendental activities like meditation and yoga, society is opening up to new ideas for achieving personal ecstasy. The opportunities for combinatory applications, in conjunction with the advancing technologies of immersive computer interface, makes a ripe environment for exploring EXR.

¹⁴McKenna advocated shutting oneself in a dark silent room, lying on the floor, and eating five grams of dried Psilocybe, known as a 'heroic dose'

¹⁵"I received the largest dose of psilocybin ever administered in a published FDA study."
<https://www.psymposia.com/magazine/largest-dose-psilocybin-fda-study-3/>

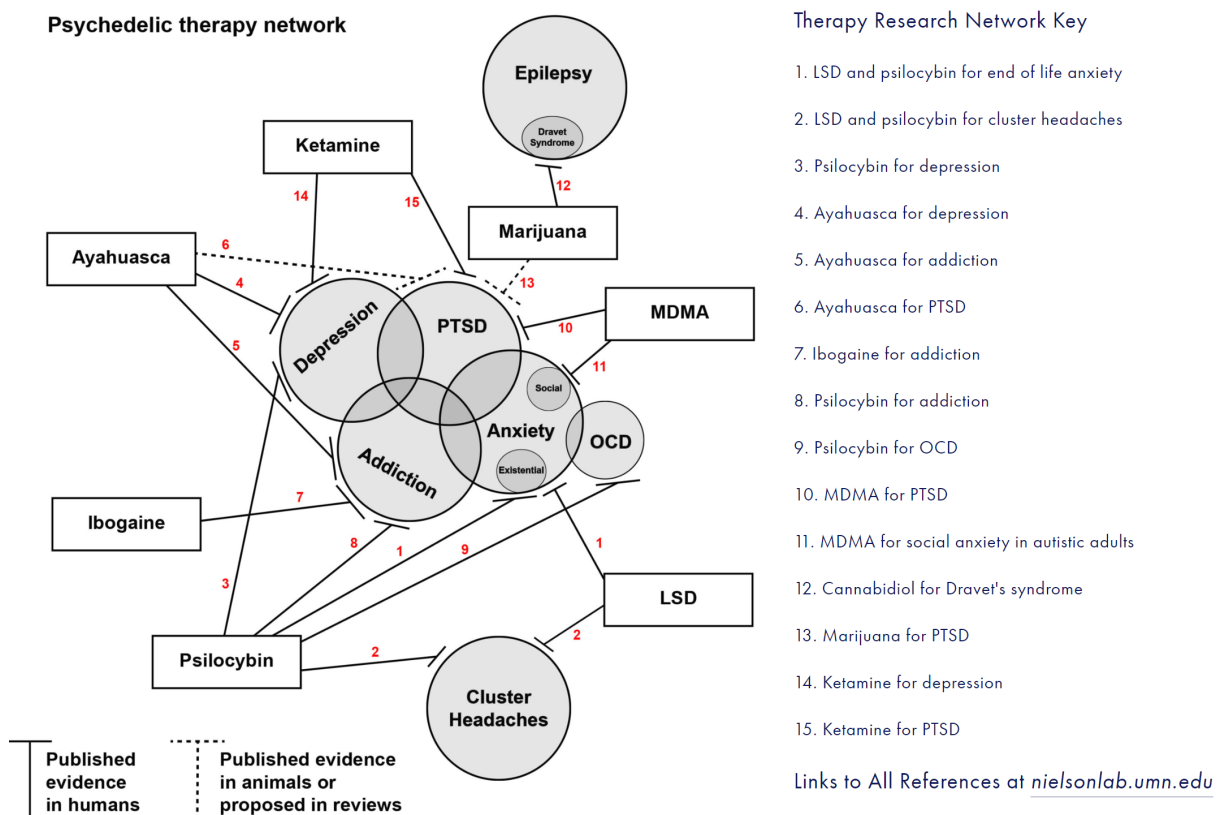


Figure 2.13: Psychedelic Therapy Network diagram, Nielson Lab, University of Minnesota

CHAPTER 3: CROSSING REALITIES



“The Demon Seated”

You are the universe experiencing itself.

Alan Watts

It may be deduced that it is the interplay of Self-in-World, and the matter in which that relationship is observed via each observer’s unique perspective, that leads to transcendent experiences. If this is so, is it also possible to direct the development of strictly external sensations to elicit similar outcomes? This paper explores the use of *Cross Reality* (XR) to craft uniquely adapted ecstatic experiences.

Current technologies of virtualization—sensory simulation of a believable world—exist along a continuum of *Mixed Reality* (MR). On one end of the scale, *Virtual Reality* (VR) completely replaces the ‘normal world’ with mediated simulation. At the other pole, *Augmented Reality* (AR) makes targeted changes to the environment, frequently adding features like textual data, signs or characters, integrating with the user’s world as a composite.

Cross Reality (XR) as a technique makes use of the Mixed Reality (MR) spectrum and then further interacts within the composite with adaptive data processing, to include any accessible

global data and real-time characteristics of the user, establishing a relationship between the three parts of *user*, *world*, and *constructs*. Unlike Augmented Reality (AR), Cross Reality (XR) employs a degree of *Artificial Intelligence* (AI), or, as the author prefers, *Synthetic Intelligence* (SI). Objects in XR have adaptive routines—situational awareness. For example, an AR cat can sit on the floor, the dinner table, or in the center of your plate—it is ambivalent to its lack of decorum. If the cat were a denizen of the XR universe, it might instead hack into your *Internet of Things* (IoT) doorbell to get you up from the dinner table so it can ‘eat’ your sushi while you are distracted. Refer to figure 3.2 for clarity.

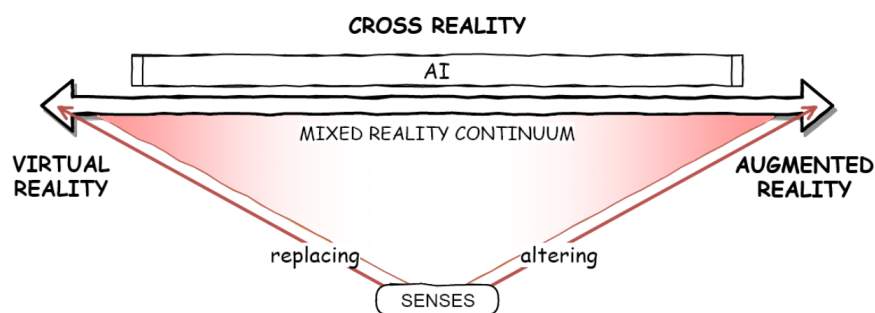


Figure 3.2: Conceptual model for mediated reality classes

The example seems perhaps glib but is never-the-less appropriate. Harnessing the potentially limitless data of the internet, distributed or *edge computing*, and immersive human interface, XR enables the technological animation of the environment as character. The state of technology today stands at the threshold of a new paradigm in shaping reality.

