

Psychedelics and Entheogens: Implications of Administration in Medical and Non-Medical Contexts

by  
Hannah Rae Kirk

A THESIS

submitted to  
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## AN ABSTRACT OF THE THESIS OF

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Abstract approved:\_\_\_\_\_

Robin Pappas

Psychedelics and entheogens began as religious sacraments. They were apotheosized for their mind-expanding powers and were thought to open realms to the world of the Gods. It was not until the first psychedelic compound was discovered in a laboratory setting a mere hundred years ago that they entered into formal scientific study. Although they were initially well-received in academic and professional circles, research into their potential was interrupted when they were made illegal. Only recently have scientists renewed the investigation of psychedelic substances, in the hope of demonstrating their potential in understanding and healing the human mind. This thesis will explore the history of psychedelics and entheogens, consider the causes behind the prohibition of their research, and outline their reintroduction into current scientific research. Psychedelic compounds have proven to be magnifiers of the mind and, under appropriate circumstances, can act as medicaments in both therapeutic and non-medical contexts. By exploring the journey of psychedelic substances from sacraments, to therapeutic aids, to dangerous drugs, and back again, this thesis will highlight what is at stake when politics and misinformation suppresses scientific research.

Key Words: Psychedelics, Entheogens, Sociopolitical Ignorance, Spirituality, Drug Policy Reform

Corresponding e-mail address: [kirkh@oregonstate.edu](mailto:kirkh@oregonstate.edu)



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APPROVED:

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Robin Pappas, Mentor, representing School of Writing, Literature, and Film

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Mina Carson, Committee Member, representing School of History, Philosophy, and Religion

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Sharyn Clough, Committee Member, representing School of History, Philosophy and Religion

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Toni Doolen, Dean, Oregon State University Honors College

I understand that my project will become part of the permanent collection of Oregon State University, Honors College. My signature below authorizes release of my project to any reader upon request.

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Hannah Rae Kirk, Author





## **ACKNOWLEDGEMENTS**

To my mentor and role-model, Dr. Robin Pappas, I extend my greatest thanks and admiration. It was because of her inspiration, encouragement, and gentle tenacity that I was able to learn and achieve as I have. Where I once thought of investigating psychedelics in formal academia as a pipe-dream and impossibility, she opened my eyes and a thousand doors into this realm of science. In the time I have known Dr. Robin, I have grown as a student, as a woman, and as a friend, much of which can be attributed to her unwavering support. I have nothing but the greatest respect and appreciation for her patience, tutelage, and enthusiasm.

To my parents, I owe a great debt of gratitude. If not for their never-ending love and support I would not be the person I am today. I love them both, dearly.

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To my partner, Jakob Daniels, the person I love most - if it were not for him, my world would not be as bright nor would my life be as fulfilled.

## **PREFACE**

My interest in psychedelics began prior to my college career when I was first introduced to popular drug culture. While I did not partake, I was struck by the variation in behavior between those who were consuming narcotics and those consuming psychedelics. Given my limited academic resources at the time, much of my independent research produced little more than indictment reports, references to the antiwar and counterculture movements, and warnings against drug abuse. It wasn't until I was introduced to Dr. Pappas and took her class on altered states, that I was made aware of the depth and breadth of information available. My interest was reignited, and I was given the opportunity to research psychedelics academically.

Given my academic pursuits in biological systems and biochemistry, I was initially interested in conducting primary research. Due to the legal restrictions on psychedelic substances, my hopes were quickly extinguished. When I inquired as to how I might be able to conduct primary research, I was presented with an FDA-approval waiting list of about 15 years, with an additional year or so of credential verification. It became clear that an alternative method of research was necessary if I was to continue my investigation. I elected to undertake a literary analysis of the history of psychedelics, under the supervision and guidance of Dr. Pappas, who had had formal education and experience in the fields of literature and writing. Given my newfound resources, provided to me by my academic institution, I quickly uncovered a reservoir of scientifically informed articles and reports. Faced with a volume of information that was seemingly contradictory to everything I had previously been taught about psychedelics, I

experienced an unsettling dissonance. I realized a review of the history of psychedelics would not be sufficient in producing a complete and comprehensive analysis of the substances. It became clear that there were many more forces at play with respect to the path psychedelics took from their discovery as chemical constituents to drugs of abuse. In an effort to rectify the insufficiency of history alone, I chose to approach the subject from a multidisciplinary position.

To satisfy my academic curiosity, I set about researching the different tributaries that informed our understanding of psychedelics. Using a bottom-up processing strategy, I thought it would be best to begin with the biochemistry and chemical physiology of psychedelics. By reducing psychedelics down to their molecular constituents, it was easier for me to analyze them, not as drugs of abuse, but as nothing more than chemical compounds. I was pleasantly surprised to find an impressive number of scientific articles that illuminated the chemical components of psychedelics. Chemically speaking, I came to find that psychedelics, while incredibly potent, are not fatal, nor do they elicit addictive or dependency behaviors seen with other drugs. Furthermore, they are not poisonous, they do not alter chromosomal arrangements, they do not produce manic psychosis, nor do they “flood the brain with serotonin,” all of which are common misconceptions.

As my chemical understanding of psychedelics grew, I saw the need to develop a historical understanding, as well. Where the biochemistry of psychedelics is the “what,” I was interested to uncover the “where.” Where did psychedelics come from? Where were they used? In an effort to illuminate their history and origin, I incorporated an anthropological and cultural approach. I found that much of the history of psychedelics

either predated written record or what was written had been destroyed. This marked the first wave of censorship that would influence any comprehensive understanding of psychedelics. An investigation into the history of religion provide information about the use of psychedelics and the probability of their involvement in the development of the first theologies.

The two disciplines, biochemistry and history, produced enough information to develop a better understanding of what psychedelics are and where they came from, yet I was still left unsatisfied. I was interested in finding out how psychedelics came to be misappropriated in the Counterculture Movement and why they came to be under legal control. Furthermore, given the volume of scientific articles, I was curious about how they came to be under Schedule One control. Reviewing the chronological path psychedelics took proved to be nebulous in providing information on how and why psychedelics came to be condemned. To rectify this lack of understanding, I turned to the philosophical investigation of the dissemination of false information and the mechanisms by which this produced uncertainty and doubt. Doing so revealed the powers that stood to benefit from the control and suppression of psychedelics as well as the rhetorical strategies that facilitated their legal regulation. Soon, the “who” and “why” of the psychedelic prohibition were brought to light.

The misfortune of the psychedelic prohibition was felt in academic and scholarly circles. Psychedelics were once substances of intense curiosity and research, so much so that academia suffered under the censorship produced by the Controlled Substance Act, which effectively stifled any further research activity. Moreover, not only was the academic understanding of psychedelics dismissed while the details of legal scheduling

were constructed, but the researchers that provided this information were deemed untrustworthy and incredible. Science has never experienced a censorship of work such as they did under the regulatory control of the Controlled Substance Act. Not only was scientific knowledge wholly dismissed but in some cases it was fervently condemned. I was intrigued by the power of politics to inject itself into the production of knowledge, and, with no credible understanding of the work being done, able to dismiss the ethos of such work. What was at stake for politics to supersede the power of science for the sole benefit of the conservative agenda? What could have been developed if researchers were allowed to continue their research? How would the fields of psychiatry, neurobiology, and transpersonal psychology advanced if this was the case? While many of these questions are beyond the scope of this thesis, the influence of false information in the censorship of scientific pursuit warrants further investigation.

I hope that the field of psychedelic studies will continue to produce knowledge. I hope that the legal scheduling of psychedelics will be reviewed and found to be inaccurate. The power of psychedelics was unnecessarily and unethically ignored. As the societies of the world continue to grow and develop, I hope alternative approaches to the influence of politics and science are explored, and I hope science never again has to endure the censorship of psychedelic research.

## **Introduction**

Psychedelics are very potent, psychoactive substances that possess the power to evoke extraordinarily profound altered states of consciousness. When ingested psychedelics elicit psychosomatic effects including: enhanced sensory perception, blended sensory experiences, altered or distorted sense of time, kaleidoscopic visuals, anxiety, nausea, feelings of oneness, fear, euphoria, heightened perception of light and geometric shapes, and mystical/spiritual sensations. While their history pre-dates written record, their psychoactive properties have been used and exploited by humans since the beginning of the age of man. Some of the earliest human civilizations revered the sacred substances; they were frequently used in cultural or religious rituals and were often consumed by shaman and religious leaders, as it was thought that the substances would bring them closer to their God(s). As human technology advanced, the sacred practices dissipated and the knowledge of psychedelic use was quieted. By the time the first psychedelic was isolated in a laboratory setting, the understanding of their power and potential was all but lost to developed society. In an attempt to understand the novel compounds, researchers began studying their properties and functions. What they found was both fascinating and confounding.

When Albert Hofmann first discovered the effects of a compound he had isolated, lysergic acid diethylamide, interest increased among the academic communities. As more compounds emerged, so too did scholarly interest. As the psychoactive effects slowly became exposed, scientists and researchers in fields such as psychology and psychiatry began investigations of their own. There seemed to have developed two lines of research.

The majority of researchers took to investigating the psychiatric potential while the others began researching the spiritual implications for which they had become known. The outcome of this initial work in the early twentieth century led psychedelics on a path to becoming one of the greatest tools in the psychiatrist's repertoire. The results of both lines of research yielded impressively positive results, better results than they imagined, let alone hoped for. Some researchers took their fascination and captivated others with their effects. To the peril of academic research, some expressions of enthusiasm mounted to outright proselytization and eventually led to a great divide between science and legislation. During the rhetorical environment of the mid-1960s, the integration of psychedelics into popular and recreational use contributed to undermining the potential for psychedelic studies to flourish. Reports of their potentially fantastic effects caused psychedelics to become one of the most widely available and abused substances of the mid-to-late 1960s. During a time when drug addiction was becoming a household topic, societal and political perspectives shifted. While the majority of the population was unaware of the academic and scientific value of psychedelics, they condemned their recreational use. The governmental authorities decided to intervene and psychedelic drugs were subject to the illegalization of nearly all recreational drugs.

The illegalization of psychedelics was not only a disservice to the scientific community, but also to the public. Research had provided evidence-based reasoning to justify their request that psychedelics remain legal and available to academic and professional communities. Denying their appeals, legislative powers took control of the substances, and with them, any hope for psychedelics to be developed into the tools and aids they were intended to be. Previously thought as holding the key to unlocking the

human mind, their potential was hidden and discarded. Psychedelics had shown to have potential as a treatment, medicament, and spiritual aid. The reservoir of evidence that supported these findings was substantial and, while criticized by some, withstanding of scrutiny. The question remains, however, why, when scholarship pointed to psychedelics as being valuable and worthy of greater support, did they become illegalized in the first place?

This thesis will explore the topic of psychedelics, their emersion in scientific research, the consequences of the political involvement in their use, and the current scientific efforts to develop a broader understanding of their implications. I hope to show the ways in which psychedelics were intended to be used, the circumstances by which they were made illegal.

The discussion will begin with a brief overview of the chemical constituents of psychedelics and their neurophysiological properties. In reducing psychedelics down to their molecular structure, I hope to, in a similar fashion, to reduce the negative connotation associated with these substances. By exploring the composition of psychedelics, not as drugs of abuse, but as a valuable chemical species, their potential can be more appropriately assessed. Following the analysis of their molecular composition and the mechanisms through which they elicit their effects, the thesis will discuss the history of psychedelics and the origins of their use. The historical and cultural implications of psychedelic consumption can serve to illuminate the ways in which psychedelics were once used and the value they held to the people who used them.



Following the analysis of the history of psychedelics, the discussion will proceed methodically through the scientific evidence that was produced after psychedelics were first introduced to scientific and academic circles. In order to establish the credibility of the research and researchers who contributed to the primary understanding of psychedelics, the thesis will discuss the work of eight scholars and the evidence that supports their claims. By describing the careers and supporting research of these academics, I hope to show the potential of psychedelics found in the studies conducted between 1940 and 1970 and to establish an understanding of the value of research that was lost when psychedelics were made illegal.

In addition, this thesis will proceed by analyzing the ways in which political institutions and sensationalist journalism interdicted the progress of psychedelics research and contributed to the dissemination of misinformation. The consequences of these influenced have had profound effects on the understanding of psychedelics and the production of scientific knowledge. Psychedelic studies have recently reemerged after decades of scientific censorship. Many of the most recent studies have echoed the information of the research conducted prior to the disbanding of psychedelic substances and are beginning to further the reach of scientific understanding. This thesis will illuminate the efforts that were made to ensure the continuation of psychedelic studies and will discuss the research of eight modern scientists who are devoted to advancing our understanding of psychedelic substances. By reorienting the conversation in this way, I hope to highlight the value and potential of psychedelic substances that has been supported by evidence based research.

The structure of the thesis is intended to create a broader understanding of psychedelics and their potential. By illuminating the path psychedelics took from the realms of religion to science to drug of abuse and back again, this study will express the value of psychedelics and the benefits that are at stake when politics and misinformation intervene in the scientific production of knowledge.

## **The Chemistry of Psychedelics**

In order to frame psychedelics as chemical substances rather than drugs of abuse, this study will begin by reviewing the chemical literature of psychedelic compounds. Reducing psychedelics down to their chemical constituents serves to shift focus away from sensational, social, preconceived notions associated with psychedelic substances and toward an analysis informed by the methodical inquiry shaping their emergence in scientific disciplines. In this section, the biochemistry and active components of five different psychedelic substances will be reviewed. The chemical structure and the ways in which psychedelics interact biochemically with neurological pathway will illuminate the process by which the psychedelic experience is produced. By considering the chemical literature of psychedelics, this section will serve to create a scientifically – rather than politically – framed understanding of what psychedelics are and how they interact with the brain.

Psychedelic substances have been categorized together as a result of the similar psychological effects they produce. The “psychedelic experience” is described by characteristic features, such as an altered state of consciousness exhibiting “transcendence of verbal concepts, of space-time dimensions, and of the ego or identity” (Leary, Metzner & Alpert, 1964). The psychedelic experience can manifest in feelings of euphoria, enhanced or altered visual and sensory perception, mystical or spiritual sensations, and psychotherapeutic breakthrough (Grof, 2006). Psychedelics have been associated with the term “hallucinogen,” which is something of a misnomer. Hallucinogens are substances with the propensity to produce hallucinations, which, at typical doses, psychedelics do not (Nichols, 2004). For this reason, “hallucinogens,” as a categorical distinction is inappropriate, and will therefore not be used. Psychedelics, as a class, modify the subject’s state of consciousness via bio-neural pathways, inducing the “psychedelic experience.”

Many psychedelic compounds are analog structures, meaning they closely resemble one another and, having similar chemical properties, undergo the same biochemical reactions. The similarity in molecular structure amongst psychedelic substances is almost certainly responsible for the characteristics most attributable to the psychedelic experience. There is a maxim in the study of biological systems and biochemistry: Form Equals Function. This maxim expresses the molecular propensity for shape and chemical characteristics to determine the purpose and function of a molecule. As demonstrated in Figure 1, not only are many psychedelic molecules structurally similar, but when compared to the 5-HT molecule, they resemble the neurotransmitter serotonin (Nichols, 2004). Historically, academics have categorized psychoactive

compounds based on the psychophysiological responses they illicit. Recognizing the similarities between psychedelic compounds and their similarity to serotonin, researchers have since begun to organize psychedelics differently from other psychoactive compounds. Psychedelics have since been categorized on the basis of their probable molecular mechanism of action and the principal effects exerted on the Central Nervous System (CNS) by an agonist action at serotonin (5-HT)<sub>2A</sub> receptors (Nichols, 2004). The involvement of serotonin and the neurological mechanisms of the psychedelic experience will be discussed further later in this study. For the time being, it is necessary to understand that the substances to be discussed all follow incredibly similar, if not identical, biochemical pathways and will therefore be considered collectively.

### ***Psilocybin***

Although psilocybin is the ingested compound, upon being metabolized, the alkaline phosphatase activity of the digestive system readily reduces psilocybin, 4-phosphoryloxy-N,N-dimethyltryptamine, into its active state, psilocin, 4-hydroxyl-dimethyltryptamine (Nichols, 2004; Smith, 1969). Psilocybin is orally active with doses effective between 6-20 micrograms (Nichols, 2004). Physiological effects last between four and six hours, beginning around 20-30 minutes after ingestion with peak psychological effects occurring after approximately 80 minutes and lasting between 1-2 hours (Nichols, 2004).

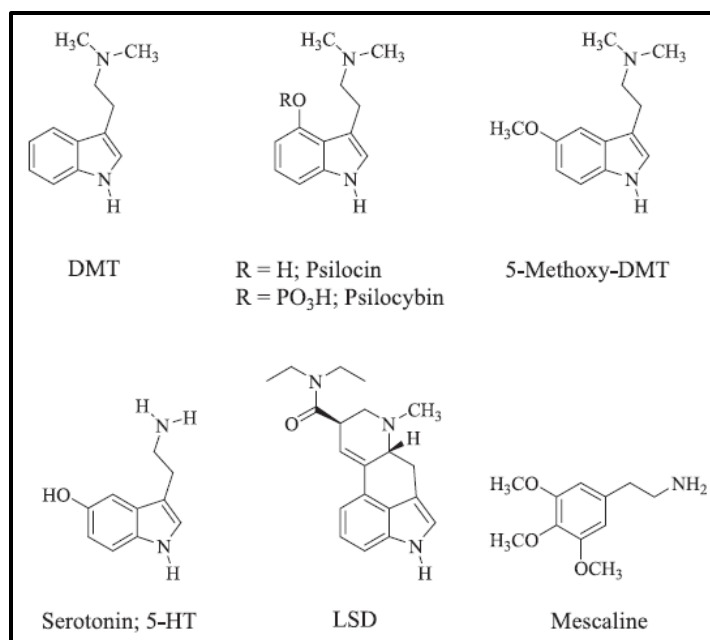


Figure 1 – Chemical structures for 5 psychedelic compounds and serotonin (1)

### ***Mescaline***

The chemical compound associated with mescaline is 3,4,5-trimethoxyamphetamine. Upon ingestion, this form is metabolized and integrated to form 3,4-methylenedioxyamphetamine (MDA). Mescaline can be found, in varying concentrations, in cacti of genera *Lophora*, *Gymnocalycium*, *Mammillaria*, *Ariocarpus*, *Optunia*, *Trichocereur*, and *Pelecyphora* (Smith, 1969). The most common form of “peyote,” the name associated with most cacti-derived psychedelic substances, is derived from the cactus *Lophora williamsii* (Nichols, 2004). Mescaline is a long-acting compound with effects lasting between 10 and 12 hours and an active dosage in the range of 200-400 micrograms, making it the least potent of all psychedelic compounds (Nichols, 2004).

