A Traditional Medicine's Deep Time History and Rethinking Depression

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A Traditional Medicine’s Deep Time History and Rethinking Depression

By:

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Psychiatric illness’s continue to plague innumerable minds around the world, with depression at the forefront as the leading cause for disability worldwide. Within the United States, more than 32,000,000 Americans 12 and older take antidepressants daily. Although, 30% of patients do not receive any benefit from taking their prescribed medications. Therapeutic options for depression have remained focused on neurochemical imbalances and biological underpinnings, while ignoring essential cognitive factors. These cognitive factors throughout traditional medicine have been the focal point for effectively treating depression. Overtime individuals fall into negative thought patterns that embed themselves within the mind and cause neuroplastic changes to occur. Once set in, neurogenesis along with neuroplasticity becomes decreased. Antidepressants have shown marginal effects on increasing neuroplasticity after 4-5 weeks. Psilocybin, a naturally occurring psychedelic tryptamine, has become increasingly researched regarding its ability to cause profound neuroplastic changes. For centuries shamans have used psilocybin within healing ceremonies to effectively treat psychiatric illnesses through cognitive restructuring. Clinical studies have validated these practices through demonstrating a downregulation of the Default Mode Network (DMN) along with increased neuroplasticity and cognition. Therefore, a probable causality for depression becomes due to an impairment of neuroplasticity resulting from repression and negative thought patterns.

**Key Terms:** Depression, Antidepressants, Disease Etiology, Psilocybin, Psychedelics, Neuroscience, and Neuroplasticity.
"Men ought to know that from nothing else but the brain come joys, delights, laughter, and sports, and sorrows, griefs, despondency, and lamentations. And by this, in an especial manner, we acquire wisdom and knowledge, and see and hear and know what are foul and what are fair, what are bad and what are good, what are sweet and what are unsavory. . . . And by the same organ, we become mad and delirious, and fears and terrors assai us. . . . All these things we endure from the brain when it is not healthy. . . . In these ways, I am of the opinion that the brain exercises the greatest power in the man."

-Hippocrates 4th Century B.C., "On the Sacred Disease"

Held within the night sky exists countless interwoven constellations and galaxies that display a wonderous complexity. Scientists over the years have created metaphorical connections between the cosmos and human brain due to their intricate complexities. Carl Sagan’s timeworn metaphor stands prominently among them as follows, “The nitrogen in our DNA. Calcium in our teeth. The iron in our blood. The carbons in our apple pies were all made in the interiors of collapsing stars. We are made of star stuff” (Jane 2017). Corneas within mammals for instance quite remarkably resemble the cosmos above. Neural pathways branch throughout the brain akin to cosmological paths resultant from dark matter and galaxies extending through never-ending darkness. Furthermore, a plethora of knowledge remains undiscovered in both cosmology and neuroscience, notably among depression.

Due to depressions unknown etiological development, treatments have remained focused on chemical imbalances and biological underpinnings. These treatments have shown moderate remission rates along with a 51% clinical effectiveness (Erik, 2008). Throughout the years, many afflicted with depression have undergone various antidepressant treatments without any effective remissions. Furthermore, these medications create a dependency that requires patients to take daily pills for years to reach “normalcy” (Dejesus et.al., 2014). Antidepressants in their basic functioning seek to
restore neurochemicals, such as serotonin, back to a ‘normal’ chemically balanced functionality. Antidepressant research however has been no pharmalogical panacea. Some along the way have caused serious side effects such as motor function disorders and tardive dyskinesia. Among medical researchers, they refer to these factors as "benefit-to-risk decision making" (Brick 2013, 5). Coupled with the fact that most primary physicians do not have adequate training, antidepressant have undergone serious academic debate concerning their efficacy and over-prescription.

