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Under the Influence: An Interdisciplinary Approach to Psychedelics

Jody Roun
jroun@rollins.edu

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**Under the Influence:
An Interdisciplinary Approach to Psychedelics**

*A Project Submitted in Partial Fulfillment
of the Requirements for the Degree of
Master of Liberal Studies*

*By
Jody Alise Roun
May 2018*

*Mentor: Dr. Suzanne Woodward
Reader: Dr. Robert Smither*

*Rollins College
Hamilton Holt School
Master of Liberal Studies Program*

Winter Park, Florida

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Project Approved:

Mentor

Reader

Director, Master of Liberal Studies Program

**Dean, Hamilton Holt School
Rollins College**

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Introductory Thoughts

The following research will outline the effects of psychedelics from an interdisciplinary approach, which is to say that I will explore the neuroscience behind psychedelic drugs and how it relates to creativity, as a primary focus, while examining the role of additional points included along the way. The goal of this research, is to gain a deeper understanding of psychedelics and truly decipher what it means to be under the influence, as the most important goal of this human existence is to achieve understanding. The aforementioned is a point that great minds like Albert Einstein and Humphry Osmond impressed on society before their death. It is a difficult and beautiful thing to observe the many differences, we humans feature. However, thinkers like Osmond and Einstein eloquently offered the ever-so-valuable point that understanding comes from the purposeful acknowledgment of our uniqueness as individuals and the potential for the role it plays. It is not in our similarities that we learn the best lessons but often our differences that spark the creative innovation housed in the human spirit. However, one must be cognitively flexible to do so.

Aside from the academic purpose of this paper, a personal motivation for me to write about psychedelics stems from the fact that psilocybin (magic mushrooms), lysergic acid diethylamide (LSD), methylenedioxymethamphetamine (MDMA), tetrahydrocannabinol (marijuana or cannabis), and other psychedelic substances are considered taboo to talk about. Education is essential when referencing illicit drugs, and the only way to understand the reality of the benefits and dangers is with education; by removing the fear surrounding the unknown.

Terminology

Serotonin – Neurotransmitter

Lysergic acid diethylamide (LSD) – Synthetic compound

Methylenedioxymethamphetamine (MDMA) – Synthetic compound

Tetrahydrocannabinol (marijuana or cannabis) – Natural compound

Psilocybin (magic mushrooms) – Natural compound

Trimethoxyphenethylamine (peyote or mescaline) – Natural compound

Dimethyltryptamine (DMT) – Natural compound

Ayahuasca – Natural compound

Microdosing – Non-psychoactive doses of psychedelics

Psychedelics

A single word wields considerable power and controversy. The term “psychedelic” is relatively new (a bit more than half a century) to common vernacular and was an adaptation to language by the psychiatrist Humphry Osmond in 1956 (Osmond & Agel, 1981). A term that would appropriately represent psychoactive compounds was needed. A shift away from terminology like psychotomimetics was needed; this term was widely used during the 1960's, in major scientific circles, though perhaps not with the public. Also, terms like illusinogen, psychotaraxic, phantasticant, oneirogenic, or even the more common ethonogen were used in the field and were limited in scope and meaning (Nichols, 2016; Osmond & Agel, 1981). The term “hallucinogen,” also limited but more commonly known and used (even today), cast a wide net. The ideology behind the term pushed right into the 21st-century modern-day conversation, despite the misleading nature of the word — in low doses psychedelics do not produce hallucinations, but we will discuss dosing later (Nichols, 2016; Osmond, 1957; Osmond & Agel, 1981; Doblin, 2016). A close but limited term that Louis Lewin offered was *fantastica*; however, Osmond believed the term lacked the neutrality that he desired (Osmond & Agel, 1981). The term hallucinogen cast a wide net, one that still expands over modern day conversation, despite the misleading nature of the word — in regular doses psychedelics do not always produce hallucinations, but we will discuss dosing later (Nichols, 2016, Osmond, 1957; Osmond & Agel, 1981). A close but limited term that Louis Lewin offered was *fantastica*; however, Osmond believed the term lacked the neutrality that he desired (Osmond, 1957; Osmond & Agel, 1981).

The unique qualities of the substances deserved a more appropriate description, one that truly embodied their function without misleading society in the way that the previous terms had done; Osmond (1981) claimed that the popular language conjoined negative associations to psychedelics within the public and private sectors, implying that they were psychosis-mimicking compounds, which still stands as a grossly misleading thought despite his efforts. In Osmond's book, *Predicting the Past*, the narrative flow of precisely how the word came to fruition is illustrated well with the exchanges between him and Huxley found within the pages. Osmond received a much-anticipated response from Huxley which offered the term *phanerothyme*. The etymological foundation for *phanerothyme* comes from the Greek *phaneroin*, which is to reveal, paired with *thumos*, the soul (Osmond, 1957; Osmond & Agel, 1981). Although Osmond thought it an excellent term, he felt it would be too complicated for the lay community to grasp the meaning. However, Huxley's term was a great starting point for Osmond and offered inspiration. He grabbed for his Latin dictionary, which featured some Greek medical terms, and as he thumbed through its pages, he came across the Greek term *psykhe*, meaning mind, and paired it with *deloun* from *delos*, which is to reveal or make clear (Harper, 2018; Osmond, 1957; Osmond & Agel, 1981). Osmond hoped to join two concepts: the psyche and transcendence, which is the birthplace of psychedelic. In his response to Huxley, he quipped, "to fall in Hell or soar angelic, you will need a pinch of psychedelic," and this marks the very moment the term pressed to paper for the first time in history (Osmond & Agel, 1981). The pair initially exchanged discourse on the topic via mail, then in March of 1957 Osmond published "A Review of the Clinical Effects of Psychotomimetic Agents" for the New York Academy of Medicine, which is where he

publically coined the term psychedelic (Osmond, 1957). The term specifically related to LSD, mushrooms, and peyote (mescaline) at the time (Osmond, 1957).

The most common definition of psychedelic, since Osmond's time, is a compound that produces psychoactive effects which alter the perception of reality and cognition or is considered mind altering. I plan to explore the differences in the classifications of psychedelics, as it relates to chemical composition. A significant claim in my writing is that in understanding the fundamental principles of the biochemistry and cognitive neuroscience to gain a deeper understanding of how it all comes together to create the psychedelic experience, or how psychoactive drugs alter the standard functions of the brain (Spinella, 2005; Kihlstrom, 2017). In addition to the point above, how this relates to creativity will reveal itself as a more substantial point of focus, rather than maintaining the antiquated idea that psychedelics are taboo and should remain so. I will heavily focus on lysergic acid diethylamide (LSD), but I will discuss methylenedioxyamphetamine (MDMA), tetrahydrocannabinol (marijuana or cannabis), and psilocybin (magic mushrooms), trimethoxyphenethylamine (peyote or mescaline), dimethyltryptamine (DMT), and ayahuasca.

The history of psychedelics goes back to ancient rituals as far back as 3,700 B.C. Typically, psychedelics were taken for religious and ritual purposes; however, there is some evidence that suggests that these substances enhanced the creativity of the primitive man and assisted with the evolution of consciousness, and often these substances are referred to as "plants of the gods" (Merlin, 2003). Two forms of evidence have withstood time; the primary source is artefactual, and the secondary is paleoethnobotanical which heavily relies on radiocarbon dating for accuracy (Merlin, 2003). However, researchers

admit there has been some difficulty agreeing upon exact taxa of certain species of plants, but this does not cause a major breakdown in the historical background. The artefactual evidence is subject to a certain amount of conjecture or interpretation — the purpose of a vessel — whereas paleobotanical evidence is quite a bit more empirical. There is some speculation allowed, as it pertains to the role of the plant—if it were ingested in large amounts, small doses, etc. — and it would be prudent to understand the plants within the context of their historical standing (Merlin, 2003).

Some of the earliest evidence of psychedelic use dates back to Mesopotamian civilization, which spans roughly between 2,000-1,000 B.C.E.; a combination of the drug ephedra mixed with marijuana was found in a vessel at a temple shrine near Iran (Merlin, 2003). This is not the first time, to date, that marijuana was found. In fact, the first evidence dates back to 10,000 B.P. in Taiwan, sourced as a main crop in China. Later, roughly 1,400 years ago, marijuana appeared in Japan by way of Chinese trading for printmaking, clothing production, and for ritual purposes (Hunter, 1978). The first ethnographic evidence of recreational use for cannabis dates to 446 B.C. (Merlin, 2003). The Chinese were not the only ones to take note of the many uses of marijuana; evidence from the Bronze and Iron Age supports that Scandinavian countries, as well as the Middle East, were procuring cannabis during antiquity for countless purposes such as clothing, rope, and other practical purposes such as medicinal (Merlin, 2003).

Fast-forward to the 1950's, a young Timothy Leary and Richard Alpert started the Harvard Psilocybin Project which sought to administer psilocybin to volunteers to study the effect on consciousness (Hall, 2018). At the time, LSD and psilocybin were both legal substances. Unfortunately, their unorthodox methods were a cause for concern to their

peers — Leary and Alpert did not have any protocol for participant selection, and poorly controlled conditions (Hall, 2018). After providing psilocybin to an undergraduate student at Harvard, Leary was terminated and caused the project to end (Hall, 2018). Before the negative attention that Leary and Alpert received, LSD was legal; however, 1966 marks the beginning of the end for psychedelics. Under the Controlled Substances Act (CSA) substances were placed in one of five categories based on their dependence liability, safety, and potential for abuse. Psychedelics were placed under schedule I substances which indicated that there is no currently accepted medical use and high potential for abuse, rendering psychedelics illegal (Controlled substances act, 2018). In 2018 psychedelics are still illegal in some states, despite some states approving medicinal marijuana, and even allowing recreational use. Nine states have legalized recreational use of marijuana, while twenty-nine states allow medicinal use, and some limit how the substance may be used (i.e., oils but not allowing individuals to smoke it) (Robinson, Berke & Gould, 2018).

The Neuroscience of Psychedelics and their Relationship to Creativity

Typically, psychedelics fall into one of five categories: lysergamides, tryptamines, or phenethylamines, empathogens, or cannabinoids:

Dr. David Nichols, of the Department of Medicinal Chemistry and Molecular Pharmacology at Purdue University, claims that LSD-25 is the most well-known of the lysergamides, and one that was almost entirely overlooked. Thankfully, Albert Hofmann, the man who discovered LSD, took a second look at the structure of the molecule; the shorthand acronym comes from the original German word: Lyserg-Säure-Diäthylamid (Nichols, 2001; Kihlstrom, 2017). Hofmann discovered that LSD was a very special molecule because it produced psychoactive effects unlike other lysergic acid molecules, which was accomplished by pairing specific reagents — the pairing of nitrogen and ethyl (Nichols, 2001). LSD blocks the neurotransmitter serotonin in the brain (Spiegel et al., 1996). A similar molecule to LSD is ergot, which is known to share psychoactive effects (Kihlstrom, 2017; Huxley, 2013).