### ***Dimethyltryptamine (DMT) and Ibogaine***

Dimethyltryptamine (DMT), the active compound found in the psychedelic mixture “ayahuasca”, is found in a vine of genus *Banisteriopsis* (Schultes & Hofmann, 1987). Dimethyltryptamine is not an orally active compound; however, when combined with the beta-carboline monoamine oxidase inhibitors of *Psychotria viridis*, the compound becomes psychedelically active when ingested (Nichols, 2004). DMT, alone, is typically active in 60-100 microgram doses and psychological effects lasting between 20-30 minutes. When ingested as the mixture, ayahuasca, a beverage containing many psychoactive compounds, among them DMT, effects can last between 10-12 hours.

<sup>1</sup>Ibogaine, 12-methoxyibogamine, is found in the *Apocynaceae* plant family such as *Tabernanthe iboga*, *Voacanga africana* and *Tabernaemontana undulata*. Orally active and dangerous in doses over 263 micrograms per kilogram body weight (mg/kg), the effects of ibogaine last from 4-6 hours (Schlep, Slaughter, Galea & Newcombe, 2016). Effective doses range between 40-100 mg/kg with some doses reaching into the 200 mg/kg range (Schelp, Slaughter, Galea & Newcombe, 2016).

### ***Methylenedioxymethamphetamine (MDMA)***

MDMA is a manufactured psychedelic compound and is colloquially associated with the name “ecstasy” or “the love drug.” Active when ingested orally, methylenedioxymethamphetamine is typically taken in doses between 50-150 micrograms (De la Torre, 2006). Psychological effects of MDMA last between 4-6 hours, with peak experiences occurring around 1-2 hours after consumption (De la Torre, 2006).

Lasting effects of lesser magnitude and strength can be experienced for up to 8 or 9 hours  
(De la Torre, 2006)

### ***Lysergic Acid Diethylamide (LSD)***

Lysergic acid diethylamide, diethyl-7-methyl- 4,6,6a,7,8,9- hexahydroindolo-[4,3-fg] quinoline- 9-carboxamide, can be found in the seeds, and to a lesser degree in the stems and leaves, of the plant family *Convolvulaceae*, *Rivea*, *Ipomoe*, and *Argyria* (Smith, 1969). These genera contain the plants commonly known as Morning Glories and Hawaiian Baby Woodrose, with woodrose containing the highest natural concentration, at about 100 times the amount of other species (Smith, 1969). The most common ergot alkaloid in LSD synthesis is the ergotamine found in various species of fungus that infect rye and other wheat grasses (Smith, 1696). LSD is active in doses as little as 0.05 micrograms, with typical doses in the 0.10-0.20 microgram range (Nichols, 2004). Larger doses confer greater effects. LSD is orally active with effects lasting between 10-12 hours (Nichols, 2004)

## **Cultural Significance and Historical Accounts**

The dawn of human history begins with the hunter-gatherer societies from which all civilizations arose. Humans relied on the land for food and shelter, and the Earth provided. During this era, we also find the first significant use of psychedelic substances. Found in naturally occurring compounds, many psychedelics can be foraged and directly consumed from some two hundred or more mushroom and fungus species and thousands of plantae species (Schultes & Hofmann, 1987). The consumption of psychedelic plants by individuals of ancient and native cultures can be traced back hundreds of thousands of years, predating written word (Grof, 2005). As psychedelics became integral in the practices of the many cultures that utilized their perception-heightening effects, they have, in the same way, become integral to the history of humans themselves. With dates of the first psychedelic uses paralleling the dates of the first developing religions, it has been argued that psychedelics drugs may have assisted in catalyzing the first philosophies and earliest theologies of humankind (Nichols, 2004). With religion, spirituality, and cognition being paramount to the human experience, it can be asserted that, in much the same way, so, too, are psychedelics.

The ancient cultures that used psychedelics held them in the highest regard, viewing them as “of the gods” or divine (Grof, 2005). The consumption of psychedelics became central to innumerable rituals, rites-of-passage, ceremonies, and shamanistic practices. Furthermore, the use of psychedelics was not a regional phenomenon; cultures all over the world independently discovered and adopted the use of psychedelic



substances. The preparation of such plants allowed for the people of these cultures to transcend the dimensions of reality, correspond with deities, interact with the forces of nature, and reach mythological realms through the lens of the psychedelic experience (Grof, 2005). There even existed, in some instances, the practice of inducing a psychedelic state for the purpose of diagnosis and healing various maladies and disorders (Grof, 2005). Though early civilizations held psychedelics in veneration and awe as religious sacraments, their use was not limited to that of spiritual exploration. For many substances, the distinction between poison, medicine, and narcotic is that of dosage (Schultes & Hofmann, 1979). The medicinal use of psychedelics was popular amongst the societies that used them, such as the healing ceremonies of the Aboriginal's to cure "sickness of the mind" (Smith, 2000). To limit the use of psychedelics to their production of mystical experiences would be to limit their medicinal potential.

Well-documented accounts of psychedelic use extend to nearly every civilization over the course of human history. For example, in ancient Indian Vedas (ancient Hindu scripture), there is documented use of a "divine potion" known as *soma*, of which induced "mystical states of consciousness" and were hypothesized to have been a principle source of the Vedic and Hindu religion (Grof, 2005). There are similar accounts of a substance, *hoama*, used in ancient Persian cultures, producing the same effects that are represented in literature as being an important sacrament (Grof, 2005). Other examples include *peyote* (containing the psychoactive substance mescaline) being ritualistically used in Native American services; *ayahuasca* (containing DMT) consumed as a respected religious sacrament by the people of Brazil; and *yage* (similar to ayahuasca) ceremonially used in the Amazon Valley of South America (Schultes &

Hofmann, 1979). In Africa, there are accounts of tribes preparing the bark of the shrub iboga, *Tabernanthe iboga*, to be used in low doses as a stimulant during hunts and, in higher doses, during ceremonial rites (Grof, 2005). The most common example of historical psychedelic use is the practice of consuming the mystical “magic mushroom” by Aztec shamans; however, such a minor example would fail to illuminate the true significance of such use. Not only did the Aztec shaman consume the sacred mushroom *teonanacatl* (meaning “god’s flesh”), but so too did the Mayan, Olmec, and Mazatec tribes (Schultes & Hofmann, 1979; Grof, 2005; Nichols, 2004). They also utilized the psychedelic effects of *Anhalonium lewinii*, *Psilocybe Mexicana*, and *ololiuhqui*, or morning glory seeds (*Rivea corymbosa*) (Grof, 2005). Still today these traditional practices are upheld by several Mexican Indian tribes, such as the Huichols, Mazatecs, and Cora people (Grof, 2005). Other examples include the *benzoin* of Southeast Asia, a “Zen’s tea whose fifth cup purifies and whose sixth calls to the realm of the immortals” and the *pituri* concoction of the Australian aborigines (Smith, 2000). There have been over two-thousand species found to contain psychedelic compounds; there are undoubtedly thousands of others and in them, possible constituents of incredible value (Schultes & Hofmann, 1979). It is no surprise that early civilizations found them and began using and exploiting their effects.

Even in the history of European culture, dating back to Ancient Greeks and the Hellenistic empire, there are accounts of psychedelic substances being distributed and consumed regularly. For instance, in the village of Eleusis, all the citizens of the village were invited to participate in an all-night ceremony each September, wherein they would consume a sacred brew called *kykeon*, containing an ergot alkaloid similar to LSD

(Nichols, 2004; Grof, 2005). Additionally, it is written that Plato, Aristotle, Pindaros, and other great names of the Ancient Greek culture participated in the ceremonial “mysteries of death and rebirth” for the gods Dionysus, Adonis, and others, which involved drinking a similar “sacred potion” (Grof, 2005). Also common in Greek culture was the regular drinking of a wine-like drink used for *Bacchanalia*, or the Roman festival of Bacchus, also thought to have contained psychoactive alkaloids (Grof, 2005).

The ergot fungus, known to infect rye and other wheat-grasses, has an extensive literary history. Once vehemently avoided and thought to be a poison, ergot first appeared in written accounts during the Middle Ages (Hofmann, 1979). Ergot is thought to have contributed to a mass poisoning, affecting thousands of people as a result of a fungal ergot infection of mass grain stores (Hofmann, 1979). Once referred to as ergotism, or ergot poisoning, ingesting infected wheats resulted in a gangrenous and convulsive illness manifesting in convulsion, hallucination, mania, and delirium (Caporeal, 1976). One account of ergot poisoning can be found in the chronicles of Saint Anthony, the patron saint of ergotism victims, who treated and cared for afflicted individuals (Hofmann, 1979). This is where the phrase “St. Anthony’s fire” was conceived to describe the turmoil experienced during an ergot infection. There is also the hypothesis that ergot poisoning played a part in the Salem Witch Trials of the mid-seventeenth century, where the convulsions and delirium of the women afflicted was associated with demonic possession (Caporeal, 1976). Since the agricultural revolution, when sanitation measures were taken to ensure the safe consumption of wheat and other products, there have been very few reported cases of ergot poisoning (Hofmann, 1979).

In the late 1500s, ergot went from poison to medicine when German physician Adam Lonitzer began using it as an ecbolic, a medication to induce childbirth (Hofmann, 1979). When the ecbolic use of ergot was determined to cause dangerous uterine contractions at uncertain doses, the practice fell from favor (Hofmann, 1979). Ergot continued to be used in obstetrics to stop postpartum hemorrhaging. Even today there are still some practices using ergot alkaloids in this manner (Hofmann, 1979; Janice, 2007). While the scientific investigation of ergot fungus continued into the nineteenth century, the use of medicinal ergot as a hemostatic and in other practices is presumably the reason the pharmaceutical company, Sandoz, allowed Hofmann to begin chemical analysis of ergot as an analeptic, substances used to stimulate respiratory and circulatory system functions.

Ergot is an excellent example of the dosage-dependent distinction between poison and medicine made by Hofmann and Schultes in 1979. While some ergot alkaloids, such as ergotoxin, are responsible for the symptoms of the gangrenous disease described above, there also exist hypostatic functions of ergot that are distinguishable and medicinally or therapeutically applicable. Some alkaloids exhibit analeptic and ecbolic properties, while others, such as in the instance of LSD<sub>25</sub>, demonstrate therapeutic potential as a curative agent for cluster headaches and other psychotherapeutically treated maladies (Fadiman, 2018). Functions such as these will be discussed for ergot and other psychedelic species, during the discussion of LSD synthesis and ergot alkaloid derivatives.

## **Synthetic Isolation and Manufactured Compounds**

Until recently, lab generated psychedelics have been more prominent in written literature than their naturally occurring relatives. The synthetic isolation of psychedelic compounds has been essential in the pursuit of knowledge and developing a comprehensive understanding of psychedelic species. By first exploring the chemical structure and biochemical mechanisms of action, doors of research opened up in a number of disciplines, including psychology & psychiatry, neurology, biochemistry, and pharmacology. Understanding the chemical foundation and neurophysiological mechanisms by which psychedelic experiences are expressed creates a unique opportunity for further research of the human mind. The nature of psychedelics and the properties that facilitate their action make it possible to study psychological undercurrents that govern experience, emotion, and behaviors to a depth and degree that cannot be matched by any other tool or method currently available (Grof, 2005). With great potential in psychotherapy and psychiatric research, laboratory efforts in synthesis and manufacturing psychedelic compounds have been paramount in the production of knowledge.

This section will discuss a few of the many researchers that contributed to the production of knowledge of psilocybin, lysergic acid diethylamide, and methylenedioxymethamphetamine. In doing so, the vehicles by which psychedelics came to be known and investigated in academic settings will be analyzed and reviewed. It is necessary to keep in mind that, upon the introduction of psychedelic substances into

various fields of research, these substances were investigated as potential medicines, therapeutic agents, and intermediates of chemical isolation techniques. The researchers who contributed to the knowledge and understanding of psychedelics were among the greatest and most recognizable in their respective fields. When academics first encountered psychedelics, they were just like any other chemical compound that warranted further investigation. Psychedelics were found to possess some potential benefit and the scientific method was employed to better understand their functions. There was no way for academics to foresee the path psychedelics would take, nor would they anticipate their subsequent journey from a potentially valuable substance to a drug of abuse. The scholars who undertook psychedelic research did so out of genuine and hopeful interest. Their work was methodical and they approached psychedelics with the same academic rigor as they would any other chemical.

The psychedelic substances and the scholars discussed in this section who researched them have had significant impact in the production of knowledge. While many academics were involved in the process of research, those discussed below either discovered the substances or were critical to the way they came to be understood. Furthermore, a few of the individuals involved in the research would serve to play a role in their proselytization and the mechanisms by which psychedelics came to be a recreational drug of misuse. The following section will discuss the ways in which psychedelics became known in scholarly circles, how they would come to develop a reputation outside of academia, and the individuals who facilitated the process.

### ***Lysergic Acid Diethylamide (LSD)***

Swedish chemist Albert Hofmann completed his doctoral work at the University of Zurich in 1929, where he first demonstrated competency as an accomplished plant and animal chemist. After only three months, Hofmann published a thesis on the chemical structure of chitin via degradation. This was met with a doctoral rating of “with distinction,” one of the highest ratings given to research theses (Hofmann, 1969). Joining the Sandoz pharmaceutical-chemical department, Hofmann began research on cardioactive *Scilla* glycosides for treatment of cardiac insufficiency, working under the founder and director of the pharmaceutical department, Professor Arthur Stoll. Hofmann was able to elucidate the chemical structure of the *Scilla* glycoside, revealing its close structural relationship with toxic substituents and their dangerous potential (Hofmann, 1969). Hofmann quickly grew in the industry, developing a formidable reputation as an authority in chemical research.

Hofmann’s success at Sandoz allowed him to continue research of his own accord on the subject of his choosing. He requested permission to investigate ergot alkaloids. Having received reports of new developments in the synthesis of water-soluble ergot alkaloids from a completing lab, Hofmann thought it prudent to initiate his own investigations, lest Sandoz lose their lead role in the field of medicinal research (Hofmann, 1969). Hofmann’s superior, Arthur Stoll, began the first investigations on ergot alkaloids in 1917, successfully isolating ergotamine, the first alkaloid obtained in pure chemical form, in 1918 (Hofmann, 1969). Sandoz abandoned ergotamine research after it was marketed to be used in therapeutics as a hemostatic remedy in obstetrics and in the treatment of migraines (Hofmann, 1969). Stoll granted Hofmann’s request with

apprehension, cautioning him by saying, “I must warn you of the difficulties you will face... [Ergot alkaloids] are exceedingly sensitive, easily decomposed substances, and less stable than any of the compounds you have investigated, but you’re welcome to try,” as Hofmann described in his autobiographical account, *LSD: My Problem Child* (Hofmann, 1969). Knowing the difficulty associated with chemical analysis of ergot alkaloids, actively avoided by his peers and predecessors, Hofmann proceeded with “creative joy and eager anticipation” into the uncharted field of ergot alkaloid research (Hofmann, 1969). Hoffman began investigating the alkaloids derived from the fungus, *Claviceps purpurea*, for their potential as an analeptic (Hofmann, 1969). Hofmann’s first success in his analysis resulted in the discovery of the obstetric medicament, ergobasine, which remains the leading hemostatic remedy used today under the trade name, Methergine (Hofmann, 1969).

In 1938, Hofmann discovered LSD<sub>25</sub>, known as lysergic acid diethylamide. Given the success of ergobasine, LSD<sub>25</sub> was briefly investigated as an analeptic; however, the research concluded when the results indicated LSD<sub>25</sub> was not responsible for any analeptic effect (Hofmann, 1969). Hofmann left LSD unexamined for five years, during which other ergot alkaloids he synthesized were pharmaceutically produced as peripheral circulation and cerebral function enhancement medications (Hofmann, 1969). Hofmann turned to LSD<sub>25</sub> with renewed interest and began reinvestigating the compound in 1943. During the renewal of his investigations, Hofmann unintentionally ingested LSD after having been accidentally exposed to a diminutive amount of the compound; Hofmann began to feel the same sensations that would later be associated with LSD itself. This



would be historically recorded as the first LSD experience, earning him the title “the father of LSD.”

Intrigued by the effects of LSD, Hofmann planned a series of self-experiments to ascertain the nature of the effects he experienced. Beginning with the smallest known dose expected to produce effects, Hofmann ingested a 250-microgram dose of lysergic acid diethylamide (Hofmann, 1969). Hofmann recorded his experience, describing feelings of euphoria, delirium, visual distortion, anxiety, sensation of well-being and renewed life, connectedness, kaleidoscopic visuals, and other sensory perception augmentations (Hofmann, 1969). This would be the first recorded, full-dose psychedelic experience. Academics, such as Thomas Roberts, would later refer to this experience as “Bicycle Day,” as Hofmann went for a bike ride while experiencing the effects of LSD<sup>2</sup>.

Hofmann’s experiment showed that LSD<sub>25</sub> behaved as a psychoactive substance with extraordinary potency. At the time, there was no academic literature indicating any known substance to have such profound psychic effects at such low doses (Hofmann, 1969). Hofmann indicated the presence of no abnormal symptoms other than dilated pupils: pulse, blood pressure, and breathing were all normal (Hofmann, 1969). Even more perplexing was the fact that he could recall every detail of his inebriated state. This indicated that cognitive function remained uninterrupted, despite the profound degradation of a normal worldview during the enhancement in sensory perception mechanisms (Hofmann, 1969). Furthermore, LSD was able to produce a far-reaching, powerful state of inebriation without resulting in a hangover, leaving Hofmann in excellent physical and mental condition (Hofmann, 1969).

Though there was a rule in the Sandoz lab expressing that any substances were to be “stricken from research if found to be lacking pharmacological interest”, as LSD<sub>25</sub> had once been, Hofmann was persuaded by his experimentation to reintroduce LSD into clinical research (Hofmann, 1969). Convinced that LSD would be of use in pharmacology, specifically neurology and psychiatry, Hofmann reported his findings to the director of the pharmacology department, Rothlin, and continued his experimentation (Hofmann, 1969). The first to repeat Hofmann’s experiment were two of his colleagues and Rothlin at one-third of the dose, which induced the same psychosomatic effects (Hofmann, 1969). The value seen in the results of Hofmann’s experiment opened up further avenues of research.