Some psychiatrists have increasingly refrained from prescribing them to patients. Dr. Irving Kirsch, head of placebo studies at Harvard, stated that "Instead of curing depression, popular anti-depressants may induce a biological vulnerability making people more likely to become depressed in the future" (Kirsch, 2014). Statements such as these have gained higher levels of validity following the Sequenced Treatment Alternatives to Relieve Depression Study. This study found that once an antidepressant treatment fails, responsiveness further decreases with each new prescription-based treatment. Clinical antidepressant studies have promoted this as a paramount pharmacological concern (Belmaker, 2008). Treatments for depression have continued on from the 1950’s relatively unchanged. Therefore, alternative therapeutic options should become more widely researched and available to those suffering from depression. Research into depression has persisted along a unilineal path too focused on neurochemicals and affective symptoms over impaired cognitive abilities.

In order to better understand depression along with traditional interventions, George M. Fosters anthropological work, “Disease Etiologies in Non-Western Medical Systems,” will lay forth the foundational conventions and terminology used in this thesis (1976). From this anthropological perspective, depression does not pertain to solely
neurochemical imbalances or biological pathologies, but rather impaired cognitive abilities (Foster, 2016). However, medically prescribed antidepressants and increasingly impersonalized society have subverted and invariably castigated many depressed individuals from seeking cognitive therapy. When observed, depression is not merely unilinear in its development. It is multifactorial. Current treatments do not account for these factors and instead have remained focused upon biological elements. A majorly undervalued factor pertains to stress among depressed individuals.

Globally, stress constitutes the leading cause for illness in over 90% percent of cases (Bruce, 2009). With stress as a known contributor towards depression many medications have focused on the mitigation of neurochemical imbalances such as serotonin. However, some researchers have begun to question the viability of other traditional medicines. In response, psychedelic alternatives have come under scientific inquiry, notably psilocybin, in addressing the need for depression and anxiety treatments. For centuries, humanity combatted depression through traditional cognitive restructuring and the utilization of psychedelics. These ethnographic accounts have subsequently raised the question into whether or not psilocybin coupled with therapy could indeed provide remission for depressed individuals. Recent studies have implicated neuroplastic changes that occur in response to the onset of depression, which has caused some researchers to rethink their depression along with current therapeutic approaches. With current research underway, alternative medicines and psilocybin could allow remission for those that do not receive remission from antidepressants. Various cultures have utilized psilocybin and other psychedelics in healing ceremonies for centuries. In more recent years, they have become an integral part of psychotherapy and neuroscientific research due to their ability in inducing intense existential experiences. When properly researched
and used the therapeutic properties of this psychoactive substance could continue to become an impetus for anxiolytic research in depression and anxiety studies around the world.
~Chapter 1~

Rethinking Depression’s Cultural Context

"To perceive a new aspect of oneself is the first step toward changing the concept of oneself."

-Carl Rogers

"Disease Etiologies in Non-Western Medical Systems":

One of the most significant variables within medical anthropology relies on the differentiation between ‘personalistic’ and ‘naturalistic’ causalities. A concept that does not become overtly used in western medical practices. Their core differentiation resides in that they address different aspects regarding the individuals’ ailments. Foundationally a ‘naturalistic’ perspective employs an empirically and biologically defined understanding towards an individual’s illness or disease. In contrast, the ‘personalistic’ viewpoint involves experiential, cognitive, and other psychological knowledge surrounding an individual’s ailment. Western society endorses a naturalistic perspective on treatments whereas traditional Peruvian, Asian, Native American, and other indigenous populations hold onto personalistic ideologies. George M. Foster, a prominent medical anthropologist, explored and conceptualized these two terms in classifying medical practices among various cultures. Foster culminated these findings in his leading anthropological “Disease Etiologies in Non-Western Medical Systems” (1976). Within this article, he advances the argument in explaining how all systems of medical practice fall under categorical divisions pertaining to either ‘naturalistic causality’ or ‘personalistic causality’ (Foster, 2016). Each delivers a different rationalization as to why and how an individual becomes ill.
Foster describes naturalistic causality in the following definition as “...explained in impersonal, systemic terms...conforms above all to an equilibrium model” (Foster et al., 1978, 53). Antidepressant’s function per an equilibrium model in that they restore neurochemicals back to functional levels. From this definition, western biomedicine resides as naturalistic due to its application of biologically and physiologically based medicine. In correspondence, their principal focus remains set upon the ‘diseases’ underpinnings over experiential characteristics. Comparatively the personalistic approach invokes an interpretation “...believed to be caused by the active, purposeful intervention of a sensate agent...punishment directed specifically against him, for reasons that concern him alone” (Foster et al., 1978, 53). These etiological differentiations set forth illustrate the need for rethinking depression and ultimately, its treatment. As this thesis will explore, neurochemical imbalances inadequately encompass depression. Both clinical and ethnographic research into psilocybin’s therapeutic potential has furthered these classifications. Therefore, any notions that illness and disease share a single definition must become dismissed. For the purposes of this thesis, a disease is correlative with naturalistic and illness with personalistic as defined under Foster’s etiology.