Tryptamines are alkaloids (another way of saying compound) responsible for the transmission of chemical messages in the brain. Drugs like psilocybin, Ayahuasca, and DMT are tryptamines (Spiegel et al., 1996; Kihlstrom, 2017). These compounds produce noticeable changes in sensory perception, shifts in mood, and altered states of thinking.

Phenethylamines act as central nervous system stimulants which increase alertness, psychical activity, euphoric feelings, and attention (Kihlstrom, 2017; Sabelli et al., 1976). Mescaline is one of the phenethylamines, which naturally occurs in the peyote

and San Pedro cacti (Bruhn, et al. 2008; Kihlstrom, 2017). Adrenochrome, a byproduct of adrenalin, can produce similar effects as mescaline (Huxley, 2013)

Ibogoids, like ibogaine, are used to treat severe opiate addiction. Ibogaine comes from the iboga plant native to the Gabon rainforest and stimulates the serotonin receptor (Cavendish, 2005). However, in large doses ibogaine causes hallucinations while providing long-term effects on the user. The experience is reported to discourage the desire to return to drugs like cocaine, heroin, and even nicotine (Cavendish, 2005; Spiegel et al., 1996). However, ibogaine is not used in the medical field because of the potential dangers such as intense hallucinations, increased heart rate, sweating, and nausea, among other side effects (Cavendish, 2005). The University of Sao Paulo is currently conducting a trial for the treatment of alcoholism using Ibogaine, which is set to begin the next phase in March of 2018 (Dos Santos, 2017).

Empathogens are chemicals like MDMA or ecstasy that are typically made synthetically (Spiegel, Markstein, & Baumann, 1996). However, some evidence suggests that ecstasy may naturally occur in the peyote cacti according to Bruhn, Ei-Seedi, Stephanson, Beck, and Shulgin (2008). Empathogens are named such because they inspire feelings of warmth and empathy when two individuals are under the influence; however, they are very neurotoxic to serotonin neurons (Spiegel et al., 1996).

Cannabinoids are a culmination of over 400 chemicals found within the cannabis plant; however, delta-9-tetrahydrocannabinol (THC) is the most potent. Typically cannabinoids are not referenced as a psychedelic, however, that is an error in understanding: not all cannabinoids are psychoactive, and the potency varies; hashish, or dried resin, has the highest concentrate of THC and this accounts for roughly 10-20%,

while ganja and sinsemilla, which are from the buds of the plants, average 5-8%, and lastly marijuana features the lowest levels of THC, around 2-5% (Spiegel et al., 1996). THC is unique as it features a receptor in the brain called anandamide, which is also the receptor that induces overeating (Spiegel et al., 1996; Cavendish, 2005; Williams & Kirkham, 1999). The oral version of THC, dronabinol, also falls into this category.

As one of the most difficult cognitive functions to measure or quantify, creativity earns its section of dedication. To understand creativity, one must define terms of this paper; the term creativity will be utilized throughout this section as a mode of thought or thought process by which some individuals attempt to solve problems, express self, or respond to outside stimuli in a novel or unique way. So, what does this mean? Since the dawn, of time humans have strived to achieve greatness in all capacities of self-expression or applied creativity; achievements in literature or writing, mathematics, architecture (which, in its own respect, is a hybrid discipline of perfection in mathematics and practical/functional design, or fine art), visual arts and design, modes of thought and methods of thinking or different ways in which one may express how they experience the world, which to most is considered philosophy and often a laughable point to those outside the liberal studies, despite however novel or vital to critical thinking they are; the very critical thinking that is vital to the everyday problem-solving required of the modern-day human.

Neuroscientists have long been dubious of attempts to measure creativity; however, Alice W. Flaherty presents the three-factor anatomical model of human idea generation and creative drive in a 2005 article published in the *Journal of Comparative Neurology*. The article denotes that the new model of creative thinking, the three-factor

anatomical model, differs from the hemispheric model by attributing that the connections between the frontal lobes and the temporal lobes are critical in the creative process rather than those, previously thought, between the left and right hemispheres (Flaherty, 2005). Additionally, the limbic system, which is primarily responsible for emotions, motivation, memories, and learning, is a secondary — albeit important — factor involved in the creative process (Flaherty, 2005). Furthermore, motivation holds an essential place in creative, novel thinking. Flaherty asks her reader if the temporal lobe is a source of suppression for creativity, as patients with conditions known to disrupt temporal lobe function, like epilepsy, experience creative bursts when changes occur to the temporal lobe — increased levels of dopamine. Later Flaherty speculates that it may be that highly intelligent individuals can find patterns amidst a sensory dump of information overload that otherwise escapes understanding. Although, Flaherty reveals that too much dopamine blurs the line of understanding and borders on psychosis.

While the concerns are evident, dopamine enforces reward-seeking behavior, particularly novelty-seeking, and may play a rather significant role in the creative process. Moreover, while too much activity in the temporal lobe can lead to a myriad of issues, like psychosis, it would be safe to assume too little would cause the opposite; however, this is not the case. Interestingly, the concept of being blocked — lacking in creative fluidity — is not associated with the temporal lobe but rather with the frontal lobe (Flaherty, 2005). Creativity does not describe a single process in the brain, but it is rather an ability that is facilitated by the temporal lobes, frontal lobes, and the limbic system (Sessa, 2008).

Heilman, Nadeau, and Beversdorf (2003) and Sessa (2008) believe that a few factors are involved in creativity; first, the communication of different areas of the brain, diminished levels of a specific neurotransmitter, and extensive specialized knowledge are critical to forming novel relationships. Divergent thinking, which is to say that one can create novel solutions or alternate thinking to a single problem, is key to creative innovation, or the ability to express novelty and understand organized relationships. However, creativity requires more than just divergent thinking, as mentioned earlier; knowledge and intelligence are necessary, too. For this process to occur, different regions of the brain must co-actively communicate — when they otherwise do not (Sessa, 2008; Heilman et al., 2003). A unique observation of co-active communication is that individuals who lack the creative spark do not experience this mode of thinking with ease without psychedelics (Roberts, 2013).

Talented, or creative, individuals maximize specific areas of the brain while engaging in creative thinking — the communication between the frontal lobes and particular regions of the temporal and parietal lobes, which are the polymodal and supramodal areas. These areas house different forms of knowledge and are crucial to creative thinking and bringing together ideas otherwise isolated in the brain (Heilman et al., 2003). Moreover, Heilman et al., (2003) argue that diminished levels of the neurotransmitter norepinephrine are also directly correlated to the symbiosis required to be creative. Because creative thinking relies on seeking novelty, Heilman et al., (2003) speculate that the likeliness of individuals who are creative are more inclined to have substance abuse problems; as there is some evidence that suggests that exposure to novel

stimuli activates the dopamine receptor, which are the same neural substrates that are responsible for the reward effects involved in drug and alcohol abuse.

Stress is associated with high levels of norepinephrine, while relaxed states are linked with low levels (Heilman et al., 2003). As mentioned earlier, diminished levels of norepinephrine are a key component to creativity, thus indicating that a brain under high levels of stress will be less likely to make the necessary connections (i.e., co-actively communicate) required to be creative and may also stunt creative thinking and the potential mental growth. An additional point Heilman et al., (2003) touch on is the role of the neurotransmitter catecholamine, which they believe plays a significant role in creativity, but its purpose is still unknown. While individuals like Flaherty may think there is a seat of creativity, other researchers like Heilman et al., (2003) may claim that there are seats, rather than one, of creativity that requires a range of organization to occur. To understand creativity, we must be able to break it down into its most finite pieces. Sawyer (2011) claims that cognitive neuroscience focuses on a specific area of the brain to provide insight into the creative process. Cognitive neuroscience looks to the neocortex for such answers; as it is the location where all higher-level mental functioning takes place, such as sensory perception, spatial reasoning, language, and cognition (Sawyer, 2011; Lui, Hansen, & Kriegstein, 2011). Functional Magnetic Resonance Imaging (fMRI), Electroencephalography (EEG), and Positron Emission Tomography (PET) assist with understanding what is occurring in the brain while the creative process happens, or while the individual is thinking (Sawyer, 2011). Each test has its strengths and weaknesses which is why most researchers use a combination of methods — using EEG paired with PET or fMRI with EEG are some options. EEG uses sensors that are

attached to the scalp to measure electromagnetic fields produced by neural activity in the brain. EEG focuses on brain waves (delta, theta, alpha, beta, and gamma) which are still a mystery. Science continues to unpack the purpose of gamma waves; however, some researchers believe gamma waves are the source of conscious perception (Sawyer, 2011). Brain waves are measured in Hertz that range from .5-20Hz and have been associated with different states of consciousness such as sleep states, waking states, and alert states. (Sawyer, 2011). The EEG is most sensitive to cortical activity and can detect small changes in brain waves when new stimuli are introduced. However, the EEG is limited in localization or determining where the neurons are in the brain when causing the change.

The PET scan works by detecting changes in the cerebral blood flow after a radioactive tracer is injected into the bloodstream, which only lasts for a short period, around one minute to be exact, then the individual is given a task to complete. The more localized radioactivity in the brain, picked up by the PET scan, indicates a higher level of activity in that particular area of the brain — which is telling us this is where the cognitive functions for a given task are taking place. The PET scan provides a 3D image of the brain activity within the one-minute span of time. In comparison to the EEG, the PET requires a bit more time, around 40 seconds more, to measure increased brain activity (Sawyer, 2011; Raichle, 2009).

In 1991 fMRI emerged to take the lead in neuroimaging (Raichle, 2009; Sawyer, 2011). fMRI uses a magnetic field to detect oxygenation in the blood. The spatial resolution for fMRI is much higher in contrast to the PET scan. Additionally, fMRI does not require a radioactive chemical to be injected into the individual and is capable of capturing an image of the brain every two seconds, which is on par with the speed of the

EEG, while including the high spatial resolution like that of the PET (Sawyer, 2011). Despite the advantages, the drawbacks of the fMRI are the scale of imaging—fMRI is limited in the space it can capture by a few millimeters, which leaves a significant portion of the brain in the dark. Were activity to occur in other areas of the brain simultaneously, only the area focused on would provide any data as a result. For the reasons outlined above, this is precisely why cognitive neuroscientists maximize all options available by using mixed methods for collecting data. Other tests are static and limit result capabilities.