Lysergic acid diethylamide research continued at Sandoz, beginning with toxicity investigations and animal experiments. Despite the known toxicity of ergot substances, it was found that LSD has an extraordinarily low toxicity. A lethal dose for humans remains unknown (Hofmann, 1969). To date, there have been no human casualties as a direct consequence of LSD poisoning. Other investigation into the psychic effects of LSD proved to be difficult to determine in lower animal populations, presumably as a result of their lack of higher intellectual functioning and development. As research continued, it was determined that while LSD is absorbed easily and completely through the gastrointestinal tract, it is very rapidly absorbed and distributed by the blood stream (Hofmann, 1969). Typically, the rapidity of the circulatory system elicits dramatic changes in the brain, specifically the forebrain with respect to LSD, where it was anticipated that the perceptual alterations originated from (Hofmann, 1969). Unexpectedly, the lowest concentration was found in the forebrain; instead, it remained

most concentrated in the centers of the midbrain integral to the regulation of emotion and the propagation of major nerve impulses in the brain (Hofmann, 1969). Furthermore, LSD was determined to be quickly metabolized and excreted, while the psychic effects continued after LSD was no longer detectable, indicating LSD acts as a trigger for biochemical, neurological, and psychological mechanisms that persist in the absence of the active principle (Hofmann, 1969). Although Hofmann could not ascertain the biochemical mechanisms through which LSD exerts its effects, his research served to provide an example of how LSD might serve as a tool in neuropsychological research.

Lysergic acid diethylamide was made available to research institutions, psychiatrists and physicians in 1947 under the trademark name, Delysid, for its potential in medicinal-psychiatric use (Hofmann, 1969). Playing the role of a drug aid in the context of psychoanalytic and psychotherapeutic treatment, LSD gained popularity in clinical treatment settings, notably by Ronald Sandison in European practice and Humphry Osmond in North America (Hofmann, 1969). Sandison developed and employed a strategy called psycholytic therapy, in which moderate doses of LSD were administered in several successive therapy sessions in an effort to “lyse” or dissolve tension and conflicts of the human psyche (Hofmann, 1969). Alternatively, American psychiatrist, Humphry Osmond, developed a similar therapy, involving multiple therapy sessions specific to preparation, a single high-dose administration, and follow-up (Hofmann, 1969). Humphry Osmond was the first among his peers to attempt to treat alcoholism and addictive behaviors with LSD use (Aaronson, Bernard, & Osmond, 1970). Over the course of his research, Osmond successfully treated over 2000 alcoholics with near 100% positive improvement and less than 45% relapse from any of his patients over a two-year

period (Aaronson, Bernard, & Osmond, 1970). For the sake of comparison, the most common form of alcohol treatment, Alcoholics Anonymous, reported a success rate of 12% of total patients successfully completing the program, and 31% of those patients relapsing within one year (ASAM, 2015). Osmond and his colleagues also initiated studies aimed at using psychedelic therapy as a means to treat terminal patients with end-of-life anxiety, with similar success (Aaronson, Bernard, & Osmond, 1970).

While some academics took to using psychedelics as a therapeutic tool, others began investigating Delysid as a psychomimetic, a substance that “mimics” the psychosis or psychotic mind of patients afflicted with schizophrenia and other related psychological maladies (Grof, 1980). The model implies that, under the influence of LSD, researchers and professionals would be able to experience first-hand similar mind-states as their patients, allowing them to develop a more sincere understanding and insight into the thoughts, emotions, and behaviors of their patients (Grof, 1980). It was thought that the consumption of LSD by therapists and researchers would offer a valuable, sympathetic, and compassionate understanding of the experience that the patient would be undertaking.

Research into the implications and potential for LSD to be employed as a therapeutic tool was adopted by many academics after Sandoz made Delysid available for distribution. One such scholar, Stanislav Grof, began his career in LSD psychotherapy shortly after Delysid hit the market. He would later become well acquainted with Hofmann and would develop the safety techniques and protocol for effective psychedelic therapies. His involvement in the methodological approach to and employment of LSD-assisted psychotherapy will be discussed in greater detail below. LSD would continue to

play a role in the fields of psychological and physiological research, as well as non-ordinary states of consciousness, or any dramatic perceptual change, intense emotion, or profound alterations in cognitive thought processes and behavior, by the mechanism of any psychosomatic manifestation (Grof, 2015). While it showed great promise in these fields, LSD, along with many of its psychedelic relatives, would be illegalized in the 1970s. The psychedelic prohibition was criticized by researchers and academics. They opposed the scientific censorship that would be produced if psychedelics were made illegal. Being likened to the discovery of the stethoscope, the synthesis of LSD was the single most powerful tool with which to investigate consciousness, and it was abruptly taken away (Grof, 1998). Today, after nearly fifty years of prohibition, LSD is still revered as a telescope of the consciousness and an incredibly powerful tool in the discovery and analysis of altered state of consciousness and their implications on the human mind.

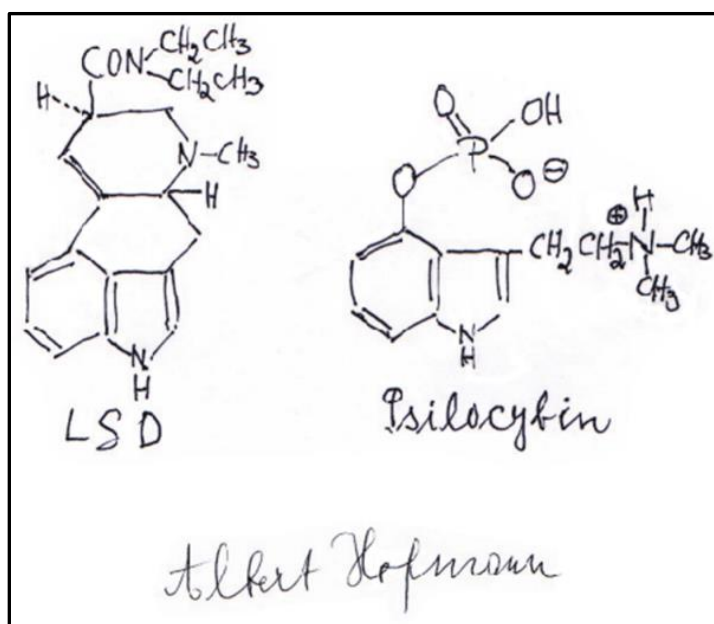


Figure 2 - Albert Hofmann's laboratory journal illustrations of LSD and psilocybin (2)

### *Psilocybin*

Once he was established as an authority in the field of analytic research and an accomplished chemist, Hofmann was often sought out by his peers for assistance in analytic and quantitative research. Being an exceptional academic and the only expert in botanical psychedelic chemistry at the time, it was no surprise that Hofmann was approached by Professor Roger Heim in 1956. An esteemed French mycologist and Director of the Museum National d'Histoire Naturelle in Paris, Heim asked for Hofmann's help to carry out chemical investigation of the sacred Mexican mushroom (Hofmann, 1958). In the two years that followed, Hofmann successfully isolated the psychedelic compounds responsible for the hallucinogenic effects of the *Psilocybe* genus, psilocybin and psilocin (Hofmann, 1959). During this time, Hofmann reportedly ingested approximately thirty-two different psilocybic species and documented their effects in his work, *The Botany and Chemistry of Hallucinogens*, which was published 12 years later (Schultes & Hofmann, 1973). Though the use of psilocybin for its psychedelic properties by native peoples predates the laboratory isolation by thousands of years, Hofmann's work still warrants mention. The synthetic isolation of the psilocybin species opened the door to further chemical investigation and, later, psychopharmaceutical research.

### ***Methylenedioxymethamphetamine (MDMA)***

In 1912, MDMA was discovered and patented by the German laboratory of Darmstadt, under the operation of pharmaceutical company, Merck. Chemist Anton Köllisch is credited with the discovery. Some speculation exists as to the company's original intention for the use of the newly discovered compound. There are those who claim MDMA was to be advertised and dispersed as an anorectic (appetite suppressant). Some insist there was no substantial claim to medical utility by Merck. Others assert MDMA was originally synthesized as an epinephrine analog. According to the available chemical literature, methylenedioxymethamphetamine was synthesized and patented as a chemical alternative to the clotting agent, *sytic hydrastinine* (Bernschneider, et al., 2006). Originally known by the name *methylsafrylamine*, MDMA was synthesized, patented, and then effectively left untouched (Bernschneider, et al., 2006). Some primary toxicology studies were conducted in Poland during the 1950s to confirm structure and derivatives, but no major pharmacological studies were conducted.

American chemist Alexander Shulgin independently isolated MDMA in 1965 while investigating chemical compounds at Dow Chemical Company, and was eventually be credited with the introduction of MDMA to the fields of psychology and psychopharmacology (Benzenhöfer, 2010). Frequently thought of as the “Godfather of MDMA,” Shulgin would go on to advocate for and personally experiment with the psychedelic effects of MDMA. Shulgin and his role in the popularization of recreational MDMA will be further discussed below. His publications and advocacy would prove to be integral to the introduction and rise in popularity of MDMA use in Chicago during the 1970s (Benzenhöfer, 2010).

When MDMA research was still in its infancy, many academics were quick to realize its potential, particularly in the field of psychiatry. As laboratory investigations progressed, so too did clinical research. Many scholars became involved in the process and promoted the use of MDMA in clinical therapy. Two scholars that contributed to the raise in the popularity of MDMA use in psychiatric circles will be discussed below. One scholar has been attributed with the clinical promotion of MDMA and the other analyzed the various ways in which MDMA could be utilized in a therapeutic setting.

Leo Zeff, an American psychologist, was a major proponent in advocating the use of MDMA in psychiatry and psychotherapy. In 1961, Zeff was practicing Jungian psychology when he was introduced to LSD (Stolaroff, 2005). Seeing great potential in the medicament, he swiftly introduced the use of LSD in his psychotherapy sessions. Over the years he practiced LSD-psychotherapy, the results he acquired and the overall experience of his patients included an expedited rate of recovery, fewer sessions, and less cost to the patient (Aaronson & Osmond, 1970). Shulgin introduced Zeff to MDMA in 1977 (Stolaroff, 2005). Already having experience with psychedelic-assisted psychotherapy and being thoroughly impressed with the effects of MDMA, Zeff enthusiastically took it upon himself to promote the use of MDMA in psychiatry, just as he did with LSD (Brown, 2002). Between 1961 and 1969, Zeff would go on to train an estimated 4,000 professionals in safe and effective methods of administering psychedelics to patients (Stolaroff, 2005). Zeff's participation in the advocacy of psychedelics through the clinical and professional world was critical to the therapeutic foundation established by the earliest trials of psychedelic-assisted psychotherapy. His contribution to psychedelic sciences and the overall status of psychedelic awareness



cannot be understated. Additionally, Zeff was the first to coin the term “Adam,” a common underground name for MDMA, as it would “reduce [those who consume it] to their innocent and primordial state” (Stolaroff, 2005). After being introduced to and utilized in the field of psychiatry, MDMA would go on to make a great contribution to the professional understanding of healing and the mind, up until its prohibition in the mid-1980s (Stolaroff, 2005).

Between 1980 and 1985, the popularity of MDMA-assisted psychotherapy grew rapidly. Although many of the psychologists integrating MDMA into their practice were trained by Zeff, the discipline as a whole lacked an discipline-wide model of administration. Understanding this, George Greer, took to designing a comprehensive clinical model. Fortunately, Greer stumbled upon the work of Stanislav Grof, who had perfected a model for psychedelic psychotherapy, one that stressed the importance of nondrug factors such as “set and setting” (Greer & Tolbert, 1998). In a study conducted over five years, Greer supervised over 80 different MDMA-assisted psychotherapy sessions, employing an amalgamation of Zeff’s and Grof’s administration and therapeutics techniques (Greer & Tolbert, 1998). With more than 90% of their subjects reporting their experiences as personally significant and generally positive, Greer and Tolbert concluded MDMA to be a valuable tool in psychotherapy, stating:

From our own observation and those of other therapists, we believe that, in the right circumstances, MDMA reduces or somehow eliminates the neurological fear response to a perceived threat to one’s emotional integrity. Though we do not understand how MDMA

reduces the experience of feeling threatened, it does seem to reduce the primary somatic symptoms of fear... We theorize that presumably unresolved emotional conflicts from the past had caused the formation of conditioned fear responses, which made it desirable for clients to avoid having feelings or thoughts associated with the conflicts. Without the conditioned fear, access to the information contained in these thoughts, feelings, or memories was enhanced, allowing the clients' value judgments to be based on more accurate information... With fear removed, a corrective emotional experience could occur (Greer & Tolbert, 1998).

They further hypothesized that MDMA alone was not responsible for the curative results observed in patients, but rather was instrumental in allowing the client to assess their own emotions based on what they learned during the uninhibited emotional state during the MDMA session (Greer & Tolbert, 1998). Cognition remained undistorted, allowing clients to assess themselves, rather than be assessed. The study discusses the need for further investigations including a double-blind study, that would adhere to scientific protocol. However, they discussed the caveat that a double-blind study may not be productive due to the nature of psychedelics with their profound effects and the lack of a suitable placebo (Greer & Tolbert, 1998). The problem of having an unsuitable placebo for double-blind experiments would prove to be difficult to rectify. The protocol of the scientific method requires an appropriate double-blind, so as to account for confounding

variables of the study design. This issue is significant in psychedelic studies, as a modified scientific approach was needed to accommodate for this discrepancy. Different researchers took different scientific approaches to address the failure of double-blind studies, including modified statistical analyses and the use of other psychoactive compounds. The methodology employed in subsequent double-blind studies will be discussed further below. It is worth mentioning that, although the study was published in 1998, after the enactment of the Federal Analog Act instituted in 1986, the study was conducted between 1980 and 1985, before MDMA and associated analogs were formally illegalized.

### ***Alexander Shulgin (Sasha)***

Alexander Shulgin, known as Sasha to friends, began his academic studies in organic chemistry at Harvard University at the age of 16 before serving in the U.S. Navy during World War II (Benzenhöfer, 2010). After his return, he continued his studies in chemistry and biochemistry at the University of California at Berkley (Benzenhöfer, 2010). After completing his doctoral work, Shulgin took a position at Dow Chemical Company in 1955. Sometime in the transition between academics and industry, Shulgin reportedly tried mescaline for the first time in the same year (Benzenhöfer, 2010). Only a few years into his employment, Shulgin successfully developed the world's first biodegradable insecticide for Dole (Dow Chemical Company) (Benzenhöfer, 2010). Given the success of the insecticide, Dow gave Shulgin free rein to experiment, design, and research at will. With this newfound freedom, Shulgin turned to psychotomimetic

and psychoactive compounds. Over the next few years, Shulgin would synthesize and test the effects of more than 200 potentially psychoactive species, often testing the substances himself or with a small group of collaborators (Benzenhöfer, 2010). These experiments included MDMA analogs, such as MDA, MDE, and MMDA. In 1966, Shulgin left Dow Chemical Company after being admonished for the volume and content of his publications, requesting he refrain from associating the Dow name with his research.

Although Shulgin reportedly synthesized MDMA in 1965, he did not self-administer the compound until 1976, after hearing of its “special effects” from a friend and colleague (Benzenhöfer, 2010). Shortly after his experience, he began a series of dose-dependent experiments with the assistance of a few close colleagues, in much the same way Hofmann did thirty years prior. In 1978, Shulgin and a medicinal chemist by the name of David Nichols of Purdue University published the first report of the psychopharmacological effects on MDMA in humans (Benzenhöfer, 2010). Shulgin would continue his prolific work of MDMA and associated psychedelic analogs, while Nichols would go on to research and determine the pharmacology, molecular mechanisms, and psychotherapeutic implications of a number of different psychedelic compounds.



**Figure 3 - Alexander and Ann Shulgin (3)**

Shulgin went on to live as an independent research and consulting chemist, designing and building a private laboratory in his California home with his wife, Ann (Benzenhöfer, 2010). Over the next number of years, Ann and Alexander, designed, synthesized, tested, and analyzed approximately 179 different phenethylamines, among other psychoactive tryptamines and amphetamines (Benzenhöfer, 2010). They would publish their findings over two decades later, in 1991, with the title, *PIHKAL: Phenethylamines I Have Known and Loved* (Shulgin & Shulgin, 1991). Shulgin received a Schedule I registration for research and cooperation with the DEA in his humble home laboratory after the Controlled Substance Act was instituted (Benzenhöfer, 2010). In early 1990, Shulgin relinquished his registration; in 1993 shortly following the release of *PIHKAL*, his laboratory was raided by the DEA (Benzenhöfer, 2010). The DEA raid was fruitless, in that no illegal substances were found, and Shulgin continued his research in collaboration with many scientists and institutions. For 40 years, Shulgin and his wife continued conducting research and publishing results. Other psychedelic researchers

revered Shulgin as “one of the century’s most important scientists,” referring to him as a one-man pharmacological research factory (Bennett, 2005). Shulgin’s collection of chemical literature on psychoactive molecules and their analogs, one of the largest collections attributed to a single researcher, makes him one of the world’s leading experts in the field of chemical psychedelic science.

### **Additional Analysis of Psychedelic-Assisted Psychotherapy**

As the production of evidence-based research on psychedelics continued between 1940 and 1970, a number of scholars got involved in the process. The academics discussed in this section, Timothy Leary, Richard Alpert, and Stanislav Grof, all had significant impact in the production of knowledge and the ways in which psychedelics came to be perceived by the public. Stanislav Grof was one of the most prolific clinical researchers during the few decades of psychedelic studies. He was the first to produce a safe and effective clinical protocol for psychedelic-assisted psychotherapy, and contributed a great deal to the understanding of how psychedelics act on the human mind and how they are beneficial in treating mental health disorders. Grof was particularly interested in the implications of psychedelics in the psychotherapeutic process of transpersonal psychology. Transpersonal psychology is a “fundamental area of research and application that is based on people’s experience of temporarily transcending our usual identification with our limited biological, historical, cultural and personal self, and,

at the deepest and most profound levels of experience possible, recognizing/being “something” of vast intelligence and compassion that encompasses/is the universe” (Grof, 2001). From this perspective out ordinary, “normal” biological, historical, cultural, and personal self is seen as an important, but “quite partial (and often pathologically distorted) manifestation or expression of this much greater “something” that is our deeper origin and destination” (Grof, 2001). Timothy Leary and Richard Alpert were two of the most infamous psychedelic researchers. Leary, specifically, is often attributed with the over proselytization and eventual condemnation of psychedelic substance due to his involvement in the antiwar and countercultures movements of the 1960s and his well-known distrust of the conservative political establishment. This section will discuss the influence these researchers had in the production of knowledge and the ways in which their approach may have supported or failed to support the progress of psychedelics in fields of academia.

### ***Timothy Leary and Richard Alpert***

Just a few years after Hofmann isolated psilocybin, Harvard psychologists began exploring the implications of the compound for psychiatry. Two notable contributors to what would be known as The Harvard Psilocybin Project were Timothy Leary and Richard Alpert (later known as Baba Ram Dass). Receiving their education from University of California at Berkley and Stanford University, respectively, Leary and Alpert became professors of psychology for Harvard University in the late 1950s.