3.1 GATHERING THE SENSES

Bounding through the world at a jog, your bones register a rhythmic impact of earth against your form, while a concert of finely detailed muscular contractions press you forward with adaptive precision. Your heading brings updates, at 1000 times per second, the coherent light of the sun, pressed into the infinite reflections from every material surface existing beyond above and below, into a warm omni-directional ambient radiance. Shadow battles with light, striking relief in the crevice of every boulder, tree, and blade of grass. Your picture of the world—scanning 180 degrees—concatenated bits of data from the buzz of 3 million excited nerve fibers crammed into an area smaller than your spear tip. Two billion sparks per second, your visual cortex shapes the chaotic noise from the world into a visual map.

A vibration comes through the air, tunneling through first your right ear, then, with detectable distinction in time and tonality, your left. You deftly halt forward progress, crouching low in tall grasses, hand reflexively shifting to a throwing grip on the javelin. The acoustical pattern is familiar, and the details of the report tells you that a group of game fowl is stirring, probably just out of sight over the ridge to the right of your current heading. Are they as aware of your presence as you are of theirs? Is their stirring a reaction to your disturbance, or some other third-body causality?

A breeze lifts tiny hairs on your arms, signaling a delicate shift in the non-corporeal medium of invisible fluid air, moving across this plane where your existence is registered. Like the acoustical signal, the passage of this movement also implies directionality, and without much conscious effort, you decipher another clue to visualize the world. The warm slanting rays of the Sun have dimmed perceptibly as you take in the scene. When red shifting sunlight brings a sudden breeze, you know that night is mounting to draw a curtain across the sky, diminishing your effectiveness, and drive you to seek shelter.

But here and now, at this moment, your awareness reveals that you are downwind of the squawking animals, who, like so many other creatures, are entering an excited phase. This is the time of day when these wild turkeys will line up, and march with the Sun at their backs, in formation, rounding up insects from the waving grasses for a delicious snack. In moments, they will appear to you atop the hill.

3.2 CODING

*Information is just bits of data. Knowledge is putting them together.
Wisdom is transcending them.*

Ram Dass

Excluding periods of unconsciousness or trauma, most people have the perception of a continuous reality storyline with minimal inconsistencies. Moments of cognitive inconsistency, to include the popular concept of “cognitive dissonance,” do not make a person’s perception of reality any less valid.

Similarly, a tolerant society makes room for a multiplicity of opinions to coexist simultaneously in a socially well-adjusted population. Is South Chicago a “nice” place, or a “violent hell-hole?” We have learned to make room for incompatible possibilities to co-exist as opinions distributed among individuals. With that granted, we do hold that individual judgments on reality do not

vacillate whimsically or erratically in a short span of time without clear reason. For those people who do struggle maintaining a consistent handle on “what is real,” many will consider their difficulty a strong sign of mental illness or psychosis.

Time and saliency order experiences in a complex web of influence and priority. Like a comet, details of the past fade to transparency, the further down the tail one traces from the present. Past experiences are more than just records of deeds and actions gone by; they are also filters to the present—furnishing a symbolic representation of what is ‘self,’ what is ‘real,’ and tempering our expectation for outcomes in a ‘future.’ These filters are in part genetic and physiological, but they are also influenced by our experiences and our understanding of the world. There is a vast array of sensory data in the world. Sights, sounds, vibrations. Our sensory systems are limited and we are not able to fully process the world around us. To compensate, our cognitive system fills in missing details and organizes all the disparate sensory streams into a unified perception of the world. Often our view of the future is biased by conscious and unconscious factors at play.

What is it that is recorded into memory? What is a piece of memory or data, and how does it recall itself? Thanks to the recent efforts in neuroscience from researchers like Nobel Laureate John O’Keefe, one part of the answer is *pattern completion* initiated in the hippocampus. To enable efficient processing of raw sensory data, organisms chunk data into collections of symbols—a process of *encoding*—to optimize decision response time. Humans, arguably the most advanced thinking organisms (we seem to think so), exploit this optimization to an extreme, encoding countless details of not only their physical environments, but also elaborate abstract constructs, including long term goals, and complex social relationships.

Parsing symbols into collections as a means of interpreting the world is a process of macro visualization. Focusing instead at the smallest instance of reality, what is the least divisible component of perception? In his book, *Mind and the World Order* (1929), the philosopher Clarence Irving Lewis was the first to use the term *qualia* as the fundamental unit of conscious experience. Deriving from Latin *quālis*, meaning “of what sort” or “of what kind.” The “blueness” of a blue sky, is an instance of qualia.

Bias projection, or *bias confirmation*, is a vital component in delivering the conscious being’s

perseverant need for consistency. And yet the experiences of *Altered State of Consciousness* (ASC) are anything but consistent. Accounts of ecstatic mind from users of DMT report an immediate departure from all expectation, into complete immersion in an ineffable universe.

There is room here for endless recursion and philosophical cul-de-sac. The mission of EXR is to play a role in transpersonal ecstasy by crafting features of an intelligently mediated phenomenological world. How we perceive and code the environment is far from perfect; however this also provides an opportunity for using technology to augment our understanding of reality in real-time. To build ecstatic experiences influenced by autonomous agents more knowing and rational than our own minds. To provide both logical and emotional understanding of circumstances.

CHAPTER 4: BUILDING ECSTASY



PSYCHONAUT

The mind is its own place, and in itself can make a heaven of hell, a hell of heaven...

John Milton, *Paradise Lost*

The world perceived is a complex interaction of raw sensory stimuli and state of mind, referenced to personal experience through a time-based persistence. The resulting product is a subjective reality. As described in Best Practices, the features of *Set* and *Setting* are parameters that influence the resulting sense of *what is real*.

Ecstasy is a process of experiencing exhilaration; a journey of heightened emotions, and altered perceptions resulting in a reprieve from ordinary expectations. When considering feasible sources for ecstatic elevation, the catalysts of meditation and psychedelic mediation are, once ‘ingested,’ a function of physiology, and therefore, internalized processes. An ecstatic sojourner does not need sensation from eyes to ‘see.’ Fully sighted persons can block all light from entering visual systems, thereby join blind persons in having wondrous visions (Sacks, 2012). Altered states perturb the sensations and perceptions of sensory data, even when there is none transduced from

the expected channels to the outside world. However, physical senses should not be discounted. What happens if the world sensations are *altered* before they emanate from the ‘real world?’

Within the technology of Cross Reality (XR) lies an opportunity for refined influence on set and setting. Contemporary technologies of virtual world-building place fine-tuned controls of an immersive sensory setting in easy reach, and the adaptive intelligence promised in deep learning emboldens features of the perceived world into conscious character. Conceiving of technique that enables real-time phenomenal hallucinations is not far-fetched. Here we postulate it is possible to use the technology of XR to elicit an ecstatic response—from the outside in.

Ecstatic Cross Reality (EXR) offers hitherto unreachable features of altered state consciousness. Chief among them is the opportunity to be observed by third parties—which is to say, empirical, and to some degree, reproducible. EXR can be simultaneously a door to deep personal discovery, and a research tool into the workings of the conscious mind.

4.1 ECSTATIC SIMULATION

Since time immemorial, humans have been using representational imagery to explain personal experiences, to record events, and to communicate ideas. Although art for art’s sake is not to be diminished, the power of symbols as a tool for elevating understanding and advancing abstract thinking is undeniable.