**Redefining Depression:**

To better appreciate the need for differentiation, oppositional perspectives from two leading authorities on depression will come under analysis. Dr. Robert Sapolsky, professor of neurology at Stanford, embodies the staunch western standpoint in viewing depression as a purely naturalistic causality and disease. When a reporter asked him to clarify why depression should remain labeled a disease despite opposition, he stated, “I
think depression is absolutely a disease. I believe that it is as much of a biological disorder as is, say, diabetes" (Levine 2017). In his 2001 publication “Depression, Antidepressants, and the Shrinking Hippocampus” his opening remarks emphasize on how devastating depression has been among medical maladies and denotes it as “a disease of malignant sadness” (Sapolsky, 2001). This publication continues on to address the problematic shrinkage of the hippocampal region, which is crucial to memory formation and learning. Dr. Sapolsky further states that among major depression patients, a 20% volume decrease occurs within the hippocampus. These observations, among other biological aspects, are irrefutable, but their inadequacy to effectively treat depression comes from an ignorance towards personalistic causalities. Dr. Sapolsky, akin to many western medical professionals, stands allopathically minded in seeking to find alleviation from affective symptoms. In the paper’s conclusion, he proclaims their fight against other academics and researchers viewpoints in stating, “findings such as these also support the frequent uphill battle for those who study depression, or suffer from it, namely convincing others that this is a real biological disorder, rather than some sort of failure of fortitude or spirit” (Sapolsky 2001, 3). Dr. Sapolsky’s denial of psychological and experiential causality illuminates the divided stance towards treating depression. Throughout the paper, Dr. Sapolsky highlights a major concern regarding how antidepressants demonstrate effects in suppressing affective symptoms, not addressing the underlying causality.

To successfully treat depression, these old notions surrounding depression must not become disassembled. Dr. Michael D. Yapko, a clinical psychologist, understands this need for expansion into a pluralistic approach due to his internationally recognized work on non-pharmacological but psychotherapeutic-based treatments for depression. Yapko employs clinical hypnosis where he instructs, similar to a shaman, the individual in how
to restructure their mindset away from negative self-thoughts. In addition to his clinical practices, he has traveled to over thirty countries and extensively throughout the United States, sharing his techniques for non-medicative treatments (Mietkiewicz, 2010). In an interview about depression, Yapko explains that there are around 227 different combinations of symptoms that can “correctly” generate a diagnosis for depression. When asked, he finds calling depression a “disease” based upon the textbook definition reasonable but for the opposite reasons that Sapolsky does. The standard definition for a disease is “a condition of the living animal or plant body or of one of its parts that impairs normal functioning and is typically manifested by distinguishing signs and symptoms” (Disease, 2018). A definition that he does not dispute too much, but rather the broader implications that become implied.

When depression befalls this connotation, Dr. Yapko finds that it becomes equivalent to other naturalistic, biological diseases that do not apply to depression (Mietkiewicz, 2010). Depression does not have the same fundamental casualties that heart disease, hepatitis C, or diabetes have. Further on in the interview, he pronounces, “While there is no question that depression has a biological component to it, it is about much more than biology. The disease label does not speak to that” (Levine, 2017). An argument that Yapko and other academics feel drives the need for a diversification regarding treatments for depression. For too long, the insatiable need for biological treatments has made antidepressants between America and European countries the most commonly used treatment. This overtly dogmatic mindset has led researchers to remain focused on naturalistic causalities when such methods lack effectiveness. However, these techniques should not become obsolete but integrated with other approaches, such as psilocybin therapies. Dr. Yapko encapsulates this concept, saying, “It’s not that those things should
not be part of the arsenal [of treatment], but biological treatment alone is undertreatment. To frame it as a disease and imply that biology is what it is about is misleading to people” (Levine 2017). The shift from earlier portrayals to avoid further stigmatization as a pathological trait or emotional weakness instead created a biomedical construct.