Artists Under the Influence

Throughout history, some individuals have found creative inspiration while under the influence of psychedelics. In some circumstances the artist deems it a necessary step to take a substance due to stress, depression, or issues with focus, or just plain curiosity. Whatever the reason, the outcome is impressive. Although some individuals simply appreciate the art that is created by another artist, their love for an obscure genre is vital. Some artists maintain that they are not able to create while under the influence but have a

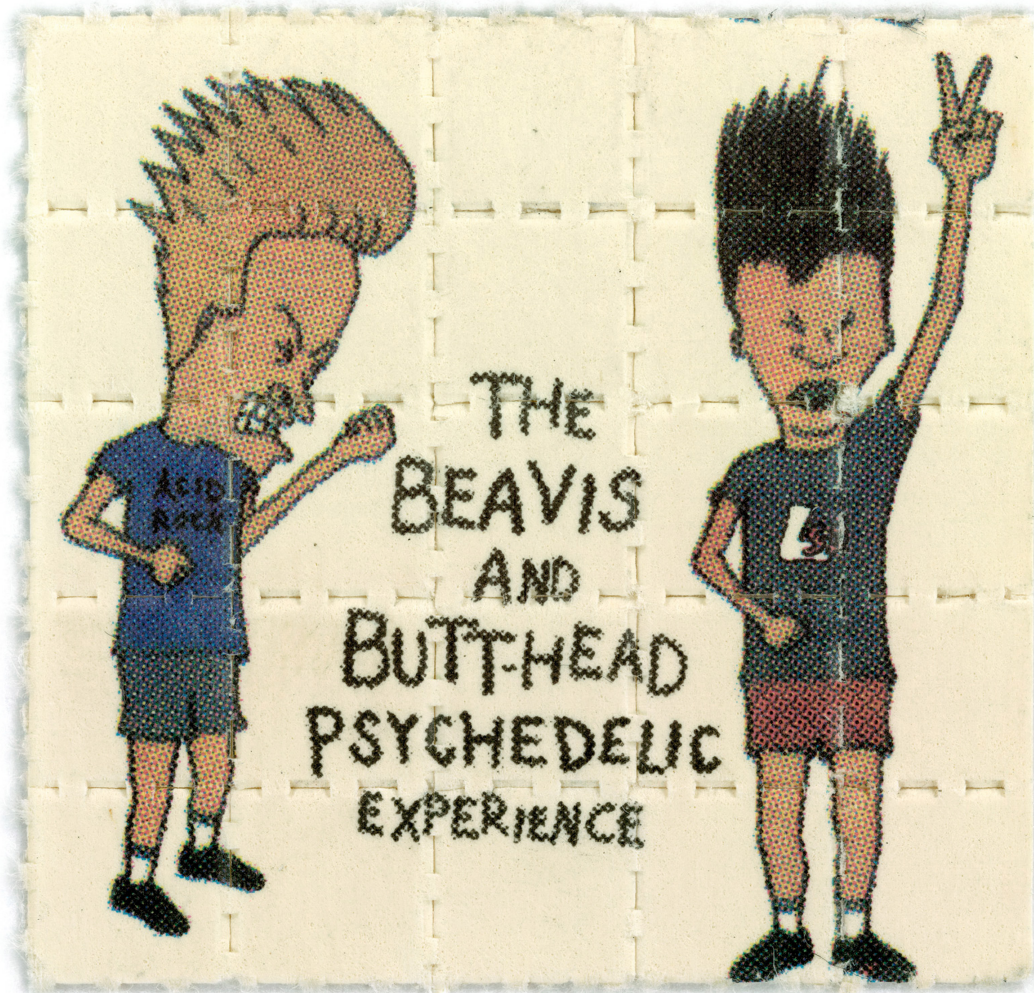


Fig. 1: McCloud, M. (2016). *Beavis and Butthead*

follow-up process immediately after the psychedelic experience, while other artists engage in the creative process while under the influence. Each case is situational and

dependent on the ingested compound. This section will explore art appreciation, artists, and art movements in conjunction with psychedelics.

Mark McCloud

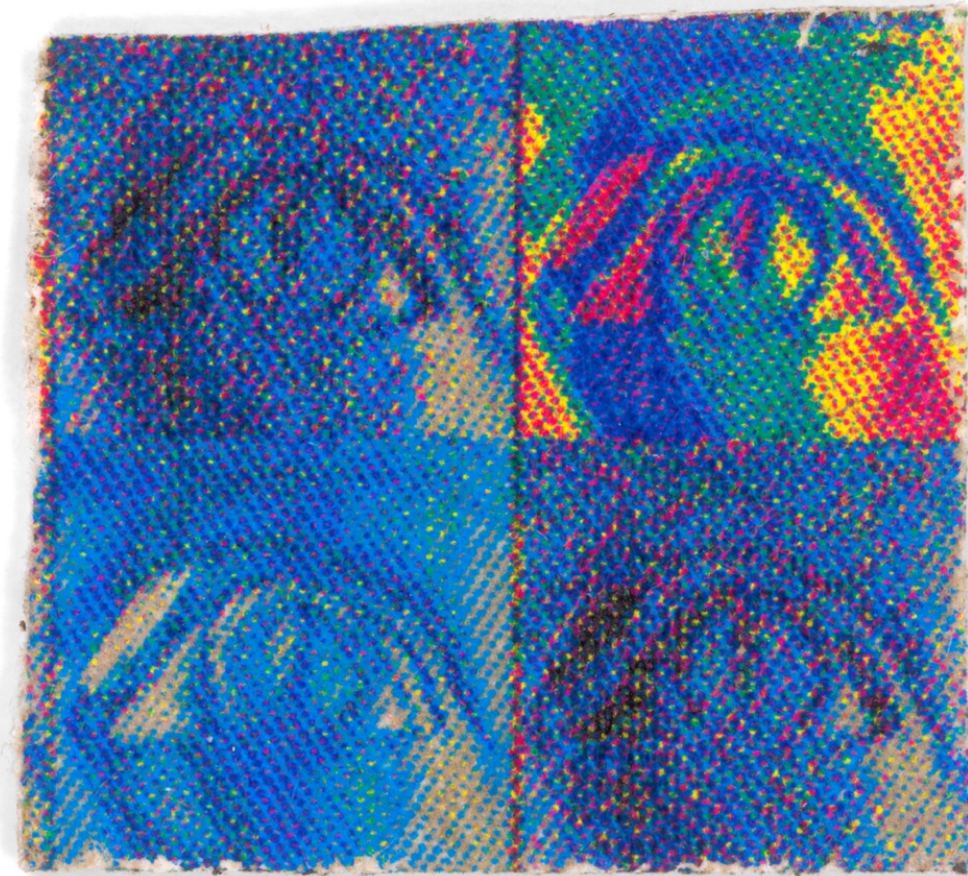


Fig. 2: McCloud, M. (2016). *Four Eyes*

Mark McCloud is not what one might call a fine artist. However, he is an art appreciator who has turned LSD blotters into a collectible and coveted art form (Rhodes, 2017). The blotter is created by the chemist who synthesizes the LSD, or by the dealer who purchases the LSD from the chemist. Once the image is printed on the absorbent cardstock either a single dose of LSD is dropped on one square at a time, or the entire sheet of paper is soaked in an LSD bath. Once the paper has absorbed the LSD, a single dose may be easily pulled away by the perforated edge, then ingested (Fig. 3 below

features 50 doses; two five by five sheets). Over some decades, McCloud has been collecting a wide range of blotters (since the early 70's) – inspired by a near-death experience (NDE) while tripping on LSD; McCloud fell out of a window and was “saved” by his NDE (Rhodes, 2017). Each blotter is unique and serves as a staple image

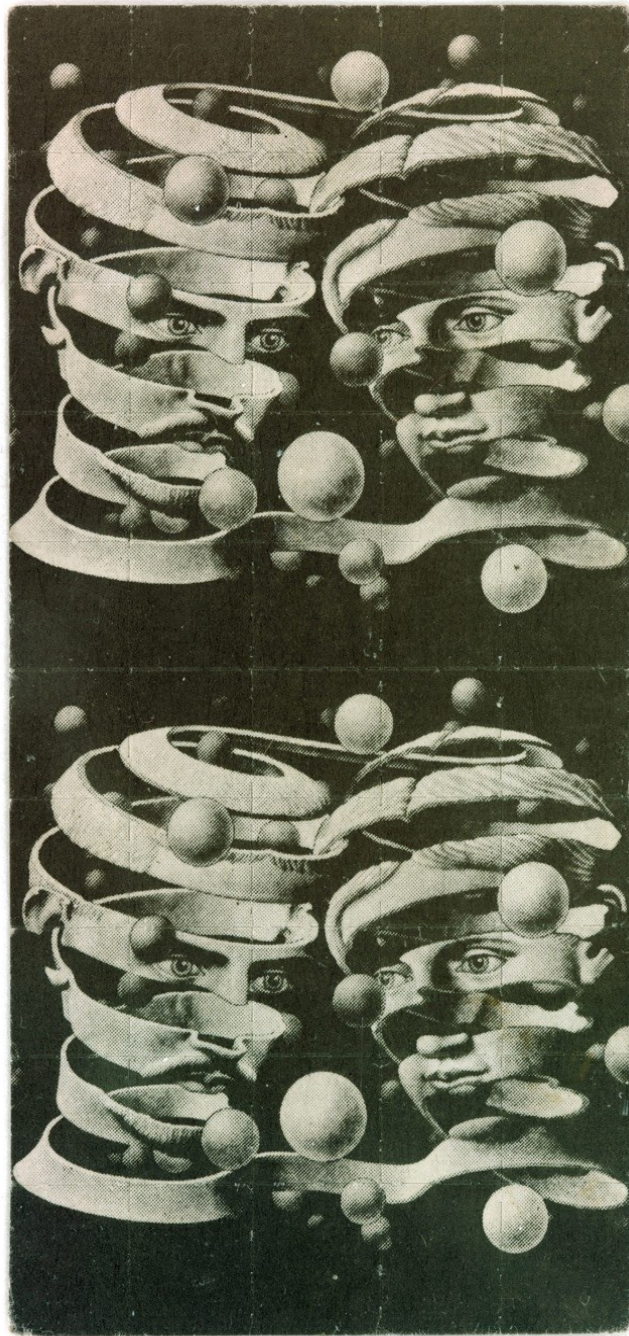


Fig. 3: McCloud, M. (2016, February 16). Escher

that was, in a sense, a calling card so the individuals ingesting the LSD would know precisely who synthesized their LSD and where to find it (Rhodes, 2017). McCloud's San Francisco home has become a mausoleum for inactive blotter tabs, over 33,000, in fact (Rhodes, 2017; Morgans, 2014; McCloud, 2016). Some are original works, unclaimed by their creator (see Fig. 2 above), while others are replicas of works by famous artists like M.C. Escher (see Fig. 3 above). Despite the fact that McCloud is not the artist of these tabs, he drew attention to the unnoticed. Beyond that, he made the unlikely LSD blotter a coveted art form and brought the uniqueness of the cardstock artwork to the foreground of people's minds, which displays the creativity on the part of each dealer or chemist – whoever is responsible for these unique tokens.