Archaeological discoveries reveal that prehistoric peoples have sought to represent the occurrences of ecstatic altered states. As the collective skill in artistic representation and the technological refinement in the variety of media tools advanced throughout the ages, the ability for image rendering steadily increased to a degree of complete realism. By the time of the Renaissance, the mastery of perspective technique with the versatility of oil painting, and an exquisite understanding of human physiology, it became second nature to craft evocative single-frame stories in painting, sculpture, and fresco, depicting either real or imagined compositions of great significance.

With the perfection of representational art achieved, the subsequent art movements of impres-

sionism, surrealism, cubism, and the entire range of symbolic deconstruction beginning in the 19th century, were possibly a logic anecdote for the shackles of reality. Salvador Dali created compositions that were at once completely real in form, yet wholly fantastic in set and setting.

Once the technology of art allowed for altering representation in time, with sequential imagery, filmmakers had access to storyline in four dimensions. Now that producing 4-dimensional media is child's play, a global internet pushes HD quality video into every hand that beckons. That on-demand media has a measurable impact on the way reality is rendered moment-to-moment in the industrialized world, is not a hard concept to grasp. Henceforth, we are immersed. Considering humanity's enthusiasm for representational art, and the provocative influence of ecstatic altered state consciousness, it is not surprising that there is a considerable body of *visionary art* to be found. Putting conventional tools of the 20th century to the task, it is inevitable that a majority of ecstatic art follows a one-way, methodical *formulaic* process.

4.1.1 FORMULAIC

Formulaic artforms are processes wherein the resulting forms are established and bound by selected input parameters. While it is not possible for a painting, or a musical score, or television show to program everything about a viewer's experience, it is practical to suggest that the media presents its content at the surface, without input from the audience. The result is unidirectional; no dialog is taking place, even if the audience is eager to comment. Formulaic ecstatic art can be *linear* or *parametric*.

. . . LINEAR

Linear artforms are bound by the direct manipulation of medium in time. The parameters for input are frozen in the result, creating an indelible product. There is one direction forward in the creation of the work, and all manipulations are found in the minds of the creators, regardless of the kind of editing tools the medium uses. For example, painting on a canvas with oil paints allows editing in physical layers, through the process of time. One could philosophize the work is composed of layers of time, as equally as layers of paint. Only one painting exists at any time, and perhaps the artist will proclaim it complete at some arbitrary phase.

Sequential art is a linear art form as well, as long as the parameters for creating it are, again, composed in the minds of the makers, using the tools of the media directly. In this case, lighting, lenses, light-sensitive medium. Even a computer using non-linear editing software for adjusting the sequence of frames. The resulting video is a linear product, with one expressed intention for reading its message.

Ecstatic art in linear mediums such as these are snapshot emulations of conceived altered mind states. Representing the features of altered reality, the tools of linear art are transformations of space, scale, perspective, and time. They can be “trippy” and evocative¹, even reminiscent of an audience’s recollections, but they are not likely to trigger an authentic ecstatic voyages.

In the static frame image genre, artists like Alex Gray, Michael Divine, and Android Jones depict transpersonal ecstatic moments in third person surreal imagery. The impact of moving pictures can be considered in films like *Enter the Void*, a 2-hour film released in 2009 depicting a real-time first-person DMT trip, followed by the remaining screen time experienced as a pseudo-second-person after-life.

Whether these works are an attempt to recreate, symbolize, or broadly make commentary about psychedelic mind states, it is unlikely that any strictly sober, beta-wave conscious viewer will ascend into an expanded consciousness simply by viewing these media.

. . . PARAMETRIC

Whereas linear art forms are created, on the whole, by accumulations of manipulation by the artist, parametric artforms harness the logic of iterative transformation. For practical discussion, this method relies on the input of computer-mediated or computer-controlled parameters, and as such, harness a conscious or quasi-conscious sensitivity beyond the purview of the artist alone.

Parameters can be algorithmic, meaning objectively mathematical, programmed into the matrices of the solution. For example, algorithmically-driven art can explore the fractal visual routines embedded in a single formula. Consider the variations on Mandelbrot zoom easily searchable on the internet, which rely on the following math to plot a graph on a time-base index:

¹“In a dreamlike state, with eyes closed, I perceived an uninterrupted stream of fantastic pictures, extraordinary shapes with intense, kaleidoscopic play of colors,” Hoffman, *LSD My Problem Child*

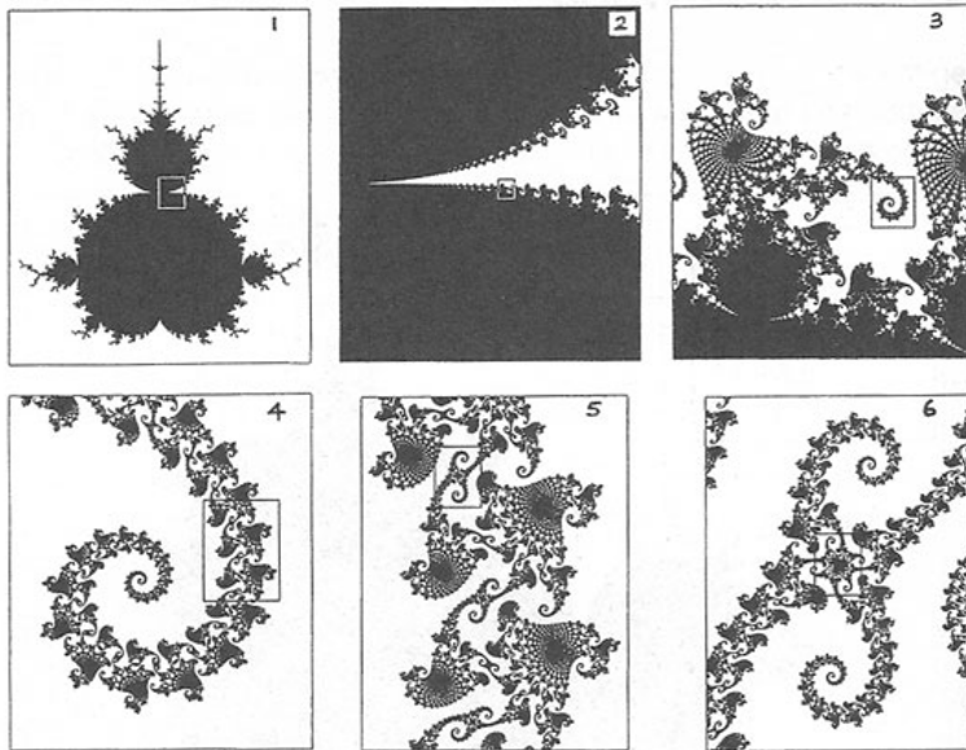


Figure 4.2: Scale zoom on fractal Mandelbrot set. Infinite iterative transformation



(a) Nova age 7, Moscow Idaho

(b) Nova, Google Deep Dreamland

Figure 4.3: Neural network iterative image processing

$$[f[\{a_, b_\}] := \{a*a - b*b + c1, 2*a*b + c2\}]$$

This fractal was first defined and drawn in 1978 by Robert W. Brooks and Peter Matelski, and first visualized by IBM in 1980 (Taylor and Sprott, 2008).