Leary quickly developed a reputation in academic circles after his publication, *Interpersonal Diagnosis of Personality*, was named the best psychotherapy book of 1957 (Leary, 1983). Leary operated under the personal maxim of “transaction,” a philosophy of treatment asserting that psychologists should not remain detached from their patients, but instead should “get involved” and engage in the events they are studying with the anticipation to change as much or more than the subject of their inquiry (Leary, 1983). Leary became a recognizable psychologist, colleague, and professor for his unique perspective. He became known his emphasis of “inner potential and personal growth through self-reliance, so that patients could avoid dependence on authoritarian physicians and dogmas” (Leary, 1983). This maxim would cause Leary to pursue venues and applications of psychotherapies previously unexplored.

Alpert and Leary shared a common interest and formal experience in psychoanalysis and psychotherapeutic research. They also shared the same habit of working late and keeping night office hours (Leary, 1983). The two colleagues quickly formed a tremendous comradery, which would eventually develop into to co-authorship, cooperative research, and, as demonstrated here, a longstanding connection through their work and friendship. One late-night, “over a shared beer, a midnight sandwich at Harvard square, and a pack of Marlboros,” they realized they shared a similar clinical philosophy (Leary, 1983). They agreed with the sentiment that “psychology has a legitimate interest in how cognition, perception, and emotion are affected by mind-altering substances,” a psychological theory that was only in its infancy at the time (Harvard, 2017). With newfound inspiration and a willing compatriot, Leary and Alpert forged a new path in psychological studies.



In 1960, Leary called a conference with the famous Bill Wilson, the founder of Alcoholics Anonymous (AA), to discuss methods of changing human behavior (Leary, 1983). Even with the success of AA, Wilson suggested that physiological or chemical stimuli were necessary to “loosen neurological bonds” – a theory he developed after observing the substantial time it took to alter human nature and recondition habits, and the inconsistent results it yielded (Leary, 1983). At the time, there was no substance or chemical known to illicit such results. Intrigued by Wilson’s postulation, Leary reached out to Frank Barron, a research psychologist for the Institute of Personality Assessment and Research at Berkley, and facilitated his transfer to the psychology department of Harvard (Leary, 1983). Beginning his investigation into chemically-assisted psychotherapy, he learned that Williams James, the founder of the Harvard Psychology Department, and Morton Prince, a pioneer American psychologist, both advocated for the use of “brain-change” drugs and the exploration of altered states of consciousness (Leary, 1983). After receiving word that Sandoz Laboratories had isolated LSD and psilocybin, Leary, Barron, and Alpert had all the material needed to propose a new line of research. The Harvard Psychedelic Drug Research program became formally instituted in 1960 (Leary, 1983).

The professors began investigating psilocybin as a tool to facilitate altered states of consciousness, during what would later be referred to as the Harvard Psilocybin Project. By the time the project received approval and began the initial stages of investigation, they became aware of an international network of scholars experimenting with the same substances, all operating under the common premise that such plants and substances, as expanders of human consciousness, could revolutionize psychology and

philosophy (Leary, 1983). Leary's notion that professionals ought to be involved in the psychotherapeutic process led them to establish an experimental protocol that was unconventional. They would not follow the medical model of administering the substance and the observing, instead adopting the practice of consuming the compound themselves during the sessions, a practice they called "existential-transactional" (Leary, 1983). Already, due to the unorthodox application, there was conflict among other scholars, where some urged them to "work within the system," stating, "society has assigned the administration of drugs to the medical professional for healing disease. Any who gives or takes drugs is a fiend. Play ball with the system. Capture the medical profession the way Freud did" (Leary, 1983). Disregarding the thinly veiled threat, they persevered. By the following spring, they had administered psychedelics to over 200 subjects, with over 85% of the participants reporting the experience to be the most profound and educational of their lives (Leary, 1983). In comparison, most therapies, including psychoanalysis, had only reported a 33% improvement over the course of treatment (Leary, 1983). Moreover, researchers involved in other international studies were experiencing similar results. Still, other academics were unsatisfied. The researchers found themselves under academic siege for their unorthodox approach, which seemingly challenged the scientific merit of the research and promoted the recreational misuse of psychotropic drugs. While some of their colleagues at Harvard disapproved of Leary and Alpert's methods, the researchers continued with their approach.

With such positive results, the team of researchers was busy publishing their results and continuing the research. They executed an array of studies in this time, including but not limited to Concord Prison Experiment and the Marsh Chapel

Experiment (commonly known as the Good Friday Experiment). The former was a measurement of the effectiveness of psychedelic psychotherapy in recidivism rates of inmates. There later was a study conducted by Harvard student Walter Pahnke, who would eventually conduct his own line of experimentation, devoting his career to psychedelic investigation. The Good Friday Experiment would be the first and one of the most profound studies done involving the psychedelic experience and spirituality or the elicitation of profound religious experience. The significance of Pahnke's experiment will be discussed more completely below. However, it is worth mentioning that the Good Friday experiment was the first of its kind to administer psilocybin to a collection of religious leaders, assessing the predisposition of religious individuals to experience heightened spiritual and mystical sensation over the duration of the psychedelic experience.

Over the duration Leary and Alpert's exploration, their research suffered from external, non-academic, influences. For example, the involvement of Harvard students as test subjects became something of a problem when complaints from parents came to the attention of the Harvard administration (Leary, 1983). While the Harvard administration was solidly in support of the research and quest for knowledge, which was receiving international attention, the politics of being an educational institution challenged the research (Leary, 1983). In efforts to maintain their professional and academic reputations, Leary and Alpert agreed to limit volunteers to fully informed graduate students, and prohibit undergraduate students from participating. Unfortunately, intentional obstruction to their research continued when professors who did not condone or support their efforts began coercing the graduate students involved. More than a few graduate student

researchers withdrew from the program after receiving “ominous signals” from other faculty that their careers would be ruined and their academic reputation corrupted if their involvement continued (Leary, 1983). Recognizing the potency of the Harvard name, and deeply disturbed by threats to the students and administration, Alpert and Leary agreed to dissociate from Harvard and form a new organization (Leary, 1983). Their research continued under the domain of the Federation for Internal Freedom (IFIF), a non-profit association aimed at setting up research centers to conduct psychedelic drug training sessions (Leary, 1983). A mass publicity response was created after a letter Leary sent to the Harvard Crimson was intercepted by Boston papers, describing the intentions of the IFIF (Leary, 1983). By the spring of 1983, Alpert and Leary received over 500 applications (Leary, 1983). The IFIF would contribute considerably to the increase in popularity of psychedelics in the United States and would continue to contribute valuable results to the ongoing production of psychedelic knowledge.

After Leary and Alpert resigned, popular media, such as the *Harvard Crimson* reported the professors as having been dishonorably dismissed after presumably missing office hours and administering psilocybin to an undergraduate off-campus (Harvard Crimson, 1962). Scholars would condemn and discredit their research on the grounds of invalidity and failure to adhere to formalized scientific protocol (e.g. few or no control groups, non-random selection and coercion of subject volunteers, unorthodox collection methods, etc.). While there are alternative scientific methods with which to conduct scientific research outside of normal conventions, it was speculated that Leary and Alpert’s methods were too extreme to result in findings of scientific value. Both Alpert and Leary continued their investigations despite criticism; however, they were subject to

scrutiny by academic communities. Leary would become a prophet of the counterculture movement while Alpert went on to investigate the implications of spirituality in psychedelic intervention.

### *Stanislav Grof*

Stanislav Grof, one of the founders and chief theoreticians of transpersonal psychology, has over sixty years of experience in research of non-ordinary states of consciousness and applied psychotherapeutics (Grof, 2017). Grof received his training and education at Charles University School of Medicine and Czechoslovakian Academy of Science, where he acquired a degree in medicine (M.D.) and medicinal philosophy (Ph.D.), respectively (Grof, 2017). In the mid-1950s, Sandoz pharmaceutical company approached the Psychiatric Research Institute in Prague, where Grof was working. Sandoz requested studies be conducted on LSD<sub>25</sub> to determine the potential for therapeutic properties (Purdue University, 2008). Eventually becoming chief investigator, Grof came to be involved in the research and devoted much of his career to examining the therapeutic potential of psychedelic substances.

Grof is a prominent figure in the development of safe and effective techniques for facilitating psychedelic-assisted psychotherapy, specifically with LSD. Over his career, Grof observed over 4,000 LSD psychotherapy sessions, employing psycholytic and psychedelic therapy principles and eventually incorporating analitic and hypnodelic models (Grof, 2015). While his research allowed him the opportunity to evaluate each of the therapeutic models, Grof describes the latter two as being relatively ineffective and

highly specialized (Grof, 1980). As a psychoanalyst by trade, Grof originally favored the psycholytic model but later developed a greater appreciation for the effectiveness of the psychedelic model (Grof, 1980). Though both approaches have their benefits, Grof believed psychedelic therapy tended to yield safer and more effective results. After careful analysis, Grof asserted:

High doses and internalization of the process lead to greater depth, intensity, and spontaneous flow of the experience; this results in more emotional turmoil, but also in a better chance for positive breakthrough...psychedelic session(s) can achieve dramatic therapeutic result by penetrating or bypassing the psychodynamic levels and utilizing powerful mechanisms of transformation on the perinatal and transpersonal levels (Grof, 1980).

While the higher doses of the psychedelic model elicit greater psychosomatic responses, they may not necessary result in “peak” or “existential” experiences. That, however, does not impact the probability of yielding positive results. While a “peak” experience is certainly helpful in the therapeutic process, its occurrence is “*condition sine qua,*” meaning it is not essential for improvement (Grof, 1980). This indicates that the benefit of psychedelic intervention is not predicated on the magnitude of perceptual augmentation associated with psychedelic substances, but rather, they have an innate ability or mechanism that facilitates the psychotherapeutic process. Grof hypothesized that the “experient does not gain a rational understanding of the process, but rather, reaches instant comprehension by losing his or her separate identity” (Grof, 1980). This

phenomenon, commonly known as “ego dissolution,” has been a subject of contemplation in many disciplines and has recently resurfaced as a proposed model for understanding of the psychedelic experience. The value of ego dissolution will be discussed further below. It is worth mentioning, however, that Grof was one of the first scientists to postulate the involvement of ego dissolution in the effectiveness of psychedelic psychotherapy.

The strategy Grof developed for operationalizing psychedelic therapy was widely adopted by other academics participating in psychedelic research, including scholars such as Osmond, Greer, Nichols, Alpert, Leary and Shulgin, among others (Grof, 2005). His process would become the clinical standard for executing a safe and effective psychotherapy. Grof constructed a 3-phase process with separate sessions for each phase. The first step is preparatory. Preparation sessions closely resemble traditional therapy. In doing so, the therapist is given the opportunity to fully understand the patient, their personality, behaviors, concerns, compulsions, and other facets of the psyche that might influence one’s mind state (Grof, 1980). Largely focusing on life history, traumas, personal philosophy, spirituality, and religion, the information gathered during this stage is invaluable during the introduction of the drug, as well as the sessions following the experience (Grof, 1980). Furthermore, it gives the client a sense of comfort and an opportunity to develop a comfortable relationship with the therapist, insomuch as an interpersonal reservation would impact the experience itself and the potential for betterment (Grof, 1980). Paramount to the preparation stage is the development of a trusting relationship between therapist and client, allowing the therapist to act as a

dependable and reliable guide and the client to be in a position to fully immerse themselves in the experience (Grof, 1980).

The second phase is the administration of the drug. Largely emphasizing set (or psychological mind set of the individual), and the setting or environment in which it is taken to modulate the session, Grof expresses the environmental factors that could potentially affect the experience. Ideally, the session would take place on a ground-floor suite, with a kitchenette and lavatory, comfortably furnished and homey (Grof, 1980). The suite should be isolated from the rest of the facility, allowing both client and therapist to continue the session uninterrupted and without unnecessary social interaction or external distraction (Grof, 1980). In doing so, the client would be allowed to focus solely on themselves without having to inhibit themselves on the basis of social acceptability or any perceived burdening to other patients or visitors (Grof, 1980). After dosing and administration, which ought to be in the morning due to the longitudinal effects of the substance, clients are encouraged to lie supine when they first become aware of the effects and focus on the “here-and-now” (Grof, 1980). While talking is discouraged during the session, the use of music is supported. The therapist should remain passive but supportive, acting as a guide only when called upon (Grof, 1980). Although complications during a session are rare, they can occur, and the therapist may take action. Grof illustrates the appropriate mode of action in a comprehensive and thoroughly detailed guide titled *Critical Situations in LSD Sessions* (Grof, 1980). Although the psychedelic experience is unique to each individual, a hospitable and comforting environment facilitates the progress of the session and promotes safety and well-being.



The third and final stage of psychedelic therapy is what Grof refers to as “integration of the drug” (Grof, 1980). Effectively a follow-up session, the integration phase is an opportunity for the client and therapist to discuss and decipher the thoughts, emotions, behaviors, and sensations felt during the experience (Grof, 1980). During this session, the client is encouraged to talk through their experience, write a detailed account, or express themselves in various art forms, while the therapist is, again, to act as a guide rather than offer answers (Grof, 1980). The integration phase may span many sessions while the client is allowed to sort through the psychological effects of the experience. Though each phase is separate and distinct, each offers unique insight and is equally essential for a successful therapy.

While there seems to be very little drawback or negative consequence to psychedelic therapy when properly executed, Grof articulated two concerns. The first of Grof’s criticisms was the sudden and dramatic clinical improvement. He was concerned that improvement could occur without the mechanism of change being wholly understood (Grof, 1980). The second was that, however likely the probability, there was no guarantee that a positive and transformative experience would occur (Grof, 1980). Despite these, Grof considered psychedelic therapy to be a progressive means of psychotherapy but that could also be employed as a non-clinical therapy to promote spiritual and personal growth.

In the thousands of psychedelic psychotherapy sessions Grof conducted, he witnessed non-medical events that suggested other prospective uses of LSD in a non-therapeutic manner. Categorizing non-medical psychedelic investigations into five categories, Grof postulated that psychedelics had potential to go beyond medicine and

psychiatry. The five categories go as follows: training sessions for mental health professionals, administration of LSD to creative individuals, drug-induced religious and mystical experience, personal growth and self-actualization, and the development of abnormal ability (Grof, 1980). As discussed above, LSD was once used by professionals as a psychomimetic, or a method by which professionals could experience first-hand the inner world of their psychotic patients. Grof believed this methodology would enhance the therapists' understanding of their patients. He thought it would enhance their ability to act as sympathetic guides in the process (Grof, 1980). Additionally, Grof promoted the idea that the administration of LSD would enhance artistic ability, allowing individuals to find access to deep sources of inspiration in their subconscious minds. He asserted that the LSD-induced creative experience would enhance artistic expression and allow artists to reach extraordinary vitality and originality (Grof, 1980). Moreover, Grof did not limit his hypothesis of enhanced creativity to artists but included mathematicians and other forms of "art". Referring to a study done in which men of various occupations were given mescaline and asked to develop problem solving solutions, Grof described the results as "[having] lowered inhibitions and anxieties, enhanced the fluency and flexibility of ideation, heightening the capacity for visual imagery...and, in some instances, allowed immediate visualization of a completed solution" (Grof, 1980). Such positive results indicated to Grof that LSD may not be limited in use to psychiatric intervention, but may also be applied to problem solving and other enhancements of the mind. Grof went on to discuss the use of psychedelics in other non-therapeutic contexts, such as the potential for LSD intervention to promote spiritual, religious, and mystical experiences. Given the historical record of psychedelics having been used with religious or spiritual intent, Grof

argued that there was no way to differentiate between “authentic mysticism” and “chemical mysticism” (Grof, 1980). He claimed that there was undeniable potential for psychedelics to enhance spirituality and facilitate self-actualization for individuals during non-clinical therapeutic intervention.

For all of his research and work in the field of psychedelic sciences and his promotion of LSD-assisted psychotherapies, Grof was awarded the title of “Grandfather of LSD” by none other than Albert Hofmann, the father of LSD, himself. Grof encouraged only the safe and purposeful use of LSD, criticizing the overeager proselytization of LSD and psilocybin by Timothy Leary, and the naiveté and ignorance concerning non-ordinary state of consciousness proliferated in Western culture (Grof, 2005). Referencing a study done by psychoanalyst Sidney Cohen describing the side effects of LSD and mescaline treatments, Grof asserted that as long as administration of the substance was done responsibly and in an appropriate setting, there would be little to no negative aftereffects (Grof, 1980). After psychedelic substances were made illegal, Grof was forced to abandon his work in with LSD. Determined to continue his work in non-ordinary states, Grof developed what is referred to as “holotropic breathwork,” a technique in which clients are encouraged to breath deeper and faster than normal, producing a non-ordinary state (Grof, 1998). Grof continued this line of investigation with hopes of developing a technique as effective as psychedelic therapy. To this day, Grof remains an eager advocate for the safe and responsible use of psychedelics in both therapeutic and non-therapeutic contexts.

## **Spirituality and Mysticism**

Psychedelics were seen as having incredible potential in the fields of chemistry, psychiatry, and neurobiology. There were some scholars, in various other disciplines, that believed the value of psychedelics was not solely limited to medical and psychotherapeutic intervention. Many academics saw an opportunity to revisit the history of psychedelics and assess their value in understanding the human mind, specifically in the contexts of artistic creativity, spirituality, and mysticism. This section will consider some of the scholars in fields such as literature and religion and how their perspectives and approaches impacted the understanding of psychedelics. Aldous Huxley, a novelist and essayist, saw value in psychedelics to facilitate creativity of the mind. Huston Smith focused on the religion implications and import of psychedelics in both historical and modern religious contexts. Charles Tart, while formally an academic in the field of transpersonal psychology, was the first to challenge the scientific perspective of spirituality research. Studies with respect to spirituality were previously viewed as having no scientific value. Tart asserted that investigations into human spirituality were, in fact, valuable to the scientific community and psychedelics could be used as tools to do so. These are just a few of the many scholars that served to inform the multidisciplinary understanding of psychedelics. By describing the discussion of psychedelics in disciplines other than psychiatry and medicine, a comprehensive understanding of psychedelics can be produced.

Since the awakening of psychedelic studies in the early 1900s, the majority of scientific research remained in clinical and laboratory settings. There was a large focus placed on psychedelics in psychiatry, neurobiology, biochemistry, and other strictly “science” based disciplines. However, there were also academics that saw the potential for psychedelics to act not only as psychotherapeutic medicaments but also as tools for the enhancement and exploration of spirituality. In an effort to create a distinction between the clinical use of psychedelics and their religious and spiritual functions, the term “entheogen” was introduced. An entheogen is any psychedelic compound taken under religious context or with the intent of spiritual enhancement (Roberts, 2017). No less valuable to the scientific exploration of the psychedelic experience, academics in the fields of philosophy, world religions, and applied ethics have also investigated the implications of psychedelics and entheogens and the multiple avenues of their potential application.