Fig. 4: Saunders, B. (2008). [*Sketchbooks*]

Bryan Lewis Saunders

From art appreciators to creators. Some individuals claim they are under the influence of a substance or have been while creating art. One artist, in particular, Bryan Lewis Saunders, has attested to taking over 60 different drugs and creating more than



8,000 self-portraits under the influence (Marks, 2016; Watercutter, 2012). The creative

Fig. 5: Saunders, B. (2008). *(Shitty) LSD*

process for Saunders involves taking one substance at a time; however, in some circumstances, a cocktail is ingested, then the artist creates a self-portrait. Saunders has been creating self-portraits every day for the last 27 years. These works of art are featured

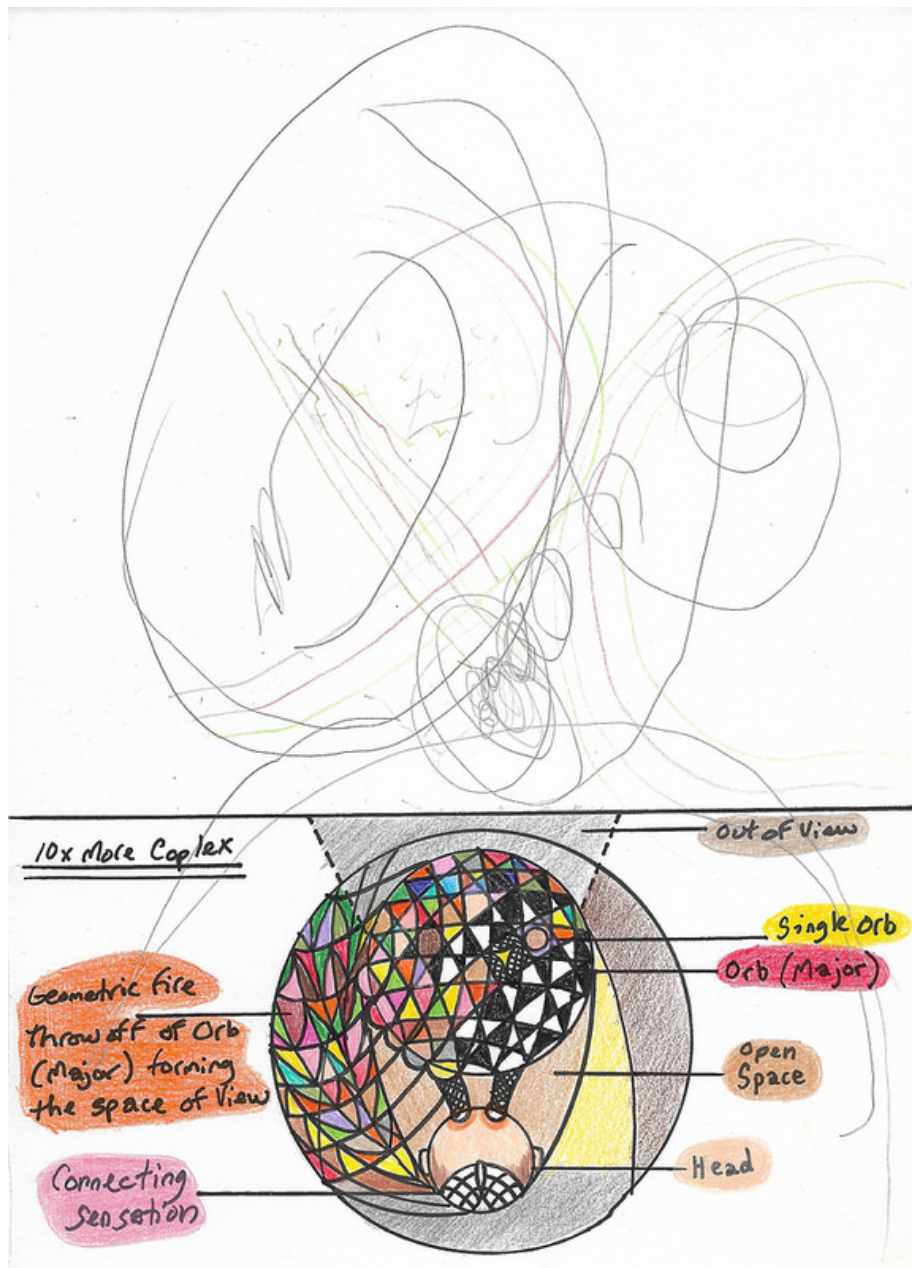


Fig. 6: Saunders, B. (2008). *DMT*

in hundreds of sketchbooks housed in his apartment (see Fig. 4 above), and he claims that his creative process allows him to have a deeper understanding of self, a sense that he

believes is a new sensory organ or an extra level of perception that had previously escaped understanding (Marks, 2016). Featured are three self-portraits created by the artist: the LSD (see Fig. 5) self-portrait, then DMT (see Fig. 6 above), and finally marijuana (see Fig. 7 below). The LSD and DMT self-portraits provide an organic line structure, while the marijuana portrait is hyper-focused and very linear — note the stanch



Fig. 7: Saunders, B. (2008). Marijuana

contrasted background which features the black and white lines in the background, with a centrally focused form in the center foreground of the drawing. Both DMT and LSD portraits provide the concept of oneness or melding; the pieces appear to be alive, yet also in tune with perceptual norms of spatial understanding—we can tell that we are looking at a form of some kind. Not all concept of form is lost, despite being under the influence of drugs.

Saunders further attributes his art and creativity to that of experiencing the novelty of life through his CNS (Saunders, 2008), which touches on what Flaherty (2005) believes the creative mind is looking for; the sole purpose of pinging the dopamine receptor in the brain, something that offers the creative individual the likelier potential of abusing drugs, as mentioned earlier. However, there is something to be said for the level of intelligence an individual has in conjunction with drug use. Kanazawa (2010) claims that the National Child Development Study shows that individuals with higher levels of intelligence, and often referred to in childhood as very bright, are more likely to experiment with drugs in their time, whereas those with lower levels of intelligence are not. The study explored many drugs, and was not limited to psychedelics, and only included individuals living in the United Kingdom. However, the study revealed that religion, religiosity, personal education and the education of the parents all play a crucial role in what motivates one to seek novelty. Novelty-seeking behavior has long stood as an evolutionary pillar to continue the species, and some scholars believe that this behavior influenced the evolution of consciousness, by inspiring individuals to take psychedelics in the first place; something that MacKenna (1993) referred to as the Stoned Ape Theory. Moreover, because our society often connects being highly intelligent with

the most positive of life outcomes, there's something to be said for moderate drug use, on an evolutionary standpoint, concerning creative thinking (Kanazawa, 2010).

Aldous Huxley

Huxley is the author of *Brave New World*. Aside from Huxley's lengthy resume, he was an avid user of LSD; however, in an interview for *The Paris Review*, Huxley was asked whether he believed that LSD had an impact on the creative process, to which he replied;

I do not think there is any generalization one can make on this. Experience has shown that there's an enormous variation in the way people respond to lysergic acid. Some people probably could get direct aesthetic inspiration for painting or poetry out of it. Others I do not think could. For most people, it is an extremely significant experience, and I suppose in an indirect way it could help the creative process. However, I do not think one can sit down and say, 'I want to write a magnificent poem, and so I am going to take lysergic acid [diethylamide].' I do not think it is by any means certain that you would get the result you wanted — you might get almost any result (Horowitz & Palmer, 1960).

Huxley goes on to say that the experience that is brought on by LSD is unlike any other, one that transcends words or understanding, and without actually living through the experience, one that is unimaginable. Of course, LSD offered loci of creativity for Huxley, just not in the typical sense. He reports that he was not inspired to write during the experience but only after it was over when the unique perspective becomes available to the writer (Horowitz & Palmer, 1960). Through this unique worldview, Huxley believed that he was able to experience the kind of world that Van Gogh and other

creative geniuses lived in (Horowitz & Palmer, 1960; Fraser & Wickes, 2017). Huxley wrote about his experience with mescaline in his book, *Doors of Perception*. In his writing, he argues that it is a salutary gift to see ourselves as others see us. It is psychedelics that assist changing the ordinary modes of consciousness, and it is our duty to *self* to explore the internal universe (Huxley, 2013).

Marshall (2012) writes that Aldous Huxley, facing death, asked to take one last trip on LSD before he passed away. In a heartwarming interview, his wife Laura recounted his final moments as peaceful and calm as he departed earth on an LSD trip. Laura stated that Aldous had a beautiful expression on his face as he died with 100 micrograms of LSD in his system. Huxley's doctors and nurses stood by in amazement while they witnessed his departure; awestruck, as he gently went off which was not an ordinary occurrence, as he died from laryngeal cancer.

Hunter S. Thompson

Hunter S. Thompson, in comparison to the previously mentioned individuals, did not take psychedelics in moderation. Thompson was an acclaimed writer and an avid substance user. In fact, he would drink several cups of coffee, then snort line after line of cocaine, followed by some marijuana (to take off the edge built up by the cocaine), only to snort more cocaine, then later dose LSD (Carroll, 2014). Now he was ready to write.

Thompson would ingest this described cocktail over the course of the day, which produced *Fear and Loathing in Las Vegas*; a work that ought to be classified as autobiographical when compared to the first-hand account that Carroll (2014) describes in her book, *Hunter: The Strange and Savage Life of Hunter S. Thompson*. Thompson's odd mixture of substances did produce something he called Gonzo journalism which was

a collaborative effort with the illustrator Ralph Steadman (Steadman, 2014;). Gonzo journalists write from the first-person narrative and include the use of satire and social criticism (Carroll, 2014).



Fig. 8: Steadman, R. (2018). *Vintage Dr. Gonzo*

Ralph Steadman



Fig. 9: Steadman, R. (2018). *Gonzo Guilt*

An artist whose works reflect the chaotic nature of Thompson's life is Ralph Steadman. Steadman attributes that an LSD experience in 1970 with Thompson sparked his illustrating career (Steadman, 2014). In an exchange, after the second-time meeting, Steadman asked Thompson if he had anything for sea sickness, and then Thompson gave him a dose of LSD. Steadman, completely unaware that he had taken LSD, started being creative with spray paint and the rest is history (Steadman, 2014). Although this was the only time Steadman took LSD in his life, it had a life-long impact on the artist and his work (Steadman, 2014). Steadman brought *Fear and Loathing in Las Vegas* to life with a series of sinister looking illustrations (see Fig. 8, 9, & 10). His style is an expression of



Fig. 10: Steadman, R. (2018). *Fear and Loathing in Las Vegas*

his emotions, unfiltered and natural but some individuals have suggested that

Steadman to be a deeply troubled person because of the caustic style of his artwork; however, he claims that he gets it all out on paper (Steadman, 2014).