If the series of still frames shown in figure 4.2 fail to impress the reader, try instead a 70 minute colorized 4K dive at 60 frames per second. It may not be ecstasy inducing, but it is nevertheless quite mesmerizing (Maths Town, 2017). The progressive imagery is reminiscent of visualizers, popular in computer music playback applications like Winamp and iTunes, which can display parameter-controlled visualizations using the music source as a constantly variable *seed*. This has the additional effect of allowing a listener to ‘see the music,’ a reasonable variation on the concept of *synesthesia*.

Although fractal math can be impressive, after showing its hand, the mysteries are diminished. The results are restricted by the formula, despite the variation in stylings chosen by the programmers.

Pushing the concept a bit further, visual routines can be augmented by the additional interjections of neural network processing. In this case, the mathematical framework allows for concurrent computational parameterization at the time of frame processing. Google’s Deep Dream is one example. Start with a seed image, add one or more influencing style images, adjust the variety of parameter sliders, and send the package off to Google’s deep neural network to generate a result. No two results will be alike, even if the same package is submitted repeatedly. The iteration parameter determines how many loops to iterate over the final frame, resampling the frame before declaring a result. The more iterations, the more altered the seed image becomes. Using Deep Dream to produce a sequence with a zoom such as used in the Mandelbrot set, will produce a very compelling hallucination, indeed.

Techniques like this invoke a dazzling array of computer science jargon, but the general process is called deep learning, a method of machine learning, and is a foundational feature of Artificial Intelligence (AI), or what some like to call Synthetic Intelligence (SI). In this case, Google’s Deep Dream is programmed to nudge successive images slowly toward biased outcomes, namely,



Figure 4.4: horse to zebra, original frame and manipulated frame, CycleGAN on Github



Figure 4.5: ‘Portraits’ generated by StyleGAN, www.thispersondoesnotexist.com

faces, animals, buildings, and landscapes [see Nova in figure 4.3].

A machine learning system invented by Ian Goodfellow in 2014, known as *Generative Adversarial Network* (GAN), comprises two neural networks contesting with each other in a game. Generative Adversarial Network (GANs) have been trained to produce extremely believable ‘photographs’ of human faces. The open-source project, CycleGAN, initiated by Jun-Yan Zhu of Adobe research, demonstrates an image translation implementation able to use video of a horse in motion, taken from a moving camera, with both foreground, middle ground, and background elements, and track very believable zebra texture mapping onto the horse’s apparent topography. If a friend using an Augmented Reality (AR) simulation claimed that the obvious quarter horse in the pasture in front of you was clearly a zebra, you might wonder if something funny got into her tea [figure 4.4].

Another GAN codebase, StyleGAN, released by Nvidia researchers in December 2018, ties directly to their proprietary video cards with highly-parallel Graphics Processing Unit (GPU) to generate completely synthetic human-like portraits. Technology like this is popularized by the controversy surrounding “Deepfakes”², a process of harvesting image recognition data to spoof video of real people performing actions that the source humans did not do. A website *This Person Does Not Exist* will serve a visiting browser a random 1k closeup portrait of a StyleGAN output [see figure 4.5]. Refresh the window to see a new image from the database.

Pressing GAN toward ‘hallucination,’ is a trick that Turkish artist Refik Anadol makes without apology. Anadol works with StyleGAN and *Progressive Growing of GANs* (PgGAN), developed by Tero Karras, et al. (Karras et al., 2017). Calling the work “machine hallucinations,” Anadol’s team sources millions of landscape and city photos, removes instances of humans, then feeds them to his AI processor to create sequential images of shifting, dissolving, evolving structure. He likens the output to reshuffled memories of a human dream. “. . . *we can roughly see the commonality of consciousness, or commonality of the memory inside the latent space, and I personally fly as . . . a director or director of photography. . . and define points of interest that are narrative and allow me to make much more purposeful decisions and use AI to tell a story* (Johnson, 2019).”

4.1.2 IMMERSIVE

Occasionally a novel will grab one’s attention, “immersing” the reader in a well-crafted narrative world. An immersion of imagination facilitated by reading may be comparable to the *persistence of vision* that actual visual processing relies on to create a view of the world. Cinema and theater are storytelling mediums that can spell the audience’s default realities for a short time, providing an immersive reprieve. Often the term *suspension of disbelief* can be used as a marker for how effective the story is at providing for immersion. However, novels and movies fall under the formulaic heading, as they are uni-directional events, with no objective variation outside of the subjective interpretation of each audience/viewer.

For the sake of this discussion, *immersion* is given a different meaning. Immersive art forms

²Deepfakes is a portmanteau of ‘deep learning’ and ‘fake’.

are defined as those that allow for viewer interaction, or *agency*, providing for a *uniquely personal journey*. Immersion can be graded on a scale from minimal to total. Branching narrative storytelling used in “choose your own adventure” style fictional books are a primitive example of a method to provide agency to the audience to shape the outcome of the story. One might argue that the wordy presentation of options to select from when ‘interacting’ with the story, and the page flipping to resolve the next line of story, make for a clear interruption of whatever immersion might have been achieved in the mental framing of the reader’s mind (the delicate persistence of reality).

Immersive storytelling and art can be many things, but the most prevalent and transfixing contemporary examples are in computer gaming (a.k.a. video games). Games that endeavor to achieve the shortest response time between a virtual world and the player, especially action-driven games, draw the attention of the player to sharp focus, occluding the non-mediated world (‘Reality’) outside the game world.

Conventional video games and VR games offer high fidelity visuals and natural interaction within virtual environments. The gameplay can occur very quickly and involve literally hundreds of thousands of other players in-sync across the internet. However, the narrative branching of offered is still restricted to a limited set of possibilities.

How might XR shift this paradigm?

4.2 EXR

For thousands of years, humans have been augmenting the perceived story of existence via ever more complex technical mediations. Since the beginning of the 20th century, artists have utilized recorded sounds and visual apparitions to create ever more immersive pseudo-realities for entertainment, communication, and learning. Filmmakers often refer to the suspension of disbelief as a key willing involvement between media and the consumer.

Providing interactive input between users and the media enhances the sense of immersion for participants. Interactivity requires the use of a device. Humans, being tool users, and adepts

in symbolic abstraction, easily incorporate language and props as triggers and game pieces. The audience can break the fourth wall with actors or quasi-sentient characters to become full participants in a kind of gameplay. Let us keep in mind that consensual social rules are also devices, and society demonstrate this as people scramble for resources like game pieces [on all sides of the rules] in the cultural game of social living.

Without becoming too esoteric, let us refocus on the topic at hand: XR and the inorganic physical devices that comprise a human-computer interface. At the time of this writing, consumer-grade Virtual Reality devices are widely accessible. The hardware has rapidly improved in terms of image quality and speed, as well as becoming less bulky, more comfortably fit, and more affordable.

Activating XR does not have to mean strapping on an array of devices. For the time being, however, the developers' platform is ready for implementation in this format.