Ideally, they sought to increase awareness but in turn dissuaded many more people from receiving treatment. With this shift, it was supposed to bring about awareness for depression, except under this befallen biological definition now only 20-25% suffering from depression receive treatment. In conjunction, non-psychiatrists prescribe 70-80% of antidepressant prescriptions (e.g., general practitioners, obstetricians, cardiologists), despite inadequate training. A situation has consequently emerged that leads to a lack of patient follow-ups and around one-half of all patients stop taking their medications due to unwanted side effects (Atkins, 2008). Termed mediocentric among the social sciences, Mediocentric denotes a view that focuses on the disease through symptoms, not the patient’s subjective interpretation (Sobo, Janine, & Loustaunau, 1997). Decisively, concerning academic works, depression today is undervalued for its profound psychological and cognitive components. Dr. Yapko, summarizing other academics’ views, in a straightforward analogy captures these dilemmas in stating, “You can’t change thinking, and heart disease goes away, the way you can change thinking and depression goes away” (Levine, 2017). No matter what definition surrounds depression, an argument for changing current approaches stands well founded. It is unquestionable that biological factors are involved, but in order to raise effectiveness, treatments must incorporate personalistic factors.
One reason academics have gravitated towards psilocybin’s therapeutic potential is because it addresses both the naturalistic and personalistic causalities. Psilocybin’s therapeutic effects address multiple aspects regarding depression in allowing both naturalistic and personalistic restorative properties. Research conducted on both depression and psilocybin should not come under strict mediocentric or ethnocentric mentalities. In contrast to the way depression became indoctrinated in western biomedical principles, psilocybin must not become perceived as inferior to biomedical medications. Antidepressants fail to cause effective remissions because they classify depression as a naturalistic disease of the brain, rather than an illness of the mind. This reductionist way of thinking disregards the multifactorial nature of depression, along with other psychiatric illnesses. Instead, an equally balanced approach that embraces both naturalistic and personalistic elements will most effectively combat depression.

Repression and Trauma:

Austrian neurologist Sigmund Freud acknowledged the subconscious role as a factor in permeating depression from expressions of “self-blame” among his patients. His theory of repression expounds on the notion that thought patterns embed themselves unhealthily within the mind. Freud positioned this theory within a reductionist framework so that most patients subconscious or dream state could come under evaluation. In the Interpretation of Dreams, he contends that these now-repressed thought patterns manifest as impulses and constrain cognition. Dr. Freud identified them as originating from the id, or mechanical and more primitive component contributing to personality (Freud, 1999). He then postulated that individuals start repressing such desires from adolescence or even
infancy. Their repression resulted from stigmatizations surrounding mental illness emanating from societal policies and customaries that chastise the concept of individuals discussing such latent desires or internal dilemmas. Dr. Freud further pinpoints this issue, stemming from the superego, which is the incorporation of learned societal morals and values. He, like Dr. Yapko, does not underestimate the importance of repressed thoughts found manifested within dreams, which later become observable depression. Dr. Freud accredits them as “the first outbreaks of madness are ascribed to origins in a terrible anxiety-dream, and that the predominant idea was connected to this dream” (Freud 1999, 74). Freud termed these latent manifestations as “micro-aggressors,” that adhere to the concept of Foster’s personalistic etiology.