### ***Huston Smith***

Huston Smith is best known for his work, *The World's Religions*, comparative religions text that has sold over three million copies. Used in collegiate level religion courses all over the world, Smith is renowned as a leading expert and scholarly authority in the study of religion, spirituality, and religious import. Acclaimed as one of the three greatest interpreters of religion and author of the “most important text in comparative studies, ever,” Smith is revered for his attention to the intricacies of religion and what implications it has on the wisdom of its respective peoples (Prothero, 2017). In a five-part

PBS series broadcast in 1996 called, *The Wisdom of Faith with Huston Smith*, Smith began each installment by reminding his audience that “if we take the world’s enduring religions at their best, we discover the distilled wisdom of the human race” (Smith, 1996). A spiritual man, Smith studied and analyzed thousands of religions and spiritual practices, applying many maxims of such religions to himself and his life, often preferring the practices of Vedanta and Zen Buddhism (Harper, 2017). In the early 1960s, Smith was introduced to and became acquainted with psychedelic drugs, which he believed brought him closer to experiencing God than his studies of religions, spirituality, and mysticism ever had. In August 1960, Smith was approached by Timothy Leary to assist in what would later be known as the Good Friday experiment. Under the direction of the comparative religions scholar Walter Pahnke, a double-blind study was conducted to investigate mystical proclivities of psilocybin (Martin, 2017). In the basement of Marsh Chapel during a two-and-a-half-hour Good Friday Mass service, fifteen theological students and professors ingested psilocybin and were left with what they generally reported to be the deepest religious experiences of their lives (Smith, 2000). Smith continued to work with Leary for a few years following the Good Friday Experiment, eventually becoming disenchanted with Leary’s gospel of “tune in, turn on, drop out”. Nevertheless, he retained his belief that psychedelics had the power to be mind-expanding and believed “the only appropriate way to respond and be mindful of the gift of God’s love [is] to share it with the rest of the world” (Huston, 2010). Smith became a powerful advocate for the religious import of psychedelics and their implications in the production of spiritual wisdom and knowledge and their potential to facilitate greater mystical and religious experiences.

In his critically acclaimed work, *Cleansing the Doors of Perception*, Smith expands on Aldous Huxley's essay addressing the importance of psychedelics. Smith criticizes the scholarly position dismissing psychedelic drugs as having little religious relevance. Instead he urged his academic peers to acknowledge that while psychedelic drugs have light to throw on the history of religion, so too can they serve to illuminate the "phenomenology of religion, the philosophy of religion, and religious life itself" (Smith, 2000). Smith predicated his argument on the idea that psychedelics very possibly spurred the first theological and philosophical discussions, initiating many of the religious perspectives, which, taking root in history, persisted after their entheogenic origins were forgotten (Smith, 2000). Working in tandem with other comparative religion experts, Smith described the first movement of ancient Hindus and Greeks toward "dynamic religion" as being associated with "divine rapture" found in intoxicating beverages. Smith asserted that most religions have arisen from chemically-induced theophanies (Smith, 2000).

Smith's claim would influence other scholarly arguments, such as Grof's, declaring that there was no distinction to be made between chemically and non-chemically induced religious experience. Smith would go so far as to note that even the Bible declares substance-induced psychic states as bearing resemblance to "authentic" religious epiphany, describing Peter's circumstantial defense of those of who were caught up in the Pentecostal experience against claims that they were merely drunk (Smith, 2000). Recognizing that drug-induced spiritual experiences can be achieved without religious intent, Smith expressed a sentiment similar to Grof, in that the main ingredients for every experience are the drug, the set, and the setting (Smith, 2000). Given the right

set and setting, psychedelic substances can induce religious experiences that are indistinguishable from experiences that seemingly occur spontaneously (Smith, 2000). In a study conducted by American psychologist Oscar Janiger that investigated the mystical experiences elicited by psychedelic substances, Smith relayed the result that one-fourth to one-third of participants had religious experiences under natural conditions (Smith, 2000). Among participants with religious proclivities, this statistic increases to a three-fourths majority and, if taken, in a religious setting, nine out of ten participants will have religious or mystical experiences (Smith, 2000). Though not all of the 333 men and women that participated in Janiger's experiment reported as having a mystical experience, 42% expressed that they "were left with a greater awareness of God, or a higher power, or ultimate reality" (Smith, 2000). The significance of such findings probed Smith to further question the relationship between drug-induced mysticism and religion itself.

Acting under the assumption that by observing mystical experiences, religious perspectives can be clarified by their relation to religious life in and of itself, Smith claimed that religion and spirituality could be better understood through the participation in and investigation of psychedelic substances (Smith, 2000). By studying the Native American Church, who practice the entheogenic consumption of peyote (mescaline), and reviewing anthropological findings associated with such use, the evidence Smith accrued suggested the possibility for chemicals to enhance religious life, within a context of faith and under the discipline of religious ritual (Smith, 2000). While Grof maintained that, as a consequence of naiveté and ignorance concerning non-ordinary states of consciousness "Western culture was unprepared to accept and incorporate the mind-altering properties



of LSD and other psychedelics into academic or religious practice”, Smith developed an alternative hypothesis (Grof, 2005). Realizing that nowhere in Western culture were the necessary conditions of set and setting met, the distinctive religious impact of psychedelic substances either went unnoticed or was purposefully negated (Smith, 2000). The religious import of psychedelics was further diluted by the lack of discipline within the counterculture (Smith, 2000). Smith ultimately concluded that although the psychedelic movement between 1940 and 1970 lacked the conditions needed for theophanies to flourish, substances themselves still maintain a religious import (Smith, 2000). Smith continued to be an advocate for psychedelic studies until his death in 2016. Even in death, his reputation as the world’s leading expert in religious studies and his promotion of psychedelic substances have gone on to inspire many of his peers to continue researching religious, spiritual, and mystical experiences and their implications in regard to the psychedelic experience.

Smith approached psychedelics from a religious and historical perspective. He saw psychedelics as a mechanism through which theologies, spirituality, and world religions could be better understood. Smith was not alone in viewing psychedelics through the lenses of alternative disciplines. While Smith contributed to the understanding of the implications of psychedelics in religious and spiritual contexts, Aldous Huxley contributed to the understanding of the influences psychedelics have on creativity and art. Both scholars were well respected in their disciplines, meaning their perspectives carried with them the weight of their expertise. Their perspectives on the potential for psychedelics to transcend their purposes in medical contexts and advance the understanding of spirituality and creativity would prove to be significant broadening

understanding about the diversity of potentially effective and important uses of psychedelics.

### ***Aldous Huxley***

Aldous Huxley was best known for his prolific writings, including the famous novel *A Brave New World* and essay *The Doors of Perception*. Widely acknowledged as one of the greatest intellectuals of his time, Huxley was nominated for the Nobel Prize in Literature seven times and was elected for the prestigious position of Companion of Literature by the Royal Society of Literature in 1962 (Bedford, 1974). Over his career, Huxley published more than fifty books and countless essays and short stories (Bedford, 1974). In the spring of 1953, Huxley was introduced to mescaline, an experience that would be the inspiration for *The Doors of Perception* and would inspire Huxley to advocate for the exploration of the psychedelic experience for the rest of his life and career (Huxley, 1954). Reflecting the sentiment of Grof, Huxley declared that, when administered in suitable doses, under supervision, and in an appropriate environment, psychedelics had the power to augment the quality of consciousness more profoundly than any other substance in the pharmacologist's repertory (Huxley, 1954). Expanding on his perception that psychedelic substances had powerful implications for the study of the mind, Huxley promoted the idea that, insofar as the psychedelic experience elicits a chemically-induced psychomimetic state, it can be presumed that other psychological disorders may also be chemically dependent (Huxley, 1954). Although he pondered this correlation, the majority of his advocacy was aimed at the mind-expanding properties of

psychedelics to elucidate mystical experience, heighten creativity, and enlighten the user. Referring to mind-altering substances as “doors in the wall” of consciousness, Huxley reflected on the natural tendency for humans to pursue different forms of altered states of consciousness, such as those produced by alcohol, smoking, and other drugs (Huxley, 1954). He criticized the Western condemnation of psychedelics and the propensity for Western culture to promote the use of tobacco and alcohol (Huxley, 1954). Huxley described the tendency of Western ideology to label all “doors in the wall” as “dope” and all their takers as “fiends,” while failing to condemn other substances in the same way (Huxley, 1954). “By bypassing the rational side of man and appealing to his subconscious and deeper emotions, the media represented psychedelics as generating psychosis and aggression, a threat equal to or greater than other drugs” (Huxley, 1958). While “the army” of alcoholics continued to grow, while hundreds of thousands of persons were maimed or killed by drunk drivers annually, while cigarettes were linked to lung cancer and other illnesses, the West persisted in condemning the comparatively harmless effects of psychedelics and their purveyors (Huxley, 1954). Comparing the effects of alcohol to the effects of psychedelic substances, Huxley described the inhibition of alcoholic inebriation and its tendency toward belligerence, acts of violence, and traffic accidents (Huxley, 1954). By contrast, Huxley claimed that the influence of psychedelics lends itself more to a quiet, mindful, and reclusive existence for the duration of the experience (Huxley, 1954). Unable to reconcile the promotion of alcohol and tobacco over psychedelics by Western culture, Huxley maintained that the psychedelic experience was superior to that of other mind-altering substances.

Huxley saw great potential for psychedelics in enhancing the creative process and expanding the mind. He firmly believed that psychedelics could offer an artist, poet, novelist, or academic an opportunity to view life in an extraordinarily new way (Huxley, 1960). As the psychedelic experience transcends written language and is inexpressible, it allows for an individual to perceive the world in a profoundly different way, such that it may inspire a person to create (Huxley, 1960). Furthermore, unlike other inebriants, psychedelics leave the user with a complete working memory of the experience, allowing them to apply revelations made during the experience, to other parts of their lives in a way incomparable to that of any other substance (Huxley, 1956). Describing the mystical effects of mescaline and LSD, Huxley illustrated two ways in which psychedelics allow for transcendence and spiritual enhancement. While both vehicles carry consciousness to the same region of the brain, the first mechanism transports the “soul” to a far-off destination (what he describes as being equal to or the same as ego dissolution), whereas the second simply “opens a passage to the mind’s antipodes”, or the unreachable areas of one’s consciousness (Huxley, 1956). Though the same psychological destinations can be discovered through hypnosis or certain forms of meditation, Huxley articulated that psychedelics have the power to produce a much longer range, taking its passenger into the *terra incognita*, or a world unknown and unexplored (Huxley, 1956). Huxley proposed that such substances have the potential to enhance religious experience and the spirituality of the user, as was reflected in his own experience. After his introduction to mescaline, Huxley became a major proponent of psychedelics under safe and appropriate circumstances. He supported the use of psychedelics to expand the mind and enhance the cognitive process. In doing so, he expressed the sentiment that, in having a rigid and

unchanging perception, one may miss the opportunity to realize that the world they have constructed is by no means the only world within the universe of the mind (Huxley, 1958). Imbedded in Huxley's claim is the possibility for psychedelics to access regions of creativity and understanding in the brain that have not been previously sought out that may serve to illuminate a novel understanding of the world and ones place in it.

Both Huxley and Smith approached psychedelics through alternative, scholarly lenses. Their contributions compensate for the potentials of psychedelics that were not addressed in strictly scientific or clinical research. There were critics who claimed that investigations into spirituality and creativity were of no value to science. The next scholar this thesis will discuss is one that challenged those views. Charles Tart was one of the first researchers to address the scientific paradigm that condemned the research of spirituality and other intangible phenomena of the human mind. His work would allow for psychedelics to be explored in contexts outside of clinical and therapeutics interventions and would open the doors into the formal research of human spirituality.

### ***Charles Tart***

Charles Tart is a psychologist and parapsychologist with particular interest in transpersonal psychology. Tart began his career in a psychophysiology lab at the University of California, Davis, doing research on altered-states of consciousness, meditation, spiritual growth, and parapsychology (Tart, 2009). After his pseudo-retirement in 1994, he continued his research and teaching at the Institute of Transpersonal Psychology in Palo Alto, California (Tart, 2009). During his career, he

became a major advocate for the scientific investigation of evidence-based spirituality, which would eventually be applied to the mystical experiences produced by psychedelic substances. Over the course of his career, Tart's work was criticized among academic circles as being a departure from logic and scientific reasoning. Some made the claim that spirituality was outside the realm of science, and to investigate spirituality would be a conflict of interest by persons of religious or spiritual background, rather than an honest and strictly scientific investigation (Tart, 2009). Disregarding such claims, Tart set out to develop scientific standards to investigate the phenomenon of spirituality, by focusing on the formal and accepted methods of scientific research. Tart saw discrepancies and variance in the definition of "truth," such that a "truth" or fact that does not fit into someone's worldview or system of belief is unlikely to be accepted. Tart utilized an alternative method of defining evidence, called *Shorter Oxford English Dictionary* definitions, or SOEDs (Tart, 2009). SOEDs are defined as any indication or sign, or facts and testimonies in support of a conclusion, statement, or belief, such that they serve as proof (Tart, 2009). By employing the strategy of including testimony as evidence, Tart was able to analyze patterns of different testimonies and assess commonalities, so that they could be statistically significant. Tart was able to apply this form of testimonial and indication-based evidence to his work with out-of-body experiences, or OBEs. In the years between 1970 and 1980, Tart was able to provide enough scientific evidence to declare that it is possible to be both scientifically objective and spiritual (Tart, 2009). He claimed that humans are "'spiritual' beings in some real and important sense", that spirituality can be enriched and enhanced through scientific means, and that academia inhibits its own growth through ignorance and prejudice of spirituality (Tart, 2009).

These assertions opened the door for other academics to begin investigating spirituality and religion as a scientifically significant human phenomenon.

During his work as a transpersonal psychologist, Tart was able to refute the claims, collectively referred to as Dismissive Materialism, that called for tangible evidence, and concluded that in failing to provide such evidence, any prior research would be rendered invalid (Tart, 2009). Claiming that the Dismissive Materialism argument is reductive in nature, Tart asserted that it was an overgeneralized philosophy failing to account for parapsychological data and was a scientifically inadequate tool to explain human life (Tart, 2009). While Tart saw the value of Dismissive Materialism in other fields of science, particularly physical sciences, the automatic dismissal of all data and observations of spirituality was reductive and insufficient in psychological pursuits (Tart, 2009). Tart's contribution to the scientific investigations of spirituality and other transpersonal phenomenon was significant. He was able to reform the ways in which evidence was acquired through psychological research.

As a transpersonal psychologist, Tart was predisposed to having a great interest in researching the human mind. Similar to Grof, Tart developed an interest for altered states of consciousness and their potential involvement in transpersonal therapy. Likening parapsychology to transpersonal psychology as physics is to engineering, Tart set about applying the maxims of parapsychological discovery to the application of the properties of transpersonal psychology (Tart, 2009). Tart saw transpersonal psychology as a mechanism with which to actively enhance and encourage the growth of human understanding, stating,

In the late 1980s, Tart was introduced to the use of psychedelic substances in transpersonal psychology. Evidence provided by Pahnke's Good Friday Experiment suggested psychedelics had the potential to elicit mystical experiences. A follow up study executed by Rick Doblin, indicated that, even twenty years later, the subjects of the experiment reported having long-term mystical effects, such that their experience remained significant to them in the years to come (Tart, 1991). Intrigued by these findings, Tart surveyed 64 Tibetan Buddhists with a history of psychedelic or marijuana use, though none of them reported as having been currently using such substances (Tart, 1991). His findings indicated that a vast majority of the participants had experienced lasting and profound spiritual effects from the substances, including broadened perspectives, comprehension of themselves and the world, experiences of vital clarity and luminosity, and feelings of a greater unity and connectedness with the world and others (Tart, 1991). Tart also found patterns among the participants that suggested those who had contemplated their experience prior to the administration and had purposeful intentions in undergoing the psychedelics experience had much more profound spiritual experiences (Tart, 1991). For the remainder of his career, Tart was involved in a number of investigations determining the transpersonal and spiritual implications of psychedelic substances. His work would also inspire others to develop scientific standards and tools to enhance the understanding of such intricate research.



## **Consequences of the Political Interdiction of Science**

Despite the extensive scientific foundation produced by the wide ranging investigation of psychedelic substances between 1930 and 1960, researchers and academics have faced incredible difficulty in resuscitating their scientific efforts. Due to the illegalization of psychedelic substances under the Controlled Substance Act of the 1970s, science was halted abruptly under a censorship never previously encountered in the scientific community. Academics who had devoted years to researching these substances criticized the ban with claims that enacting a censorship over science was a failure to facilitate the comprehensive production of knowledge and understanding.

The interdiction of psychedelic studies appears to have occurred through two mechanisms. The first is the influence of political institutions on the control and distribution of substances. The second involves the discrediting of scientific research as a byproduct of sensationalist journalism. In an effort to understand the factors that have deterred the progress of psychedelic studies the effects of the dissemination of false information will be identified, the political and academic ramifications of the CSA will be analyzed, and the scientific paradigm and attitude toward spirituality and mysticism will be discussed.

The largest and arguably most profound detriment to psychedelic research is the influence of governmental institutions in the negation of scientific evidence. In response to the rise in popularity of psychedelic use during the Counterculture Movement of the 1960s, not only were scientific studies and religious practices dismissed and ignored, but individuals and whole groups were rendered untrustworthy. By 1970, there was little faith

left in the validity or truth of anything the discredited individuals deemed honest or factual with regards to psychedelic studies. Not only does discrediting leave the individual devoid of any previously established ethos, it also serves to wholly inhibit the dissemination or retrieval of any information to or from the community and/or public body. What makes this form of misinformation dangerous is in the case of the knowing and purposeful dismissal of researchers and their work. A targeted and specific denunciation of an individual's or group's work occurred for of hundreds of psychedelic researchers. In instances where there is a targeted dissolution of ethos and credibility for political or public figure(s), the effect on the public, especially if the figure is being accused by a person of notoriety, is a misinformed belief in the word of the accuser. Effectively, all power is relinquished to the accusatory figure, and with it they are able to orchestrate how the other ought to be perceived. In this case, the effort made to retain their ethos and reputation by the discredited individual or group is rendered ineffective and their evidence is dismissed. Such was the case in the United States, when the conservative political platform denounced the use and value of psychedelic substance during the psychedelic prohibition of the 1970s.