Psychedelic Art & Wes Wilson

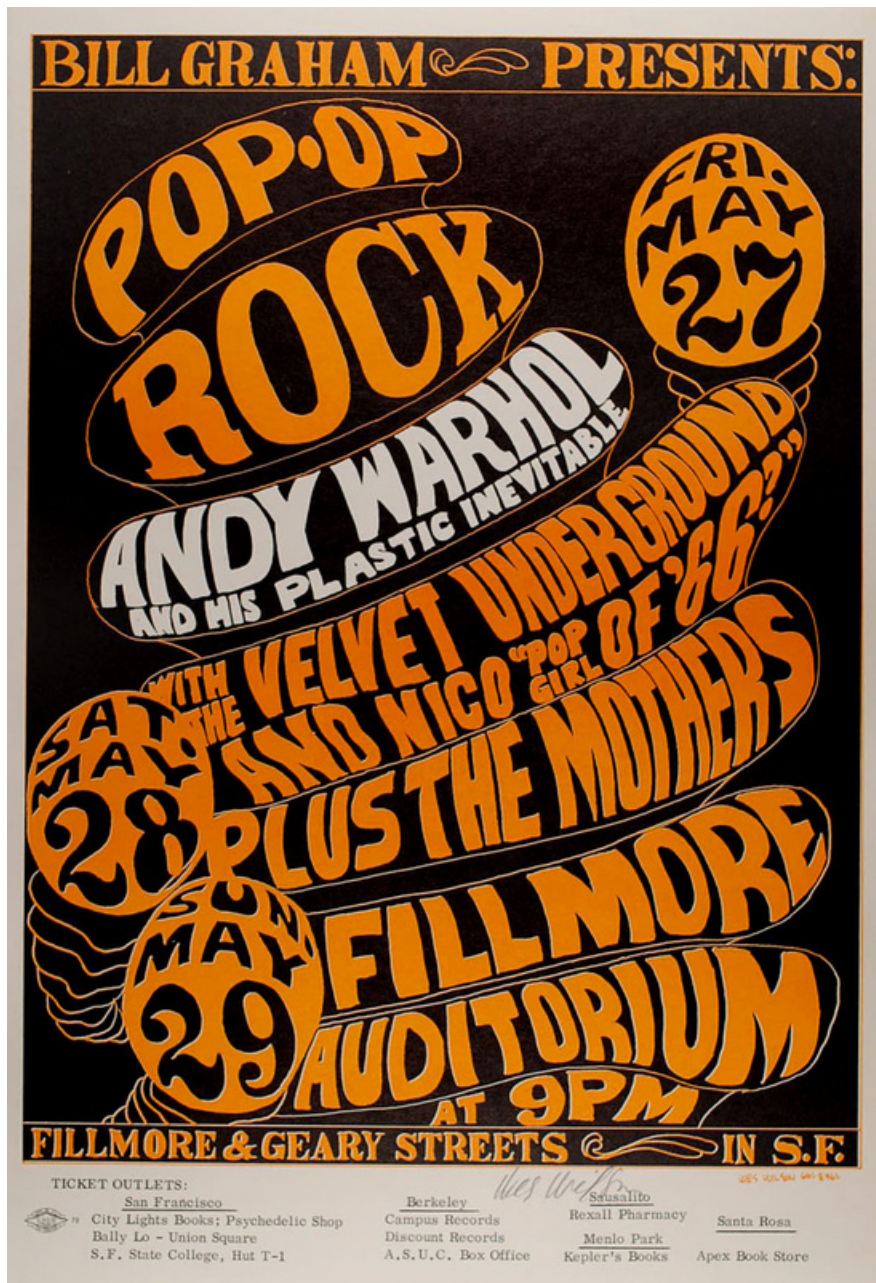


Fig. 11: Wilson, W. (1966). BG-8

A counterculture arose during the 1960's that offered a new type of art inspired by psychedelics. Psychedelic art has been described as anything that breaks down

conventional ideas of art, experiments with or toys with different concepts and perceptions of reality or describes an obscure view of the world; transcendent art (Rivers, 2013; Krippner, 2016). The works created by psychedelic artists push the limits of the optical or visionary regardless of whether or not the creator was under the influence before or during their creation (Rivers, 2013). Although psychedelic art has been coined as a bridge between modern and contemporary art by some scholars, very little attention has been paid to this style, and typically it is not recognized or mentioned in most art textbooks (Rivers, 2013). We see it everywhere and do not even know it. An overlooked yet well-known artist, Wes Wilson, dedicated his life to creating psychedelic poster art (see Fig. 11 & 12), made popular during the 1960's by the famous promoter, Bill Graham (Popeson, 2014; Brignall, 2015). However, there's no evidence that Wes Wilson created these works while under the influence. The artist attributed credit to the Art Nouveau movement for inspiration, which was short-lived and popularized around the 1850's, and quickly morphed into the Art Deco movement around the 1910's (Marien & Fleming, 2005). One of the founding fathers of the Art Nouveau movement was Henri de Toulouse-Lautrec, an avid psychedelic user (Wilson, 2011; Marien & Fleming, 2005). One might speculate that the influence of psychedelics reaches beyond the user to influence style, culture, and individuals outside of the experience. This point should be considered, given that someone like Wes Wilson — who has not claimed psychedelics as a source of influence — drew inspiration from styles formatted with psychedelic undertones.

The limitations for psychedelic art stem from an unclear understanding of stylistic expectations; psychedelic artists created whatever immersed from their experience, and



Fig. 12: Wilson, W. (1967). BG-48

they lacked a cohesive manifesto that would group their pieces in an identifiable way. For

example, when viewing Impressionist works of art, it is understood that the viewer is looking at an Impressionist work, as the art and artist creating the work are following a framework for the stylistic expectations (Marien & Fleming, 2005). Typically, we know what we are looking at, and where it fits in the art world because it fulfills major expectations of the Impressionist style, which makes it easy to classify (Marien & Fleming, 2005). Unfortunately, psychedelic art is not necessarily the same, because the art aligns with a common *experience* rather than a common *style*; a psychedelic experience (Krippner, 2016). As a result, the breadth of work is amorphous and difficult to pinpoint. If there is a commonality observed in the stylization of psychedelic art, it stems from the fundamentals of abstraction and Surrealism, which both play on psychoanalytical influences (Krippner, 2016).

Psychedelic art looked to the two styles and their respective foundations for inspiration. Artists like Mark Rothko and Jackson Pollock are two widely known abstract artists who claimed their inspiration came from Jungian psychoanalytical theory. Psychoanalytic theory suggests that the unconscious mind influences our decisions in ways we do not fully understand. How this all effects the creative mind, under the influence of psychedelics, is something that continues to reveal itself and remains unclear (Browron, 1999; Cernuschi, 1992; Jabr, 2013). Some scholars avoid claiming that psychedelic art was a movement at all for these reasons, which is why they rather regard it as an “amorphous influence rather than a cogent style” (Rivers, 2013).

Current Research on Psychedelics

A renaissance is currently underway, a new-found interest in psychedelic research has been happening right below the surface. The Multidisciplinary Association for Psychedelic Studies (MAPS) is a non-profit research and educational organization that has been funding psychedelic research since 1986 (O'Neill, 2018). Executive Director Rick Doblin, Ph.D. spearheads the effort. In 1972, when he was eighteen years old, Doblin dropped out of college. Doblin continued taking LSD during this time and believes that he was “educating the mind” by taking LSD as a youth; it started making him experience emotions he was not familiar with and confronting new ideas about life and reality. Furthermore, Doblin explains that he felt grounded by his experiences with LSD and this sense of the world changed into “non-ordinary consciousness” (O'Neill, 2018).

After his life-changing experience with psychedelics, Doblin decided that he would dedicate his life to research in psychedelic therapy—so that one day he could help those who needed the very therapy that he benefited from (O'Neill, 2018). Later, Doblin earns a Ph.D. in Public Policy from Harvard’s Kennedy School of Government, which serves as an important foundation for MAPS and its future success. Notable supporters like Dr. Richard Rockefeller, and his cousin, Senator Jay Rockefeller, assisted Doblin and MAPS through the political red tape. For over twenty years Doblin (and MAPS) has been working with the Department of Defense on treatments for veterans with severe PTSD; therapies with MDMA, specifically; however, MAPS dedicates its resources to a range of trials with different psychedelics, not just MDMA (O'Neill, 2018). With the help of the Rockefeller’s, Doblin and MAPS have made great progress in psychedelic research with

the cooperation of the Department of Veteran Affairs and the Food and Drug Administration (FDA). The FDA, since 1966, blocked psychedelic research but in the early 1990's things started to change (Hall, 2018). The FDA allied with science, rejecting political agenda (O'Neill, 2018).

MAPS has long stood as a pillar in research in psychedelics and currently has several trials underway: MDMA-assisted psychotherapy, which looks into whether or not MDMA assisted therapy can assist with emotional damage sustained by sexual assault, war, violent crimes and other trauma (O'Neill, 2018), medical marijuana and PTSD, which offers veterans of war marijuana to treat PTSD, along with LSD-assisted psychotherapy, ibogaine-assisted therapy, and ayahuasca-assisted therapy are additional psychedelics that are currently underway (Thomas, 2013).

Ross et al. (2016) conducted a randomized, double-blind, controlled, crossover study with 29 terminally ill cancer patients at New York University's Langone's Perlmutter Cancer Center. Each patient received either a placebo that causes rapid heart rate (250 mg of niacin) or .3 mg of synthesized psilocybin. Data were collected over a 5-year span from participants. The purpose of the study was to learn what effect psilocybin might have on the anxiety and depression in advanced-stage cancer patients (stages III and IV). More than two-thirds of the participants were treated with antidepressants without success. Follow-ups with the patients regarding cancer-related existential distress, which includes hopelessness, and attitudes and affects associated with death, revealed the findings were substantial and long-lasting (Ross et al., 2016). Post-dosing patients experienced a reduction in anxiety and depression immediately after dosing through the seven-week mark, and even at the six-and-a-half-month follow-up (Ross et

al., 2016). Furthermore, anxiety and attitudes toward death improved in the long term (six-and-a-half months or more). The psilocybin experience was reported as highly meaningful, spiritual, and left positive cognitive and behavioral changes that lasted weeks to months for the participants (Ross et al., 2016). Ross et al. (2016) reveal that more research needs to be conducted on a wider range of participants; however, what was collected shows the positive effects of psilocybin; spanning as long as eight months in this particular trial and only after a single dose — overall mental well-being was reported as improved.

However, this is not the only study to use psychedelics for psychiatric treatment on the terminally ill. Grob et al. (2011) conducted a within-subject, double-blind, placebo-controlled study with 12 advanced-stage cancer patients which found that patients sustained improved attitudes and decreased anxiety after taking .2 mg doses of psilocybin in two sessions which were separated by several weeks. The Beck Depression Inventory (BDI) was used as a method to measure the scale of depression pre and post dosing; scores dropped almost 30% after the first session, maintaining up to the six-month follow-up (Grob et al., 2011). In another study conducted by Lyons and Carhart-Harris (2018) psilocybin was administered in much higher doses than previously mentioned; first 10 mg, as a safety, then 25 mg. The dosing sessions were separated by one week. Findings revealed longer lasting effects on decreased levels of authoritarianism and depression for seven to twelve months following two doses and increased levels of interconnectedness with nature for seven to twelve months after dosing (Lyons & Carhart-Harris, 2018).

Limited research on medical marijuana has been published despite the increased popularity in the United States over the last two decades (Birdsall, M, Birdsall, T & Tims, 2016). Currently, seven clinical trials are in place with some mixed findings (Interventional Studies, 2018). Because medical marijuana has the potential for medicinal applications more research is required; however, some researchers suggest that vaporizing marijuana as a pain management solution is a viable alternative to opiates. By vaporizing the marijuana, the patient reduces the number of hazardous carcinogens (Birdsall et al., 2016; Weintraub, 2018). Some research suggests that cannabidiol (CBD), which is extracted from the same plant but does not produce psychoactive effects, may be beneficial for pain management and the treatment of cancer (Johnson, 2017; Mcallister, Soroceanu & Desprez, 2015). CBD is unique as it influences the body to utilize its own CB1 and CB2 receptors in the brain — the body naturally produces cannabinoids (Johnson, 2017). CB1 is responsible for coordination, pain, emotions, and appetite, while CB2 is responsible for receptors relating to the immune system, specifically inflammation, and pain (Johnson, 2017). The first evidence that CBD is in part responsible for antitumor activity was in a study conducted by Singer et al., (2015). Roughly twenty studies conducted between 2000 - 2015 revealed that cancer cell growth decreased, and malignancy of tumors decreased in humans and rats over a range of cancer types (Mcallister, Soroceanu & Desprez, 2015; Singer et al., 2015).