These Freudian ideologies recently underwent neuroscientific testing and quantification via functional magnetic imaging (fMRI). fMRIs in this case served as an imaging technology that showed depressed individuals’ brains responding with different portions activated when compared to “healthy” patients. Dr. Roland Zahn, from Manchester University’s School of Psychological Sciences, stated from the results that, “For the first time, we chart the regions of the brain that interact to link detailed knowledge about socially appropriate behavior – the anterior temporal lobe – with feelings of guilt – the subgenual region of the brain – in people who are prone to depression” (Nauert 2015, 1). These fMRIs further revealed that those who had been previously depressed did not “couple” certain brain regions correlated with “knowledge of appropriate behavior” and guilt with the same strength as observed in those who had “never” been depressed. An interesting aspect was that “decoupling” only occurred when depressed patients fell into negative thoughts patterns or self-blame but did not occur when they became angry with or blamed others. Dr. Zahn, in effect from the findings,
recognized that Dr. Freud’s observations were accurate in separating depression from “normal sadness,” in that depressed individuals have a proneness to predisposed thought patterns of self-blame and guilt (Nauert, 2015). This predisposition would go on to strengthen the notion that neuroplastic changes have occurred in response to depression, not solely chemical imbalances.

However, naturalistic, western medical treatments remain focused on pinpointing the malfunctioning’s and therefore produce impersonal cures intended to restore equilibriums somatically or psychosomatically (Belmaker, 2008). In juxtaposition, personalistic etiologies and traditional therapeutic measures have existed centering on the acceptance of the illness as being unique to the individual. Through this practice, the ailment comes from infliction by another person or social group, which then torments the mind, be it a spirit, ghost, or demon among various cultures (Foster 2016, 5). Therefore, it is no longer merely a metaphorical analogy when someone denotes having “demons” in his or her mind. Although not comparable to the Judeo-Christian concept of a black fanged creature crawling about, but rather well-established, ingrained, thought patterns that are strangling the mind. It is this suffocation that causes cognitive dissonance and other sensations more commonly referred to as “drowning.” From a personalistic outlook, for many, it feels like they are drowning in a sea void of emotions while everyone around them is breathing life. Even nestled into the safety of bed, these sensations continue to pervade the depths of their mind.

When approached in a personalistic manner, the dismissed perception of demons embedded within the subconscious mind becomes real. Dr. Freud realized that such evocative sensations and dreams might appear externally treated, but they can continue to torment an individual from within their subconscious. He phrased it as, “In cases of
recuperation after a mental illness, it often becomes particularly clear that, although the patient may be functioning soundly by day, his dream-life can still be in the grip of psychosis” (Freud, 1999, 75). This quote directly addresses the need for introspection and interpersonal methods to effectively treat depression through cognitive restructuring.

For decades stigmatizations such as, “it is all in your head” or “just get over it” only cause further repression and fuel well-worn self-blame pathways. Therefore, a possible causation for many people comes about from negative thought patterns that become integrated into the unconscious, subsequently causing neuroplastic changes to occur.

**Neuroplasticity Among Depressed Individuals:**

Neuroplasticity pertains to a neuron’s ability to anatomically and functionally regenerate new connections between themselves, forming new synaptic connections. It functions as an adaptive feature of the nervous system, which allows for an appropriate biological response to aversive stresses and stimuli. Researchers Dr. Jonathan Savits, Dr. Wayne Drevets, and Dr. Kanner established that when an individual develops depression, synaptic formations become impaired that in turn constrain cognition. Among those suffering from Major Depressive Disorder, they discovered that cortical activity experienced an altercation through shrinkage of glial cells and neurons through the loss of dendritic activity located in the prefrontal cortex (PFC) and hippocampus. These neurotropic (relating to the growth of nervous tissue) altercations are responsible for the impairments found affecting neuroplasticity and cellular resilience, meaning the cells ability to manage environmental changes has become diminished (Savits and Drevets,
Although identified, these physiological and neurotropic elements do not account for the factors of personalistic causality.

Dr. Elisa Sobo, in “The Cultural Context of Health, Illness, and Medicine,” disputes how biological factors are undoubtedly useful in determining various aspects of an individual, but it is not the only factor in determining depression. Dr. Sobo therefore explains that environmental determinism plays a crucial role. She posits how the environment, to which scientific research concerning epigenetics has revealed, can manipulate genetic factors and biological makeups. However, environments are primarily culturally constructed and consequently abide to the cultural practices (Sobo, Janine, and Loustaunau, 1997). Geneticists have formulated the ‘Broad-Sense Heritability’ equation to measure the extent of genetic vs. environmental effecting factors within a population. What they found was that many characteristics for humans contain both an active environmental and genetic component. One limiting element, however, pertains to the fact that this equation involved only a singular environment and population, from which it became calculated and not intended for cross-population analysis (Wone 2017, 65).