Amidst the rising popularity of drug use in the 1960s, including cocaine, heroin, opioids, and other narcotics, governmental institutions and popular media served to promote misinformation with respect to psychedelics, simply by associating them with other well-known drugs and, more wholly, as contributing to the unruly and unlawful proselytization of "drug culture." By condemning the "drug prophet," Leary and as well as his infamous motto "Tune In, Turn On, and Drop Out," popular media<sup>3</sup>, successfully associated the use of psychedelics with the abuse of other drugs during the 1960s and into

the 1970s (Dispatcher, 1969). In a nation where drugs of addiction were becoming more common, journalist reports of psychedelic use, as it was related to other drug abuse, instilled fear and contempt among the masses. There grew a fear of addiction and addicts, such fear was “powerful enough to permit the most profound and punitive methods” to be employed in the fight against drugs and addicts (Musto, 1999). Such fear resulted in purveyors of drugs, including psychedelics, as having been branded “worse than murderers,” in that destroying the personality is worse than simply killing the body (Musto, 1999). The inaccurate association of psychedelics with narcotic drug use facilitated the discrediting of individuals that researched and advocated for psychedelics, simply by their association with substances of perceived abuse and addiction. Despite the thousands of studies conducted and the irrefutable evidence suggesting potential of psychedelic substances as therapeutic tools and medicaments, the evidence was seemingly struck from record and condemned.

Reinforcing the public’s wary and distrusting perception of psychedelics was the formal condemnation by governmental factions and their own failed experimentation. After the unethical exploitation of psychedelic substances during the experimentation by the CIA between 1964 and 1973 was exposed, people began to question the validity of psychedelics as a whole. During the infamous experiments known as the MK-Ultra Project, the CIA employed unethical and unorthodox methodologies in efforts to research LSD as a mind-controlling agent, truth serum, and even a weapon of war (Lee & Shlain, 1985). Experimentation on uninformed participants continued, even after the evidence suggested no efficacy in the above described uses. The CIA persisted as contingency, in case the Soviets discovered war-oriented benefits of psychedelics substances (Lee &

Shlain, 1985). It has been suggested that the CIA and Federal Bureau of Investigation encouraged the dis-accreditation of psychedelics based on their own failed research attempts (Lee & Shlain, 1985). Governmental institutions failed to take into account the therapeutic and medicinal nature of psychedelic substances. Instead the focus narrowed to the perception augmenting and sometimes disorienting psychological effects they elicit. While their research into war-time methods of mind control and disillusion may have failed, they neglected to inform the public on the intended use and supporting evidence previously procured by academics that researched psychedelics in the fields of psychiatry and neurobiology. The accounts of the MK-Ultra Project become a focus of popular media and, in turn, distorted society's comprehension of psychedelic substances. The failure of their own investigations and their neglect to reference any prior research diluted the knowledge of psychedelics, leaving society imbued with a false and uncertain understanding. Propagated by mass media and governmental institutions, fear and a convoluted understanding lead the public to unceremoniously nullify any betterment to be pursued by the use of psychedelic substances.

It is difficult to deny the ways in which governmental institutions enact authority over the accessibility and reproduction of information, and, in some cases, even the production of knowledge and information in itself. In the words of Robert Proctor, "[we must] study the social construction of ignorance. The persistence of controversy is often not a natural consequence of imperfect knowledge but a political consequence of conflicting interests and structural apathies. Controversy can be engineered: ignorance and uncertainty can be manufactured, maintained, and disseminated" (Proctor, 1995). It stands to reason that in instances in which political influences are responsible for the

dissemination of misinformation and uncertainty, those same political influences would have motives or reasons to do so. Political platforms are strong forces in the production of knowledge, as well as the dispersal of public information. Any action from a notable or authoritarian figure has consequences. In the case of psychedelic studies, these repercussions included the loss of potential medicaments and the interdiction of valuable science.

The counterculture movement of the 1960s, although not solely characterized by the use of drugs and moral hedonism, was arguably the single most catalyzing movement between academic freedom and political censorship of psychedelic science. As previously mentioned, recreational drug use was becoming increasingly popular, not only in the United States, but internationally, as well. It also came to be understood that the import, export, and distribution of drugs and other substances was not only dangerous, but incredibly lucrative. The social and political reaction by the public of the United States was influenced by a number of rhetorical frameworks, many of which are beyond the scope of this discussion. In the history of the United States, there have been a series of drug-limiting laws, all of which rise and fall in popularity in tandem with political office elections and platforms (Musto, 1999). A major proponent of the 1968 election was the Republican platform, promising “a vigorous nation-wide drive against trafficking in narcotics and dangerous drugs,” including special emphasis on the first steps toward addiction, the use of marijuana, and such drugs as LSD (Republican Political Platform, 1968). In a nation where fear of substance and substance abuse was exploited by hyperbolic journalism, it was convenient to apply a drug reform policy to a political platform, a convenience that would assist Nixon in winning the election. That said, as

with all politically and executively enforceable legislation, if a nation adopts political reform against drugs, they must also remain alert as to the consequences (Musto, 1999). After President Nixon was elected, he made quick work of promoting and eventually signing the Controlled Substance Act in 1970. Formally known as the Comprehensive Drug Abuse Prevention Act, the policy was signed into law in October of 1970, making the manufacture, importation, possession, use, and distribution of narcotics, depressants, hallucinogens, and other ingestible chemicals illegal (Anderson, 2014).

There is reason to believe that the Comprehensive Drug Abuse Prevention and Control Act of 1970 came to pass as a byproduct of the Single Convention on Narcotic Drugs in 1961. The convention was a multi-national conference called to discuss the international use and distribution of narcotic drugs (opium, coca and derivatives, etc.) (UNTC, 2017). In an attempt to consolidate, regulated, and improve all previous drug treaties and policies, the Single Convention on Narcotic Control would be historically seen as a failure yet would influence other treaties and drug policies (Bush, 2001). During the convention, the United States stood in favor of supranational control of substance manufacturing and dispersal based on industrial strengths as determined by the US economy. A vote in this favor would give the United States some degree of control over the manufacturing and distribution of narcotics and other drugs (Bush, 2001). The convention did not rule in favor of the United States position, but instead favored a position based on the inaccurate assumption that, given international compliance, a treaty of drug regulation that deemed substances as nonviable in medicine and science would serve to disrupt the international distribution of narcotic drugs (Bush, 2001). It is speculated that the signing of the Controlled Substance Act was a reaction to the results

of the convention. Worth noting, however, are claims made that the passing of the CSA was an attempt to try to reclaim control over the drug market by attempting to disband the trade and, in some round-about-way, allow the United States to retain control over the drug industry (Bush, 2001). After the Single Narcotic Convention deemed substances non-medical and non-scientific, theoretically, the United States would also reserve the right to dictate substance procurement for the medical, pharmaceutical, and academics fields. By assuming control of the production and distribution of hundreds of substances and compounds, it can be predicted that a substantive monetary influx would follow. Following the signing in of the Controlled Substance Act, not only were narcotics forbidden, but all substances of perceived potential for abuse became illegal, as well.

The CSA contains the scheduling, or categorization, for which substances are bracketed and by what variable degree they are thought to be potentially dangerous or abused. The act also provided a mechanism for which substances to be controlled (added to or transferred between schedules) or decontrolled (removed from a schedule) can appeal to be scheduled or re-scheduled (DEA, 2017). The schedules are also indicative of availability and ease of access.

The following factors are those required to be considered in the scheduling of a substance or drug:

- |  |  |
|--|--|
| 1. Actual or relative potential for abuse                          | 2. All scientific evidence of the pharmacological effect |
| 3. The state of current scientific knowledge regarding the drug or | 4. The historical and current patterns                   |

substance

of abuse

5. The scope, duration, and  
significance of abuse

6. The risk to public health

7. The psychic or psychological  
dependence liability

8. Whether the substance is an  
immediate precursor to a substance  
already controlled (DEA, 2017)

There are five drug schedules of descending acuity, described by the DEA, go as follows:

Schedule One: The drug has a high potential for abuse. The drug has no currently accepted medical use in treatment in the United States. There is a lack of accepted safety for use of the drug under medical supervision.

Schedule Two: The drug has a high potential for abuse. The drug has a currently accepted medical use in treatment in the United States or a currently accepted medical use with severe restrictions. Abuse of the drug may lead to severe psychological or physical dependence.

Schedule Three: The drug has a potential for abuse less than the drugs in schedules 1 and 2. The drug has a currently accepted medical use in treatment in the United



States. Abuse of the drug may lead to moderate or low physical dependence or high psychological dependence.

Schedule Four: The drug has a low potential for abuse relative to the drugs in schedule 3. The drug has a currently accepted medical use in treatment in the United States.

Abuse of the drug may lead to limited physical dependence or psychological dependence relative to the drugs in schedule 3.

Schedule Five: The drug has a low potential for abuse relative to the drugs in schedule 4. The drug has a currently accepted medical use in treatment in the United States.

Abuse of the drug may lead to limited physical dependence or psychological dependence relative to the drugs in schedule 4 (DEA, 2017).

Psychedelic substances are currently under the Schedule One classification. As described above, schedule one classifications declare that a substance has a high potential for abuse, no accepted medical use, and lacks safety protocols for consumers. The authorization of the Controlled Substance Act had many consequences. Placing psychedelic compounds in Schedule One served to act as a “cease and desist” order on scientific investigation and psychotherapeutic intervention. Furthermore, rectifying the inaccuracy of the legal schedule became especially challenging. For example, once

scheduled, it is incredibly difficult, if at all possible, for a substance to be re-scheduled or removed from scheduling. Many psychedelic substances were placed under Schedule 1 following the Convention on Psychotropic Substances convened in 1971. While almost all therapists reporting successes with psychedelic substances stated that the incidence of recovery or significant improvement was substantially greater than with other therapies employed by them in the past, indicating acceptable medical value, psychedelics were erroneously placed in the strictest and most heavily regulated bracket. The psychedelic drugs that have value for psychotherapy have been “most vigorously challenged or denied by [opponents] who have done no work with the drug” (Osmond, 1970). In placing psychedelic substances in Schedule One, the entirety of the scientific foundation was dismissed by nature of the categorical damnation. While the public seemed not to have been privy to the prior research conducted, all potential for psychedelic substances was suppressed, concealed under the political assertion that they were dangerous substances requiring close control.

Scientific investigation was banned, curative research halted, and the future of psychedelic studies dimmed. There were academics who fought vehemently for an accurate scheduling, but to no avail. Some of those same academics, however, would live to witness the hard-won revival of research, decades later. Between 1970 and 1992, psychedelics were left academically untouched, and in the following generation any practical knowledge of these substances was reduced to being transmitted as horror stories that failed to reflect reality (Musto, 1999). The truth of psychedelics and the implications of their use were never honestly depicted during their political scheduling. Political institutions, determined to further denigrate psychedelics in the eyes of the

public, depended greatly on mass media for the dispersion of political propaganda. The media published stories depicting psychedelic substances and their purveyors as anti-establishment, manic degenerates. One such media production was the infamous death of Diane Linkletter. With suicidal intention, Ms. Linkletter tragically fell to her death, from her kitchen window in October 1969 (Dispatcher, 1969). Although all evidence indicated the event to be suicide, including the revelation that the victim showed a history of suicidal ideation and had made distressing phone calls to her family just prior to the incident, her father, a popular media personality, went on record, blaming his daughter's death on LSD. Reportedly stating, "It isn't suicide because she wasn't herself. It was murder. She was murdered by the people who manufacture and sell LSD," Mr. Linkletter painted a picture for the public of the perceived horrors of LSD (Dispatch, 1969). The tragedy of Ms. Linkletter's death was covered nationally. The stewards of psychedelic sciences and any individuals associated with the use or distribution of such substances were once again likened to that of murderers, the bottom-most dregs of society. Of course, there was no indication that Ms. Linkletter had even participated in the consumption of LSD, and certainly not on the day of her death. Her story did, however, allow for other scapegoat stories to be reproduced, further enhancing the castigation of psychedelic substances.

The influence of mass media on the dissemination of false information cannot be understated. At a national level, journalism that demonized psychedelic drugs contributed to the swift silencing of researchers and advocates. With little remaining credibility and the legal schedule of psychedelics making them effectively impossible to procure, the science of psychedelics came to, what appeared to be, an untimely end. Furthermore, the

conservative establishment that stood to benefit financially and politically and from signing of the Controlled Substance Act succeeded in modifying the production of knowledge. By cultivating doubt and fear in the public, this conviction has proven to have a longstanding capacity to inhibit further research.

Historical attempts to resurrect scientific investigation have been continually ignored or actively inhibited, disregarding valid and persuasive evidence procured from previously executed studies. Purveyors of psychedelic research fought to prevent the proposed legal scheduling of psychedelic substances, to no avail. Subsequent attempts to re-schedule or un-schedule psychedelics have gone ignored. In the twenty years following their prohibition, psychedelics have only recently been reintroduced into academic research as of 1992; however, they maintain their classification in the United States as Schedule One substances.

While the legal schedule of psychedelics remained intact, a few scholars and advocates continued to persist in their efforts to further psychedelic research. Discussed below are two academics who developed foundations and programs to support the effort to renew psychedelic studies. In the United States, Rick Doblin founded an association aimed at working with governmental institutions to reinstate the academic availability of psychedelic substances. Overseas, in London, Amanda Feilding founded a similar institution with the goal of promoting the continuation of psychedelic research and facilitating the research of psychedelics by utilizing the latest scientific technologies available. Both scholars were introduced to psychedelic substances during the height of psychedelic research in or around the mid-1960s. Both scholars were involved, to some

degree, in the first wave of knowledge production, and both scholars refused to let the value and potential of psychedelics be summarily dismissed.

A pioneer in the resuscitation of psychedelic research, Rick Doblin established the *Multidisciplinary Association for Psychedelic Studies (MAPS)* in 1986 (MAPS, 2018). MAPS is a non-profit research and educational organization that develops medical, legal and cultural contexts for people to benefit from the careful uses of psychedelics and marijuana (MAPS, 2018). Inspired by the tragedy of the Holocaust, specifically the vehicles of ignorance bred by political powers during the uprising of the fascist regime, Doblin recognized that the “catastrophic abuse of power and violence was made possible by ignorance, fear, scapegoating, and projecting fear of addiction” (Hartogsohn, 2013). Doblin received his PhD in Public Policy from Kennedy School of Government at Harvard University, where he wrote his dissertation on the regulation of the medical uses of psychedelics and marijuana and his Master’s thesis on a survey of oncologists about smoked marijuana versus the oral THC pill in nausea control for cancer patients (MAPS, 2018). Wary of the damage done to the reputation of psychedelic sciences, Doblin spent almost two decades devoted to working within the system, emphasizing a cautious, careful, and rigorous approach to scientific research (Hartogsohn, 2013).

In 1989, the Pilot Drug Evaluation Staff was established under the FDA with the responsibility of reviewing research with psychedelics and marijuana and other medications, so as to expedite the process of drug development (Hartogsohn, 2013). Doblin attributes the political change in perception to the pharmaceutical industry and the influence of Congress on the FDA to speed up the drug development review process (Hartogsohn, 2013). In 1992, the FDA advisory committee recommended that human

studies be resumed and regulated by the FDA in the same way they regulate any major pharmaceutical company (Hartogsohn, 2013). In doing so, the FDA granted MAPS the opportunity to renew highly regulated psychedelic research. Doblin has played a central role in advancing the cause of psychedelic research since 1986 and has since facilitated a major portion of modern psychedelic research. However great his accomplishments, they did come at a cost. In the years following the passing of the CSA in 1970 until the establishment of MAPS in 1986 and the first FDA accepted research proposal in 1992, Doblin spent more than twenty years speaking to legislative position holders, debating on behalf of psychedelics, and persuading governmental institutions to allow for controlled trial studies to continue in earnest. As a result of his tireless effort, Doblin has been attributed with having chartered the psychedelic renaissance in the United States.

As Doblin worked in the United States to procure the necessary approvals to continue psychedelic research, other scholars contributed to the fight for the freedom to further scientific research. The majority of Doblin's work was aimed at obtaining institutional approval and, effectively, recreating the investigations conducted prior to the prohibition of psychedelic studies. Alternatively, other scholars have contributed to the progress of scientific research in different ways. One such scholar founded a program aimed at promoting drug policy reform and progressing scientific research, not by echoing the work of prior studies, but by advancing the production of knowledge by integrating the latest advances in scientific technology.

Overseas, a similar institution was established called *The Beckley Foundation*. Founded in 1996 under the namesake, *The Foundation to Further Consciousness*, the Beckley Foundation was renamed in 1998 (The Beckley Foundation, 201). Amanda

Feilding was fueled by the inaccuracy and unintended consequences of the CSA and America's "war on drugs" when she decided to create the foundation (The Beckley Foundation, 2017). Focusing largely on global drug policy reform and evidence-based understanding of psychedelic use, Feilding has successfully established a number of programs and organizations under the umbrella of the Beckley Foundation. In 2005, Feilding began collaborations with the University of Bristol and Professor David Nutt to spear-head institutionally-supported investigations into the effects of LSD and psilocybin on brain function. With the success of the Beckley Foundation's work with the University of Bristol, Feilding went on to found the *Beckley/Imperial Research Programme* with London Imperial College in 2009 and coordinate the *Global Initiative for Drug Policy Reform* in 2011 (The Beckley Foundation, 2017). Since its founding, The Beckley Foundation has produced upwards of fifty peer-reviewed research publications and has contributed significantly to the modern understanding of the psychedelic-induced experience. Having overseen a great deal of these studies, and co-authoring many, Feilding has been a pivotal entity in the fight of freedom for psychedelic research. Feilding was first introduced to the LSD in the mid-1960s during the first wave of scientific research into psychedelics (The Beckley Foundation, 2017). Impressed by the capacity of LSD to initiate mystical states of consciousness and heighten creativity, she was quick to recognize LSD as having transformative and therapeutic power (The Beckley Foundation, 2017). Recognizing that the potential harms and benefits of psychedelics could only be adequately assessed by developing a sound scientific understanding of their mechanisms of action, Feilding saw the benefit of adopting the newest and most cutting-edge technologies to ascertain the underlying

neurophysiological changes produced by the psychedelic experience (The Beckley Foundation, 2017). Feilding's aim is to investigate how the "changes in cerebral circulation and neuronal activity underlie the effects of various psychoactive substances, so as to better harness their potential to improve the human condition" (The Beckley Foundation, 2017). Due to her political activism and contributions to global drug policy reform, Feilding has been a pivotal and widely acknowledged entity in the reawakening of psychedelic studies.