In the previous section, ecstatic art forms were relegated to a formulaic producer/consumer approach. That is to say, the audience does not partake in the visions, she merely receives them and makes of them in their form what she will. EXR makes additional advances in ecstatic narrative in the following ways:

- Rendering the perceiver's perspective adaptively, in real-time
- Providing input control with feedback
- Access to unbounded data

In this way, XR in general, and EXR specifically, may promise to perform as a *nonspecific amplifier*, as Stanislov Grof called psychedelic technologies. For the designer, it is merely a matter of what program to write.

4.2.1 PERSPECTIVE

People are accustomed to their biological sensor arrays as currently situated with respects to their bodies. They are remarkably capable of negotiating a complex shifting built environment, without injury or loss of continuity. A healthy human can find her left big toe in the complete

dark within seconds of waking up. She can walk backward into her apartment pushing the door open with one foot while her arms are encumbered with shifting centers of gravity in multiple groceries bags. During the first visit to her mother’s new house, at 20 paces, she can recognize a 30-year-old photo of her childhood pet attached to the refrigerator with a circular magnet and remove it with two fingers without interrupting a conversation with her insurance agent on the cellphone pinched between her cheek and shoulder.

It takes a powerful mediation to break that kind of hold on ‘reality.’ There is little wonder as to why “trippy visions” and deeply mystical experiences are easily dismissed as nutty aberrations when they are not personal. Our senses of the real world are phenomenological. To convincingly mediate a viewer’s reality, using the complete array of senses will be the most effective.

The ordinary VR headset is remarkably good at this. Just taking the visual headset alone, without any audio or tactical input/output [which is currently very course], the position of the viewer’s body transforms the virtual camera’s view into the virtual world. This delivers a convincing sense to the viewer that she ‘is there.’

4.2.2 CONTROLS

The most provocative and natural input control for the EXR platform is the user’s body. Human beings spend the first [three] years of their existence programming their nervous systems to process sensory data and manipulate their physical housings, navigating complex space, and time.

The visual system dominates human sensory processing. A majority of the cortex is dedicated to handling sensory stimulus input from the eyes. Fortunately for the EXR premise, screen technology has made huge leaps in resolution, fidelity, and has multiple solutions, from lasers, OLED, LCD, bistables ³, and so on.

One dramatic weakness for input/output systems in current technology is in haptics, or tactile, feedback. The human proprioceptive sense is also taken for granted. Notable in the report of

³organic light-emitting diode (OLED), liquid-crystal display (LCD), electronic “ink” popularized by reading tablets

ecstatic experience, is whole-body physiological response. A very compelling EXR simulation would benefit immensely from tapping into that landscape.

In the present era, developments for more sophisticated and wider bandwidth controls are envisioned or under literal development. The leading *Brain Machine Interface* (BMI) peripheral is Elon Musk's Neuralink. The device makes use of cortical implant technology to insert arrays of electrodes 5 μm in width and numbering up to 3,072 electrodes per array (Musk et al., 2019). If such an array were placed on the motor cortex, one could think of movement to control an avatar, an exoskeleton, or even a robotic limb. If the array were placed on the fusiform face area, it could be possible to decipher whom someone was thinking about. The possibilities are limitless.

4.2.3 DATA

As expected, EXR makes use of all the features of a connected world. At the time of this writing, 5G wireless infrastructure is being implemented across the United States. Whether by way of 5G or a future generation of wireless or with a minimally-tethered platform, the compute demands for a responsive and aware sensory simulator will be considerable. Accessing parallel computing in a local network, or the cloud, with historic user profile-based machine learning will be essential. *Edge computing* is a current term that captures the demand cycle transport of I/O for connected devices in the current buzz lingo of disruptive tech.

To create a believable personalized immersion and break into the world of ecstasy, an ecstatic cross reality platform will be aware of the user's biometrics and brainwaves. Eye movements, respiration, and pulse are high-value inputs. *Electroencephalography* (EEG) or similar conceptual devices Brain Machine Interface (BMI) like Neuralink would enable advanced responses and awareness.

4.3 ECSTATIC MEDIATIONS

As with any good design, technical gimmicks and creative aspirations are only as good as the execution. Buster Keaton was able to make people shriek and duck in terror in the primitive,

soundless theaters of the early 20th century. XR technology is in a comparably similar phase of development. For examples of what might be possible in transpersonal XR, consider the work in Virtual Reality (VR) by Sander Bos in which live music from a sitar, flute, and hang drum transform elements in real-time visualization⁴. In the virtual world, a glowing aura-enshrouded sitar player seems to occupy the place where the music emanates from in the real-world room. Landscape elements shift and move, as the viewer's perspective shifts and transforms, creating an apparent movement [still frame shown in figure 4.6].

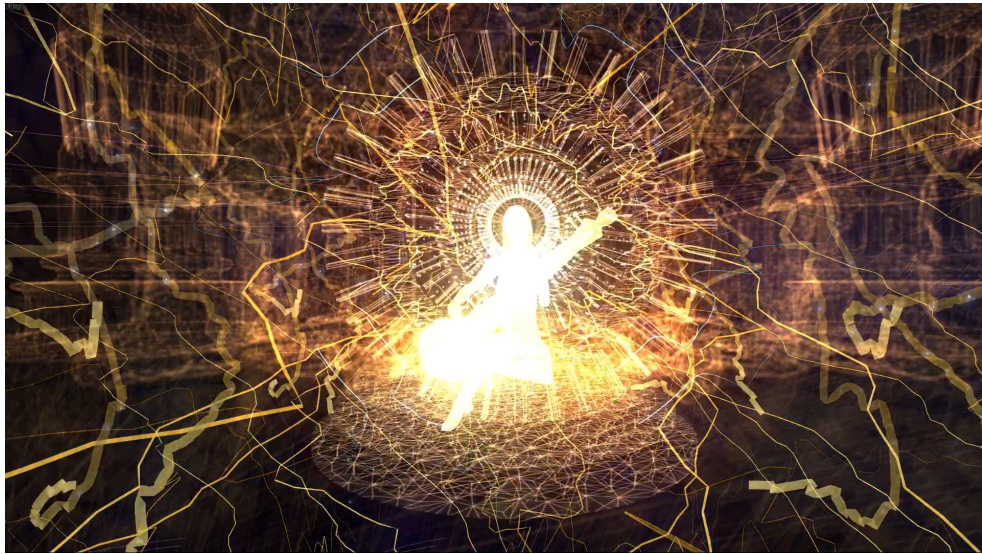


Figure 4.6: Raga Chromesthesia, Sander Bos 2016

To view more examples of cutting-edge interactive artwork with new media, go to www.vrgalacticgallery.com, a VR gallery curated by Zach Krausnick and David Starfire.

4.3.1 STUDY: PSYCHOTHERAPY

In a relatively obscure online podcast titled, *Psychotropic: Stories Involving Psychotropic Drugs*, is the story of Jesse, a young graduate suffering depression and anxiety from a long-time repressed childhood trauma. Without professional help or diagnosis, he experimented with mushrooms and DMT, resolving to self-prescribe combinations of daily meditation, and occasional psilocybin to maintain a positive mood. Jesse judges the therapy successful and further engages a professional psychotherapist who practices *Eye Movement Desensitization and*

⁴Video demonstration recorded in 2016 (Sander Bos, 2017) YouTube

Reprocessing (EMDR) therapy.