These findings support the argument that depression is not merely biological, but also personalistic in respects to an individual’s environment.

For decades depression has been associated with demons, even suffocating them, and when the brain becomes impaired, they are no longer able to escape the cyclic negative thoughts that permeate the mind. Instead, recent research has shown that negative thoughts mutate into a deep-rooted mindset. Therefore, a probable causality for depression becomes an impairment of neuroplasticity resulting from damaging thought patterns. Dr. Michael J. Player and his colleagues in “Neuroplasticity in Depressed Individuals Compared with Healthy Controls”, discovered that antidepressants affect
slowly increasing neuroplasticity within depressed patients (Player et al., 2013). Their research furthered the notion that antidepressant-induced neuroplasticity could explain why the medications begin working a couple of weeks after neurotransmitter levels have become raised. Without implemented psychological counseling, many do not, however, receive full recuperation. Instead, they receive partial benefit from the neuroplastic effects taking place without addressing their negative thought patterns. Subsequently, when patients continue to forgo introspection, they end up circumventing a complete recovery (Player et al., 2013). Within this context, “partial benefits” become used because antidepressants have a statistically minor effect on neuroplasticity compared to psilocybin.

Regarding western treatment, psychological interventions, involving interpersonal and cognitive therapies, are used only as “maintenance” for depression, not as treatment (DeRubels et al. 2005). Medically prescribed antidepressants have not worked effectively for many people and coupled with an ever-increasingly impersonalized society further subverts and invariably castigates depressed individuals from seeking more personalized treatments.
The Western Biomedical Paradigm

“Psychotherapy works, and some types of therapy have shown to be much more effective than antidepressants over the long run.”
-Irving Kirsch

An Account of Antidepressant’s Development:

“We begin . . . with the realization that traditionally, drugs are therapeutic chemicals designed to have maximal benefit with minimal risk of side effects or toxicity” (Brick 2013, 1). Within western medicine, the leading etiological developments relating to depression have focused on inhibition and reuptake findings from major antidepressant medications (Brick, 2013). Therefore, from the perspective of western biomedicine, effective treatments have been available since the introduction of the monoamine oxidase inhibitor, Isoniazid, in the 1950s. Shortly after that came Imipramine, a prototype tricyclic antidepressant (TCA). After passing through clinical trials, both became widely used in medical and therapeutic settings (Leonard and Spencer, 1990). Afterward, Imipramine and Iproniazid resulted in two significant contributions made towards psychiatry: “one of a social-health nature, consisting of an authentic change in the psychiatric care of depressive patients; and the other of a purely pharmacological nature” (Lopez & Alamo, 2009). In regard to neuropharmacology and psychiatry, the two compounds had now become indispensable tools for research since they provided the “first aetiopathogenic hypotheses of depressive disorders” (Lopez & Alamo 2009, 1). To clarify this statement, “aetiopathogenic” means the development and the preliminary cause of an abnormal condition or disease (Etiopathogenesis, 2018). From which depression’s causality had become deduced, in that the brain was experiencing a
malfunctioning due to insufficient levels of neurotransmitters. This deduction has subsequently led to the basic functioning of antidepressants, which bind to designated receptors that release the desired neurochemicals.

In “Future of Depression Psychopharmacology,” Dr. Robert H. Belmaker addresses this, along with western medicine’s two most essential hypotheses regarding depression, the Monoamine Hypothesis and Cortisol Hypothesis. He stated that “no monoamine-related findings have been found that are diagnostic for depression; blood cortisol levels are not diagnostic of depression” (Belmaker, 2008, 682). Dr. Belmaker then quickly dismissed the notion of cortisol being singularly useful in depression treatment. The Cortisol Hypothesis entails the concept that depression’s casualty results from elevated levels of cortisol that, which in turn causes heightened stress levels. From this newfound notion, researchers then became focused on targeting the hypothalamus that releases cortisol-releasing factor hormone (CRH). CRH is responsible for stimulating the anterior pituitary gland to release adrenocorticotropic hormones (Belmaker, 2008). However, in his meta-analysis of the studies performed, he found that the CRH antagonists were statistically infective for depression. Moreover, Dr. Belmaker and colleagues found that chronic and acute treatments containing cortisol did cause mild depression consistently, along with the fact that elevated levels of cortisol in depressed individuals was comparatively minimal compared to healthy individuals (Belmaker, 2008).