Previously noted, ayahuasca is a combined compound composed of *Banisteriopsis caapi* and the leaves of *Psychotria viridis*; DMT and harmala alkaloids (Bouso et al., 2015). Very little clinical research on ayahuasca exists. In a recent study conducted by Bouso et al., (2015) long-term use of psychedelic drugs is associated with changes in

brain structure and alters personality. The study used MRI images of 22 regular users of ayahuasca. Participants were limited to members of the Santo Daime church located in Barcelona, Spain. The study's inclusion criteria required that participants have taken ayahuasca at least fifty times in the previous two years, no history of psychiatric or neurological disorders, limited lifetime drug use outside of ayahuasca, and no drug use for two weeks before the study (Bouso et al., 2015). Several tests were issued to the participants, including but not limited to the Temperament and Character Inventory-Revised (TCI-R), A psychopathological assessment using the Symptom Check-List-90-Revised (SCL-90-R) questionnaire, which measures anxiety depression and psychoticism, and three neuropsychological tests in order to create a baseline for the participants (Bouso et al., 2015). The data reveal that long-term use alters attitudes and interests in participants, such that they become more cognitively flexible (open-minded) and less materialistic, gaining mystic-like feelings, or oneness (Bouso et al., 2015). In fact, ayahuasca users displayed higher than average levels of self-transcendence, a feeling linked to religiousness and spirituality, and thinning of the cortical thickness (CT), according to Bouso et al. (2015).

Microdosing is the long-term (or short-term, as it is in complete control of the user) use of psychedelics like LSD & psilocybin, self-administered as a way to enhance consciousness; LSD & psilocybin are said to heighten awareness, and spiritual affect, and to increase focus, boost creativity, and stabilize mood (Johnstad, 2018; Oberhaus, 2017; Doblin, 2016). Low doses range anywhere from .5 mg up to 10 mg for LSD, and anywhere from .2g to .5g for psilocybin, while some experienced psychedelic users self-report higher doses in the 10 – 20 mg range, which appears to be a rather blurred line, and

indicates that dosing can be person-by-person basis (Johnstad, 2018; Doblin, 2017). The purpose of controlling the dosing is to gain the positive mental insights of the psychedelics without actually experiencing the psychoactive effects. However, one indisputable point is the span between microdoses, which seems to be key, as some users report negative effects if taken too close together or in consecutive days without rest (Johnstad, 2018). A recommended dosing schedule should be taken in the morning every fourth day, and it is best to start with less and feel out one's system. The idea is to improve and enhance overall cognition, rather than experience a drug high.

Over the past few decades, microdosing has become increasingly popular in Silicon Valley and more recently has been spreading to other cities as the promise for better focus and creativity, which offers a much-needed edge in big business (Solon, 2017; Sahakian, D'Angelo, & Savulich, 2018). However, there are some issues with self-administering LSD, and psilocybin; there is a very fine line between a microdose and a minidose, which houses more powerful psychoactive effects on the individual. So, understanding the precise amount of the drug that is ingested is a key component to the success of the micro versus the mini (Johnstad, 2018). Because there are no clinical studies on micro-dosing currently available, the jury is still out on this topic; however, Jim Fadiman has been microdoing for several years as well as Albert Hofmann (Kabil, 2016; Fadiman, 2018). Hofmann microdosed for at least the last twenty years of his life, and he lived to the age of 102 (Hall, 2016).

In some circumstances, users of psychedelics, outside the medical application like clinical research, encounter a difficult trip. A difficult trip is one that causes the user panic, anxiety, or great fear. Often this leads to erratic behavior and thought patterns,

which can lead to mental destruction — a mental break. The Zendo Project, which is a side project of MAPS, offers peer support to individuals who are overwhelmed and uncomfortable while in a non-ordinary state of consciousness (O'Neill, 2018). Zendo's goal is to reduce the number of harmful experiences that may arise – mental breaks, arrests, etc.— within the community. As a preventative measure, Zendo psychologists and psychiatrist deploy to festivals all over the world to reduce the number of harmful psychedelic experiences (O'Neill, 2018).

The dangers of tryptamine derivatives, synthetically produced, like alpha-methyltryptamine (AMT), 5-methoxy-N, N-dimethyltryptamine (5-MeO-DMT) and 5-methoxy-N, N-diisopropyltryptamine (5-MeO-DIPT), are clear according to Margarida Araujo (2015). Now, they are widely available in headshops, which are locations that tobacco pipes are available, for anyone to purchase. Researcher Margarida Araujo (2015) expresses concern for the increased availability of these synthetic tryptamines to the public, as the compound has been linked to some deaths.

Final Thoughts

As I reflected on which topic I desired most to write about, I did not hesitate with a response which leads me right to psychedelics. I have modestly explored with psychedelics over the course of my life and have long-lasting impressions from each experience, just like the research above outlines, which is what primarily influenced my decision to write about such a taboo topic. Though this section will be rather anecdotal, I believe it is an appropriate — albeit liberal — way to end my writing. In the beginning, I featured a quote of Einstein's which I mentioned has inspired me a great deal. I have often struggled with providing my true thought for fear of a deeply negative reaction. I have experienced a great deal of opposition to obscure topics, which is why I felt it was

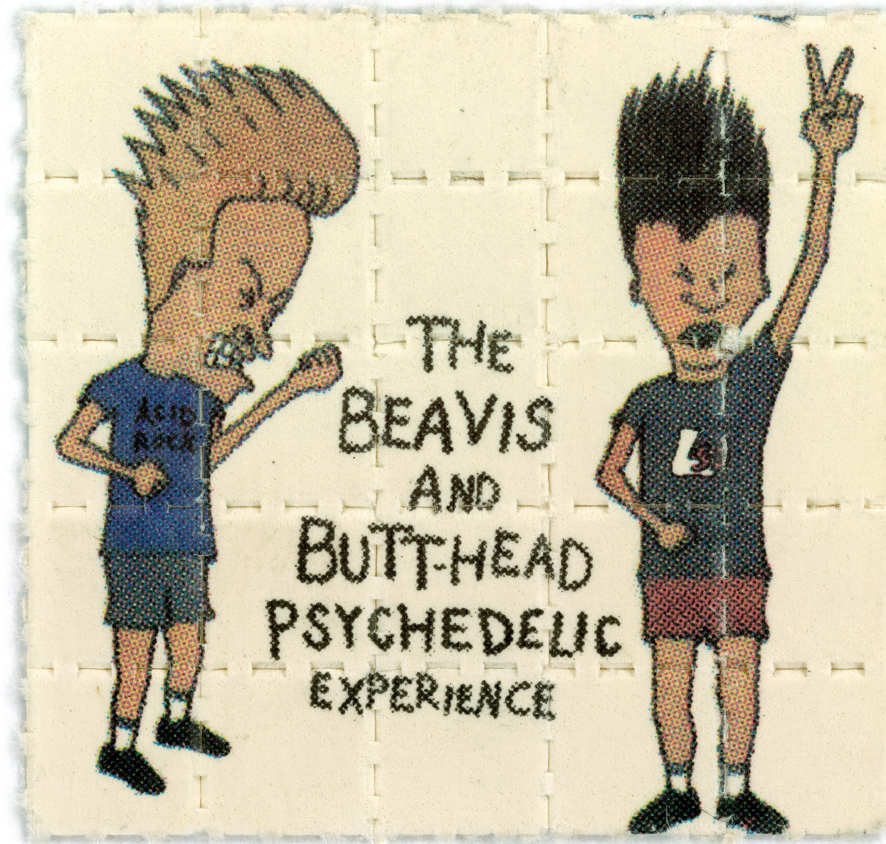


Fig. 13: McCloud, M. (2016). *Beavis and Butthead*

necessary to choose a topic that I felt deeply passionate about—no matter the reaction I received.

My journey with psychedelics began many years ago. Weekdays, I typically focused on working and attending school for my undergraduate degree. At the time I was working full time and going to school full time, so the weekends were mine; my cherished time where I was able to catch up on things around the house. I typically spent this time finishing up the homework that I was not able to manage during the busy week and other mundane chores that seemed never-ending. One particular Saturday I cleaned my modestly sized two-bedroom apartment with my then long-term boyfriend, put up lights to set a mood, and prepared the house for a special occasion; this weekend would be anything but mundane because I was going to do LSD for the first time. Each time I have ingested a psychoactive substance I have done my best to mentally prepare, in all capacities, to ensure the most successful and positive experience possible.

From a small black box, which was ornately adorned with plastic geometric shapes on all sides, I grabbed a little plastic zip-lock. Inside the bag were four square-cut pieces of paper with little Beavis & Butthead figures appropriately, printed on them (see Fig. 13). I placed the paper on my tongue and let it settle. Earlier in the day, I set out paint, canvases, drawing paper, and my coveted Prisma-Color markers all because I hoped that I might feel inspired to create something — during this time in my life I had been experiencing a lull in creativity. I was not sure what to expect despite all of the experiences that people, within my circle of friends, shared with me over the years. After all, no two people experience LSD the same. A bit of time passed, and as I walked down the hallway, I casually looked over and noticed the rope lights, lining the hallway floor,

throbbing like they were breathing; like they were alive. At the time I just observed the event, a bit captivated by an ordinarily inanimate object, something that typically would not attract my attention for more than a fraction of a second, which engaged me for what seemed to be an eternity. I walked over and touched the rope lights, knowing I was experiencing an LSD-induced hallucination and held the rope between my thumb and forefinger as it continued to expand and contract in my hand. My significant other distracted my attention away from the breathing light toward the living room, where my art supplies waited for me.

My perception of time altered — my experience seemed very rapid at first, then later slowed down into a very distorted sense of reality. My limbs looked like they were in a movie, but they were not playing in sync with their surroundings — I did not realize then that this was typical of LSD. Nevertheless, I went with it because I knew to expect the unexpected with LSD. Everything in my reality started to glitch or skip around a bit, especially my arms and hands or the things closest in my depth-of-field. For the first time, as I was drawing, I experienced what felt like freedom, or something I believe to be beautiful, a oneness with something I was creating, the very familiar oneness that many participants from the clinical trials that I have reference refer to. So, in a sense, we share this moment.