Eye Movement Desensitization and Reprocessing (EMDR) is accepted as an effective treatment modality in Cognitive Processing Therapy by the American Psychiatric Association, developed in the 1990s. The distinguishing mechanism of EMDR involves guided sessions wherein the administering therapist works through traumatic events by asking patients to recall distressing images while stimulating them with some form of bilateral sensory input—alternating bilateral sensation, by periodic switching between brain hemispheres, via lateralized sensory processing. Common methods are to request the subject to follow a pendulum focal point with only their eyes, which could be the therapist’s finger, an oscillating light, or the like. The electronics marketplace being what it is, EMDR kits comprised of a wide focusing light bar, headphones, hand-held vibrating pucks, and a controlling mobile application, are easy to buy online.

If this sounds a bit like a technique of 18th-century hypnotism—a medallion putting a subject into a trance—Jesse might agree, as he insists that the process helped him to deal with undesirable thoughts by encouraging disassociation, enabling him to “. . . [access] harder memories that are more difficult. . . kinda like psychedelics. When I take mushrooms, it’s similar.”

An early field test to evaluate the effectiveness of EMDR therapy, sponsored by the VA Medical Hospital and Colorado School of Professional Psychology, was trialed in the immediate aftermath of the 2001 New York 9/11 attacks. The study relied on local EMDR certified therapists providing up to five pro bono sessions to treat a cohort of 65 subjects drawn from populations directly impacted by the World Trade Center disaster.

The study made two conclusions. First, that simply EMDR is a useful treatment intervention in the immediate aftermath of a disaster. Secondly, psychological treatment in mass disasters is often complicated by the suddenly unfavorable ratio of patients to available therapists. The sheer number of clients, the turmoil of movement in the lives of the families of the survivors, and the general downstream mayhem can harry effective scheduling. For example, in the initial screening, 141 individuals contacted the emergency network for candidacy, but over half were eliminated for staffing limitations or were unable to complete all the sessions.

Here is an opportunity for augmenting the aforementioned “EMDR kit” with the features of a customized EXR.

Theorizing about the features of an EXR EMDR platform, the task of delivering bilateral sensory input is inconsequential. Consumer-grade VR platforms of today can easily direct stereo visual and audio with perfect precision. Haptic feedback, although limited, also ships standard with a complete commercial package. As the visual and audio stimulation is highly configurable, with HD quality moving images delivered to the eyes and full frequency response to the ears, the possibilities for a sophisticated customized therapeutic session, are rich. A team of therapists could develop an online program using in-processing profile interviews, and passive progress monitoring from session data, without necessitating regular clinic visits or house calls. Patients and therapists can regularly tweak the profiles, configuring for other issues that unearth from the past, or develop in the present.

Such a system could conceivably multiply not only the effectiveness but the through-put of a wider therapy network. But why stop there? Customizing individualized sessions could expand in scope to include daily sessions for a broader population, following the progress of meditation applications and mindfulness techniques that show growing popular support in a stressed-out 21st century. Perhaps in time, as hardware evolves, especially input/output, an open-source configurable EXR therapy system could be trained into guiding a devotee into legitimate dial-up ecstatic bliss

XR could be applied to other psychological disorders such as depression, where one could develop empathy for themselves or anti-social disorders where they cultivate empathy for others.

4.3.2 STUDY: PSYCHONAUT

I landed in a crouch, touching the ground in four points. Six points.
I have two sets of arms, obviously. Quarter-second tracers.

Phwoossh!

A burst of fragrant air blows against my face. I imagine tendrils of hair whipping behind me in slow motion. That lasted too long. It also happened too slowly—after my forward motion halted. Funny delay, that.

I close my eyes, throw my head back, and Ahhhhhhhhhhh!! a full-throated baritone. Harmonics converge in impossible chorus on my head area. Acoustic wave-forms flicker in brilliant blue fire within my peripheral vision. My peripheral vision must be in some new dimension because my forward vision is a 360-degree fish-eye. When I want it to be.

Now, I don't. I need to rest. Darkness.

Sukhasana. Deep slow breath.

My moments-ago sighing chorus with myself attracted giggling sopranos. Faeries again. I banish them with a huff. Delicate glass shatters, a short-lived local rainstorm. Tennessee Williams, Rain Menagerie. "Rise and shine!" Don't be ridiculous.

Let's start over.

Deep Slow Breath... Deep Slow Breath...

Deep...

Slow...

...this could take awhile, why don't you come back?

The point of light is growing. Centered.

It is... a golden... geometrics. Why do six sides always dominate? Benzene rings, right? I gotta remember to ask Bucky. The bees know. Oh yeah, that's right... tubes just do that when you pack them together. I love that. Well it has to be something, you know? Why not hexagons.

Ok, pay attention. All these tubes are making a picture now.

If increasing resolution in a plane multiplies in squares, then it cubes with depth. It's just weird to think of the world as the sum of cubes. Yeah, voxels, whatever, no one says that anymore. Regardless... we need to get bigger than that if we want to complete this visit.

"This way. Quietly," my dead cat says to me, looking backward over his shoulder as he eases forward through the tall savanna grasses. Sure smells nice here.

Smiling, I throw him a little nod and wink, setting my right paw down in the spot his rear foot just vacated. Following too closely, I think. Ok, I don't really want to be looking at your butt, Jem. I chuckle.

I BLINK; reposition off his left flank.

WE BLINK; Standing atop a small ridge.

Looking into a tidy, colorful valley. Poppies, orange, dense, like the Antelope Valley. There. Are. No. Antelope. It's just a name.

There. Are. Butterflies.

“So, this is what you’ve been up to?”

“Yep,” his toothy grin. His face looks Cheshire. It’s a good fit. I think you could have used this face when you were alive. “Ha! I did! You don’t know everything.” How true. How true.

We tense our leg muscles. We do that cat-haunch-wiggle-prepare-to-pounce dance. It feels good! I feel the charge well up from within, then spread outward, like pulling a blanket one cell thick across the surface of my skin; every cell tingles and bursts in a sequential crescendo.

We’re off! I delight in the sensation as we bound down the hill and tumble in butterflies.

For eons.

With an arc of saline fluid streaming from my arm, I sit up, wave my hand over the sensor glass to end the program. The dermal patch is hot and itchy on the back of my head. I feel around the unfamiliar mechanism, disconnect the fiber feed and gingerly tug the patch off. Remove the two Velcro ulnar bracelets. Meanwhile, gentle spotlights have come on, casting caustic reflections on the chamber walls from all this sudden movement in the water. I sit for some time, so the patterns can relax, too.

With a tight smile, and one more little nod to where Jem stood for that moment before the hunt, I rise from the tank, and reach for my towel.



Figure 4.7: Jem Cat, psychonaut companion, *butterfly slayer*. In memorandum, Dec 17, 2019.