The Monoamine (MAO) Hypothesis established in the mid-1960s served as a treatment for depression. Functionally, the antidepressant’s effectiveness became focused around monoamine oxidase inhibitors, monoamine reuptake inhibitors, and reserpine that demonstrated depressogenic effects as a monoamine depleter. Categorically MAOs
are a class of enzymes that generate oxidative deamination, the breaking down of biogenic amines (dopamine, serotonin, norepinephrine, epinephrine) and sympathomimetic amines (benzylamine, tyramine). These antidepressants seek to rebalance reduced levels of biogenic amines primarily throughout the limbic system (Hillhouse 2015, 3). The location of MAOs responsible for oxidative deamination, are found within the presynaptic terminal. As a result of blocking reuptake, the neurotransmitter monoamine concentration increases while awaiting the next action potential. Although Monoamine Oxidase Inhibitors (MAOI) had passed drug testing, reports later surfaced of a hypertensive crisis, severe spikes in blood pressure, which resulted from ingestion of dietary tyramine while on MAOIs (Pinder & Wieringa, 2007). As an amino acid responsible for regulating blood pressure, tyramine’s operation is imperative for bodily functions. In healthy amounts, the monoamine oxidase inhibitors block the enzyme monoamine oxidase from breaking down excess tyramine. Conversely, avoiding high levels of tyramine is very difficult when looking at the dietary selection that contains the amino acid: e.g., cured meats, aged cheeses, soybeans, alcoholic beverages, pickled or fermented foods, dried fruit (Hall-Flavian, 2016). In response, the first MAO produced, Iproniazid, in the mid-1950s after being heavily prescribed was removed from the United States market following its safety concerns. It later became known as the “Cheese Reaction,” as dairy products were found to have detrimental effects on the sympathetic nervous system. Additionally, MAOIs caused increased levels of norepinephrine and tyramine that lead to hypertension and cardiovascular complications (Hillhouse 2015, 5). MAOIs, however, began the movement for modulating at the synaptic level with intentions of regulating monoaminergic neurotransmissions.
Currently, antidepressant research still revolves around this concept (Lopez & Alamo, 2009).

Despite these significant drawbacks, inquisitions into MAOIs continued to stimulate “excellent” research concerning the fact that researchers found depressed patients had 30% increased levels of monoamine oxidase compared to those without (Belmaker, 2008). Following the possibility of subsiding depressive symptoms compared to hypertensive debilitation and additional side effects, medical professionals via the direction of the pharmaceutical industry decided to continue prescribing them as alternatives when other antidepressants did not work. In using monoamines as alternatives to other ineffective antidepressants, it acknowledges the efficacy problem relating to the treatments available for depression. In their meta-analyses, Dr. Belmaker and Dr. Irving Kirsch both found that the placebo drug difference, when used in controlled studies, suggests approximately less than one-third of depressed patients are monoamine associated (Kirsch, 2014; Belmaker, 2008). This finding creates a progenitor point when considering that MAOIs were thought to be the most effective antidepressants available in psychiatrists’ and doctors’ medical arsenals.

In 2008 Kirsch, Associate Director for Placebo Studies and lecturer at Harvard Medical School, along with colleagues, ran a new meta-analysis to address antidepressants effectiveness. The team chose to remove publication bias in that they included not only published but also unpublished trials acquired from the Food and Drug Administration (FDA). Their meta-analysis sparked significant public and scientific controversy, stating that the placebo effect could account for the apparent effectiveness of antidepressants. What they found was that antidepressants were not clinically significant in treating mild, moderate, or severe depression. Kirsch’s team found a drug-placebo
mean of 1.8 points on the Hamilton Depression Rating Scale (HDRS) (Kirsch et al., 2008). The HDRS is the most widely used and accepted model in accessing depression among clinicians and psychiatrists. Covered throughout the assessment, are 21 inquiries relating to symptoms of depression felt in the past week, with four items to subcategorize the depression. One limitation of the HDRS pertains to an inability to evaluate atypical symptoms of depression (e.g., hyperphagia, hypersomnia) (Ehde, 2011). Clinical significance was found to only occur in very severe depression, an occurrence that incurred an argument against the observed decrease from the placebo response.