The ink coming from my markers felt like it was an extension of me and I began to reflect on the years of art I had created up to this point. I longed for its return, as almost all of my work-to-date occupied homes outside of my own. I swelled with emotion as I thought of how connected I felt to the things I had given life to. In the years proceeding this moment, I had been so incredibly self-critical, I was never able to enjoy the art-



Fig. 14: Roun, J. (2016). *Dematerialize*

making processes so profoundly, at least not in the way that I was while under the influence of LSD. I have struggled with perfecting everything I attempt to make or do, creatively or otherwise, and I continue to satiate for that perfect moment of creation that I

once had under the influence. I have always been able to find fault or err in things that I

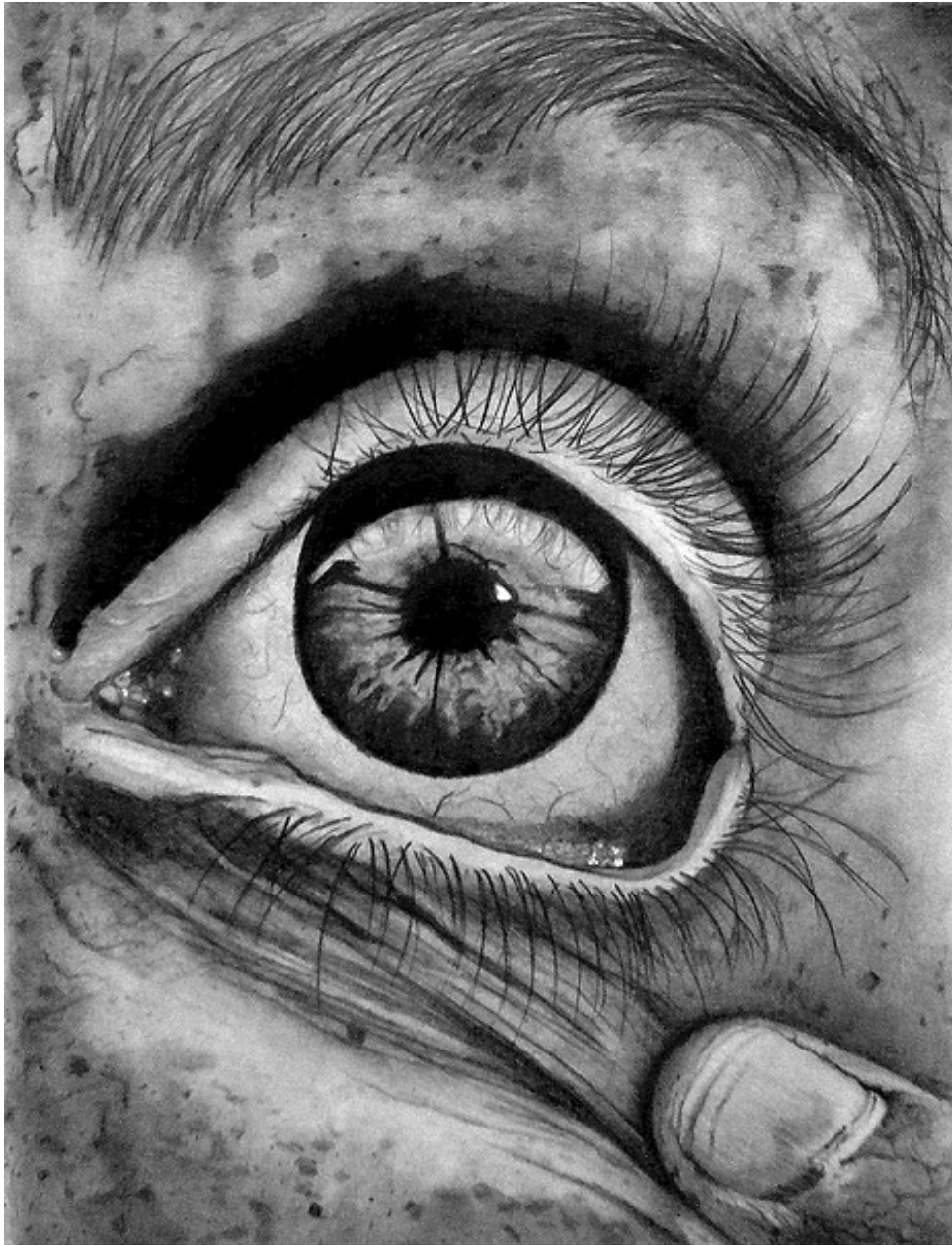


Fig. 15: Roun, J. (2016). L'oeil

create, and I have never felt satisfied with anything that I have made, outside of my experiences with hallucinogens.

Just like the artist I have written about I too have created works of art under the influence. Outlined below are a few of the pieces I have created over the years while

under the influence of different substances, some more recent than others: as I reflect on the line quality in pieces above, I cannot help but notice the similarities. If compared to Saunder's pieces they are akin! The precision in line work is parallel, and the LSD pieces (see Fig. 20 & 21) feature the same bubbly, free-flowing blob-like forms as Saunder's self-portrait on LSD. Figures 14 - 19 were made while under the influence of marijuana, Fig. 20 & 21 while under the influence of LSD, and Fig. 22, 23, and 24 while under the influence of cocaine.