CHAPTER 5: SUMMARY AND CONCLUSIONS

Born in the early 70s, I was fated to enter adolescence with Nancy Reagan’s posters on the back of every homeroom door and those impressive adverts on television—about making breakfast in the frying pan? Maybe you know them. I remember, still, succinctly, my 2nd-grade teacher proselytizing, “*Just one fly’s footprint of LSD can scramble your brain.*”

I believed every word. I’m not sure if the messages were effective because of childhood gullibility, or a result of the ambivalence toward drugs after balancing risk versus reward. For *what could be the reward?* I could not imagine. In the meantime, drug education in the 80s lumped every unsanctioned chemical into one category: narcotics. Narcotics users were desperate losers with debilitating tragic lives. They walked the line of addiction and criminal incarceration. None for me, thanks. I had no interest in any of it—not pot, not alcohol, not tobacco.

Alcohol is one such substance well integrated into our culture, despite the fallacious attempt to embargo it 50 years before I was alive. There may be government restrictions on marketing and distribution, but it was clear that some people could use it without disastrous consequences. And yet, abuse and addiction were still visible with this “permissible” substance.

Contradictions abound, right at the surface, and a critical mind will eventually resolve to provide personal guidelines for navigating the world of intoxicating substances as an adult. The first distinction that became clear to me, with nearly passive awareness, was the emerging difference between true narcotics and hallucinogens. I never once heard of a substance abuse center for magic mushroom addicts. Homeless LSD junkies? That’s not a trope. I didn’t socialize with drug-users, so I was not directly party to the features of the supply chain, but even in the pervasive anti-drug media narratives, there were no psychedelic school-yard pushers, no king-pin LSD drug lords. Miami Vice had cool heroic drug-busting cops—they took down cocaine and heroin rings, not Peyote button wizards, or weirdos licking Sonora desert toads.

That disparity reveals another clue to the discerning skeptic. The classical psychedelics are, legislatively, more restricted than the substances that the drug empires and the law enforcement

agencies draw their power from. Considering this, and noticing that there are substantially fewer criminal events with psychedelics, raises a flag. While it is true that marijuana has an unfortunate history of cops and cartels, fortune, and fatalities (cannabis needs its own story), it is otherwise the coke, heroin, and illicit pills that bring in the Benjamins. It turns out that the classical psychedelics have a distinct consumer advantage over other drugs due to a minimal dose and exposure demand—a threshold experience requires minuscule dosage, and most users are in no rush to re-up. In the end, perhaps there is simply not much money to be made, so the concentration of power is minimal. For the true narcotics, the profitability is enormous, and the push-pull narrative of destruction following the illegal drug trade is legendary.

The initial investigation of this thesis centered on *altered states*. I expected to hypothesize on innovations in consciousness, the inspirations found in a fanciful mind temporarily re-tuned. Key to unlocking that experience, I believed, was the temporary break from the persistent symbolic lock of momentary living. Every moment of consciousness is enthralled with the conformity of expectation. Imagine any day in life and the continuous conviction of abstract symbology that makes every particle of awareness rational. My responsibilities, my clothes, this table, food on a plate, vehicular traffic, images on screens, a flowering tree, financial obligation, even my name—who am I?—there is little break from any of it. The occasional mystery is given idle curiosity, (and might even become the subject of a quest to eliminate it!) until the pressure of some other duty closes the window. Those among us who don't behave with this kind of consistent acceptance (“...you see little green men, you say?”) are often held to be a bit strange, or maybe even crazy, as people do suffer affective mental disorders that prevent so-called ‘normal’ summation of all these interference patterns at any given moment.

Organisms chunk reality into a discreet number of abstract packages (pattern recognition) and organize them into challenge sets (analytics), for rapid and effective problem solving (reaction). This a strategy for survival, and evolution is an arms race to develop the best adaptive system¹. Humans complexify the possible challenge sets with an elaborate and ever-growing web of social abstractions. Perhaps our complex symbolic world entraps us in these layers of abstractions, favoring cerebral acts over intuitive ones, mental gymnastics over spiritual harmony.

¹Consider the great white shark for its exquisitely lethal biological systems

But these patterns don't only occur at the liminal sensory level. People can become disharmonious inside larger patterns, something on a higher order, and become stuck in cycles they know are irrational and unhealthy—perhaps violent or self-destructive habits, addictions, or depression. When Humphrey Osmond first conceived of using LSD to assist in psychotherapy for alcoholics, he was seeking to utilize the psychotomimetic properties he thought the drug could access. Having worked with alcoholics prior, there had been some anecdotal evidence that patients could overcome addiction after going through the unpleasant onset of delirium tremens—a physically and emotionally tortuous response to the physical withdrawal from substance addiction². Osmond's thinking was to trigger a predictable psychosis in the patient intentionally, and with a semblance of control that administering a drug in a clinical environment proffers, help guide the patient to a healthy understanding of what is at stake—that appears to be what he was after, at any rate.

It didn't work that way. The patients didn't have terrifying psychotic experiences—they entered ecstatic altered states of consciousness. With a kind and thoughtful guide on hand, Osmond was a *Shaman*, and these people often turned their lives around in one powerful session. It's really quite remarkable.

Considering these factors, I was inclined to model the reference disruption experience on psychedelics for their incomparable power to safely and temporarily shake up the snow globe. That seed idea offered three conceptual challenges,

Condition A: what is this 'temporary insanity' condition? What are the terms and conditions? Perhaps there is one word or phrase which summarizes the potentials. The research needs a title, and I hoped to find a character terminology to make it short and catchy.

Condition B: What other methods or techniques would enable this mind state? Could a disciplined mind learn how to shatter mundane reality? How about congenital malformation, or brain injury?

Condition C: Can the state be triggered, guided, or enhanced with 'virtual reality?'

The goal was to link altered mind states akin to psychedelic vision to the interface of virtual

²some literature refers to toxic psychosis, or substance-induced psychosis

reality in a practical way. As an artist/engineer, the salient features would be not only practical, but aesthetic; theoretically feasible, and conceivably enlightening. I had doubts, but my major professor, no slouch in the fields of psychology and human-computer interface, urged me on.

Breaking the inquiry into the three sub-questions helped me to reduce the complexity and make sectional progress. Throughout the process, cumulative discoveries refined the underlying concept, often harmonizing discovery across the triad relationship.

Discussion of psychedelic drugs brings with it the bias of taboo and legal consternation. Hoping to distance the writing from such prejudice, I discovered early on that the first serious researchers sought similarly to distinguish the character of psychoactive mind-expansive inquiry from the frivolity of recreation. Wasson, Ott, and a small cohort gathered to discuss, and the term *entheogen* emerged as their solution. For a time, I used entheogen as the focus term and attempted to lens the entire concept with it, but it did not fit well. Simultaneously, it made for a clumsy title term.

After some research, I settled on ecstasy as the focal term to encapsulate altered states of mind, *Condition A*, and as soon as I fully understand what it can mean, it quickly unearthed deep and well-documented association with meditation, religious revelation, and even psychosis.

Throughout the scientific revolution, long before laboratory chemistry and the awareness of neurochemicals, philosophers of mind have observed the effects of ecstasy. Pre-enlightenment theologians write of ecstasy. Moreover, archaeological evidence has uncovered ceremonial practices, in art and burial ritual, that make a strong correlation to mystical occurrences, sometimes accompanied by native psychoactive plant influences. This discovery supplied supporting evidence for my search for co-present methodology required by *Condition B*. Now solve for *C*.