While ground has been broken in the reformation of psychedelic studies, thanks to the years of advocating for political reform and a renewal of research by academics such as Feilding and Doblin, among others, there still exists a reservoir of uncertainty. While some studies have come to fruition and others are still in their infancy, it seems that psychedelic studies have been given a second chance. However, the fact remains that psychedelics are a schedule one drug in the United States. Though the reintroduction of psychedelic studies has occurred and has steadily increased over the years, governmental institutions still refuse to relinquish control of such substances and un-schedule psychedelics as a potentially dangerous, class one drug. In failing to do so, the willful participation in the preservation of misinformation still continues to dampen the efforts of academics and other advocates. Schedule One, by definition, asserts that such substances have absolutely no medical value, a high potential for abuse, and no acceptable safety standards in administration by a professional (DEA, 2017). The definition alone clearly indicates either the lack of awareness by governmental institutions, or, more insidiously, a premeditated and deliberate misplacement of psychedelics in their scheduling. While the latter suggests a conscious and calculated measure of misinformation, the second



suggests that rescheduling is possible. If a reformed drug policy was attainable and legislators were able to alter their perception of psychedelics the false information that instigated the initial proposal for class one scheduling, than, upon the renewal of research and psychiatric administration of psychedelic substances, their scheduling would have been reviewed and augmented. The schedule remains the same, yet psychedelics have been given the sanction for academic research and the endorsement for medical and psychiatric administration. The obstinate refusal to reschedule psychedelic substances is indicative of another, less obvious, motive.

While research into the psychiatric implications of psychedelics may prove valuable in the attempts made to reduce academic procurement restrictions and serve to inform arguments to re-class psychedelic substances from Schedule One regulations, other facets of use, such as transpersonal and spiritual enhancement, are subject to dismissal and negation. Furthermore, resource allocation and research bias may inhibit the pursuit of other realms of therapeutic potential. All science has a natural tendency for research bias, such as the interest of the principle investigator in the subject of research, time constraints, and resource management, as well as other progress-determining factors (Fadiman, 2017). Interest bias and academic constraints, however, are more often overpowered by interests and biases of higher level management and the influences of economic value and financial profit. In this way a holistic understanding achievable by comprehensive research is avoided, and thus, that knowledge is never known or understood. Without the authority to act in their own interest, the researcher is subject to the wants and demands of their superiors and the market. The failure to pursue potentially valuable paths of research, such as this, has been seen in fields of psychedelic research,

since the first laboratory isolation of MDMA, by Anton Köllisch of Merck Pharmaceuticals, in 1912. After having first isolated MDMA, Köllisch's attention was required elsewhere, as per the direction of his primary investigator, leaving MDMA untouched for almost 50 years (presumably, never having the opportunity to further investigate the compound he discovered, due to Shulgin's investigations of the 1960s). In more recent studies, research bias toward DSM-IV-associated disorders, particularly PTSD, are seeing more funding and accessibility than other ailments or practices.

In the same fashion that science is inherently plagued by some degree of research bias, it is also subject to the interests of the researcher and their own cultural understanding, over that of others. That is interests, beliefs, and theories of an individual or institution obscure other possibilities to the extent that the experiences and values of an individual or group are ignored in the production of knowledge (Tuana, 2006). In this way, the knowledge, wisdom, and approaches of marginalized persons is underutilized, if taken into consideration at all, and thus a whole truth is never achieved. This phenomenon is seen in psychedelic science in the instances of the scientific measures taken to explore and understand the mystical and spiritual perception often elicited during psychedelic experiences. Often disregarded and cast aside in favor of other perceivably more viable, important or self-indulging studies, spiritualism and mysticism of the psychedelic experience are often overlooked. Although psychedelics have shown great therapeutic potential in the fields of psychiatry and psychology, they also have historically shown potential in the fields of neurobiology and biochemistry as tools to investigate neurological circulation and electro-neurological mechanisms. Despite this, modern investigations continue to be predicated on largely psychiatric-based therapies.

Furthermore, research involving psychedelics in transpersonal psychology and in spiritual or mystical context have not been pursued to the same degree as other forms of research. While psychedelic research has been renewed, it is still seemingly under probationary review. It warrants mention that the dismissal of appeals to investigate the power and potential of psychedelics outside of clinical and therapeutic contexts may be understood as a byproduct of the precautionary attempts to ensure that the psychedelic research that has been approved does not become revoked.

Veiled as being a protective service, sheltering society from the “fiends” that promote the procurement, distribution, and consumption of addictive and harmful drugs, the CSA failed to take into consideration the religious and medico-ethical rights of its citizens. Medico-ethical rights, although there are many, fall into two categories: positive and negative. The former ensure that all citizens are granted the right to autonomously determine what to do with or for their own person. The latter suggest that all citizens have the right to seek safe, knowledgeable and professional assistance with the actions involved under the sanction of positive rights. For example, an individual has the positive right to refuse or accept psychotherapeutic intervention (positive rights); they are then able to seek professional assistance in doing so (negative rights). In the context of the psychedelic prohibition, not only did the CSA schedule revoke the people’s positive right to undertake or pursue the psychedelic experience, but in making it illegal to academics and professionals, repudiated their negative right to seek a trained, knowledgeable professional to assist them. Furthermore, the CSA undermined the United States Constitution under Amendment I, the right to freedom from religious and spiritual persecution. The legal pressure on some religious organizations that practiced rituals

associated with psychedelic sacrament led to the Religious Freedom Restoration Act (RFRA) of 1993 (Burwell, 2014). The RFRA reinstated citizens' rights and freedom to practice their religion, with respect to the psychedelic sacraments, including but not limited to the ritualistic consumption of peyote (mescaline), ayahuasca (DMT), and other psychedelic substances. Neither the U.S. constitution nor the RFRA, however, recognize non-denominational pursuits for spiritual enhancement. Instances in which civilian rights are subject to dismissal, the production of a comprehensive understanding is inhibited. They remain ignorant, not privy to the information necessary to develop the knowledge with which to make informed discussions.

The majority of information available to the public, with respect to the results and conclusions found during the years of psychedelic investigation, was censored and suppressed under the Controlled Substance Act of 1970. Science was never given the opportunity to develop a full understanding of the physiological and therapeutic implications of these substances. Psychedelic research and academic interest in the substances was once relatively common, especially in the 1960s, if not respected (Smith, 2011). Today, the common, public knowledge of psychedelics is largely inaccurate and poorly informed. This result is almost certainly a byproduct of the production of misinformation and uncertainty. With many sources of misinformation contributing to the production of uncertainty, the effects of such uncertainty are compounded. That is not to say these effects cannot be reversed. With due diligence in future endeavors and the pursuit of scientific research, an informed understanding of psychedelics can be eventually produced.

## **Modern Research and the Psychedelic Renaissance**

The scientific production of knowledge on psychedelics suffered under the regulatory control of the CSA and sociopolitical misinformation resulting from its enactment. That, however, did not stop scholars and academics from pursuing the legal rescheduling of psychedelic substances and the continuation of psychedelic research. After the first pilot study was approved for psilocybin to be investigated within the confines of psychiatric intervention, many subsequent studies have been approved and conducted, albeit while still remaining under the control of DEA and FDA-approval. This section will illuminate a few of the studies that have been conducted and the researchers that have contributed to the continuation of psychedelic research. Since 1992, studies investigating the implications of psychedelic-assisted psychotherapy and the occurrence of spiritual and mystical experiences and their significance have been conducted. In doing so, the scholars that have contributed to this research are actively promoting and facilitating the continuation of the production of knowledge. Scientists today have repeated studies similar to those conducted in the 1960s. In doing so, modern scientific investigation has positively confirmed the results of earlier studies and has opened doors to other paths of research. By utilizing the latest technological advances and applying a modern understanding of psychology and neurophysiology, science has come closer to illuminating the potential for psychedelics to be used in both medicinal and non-medicinal contexts. This section will discuss the researchers and their work and the foundations that have supported the progress of psychedelic research. The scientific pursuits discussed in this section, such as the novel discoveries produced by modern

technology and the surprising results of alternative approaches, will serve to provide a modernized and technologically informed understanding of psychedelics.

Research during the decades of the psychedelic renaissance has been modernized through the use of cutting edge technology and advancements in bioinformatics. Additionally, during the years when psychedelics were subject to the censorship of their legal schedule, the fields that inform psychedelic investigations did not remain stagnant. The discoveries and progress made in the fields of neurophysiology, psychology, and medicine, serve to provide further insight into the potential of psychedelics. Neuroscience and neurological methodology have developed and expanded incredibly since the mid-1980s, such as the development of the MRI machine and other technological advancements. Even psychology has made great strides in understanding behavior and the interpretation of sensory perception in the last decade alone. With the help of these academic strides, psychedelic science has been more quantified, scientifically supported, and thoroughly analyzed than ever before. That said, however, the major results of most all modern psychedelic research have reflected, or at least paralleled, that of some of the earliest studies done back in the early to mid-1900s. This indicates a degree of generalizability and internal validity of previous studies. There seems to be an undeniable ability for psychedelics to yield positive results in psychotherapy, addiction and substance abuse treatments, post-traumatic stress disorder therapies, introspective techniques for the betterment of the well-person (that is, the use of psychedelics outside of medical contexts), and spiritual development. Had it not been for the global standstill in scientific investigations of psychedelic substances, due to the implementation of the Controlled Substance Act, these discoveries could have been more easily facilitated, the

process to regulated production and distribution of psychedelic medicaments expedited, and the healthful treatment of persons in need more readily precipitated.

### ***Carharrrt-Harris and London Imperial College***

With the resources of London Imperial College supporting the efforts of the Beckley Foundation, Feilding and the researchers under her supervision have uncovered a great deal of information concerning the cerebral mechanisms that function to elicit the psychosomatic changes observed during the psychedelic experience. One notable scientist involved in the current investigations of brain under the influence of psychedelics is Robin Carharrrt-Harris, of London Imperial College - colleague to both Amanda Feilding and David Nutt. Having produced the latest research illuminating the physiological effects of psychedelics on the brain, Carharrrt-Harris's imaging and research has the capacity to describe the psychophysiological effects of the substances. Knowing what areas of the brain are activated and when can be used to determine why subjects experience the feelings and thoughts most typically associated with a psychedelic experience. A study conducted in 2012, one of the first of its kind, investigated the neuroelectrical mechanisms of psilocybin. Conducted by Carharrrt-Harris, ten healthy participants underwent resonance imaging first after having received 2 micrograms intravenous saline as a basal state measure, then again after having been administered 2 micrograms psilocybin – these two processes were separated by seven days (Carharrrt-Harris, 2012). Participants were given two sets of positive autobiographical memory cues and asked to view each cue card and then, closing their eyes, imagine re-experiencing the

event. The images obtained during the first resonance demonstrated increased activity seen in the limbic and striatal regions, during early phase recollection, and then in the prefrontal cortex during late phase recollection; dissimilarly, under the influence of psilocybin, the recalled memories also elicited neural activity in the visual and sensory cortexes, that were not present under placebo (Carhartt-Harris, 2012). After completion, participant ratings during subject follow-up yielded greater instances of memory vividness and visual imagery, which implies that psilocybin may be beneficial in enhancing autobiographical recollection and, therefore, useful in psychotherapy as a tool to facilitate memory recollection (Carhartt-Harris, 2012). Evidence that psilocybin enhances autobiographical recollection suggests that it may be useful in psychotherapy either as a tool to “facilitate the recall of salient memories or to reverse negative cognitive biases” (Carhartt-Harris, 2012). In addition to reports of increased memory vividness, participants also reported enhanced feelings or perception of well-being (Carhartt-Harris, 2012). Recalling earlier experimentation done by Grof and Greer, similar results were observed, albeit under less technologically advanced circumstances. Where Grof and Greer derived their results from testimonial evidence and subject observation, Carhartt-Harris was able to obtain visual results in real time. The fMRI imagining has allowed research to compare testimonial evidence to the electrical impulses present in the brain at the time of recollection.

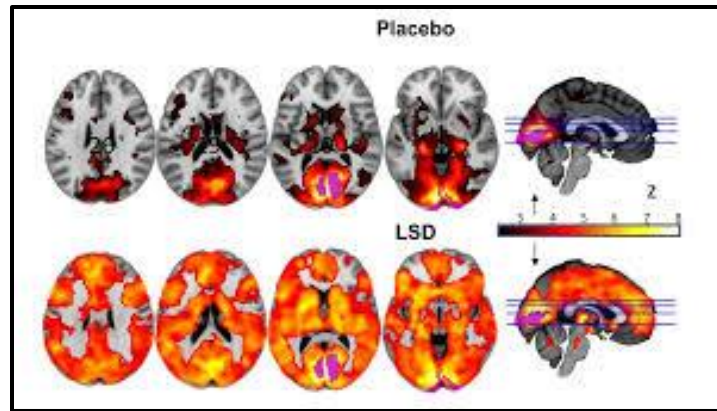
Employing fMRI imaging is just one example of how psychedelic studies will benefit from the technological advancements made in the last few decades. The development and utility of fMRI (functional magnetic resonance imaging) was not common lab technology until the early 1990s, when it became the standard for brain



activity measurement and imaging (NDCN, 2017). Perhaps one of the greatest leaps in psychedelic research has been the images achieved through fMRI, allowing scientists to visualize the neural activity of the brain during the process of the psychedelic experience. Functional magnetic resonance imaging is a noninvasive technique used by clinicians and scientists as a tool for viewing and mapping brain activity. Using blood oxygen level dependent contrast, the fMRI is able to detect changes in the blood concentration that occur with increased neural activity (Bobholz, 2007). Effectively, we can see where the blood in the brain is being allocated during different neurological activities and function, in real time. “Over the first decade following this discovery, fMRI was used extensively to map brain activity evoked from sensory, motor, cognitive, and emotional tasks in healthy individuals. More recently, this technique has been applied to further our understanding of neurobehavioral disorders” (Bobholz). In the same fashion, fMRI has been able to measure and map the brain activity that is elicited by the consumption of a psychedelic compound.

Carhartt-Harris completed a similar study in 2016, again using fMRI technology, to observe the phenomenon of “ego dissolution.” What would later be called neurological “cross-talk”, Carhartt-Harris was able to illuminate how and when instances of increased regional connectivity correlate with occurrences of reported ego-dissolution. Ego dissolution is a phenomenon often related to reports of the perceptual boundaries between one’s self and one’s environments are either deduced or extinguished (Carhartt-Harris, 2016). The imaging indicated that during instances of perceived ego dissolution, multiple regions of the brain become electrically activated. Moreover, it revealed the involvement of regulatory regions of the brain called “neural hubs”, “hub structures”, or, simply

“hubs” (Carhartt-Harris, 2016). Under normal circumstances, these structures serve to negatively regulate cerebral circulation, such that they will inhibit blood flow to certain regions of the brain, and thus limiting the electrical activity in those regions. When working properly, the inhibitory effects of the hub structures limit inter-regional communication, so as to allow the brain to focus on a single faction of sensory stimulus. Under the influence of psychedelics, however, these hub structures seem to lose such regulatory properties and remain relatively open. In a sense, they act as a flood-gate, typically allowing for only the imperative information to travel between regions. In this way, the brain organizes and categorizes sensory information. Without that gate structure, there is something similar to a flood of sensory activation. What results is sensory overload, heightened imagination, fluidity of thought, and correlatively, ego dissolution. While these results are impressive in and of themselves, they are also indicative of how psychedelic therapy may be so productive. As described by Feilding, “[the ego] is a conditioned reflex mechanism to control the distribution of blood to the brain...through conditioned learning, we learn to control, to restrict, to direct, and to censor and simplify...ego dissolution is key to therapy as the trauma can be reached and washed out” (Feilding, 2016). The standing hypothesis asserts that re-wiring or re-conditioning the neurological perception of a stored trauma, by means of the anti-inhibitory functions of psychedelics, can facilitate the discovery and reconstruction of memory perception. Patients would be able to reconstruct the conditioned perception they have developed.



**Figure 4 - fMRI Brain Scan of Brain, Placebo/LSD (4)**

The theory that informs this plausible explanation is referred to as “the entropic brain” hypothesis. Entropy is a physical measurement of randomness and uncertainty. Entropy is calculated using the free-energy principle, which scientists use to quantify and the ways in which biological systems maintain order. The principle states that biological systems organize around a “critical point”, a border between order and a more chaotic state. For example, in chemistry there exists a critical point between phase changes, a point where, given enough energy to disrupt, the substance can undergo a phase change, such as when a boiling liquid begins to evaporate into a more “chaotic” state. A similar interpretation can be used to explain the importance of hub structures. The brain maintains the order of sensory information using the hub structure as an acting critical point, when given enough energy to alter the basal state of the hubs the brain will respond with an increase in entropy, or chaos, or neural activity (Carhartt-Harris, 2016). By increasing the neural activity, thus increasing the entropy of the brain, it can be assumed that during the process of reverting back to the original state functions (a process called

self-state organization or self-organizing criticality), the neural pathways can be reconstructed via the mechanisms of suggestibility.

Suggestibility has been of psychological interest for quite some time. Often of great interest during psychotherapy, the principle of suggestibility is key to the process of self-evaluation so as to facilitate the amelioration of psychological ailments. To investigate the influence of suggestibility in psychedelic therapy, a study was conducted to evaluate the levels of suggestibility produced by psychedelic substances. Participants were given either LSD or a similar, less potent, psychoactive compound acting as a placebo (Carhartt-Harris, 2014). Suggestibility was assessed using the Creative Imagination Scale (CIT) and the Mental Imagery Test (MIT) (Carhartt-Harris, 2014). Those who received LSD displayed a significant increase in the CIT measurement, but not so with the MIT (Carhartt-Harris, 2014). This is indicative of the fact that, while suggestibility is increased, mental imagery is neither helped nor hindered (Carhartt-Harris, 2014). It has been implied that a positive response to psychotherapeutic intervention is probable, as heightened suggestibility has been historically attributed to an increase in the positive outcomes of psychotherapy.