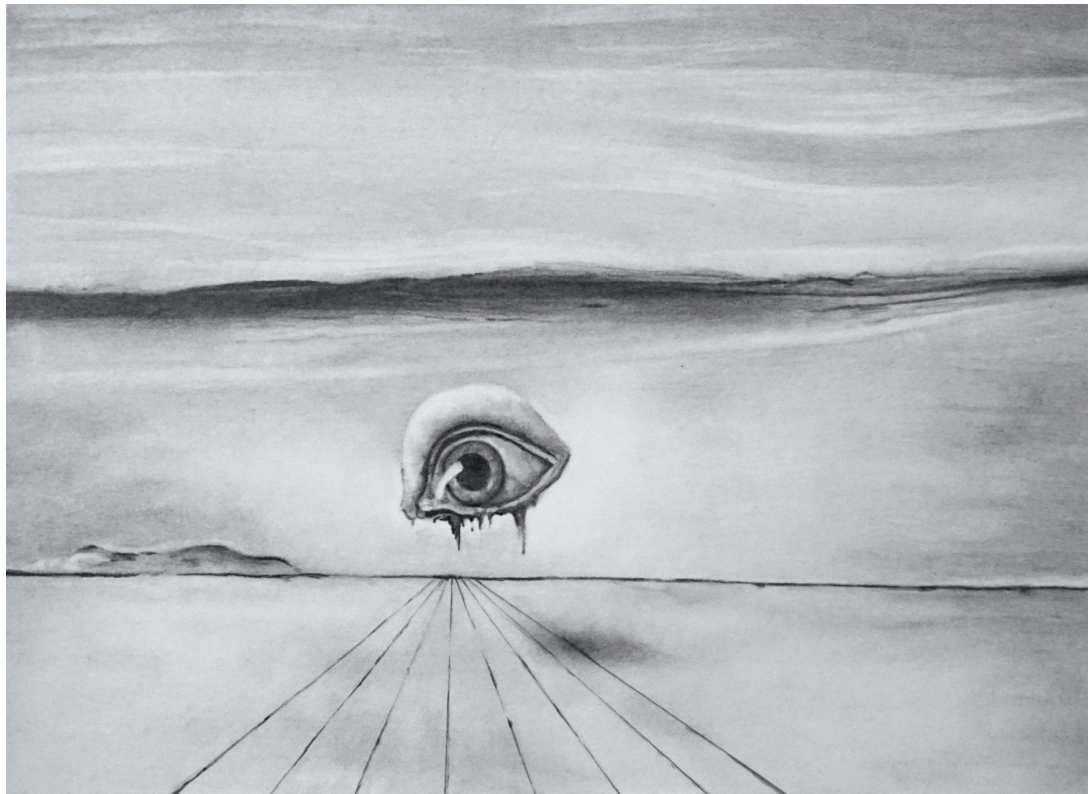


Fig. 16: Roun, J. (2018). Oculus Videre

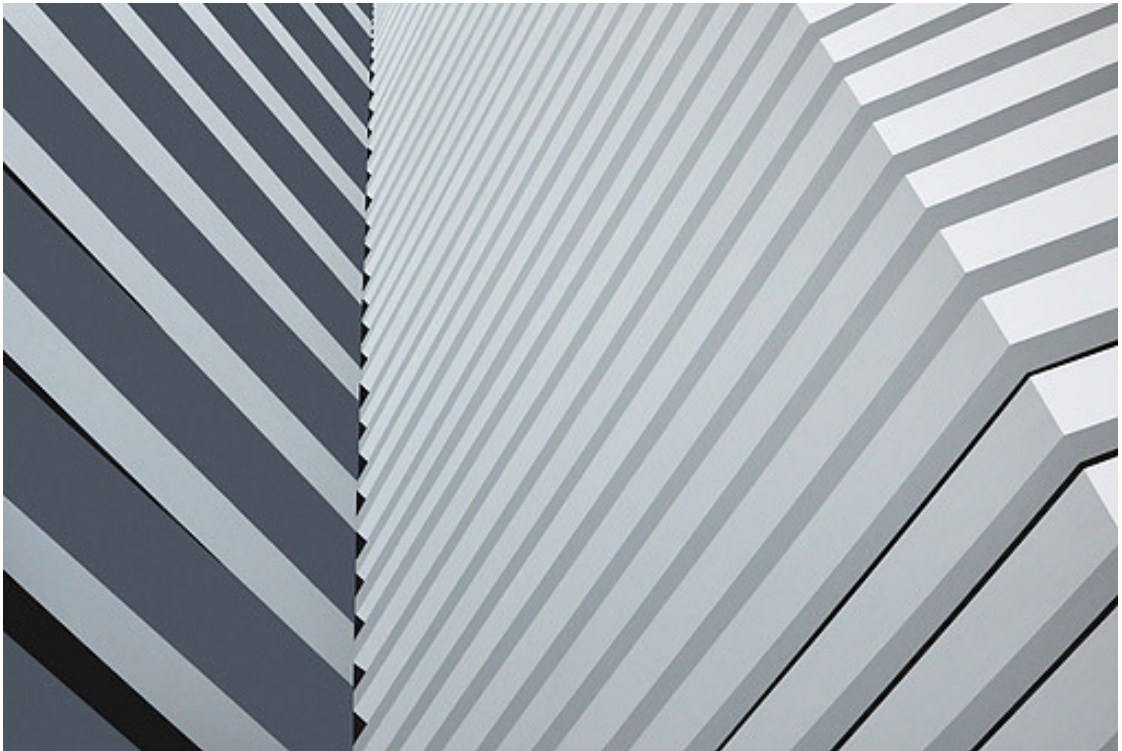


Fig. 17: Roun, J. (2016) Linear I



Fig. 18: Roun, J. (2016) Semper fidelis ad Mortem

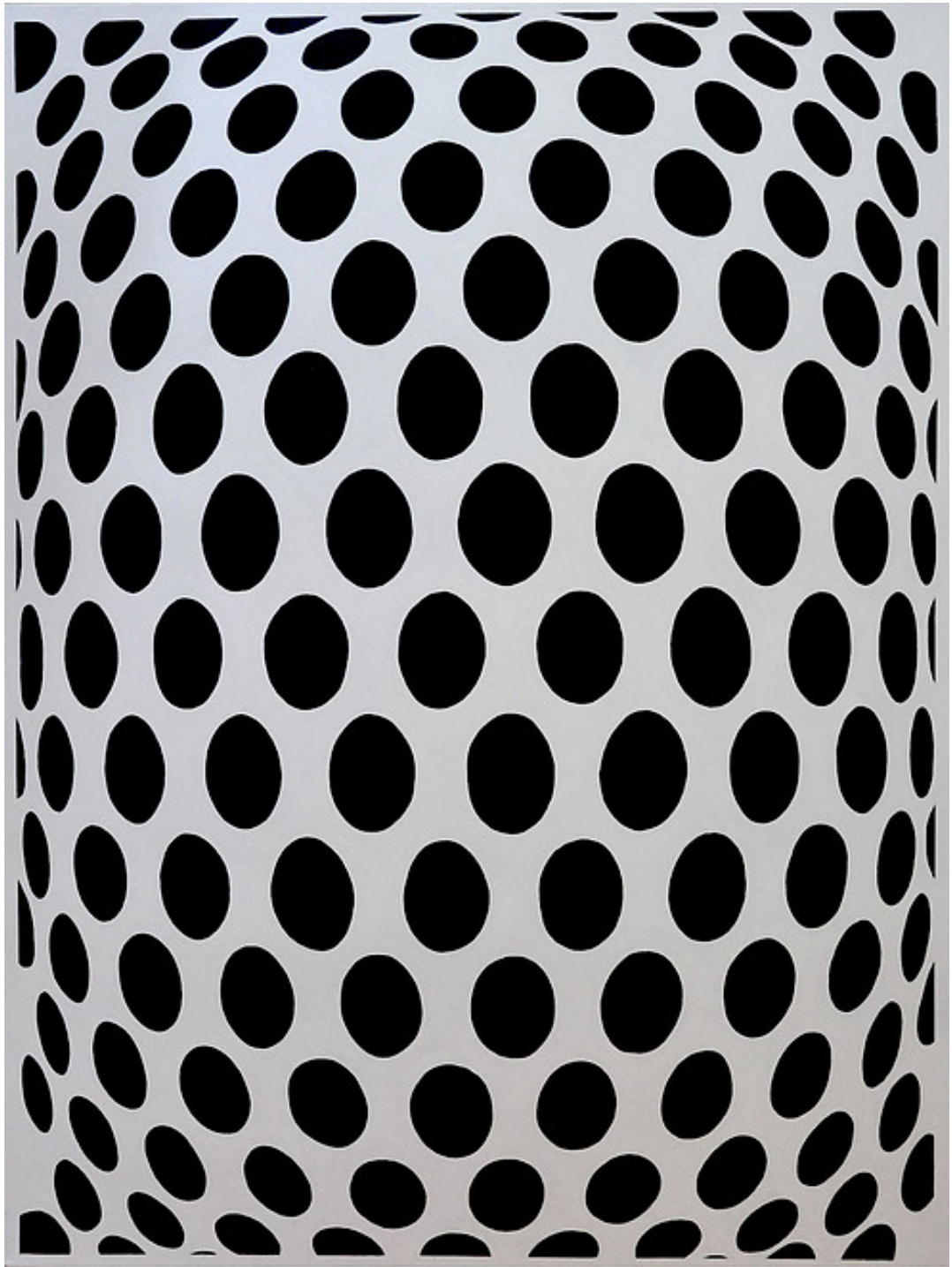


Fig. 19: Roun, J. (2016) Replica

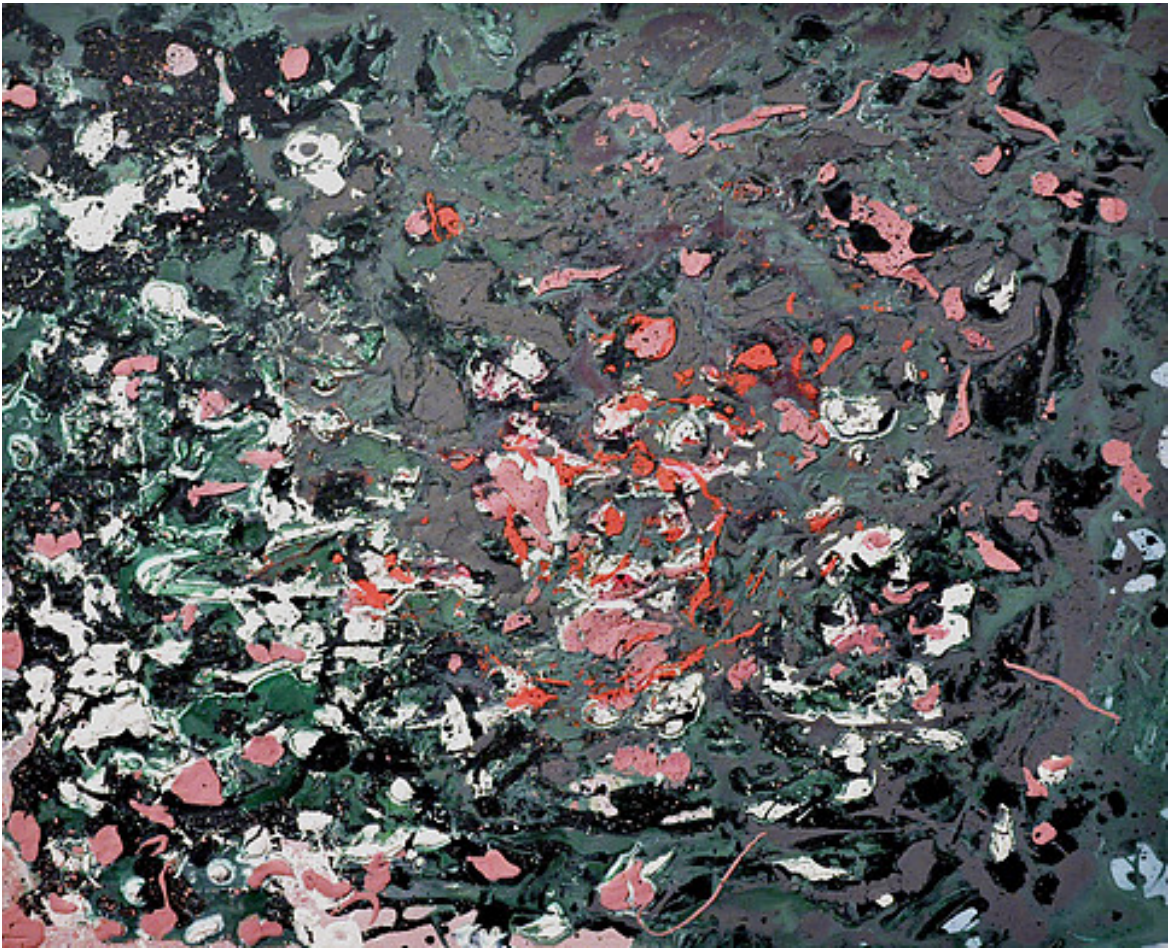


Fig. 20: Roun, J. (2016) Snoopy

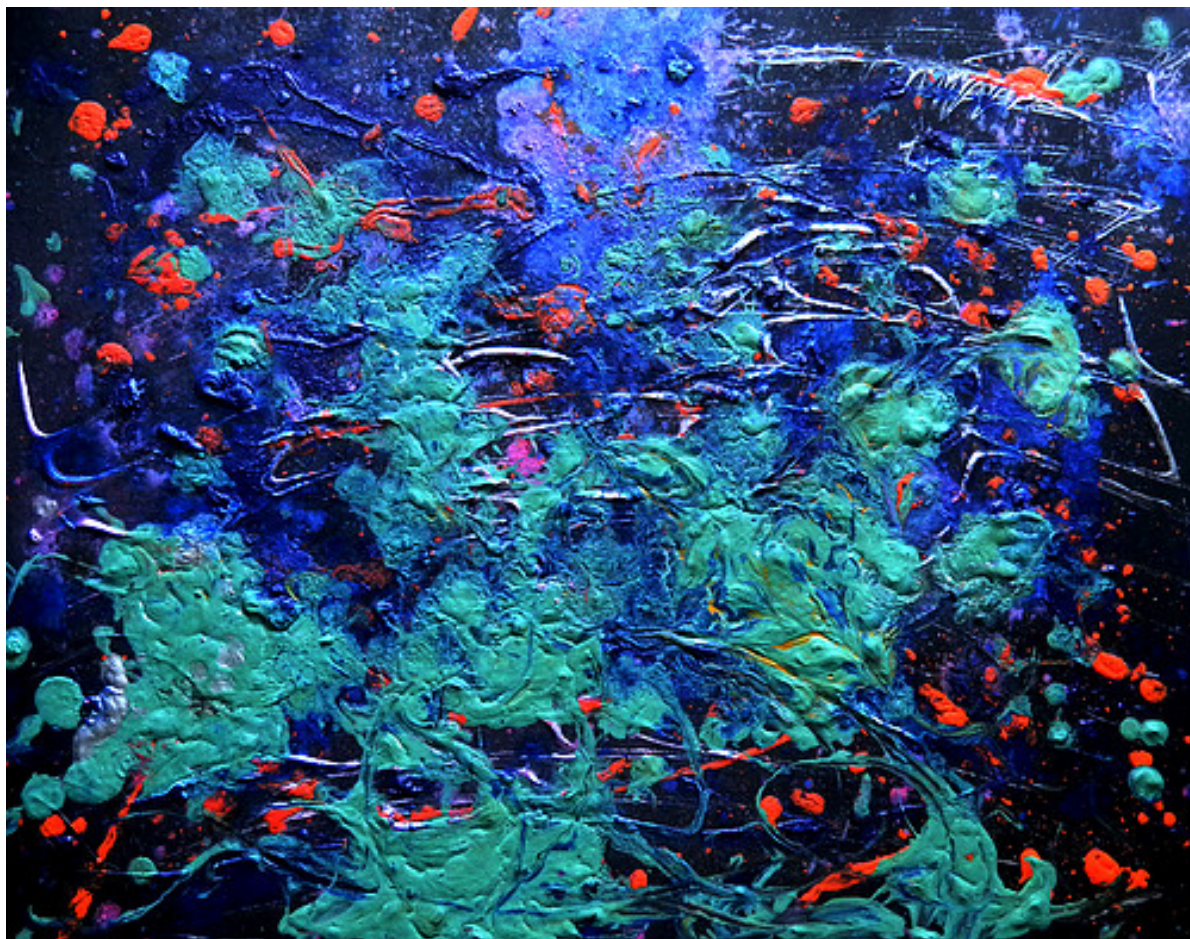


Fig. 21: Roun, J. (2016) Untitled



Fig. 22: Roun, J. (2016). *Deep blue I*



Fig. 23: Roun, J. (2016). Deep blue II



Fig. 24: Roun, J. (2016). *Deep blue III*

My research concludes that there are many benefits and many dangers to taking hallucinogens. However, being informed and taking these compounds in moderation seems to be key, or at least that is what I believe. It is when excess is embraced, as in the Hunter S. Thompson example, that the limit is pushed, and no true psychological gain is achieved. There will always exist the possibility of a bad psychedelic experience (trip), as nothing in this life is free from risk, but the user should be informed and aware of this possibility and take life one trip at a time.

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