5.1 ABOUT ECSTASY

My exploration of ecstasy invites introduction to a phrase, *intimate transpersonal dialog*. Transpersonal, as established in writing, conveys experiences in which the sense of identity or self extends beyond the individual. Propelled into a liminal existence between subjectivity (the

ego) and objectivity (ego-dissolved oneness), the ecstatic voyager exhilarates in continuous rapid discovery, a swirling melange of meaning and confusion, wrapped in a tight dialog between the reference old self, and the universal new self.

With only yourself on this journey, the transpersonal elevation is isolating, while it is at the same time unifying. William James' guidelines capture the contradictions well:

- Ineffable: the voyager walks in a world alone; sharing is made difficult or impossible, as indescribable landscape presents only to her.
- Noetic: compelling and deeply significant; discovering universal truths
- Transient: rapidly changing, fleeting, yet familiar
- Passivity: not out of control, but inescapably elevated until the stimuli are fully metabolized.

Unique, unscripted interactions. Free moving in strange yet familiar cognitive space. Discovering universal patterns. Connection to inner peace, compassion for others, and the wholly numinous. Revealing ancient cultural bonds woven into existence. Connection to Nature, Earth, and Spirit.

Tinkering with the conscious mind is not without risk. While this work describes advocacy for mind-expanding ecstasy and proposes to direct artistic and aware electronic mediation to guide, assist and evoke ecstasy for willing participants, there is an ever-present danger when unleashing chaotic forces to mingle in the mind.

Carl Jung contributed directly to the conceptual formation of, and the actionable advocacy for, transpersonal transformation, and yet chose for himself to never employ psychedelics, though the option was easily had. In a private letter on the subject in 1954, he opined about 'gifts of the gods' like mescaline (Psychedelic Frontier, 2018):

I should hate the thought that I had touched on the sphere where the paint is made that colours the world, where the light is created that makes shine the splendor of the dawn, the lines and shapes of all form, the sound that fills the orbit, the thought that illuminates the darkness of the void.

Much of the research and writing of this paper focused on the power of exogenous psychoactive chemicals to effect the operations of human consciousness. The subject is provocative, and the

history is full of colorful and brilliant characters, making for entertaining subject matter. Also, the academic record for psychedelics is easy to find, and rich in references, despite the roughly 100 years (only!) science has been engaged with understanding them, about half of those years the drugs have been restricted and persecuted. Meanwhile, the ecstatic meditation practices have been unrestricted, with continuous lineage into the deepest recesses of human record keeping. And yet psychedelic ecstasy *appears* to provide greater accessibility, immediacy, and easier access to third-party observation.

This is no mystery. Ingesting 5g of a dried fungus will, without fail, take the consumer on a multiple hour trip, with no stops for bathroom breaks. It's just that simple. Meditation requires much more time, discipline, and knowledge.

With that said, a casual glance at the representation from the wide array of psychedelic researchers, mystics, and causal day-trippers alike, brings back two consistent messages.

One, drugs are not for everyday use. The psychotherapists sometimes used singular treatment sessions to bring about positive effects for chronic illness. The mind-mappers, seeking inspiration and problem-solving insight, might take a low threshold dose, to shake things up a bit, to free up from a mental block. The psychonauts, retreat to the Amazon for once-in-a-lifetime ayahuasca ceremonies, or journey to the high desert for a weekend camping trip under the stars with a tab of acid.

Daily rituals, these trips are not. Coffee, yes. Cigarettes, if you have to. Glass of wine, lovely. Also, meditation.

Message two, meditation is perfectly suited for daily ritual. In many of the anecdotal comparisons between drug ecstasy and meditation ecstasy, the meditation was held to create a superior ecstatic product. Perhaps this is due to the completely endogenous nature of meditation.

Ecstatic Cross Reality has interesting company to keep. I suspect it can be effective in assisting each modality, and may even stand on its own.

5.2 ABOUT EXR

As demonstrated in the psychotherapy case study, one return on investment for EXR platform development is the ability to create sophisticated, but unmanned, or minimally-manned, therapies. A full sensory on-demand programmable “space suit” tuned to some degree of ecstasy would allow for therapists, doctors, and (why not?) priests, gurus, yogis, and self-help missionaries to force multiply their therapies, regiments, liturgies, meditations, or workouts. The near-field VR will be working on these features—XR can draw upon the development cycles and press the effects to achieve degrees of ecstasy.

The potential for abuse, as in all evocative tech, can be recognized. Addictive personality types could fall prey to an on-demand ecstatic spaceship, as drug, media, and gaming abusers are keen to remind us. Yet more subtle a concern, do the electronically simulated avenues to empathy, and the appreciation of the Natural World, seduce humans into declining equal time with the ‘legitimate’ sources by normalizing the machine-mediated variants? Might our future look like the dystopian cyberpunk realm of William Gibson?

Roger Lew says, *“In the design and application of EXR, we should consider what it means to be human and how ecstatic transpersonal experiences can make us better versions of ourselves. Much as we should be ambivalent to drugs, recognizing that some can have profound medicinal properties and others are addictive, numbing, and fatal; we should be ambivalent to technology and strive to build a future where we employ technology for the betterment of ourselves, our brethren, and the universe as a whole rather than become enslaved and isolated by it.”*

5.3 FURTHER RESEARCH

It is expected that rapid changes in hardware and software will bring about significant feature improvements on the full range of Mixed Reality mediums. Increases in computing speed, memory and storage access, sensory resolution, and so on, combine toward Arthur C Clarke’s magic technology (I think we are there, but we already take it for granted).

With many of these applications machine learning is employed to discern the abstract symbols

we collectively regard as informative. For example, autonomous vehicles being able to discern pedestrians at highway speeds is important for the mechanical task of driving, but that application is precisely contrary to the goal of EXR. EXR aims to break collective abstractions and enable users to see novel patterns and structures.

With regards to human-computer interface, it is conceivable that ‘computers’ are converging to the same juncture, which is something akin to a seamless, unobtrusive wearable XR platform. Neurolink, voice recognition, and more complete access to haptic feedback, makes the *ecstasy* in ecstatic XR merely a question of implementation.

While this writing attempts to provide a background to both justify and anticipate the value and feasibility of EXR, the summation is not clearly inevitable. Machine learning, a critical necessity for Cross Reality, is mostly in the hands of institutions beyond the reach of artists and yogis³. Commercial and government forces at play in the cutting-edge technology world arguably focus on lower-hanging fruit. Facebook and Google want all your data, and while it remains optional to use their services—most people seem to want to—the mission at the top may not align with public’s best interests. Also in the newsfeeds of late (I saw it on Facebook), the word is out that Big Brother is alive and well, and he wants to make sure you are following the rules. The Chinese and the American governments each employ their unique, authoritative styles, neither of which are tolerant of unpredictability in their constituencies.

The preceding paragraph might sound like something Timothy Leary would say (I’ll accept a comparison to Terence McKenna as a particular honor), but I think they both would agree that in the end, it’s up to you to take control of your mind. Ecstasy is a gift and a responsibility.

In the meantime, psychotherapists, cognitive scientists, designers, and artists, have access to new frontiers of expanded human consciousness.

³*Mostly*, and yet open source code is spreading the power of GANs for developers of ordinary means.

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