### ***Multidisciplinary Association for Psychedelic Sciences***

Established in 1986 by Rick Doblin and receiving FDA approval for the first pilot studies of the psychedelic renaissance in 1992, the MAPS foundation has spearheaded the resurgence of psychedelic research in the United States. Since the first FDA approval for a psilocybin study, MAPS has expanded enormously, now encompassing realms of

research investigating MDMA, LSD, Ibogaine, ayahuasca, and medicinal marijuana therapies all across the country. Their project of highest priority and greatest potential is the funding and execution of clinical trials using MDMA as a tool to assist psychotherapy for treatment of PTSD (MAPS, 2018). The preliminary studies indicated that, in conjunction with psychotherapy, MDMA can help to reduce anxiety, PTSD, and other forms of psychological ailments. MAPS is currently undertaking a multimillion dollar plan to authorize MDMA as an FDA-approved prescription by 2021 (MAPS, 2018). More impressively, as for-profit pharmaceutical companies are uninterested in developing MDMA for medicinal purposes, MAPS may turn out to be the only non-profit organization from which MDMA will be distributed. Presumably, this will dramatically reduce cost to the patient and incentivize the practical integration of MDMA-assisted therapies. Furthermore, they have developed and begun implementing MDMA Therapy Training Programs for professionals, so as to teach them the proper methods of administration and contingency operations if an unanticipated situation were to arise. Since the beginning of the program, MAPS has had over 56 participating professionals enroll (MAPS, 2018). While MDMA is the compound of highest priority at present, MAPS is also preparing to enact similar programs for LSD and Ibogaine. As research continues, MAPS has been breaking ground for the eventual reintroduction of psychedelics into professional circles. Starting with training and a comprehensive understanding of the substances, the world will be better prepared to receive psychedelics than it was in 1960. The Multidisciplinary Association for Psychedelic Science is the only organization at this time to be working towards this goal.

## ***James Fadiman***

Other studies, such as those conducted by James Fadiman and his associate Sofia Korb, have begun researching other ways in which psychedelics may be of medicament value and in what ways they may be administered. Fadiman spent over two decades teaching and researching at the Institute of Transpersonal Psychology and over his forty-year career has been a supporter of psychedelic intervention. In his one of his most recent publications, *The Psychedelic Explorers Guide: Safe, Therapeutic, and Spiritual Journeys*, Fadiman outlines the best practices for safe psychedelic use, in both therapeutic and spiritual contexts (Fadiman, 2011). Approaching the subject from historical, psychological, and cultural perspectives, Fadiman establishes an “instructions manual” so to speak, of how to safely and effectively use psychedelics. Though Fadiman published during a time in which psychedelics are illegal, he in no way encourages or supports illegal behavior. However, given his vast knowledge of the power of psychedelics, and understanding that an estimated more than twenty-three million Americans used LSD via and despite their wide black-market availability, Fadiman thought it prudent to provide instruction for the safe and purposeful use of such powerful substances (Fadiman, 2011). Not surprisingly, much of Fadiman’s instruction reflects the work of his colleague Grof, in where the set and setting are paramount to a successful experience. He has however, begun to investigate how different doses may elicit different results. Fadiman was among the first to promote investigations into the power of psychedelics below the threshold for altered sensory perception. Microdosing is the act of consuming psychedelics, most commonly LSD, in a dose range between 5 and 25 micrograms. Such a low dose will subtly enhance perception but not to the degree of a therapeutic dose (100-250

micrograms), what Fadiman refers to as being “sub-perceptual” (Fadiman, 2011). His research includes elements of microdosing that facilitate creativity and problem solving among engineers, architects, and other professionals (Fadiman, 2011). These investigations have spurred interest among his peers and in 2017 he delivered a presentation on the state of his microdosing research.

During the Psychedelic Summit Conference of 2017, Fadiman delivered results of an ongoing, self-report study of more 1,304 subjects from over a dozen countries (Fadiman, 2107). There were two distinct groups of people participating in the study: those who sought alleviation from psychical and mental ailments and those who sought enhanced wellness (Fadiman, 2017). Among the group with mental or physical maladies, the greatest number of participants reported as having depression or treatment resistance depression, among other psychological disorders (Fadiman, 2017). What they found was a general decrease in psychological symptoms, often a reduction of medications, and a sensation of enhanced well-being (Fadiman, 2017). Both groups reported experiencing enhanced focus, a distinct drop in procrastination, and increased pattern recognition; that is, they were able to see more variables in motion, more of the time, which increased their ability in problem solving and other creativity-oriented tasks (Fadiman, 2017). Other findings included reduced menstrual pain, increased tolerance of others, and many other surprising indications, many of which were unintended, seemingly latent, consequences of microdosing. There were no reports of lasting harm or negative side effects. The study protocol was developed by Fadiman, where participants were instructed to microdose the first day, rest the second and third, and begin again on the fourth, for a total of ten cycles, for approximately 30 days (Fadiman, 2017). Of the

participants who completed the full ten cycles, the majority reported having stopped the microdosing schedule entirely or continuing with irregularity (Fadiman, 2017). While the effects and investigations of the implications of microdosing are still in their infancy, the initial reports have offered incredible insight and opportunities to further research. It is a lesser known fact that Hofmann was a major advocate for microdosing, and presumably the first to do so. He was known to have microdosed with unknown regularity for many decades before his passing.

A major proponent of Fadiman's research is the idea that "one does not have to be sick to be well" (Fadiman, 2017). This position is a sentiment shared by many in the field, especially those with interest or experience in transpersonal psychology. Stating, "what is important is the effect that taking the substance has on one's life and well-being, not the subtleties of this or that product," Fadiman makes the claim that psychedelics ought not to be solely purposed for psychiatric, medicinal, or therapeutic purpose (Fadiman, 2011). They also show potential in enhancing one's perception of self and others, facilitating spiritual and mystical exploration, and increasing the creative process and problem-solving ability. A Buddhist teacher, and colleague of Fadiman, noted that it was true for the majority of American Buddhist teachers to have experimented with psychedelic substance, a practice not contradictory of the Buddhists vows (Fadiman, 2011). As previously discussed, in the study conducted by Charles Tart, it was expressed that Buddhist practitioners were often left with a greater sense of purpose and world understanding after undertaking the psychedelic experience (Tart, 1991). Fadiman is convinced that the possibility of long-term performance enhancement is possible via the use of psychedelic in a safe, supportive setting. He reports being frequently and



pleasantly surprised by the number of seemingly spontaneous and beneficial secondary side effects of use, and is a revered advocate for the continuation of psychedelic studies (Fadiman, 2017). Fadiman's work not only brought to light another potential use for psychedelics but opened the door to many research opportunities to investigate such unanticipated side effects. As Fadiman has come to prove, psychedelics are not single-use medicaments, but rather, they offer an incredible range of therapeutic and curative potential, whether in psychedelic therapy, in the potential they have demonstrated as sub-perceptual supplements, or as a facilitator for spiritual enhancement. Fadiman's contribution to psychedelic sciences has paved the way for years of research to come and he will be remembered as one of the greatest psychedelic scientists of his time. His research and advocacy has helped thousands of people to date, and can be anticipated to help thousands more achieve the wellness they pursue.

### ***Thomas Roberts***

Thomas Roberts is an emeritus professor of educational psychology at North Illinois University and a major advocate for the legal adaptation of psychedelics, primarily for their academic and spiritual implications. As a founding member of the Multidisciplinary Association for Psychedelic Studies, and a co-founder of the Council of Spiritual Practice and the International Transpersonal Association, Roberts has devoted much of his life and career to the promotion of safe and purposeful use of psychedelic substances (Roberts, 2017). Roberts has written and published numerous books and essays illuminating the potential for psychedelics to act as entheogenic tools to facilitate

the growth and development of wellness and spirituality. In efforts to assess the religious import of entheogens, the Chicago Theological Seminary and the Council on Spiritual Practices, for which he is a co-founder of, cooperatively invited several dozen leaders in religion, mental health, and allied fields from around the world to gather and discuss entheogens and other psychoactive sacraments (Roberts, 2012). The overwhelming and seemingly unanimous opinion among the participants reflected the sentiment that entheogens were of religious import and no account of religion and consciousness can be complete with entheogenic states discarded (Roberts, 2002). Roberts reiterated the fact that entheogens have been used and revered by many cultures over the course of history and the propensity for such substances to illicit altered state of consciousness and facilitate mystical or transcendental experiences that reveal them to be useful tools in psychological and spiritual healing (Roberts, 2002). Roberts has built upon this, declaring entheogens as a tool to make spirituality and religion more satisfying (Wishnia, 1996).

Considering entheogens to be magnifiers of psychological processes and the human mind as a whole, Roberts suggests they can be used to learn about the human mind, specifically the mind's tendency toward spirituality and the human motivation for self-transcendence (Roberts, 2002). Roberts was among the first to suggest using psychedelics and entheogens as instruments to "map the mind". Likening his proposal to "a human genome project for the mind," Roberts asserts that entheogens can be used in a systematic approach to investigate the different triggers and dimensions of various mind-states and their functions (Wishnia, 1996). Roberts describes mind-states as being the overall patterns of cognitive and bodily functions at any one time (Roberts, 2013). An study of the different modalities of the mind would provide incredible insight into

ordinary and non-ordinary states of consciousness, how they overlap and interact, and their implications on the psychology of the human mind. Considering the relationship between psychedelic and mystical experiences and their relationship, it becomes apparent that their respective mind-states either overlap or are incredibly closely related to one another (Roberts, 2013). Roberts believes that the incomplete understanding of the human mind can be mitigated by researching psychedelics and entheogens, meditation, hypnosis, and contemplative prayer all as having profound effects of the state functions of the human mind. He suggests that “psychedelics reveal non-ordinary mind-body states, each of which allow for new patterns of information processing and the potential for activating ability that do not exist in ordinary states” (Roberts, 2013). Roberts continues to be an active advocate for the appropriate use of entheogens and psychedelics. Moreover, Roberts continues to be an advocate for the inherent potential of entheogens and psychedelics to act as magnifiers and tools in the pursuit of spiritual enhancement and healing.

### ***Roland Griffiths and Robert Jesse***

Roland Griffiths and Robert Jesse have been persistent in the fight for spiritual freedom and recognition of entheogens among academic circles. Collectively, they have published close to five hundred peer-reviewed journal articles, many of which illuminate the profound spiritual and mystical effects of entheogens. Both men are researchers and professors in the Department of Psychiatry and Behavioral Science at Johns Hopkins School of Medicine (ResearchGate, 2018). Robert Jesse is a conveyor of the Council on

Spiritual Practices and has been instrumental in the creation of the psilocybin research team and their efforts at Johns Hopkins. One of their studies, conducted in 2011, looked at the immediate and persisting dose-related effects of psilocybin as it occasioned mystical experiences. Eighteen participants were administered psilocybin of various dose ranges in a closed, double-blind fashion, and asked to complete questionnaires describing their experience immediately and after 1 and 14 months, respectively (Griffiths, et al., 2011). Their results concluded that, under supportive conditions (i.e. an appropriate set and setting), doses over 20 micrograms were reported as inducing mystical-type experiences, of which resulted in persisting positive effects on attitude, mood, life satisfaction, altruism/social effects, and behavior (Griffiths, et al., 2011). After the fourteen month follow up concluded, 83% of participants who received psilocybin expressed the experience as the single most or among the top five most spiritually significant experiences of their life (Griffiths, et al., 2011). In another co-executed study, Griffith and Roberts assessed the potential for psilocybin-induced mystical experiences to have substantial and sustained personal meaning and spiritual significance (Griffiths, et al., 2006). Subjects with no previous psychedelic knowledge that reported to participate in religious or spiritual activities were selected to participate in a double-blind psilocybin study. Two to three sessions were conducted at 2 month intervals, in which participants received either 30 or 70 micrograms of psilocybin (Griffiths, et al., 2006). The results showed significant and sustained positive changes in attitude and behavior as reported by the participants themselves and community member ratings (Griffiths, et al., 2006). The ability to occasion such profound and significant results indicates the propensity for psilocybin to elicit experiences similar to spontaneously occurring mystical experiences

(Griffiths, et al., 2006). Results such as these, reflect Grof's assertion that there is no discernible difference between chemically-induced mysticism and its seemingly spontaneous correlative. Similar to the study above, almost 70% of the participants ranked their experience with psilocybin as being among the top five most significant experiences of their life, while 10% declared it the single-most meaningful (Griffiths, et al., 2006). While some of the participants experienced negative psychological effects, such as fear and anxiety, the majority reported such symptoms as resolving themselves or having added to the mystical effects of the experience (Griffiths, et al., 2006). Griffiths and Roberts caution against the use of psychedelics under any circumstance outside of an appropriate setting for this reason. While they do not condone the illegal procurement and use of psychedelics, they do advocate for the continuation of research and promote the potential of spiritual growth as a potential use and benefit of psychedelic therapy, both in medical and non-medical contexts.

## **Closing Remarks**

Psychedelics have endured a long and arduous journey. Their story began thousands of years ago when the first humans discovered their effects and utilized this power to illuminate the first theological ideas. As civilization developed and the modern world emerged, the use of psychedelics faded into history, left for only a few select groups to experience their holistic potential. They were then reintroduced to society by

means of science and remained there for many decades. Over the course of the first wave of scientific progress, psychedelic substances became popular substances in academic circles. The scientists who worked with psychedelics substances were among those of the highest caliber and most revered scholars of their time. Their research was thorough and informing, leading them to discover properties of psychedelics that would go on to inspire research in other academic fields such as chemistry, psychology, biochemistry, neurology, philosophy, and ethics. However, despite the potential value of these substances as revealed by the years of scholarly research that was devoted to them, they were discarded.

The history of psychedelic substances has irrefutably shown well-substantiated potential in therapeutic and non-medical contexts. The evidence that has been derived from fifty years of scientific investigation supports this claim. However, psychedelics are subject to an unjustly negative connotation as a byproduct of the false information that served to quiet them and the people who devoted their time and careers to proving their value. Unfortunately, uncontrolled recreational misuse and, it must be admitted, a few well-publicized cases of questionably performed scientific studies, have negatively biased the general opinion of psychedelic substances. The negative opinion of psychedelics, as was cultivated and disseminated by means of legislative intervention and radical journalism, has been and continues to be challenged by contemporary and evidence-based scientific approaches. In some cultures, psychedelics were important tools for spiritual experiences and psychotherapeutic intervention. Others condemned them as being dangerous drugs of misuse. Any attempt at reconciling these opposing ideologies has

failed. That, however, does not mean the false information that currently informs the public opinion of psychedelics cannot be alleviated.

It is difficult to analyze research investigating the implications of psychedelics and maintain a negative opinion of their potential. Further efforts need to be made to disrupt the promotion of false information, and, instead, promote the production of knowledge. To do so, a paradigm shift must occur among both the advocates and the opposition. Those who oppose the continuation of psychedelics research have not yet proved evidence in support of their negation. There have been great efforts made to ensure the success of the psychedelic renaissance, and a few have taken it upon themselves to target the unjust and inaccurate classification of psychedelics substances. Others maintain the opinion that, with enough evidence-based research, the problem of their scheduling will hypothetically resolve itself. However, this is not the case. If all legislative impositions were established and derived solely from evidence-based logic, the scheduling and subsequent silencing of psychedelics would never have occurred. While research should and has continued, the root of uncertainty remains. If psychedelics are to ever reach the fulfillment they promise in both medical and non-medical contexts, a mass production of knowledge must come to pass to eventually contradict or override the standing opposition. This includes efforts in both the deconstruction of uncertainty and the continuation of the production of knowledge.

The Controlled Substance Act was efficient in disseminating an inaccurate knowledge of psychedelics. By reviewing the elements that produced uncertainty, it has become clear that the scheduling of psychedelics was not an honest effort to preserve the safety of the nation. Instead the induction of the CSA functioned as a thinly veiled

attempt to control the use and distribution of substances from more political and economic positions. What failed to be taken into account was the purpose and potential for psychedelics to be instituted as medicaments for the health of society and its people. By associating psychedelics with other, more dangerous substances of addiction, the benefit of psychedelics was buried, efforts to promote their benefit dismissed, and the hope for citizens to one day have this benefit available to them inhibited. The governmental institutions that propelled this movement acted with ethical ignorance and, consequently, did a disservice to their nation. In order for the benefit of psychedelics to, hopefully, one day reach the people who may serve to benefit from them, greater efforts must be made to more accurately inform the public and reduce to legislative power of the CSA, if not disband it entirely.

Accurate information on psychedelic substances is buried among governmental websites condemning them as illicit substances and other forums indicative of recreational misuse. Finding unbiased information about psychedelics with the resources of layperson is often difficult. It is disturbing to find that the evidence of 40,000 different successful trials, thousands of academic articles, and hundreds of books and other educational resources have been superseded by inaccurate and denigrating information. This is not the fault of the layman, but can instead be attributed to the perpetuation of misinformation. In a time when people are beginning to challenge the authority of power and privilege, psychedelics have an opportunity to clear their name and reestablish their once prominent presence as subjects of research, psychotherapeutic tools, and spiritual aids.



While the long journey of psychedelics is far from over, in an age of information, an informed knowledge of psychedelics may come to be established. Shortly after the death of his wife, Hofmann was asked to comment on the renewal of LSD research, to which he said was “the fulfillment of my heart’s desire.” From wonder child to problem child, Hofmann anticipated that the Western world may not have been ready for the power of LSD and other psychedelics substances, and he was right. The commendable efforts of the Multidisciplinary Association of Psychedelic Studies and the Beckley Foundation have already broken ground and made progress in the newly forged path to psychedelic freedom. These are formidable efforts; however, they remain undermined by legal confrontation. Psychedelics will never be given the opportunity to assist in the treatment and health of afflicted individuals if this legislation remains intact.

The United States and global prohibition has, for decades, delayed medical research into the healing properties of Schedule One drugs. Now that this research in finally being conducted, we’re learning that enormous suffering and many suicides could have been prevented. It’s long past time for the mainstreaming of medical use of [psychedelics], and for replacing prohibition and criminalization with public health approaches to reduce drug abuse. In a post-prohibition world, we’ll finally recognize that.” (Doblin, 2018).

It is the duty of informed people to promote and assist in the dissemination of accurate information and facilitate in the creation of a more accepting, understanding, and

enlightened political and societal environment. It is a right of society for psychedelic assistance to be made legal and available, and it is a responsibility of political and academic circles to facilitate the paradigm shift needed for as revolution of this magnitude to occur.

## FOOTNOTES

<sup>1</sup>Ibogaine has been included with dimethyltryptamine for the similarities found in the chemical literature and therapeutic application. Although the psychotherapeutic investigations of ibogaine are adequately represented, the pharmacological analysis of ibogaine, as compared to the other compounds is lacking. This anomaly is presumably due to the volume of pharmacological literature for DMT, where investigations for ibogaine have been executed under the assumption that, due to their chemical comparability, the two compounds will act on the same biochemical mechanisms, evoking the same psychosomatic symptoms.

<sup>2</sup>Nancy Tuana is best known for her work on the epistemologies of ignorance and the powers that produce, them with respect to the women's health movement, as expressed in her work, *The Speculum of Ignorance*. While Tuana never addresses psychedelic substances specifically, the framework of her argument serves to express the forms of ignorance that plague science and the pursuit of the production of knowledge.

<sup>3</sup>See for example: The Harvard Crimson, October 1962; The New York Times, 1963; Dispatcher 1967; The Examiner 1968

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