Subsequently, they put forth a controversial conclusion that “significant antidepressant-placebo differences have not been established” (Penn & Tracy 2012, 182). Some, therefore, argued that obtaining positive results against a placebo demonstrated more efficacy. However, in accordance to surmounting evidence from unpublished and published data, they suggest that is not the case. The pharmaceutical company Merck and Co., one of the largest in the world, heavily funded research into the antagonist aprepitant. The research yielded negative results in respect to the placebo effect in phase III of testing, in which it then was withdrawn (Penn and Tracy, 2012). Consequently, how over the last five decades have thousands of positive correlative studies and trials emerged?

**Publication Bias & Antidepressants:**

The key word in understanding this dilemma pertains to “published.” Medical professionals and researchers, such as Dr. Erick Turner, Dr. Ben Goldacre, Dr. Annette Matthews, and Dr. Robert Rosenthal, to name a few, have identified the problematic
actions of pharmaceutical companies withholding information. They found that drug companies only published studies with positive results and shelved those with negative results. Dr. Turner, along with colleagues, addressed this growing concern in “Selective Publication of Antidepressant Trials and Its Influence on Apparent Efficacy.” When data is inappropriately reported or concealed, antidepressants appear statically effective (Turner et al., 2008). Therefore, under the Freedom of Information Act (FOIA), the investigators applied to the FDA to receive all studies submitted from pharmaceutical companies, published and unpublished. They received recorded data from 12,564 patients among the 74 studies conducted. The metanalysis found that per the published data, 94% of all antidepressants were resultantly positive. When all the published and unpublished data underwent analysis, they found a stark difference between the corresponding statistics. The new metanalysis calculations provided evidence that only 51% of the trials were positive, which means that 49% of trials either had negative or significantly ineffective results). Another separate metanalysis performed on the FDA’s data showed that “an increase in effect size ranged from 11 to 69% for individual drugs and was 32% overall” (Turner et al. 2008, 252). When coupled with a new meta-analysis concentrating on the placebo effect, antidepressants again failed to show any clinical significance in treating depression.

When negative results do not become published, they contribute to undermining the principles of evidence-based medicine. Over-prescription, in turn, places millions of individuals at risk when using potentially unsafe or ineffective drugs. With 13% of Americans on antidepressants and climbing, these drugs cannot afford such inadequacies and ineffective mechanisms. For example, the withholding of information regarding negative Selective Serotonin Reuptake Inhibitor (SSRI) results from clinical trials
(Shimazawa and Ikeda, 2014). Some withheld side effects of SSRIs include sexual
dysfunction in 70-80% of patients, long-term weight gain, diarrhea, seizures, nausea,
anorexia, forgetfulness, and insomnia. Also, 20% suffered from severe withdrawal
symptoms resulting from the provided medication (Penn and Tracy, 2012). As part of the
second wave, SSRIs had different mechanistic modes and chemical configurations
compared to MAOIs. Enzymatically MAOs are responsible for metabolizing 5-HT,
commonly known as serotonin. Typically, serotonin becomes cleared from the cleft
through serotonin transporters (SERT) placed within the presynaptic terminal. SSRIs
function through inhibiting SERT, causing inhibition of serotonin reuptake into the
presynaptic neuron, therefore, increasing its extracellular concentration. Despite a
different modulative approach and the corresponding side effects it caused, the
medication has become the most widely prescribed among second-generation
antidepressants (Pinder and Wieringa 1993).

The real revelation concerning publication bias emerged in 2008, when Serzone,
Prozac, Effexor, and Paxil were found no more effective than placebo or sugar pills in
clinical trials. The main finding was that patients improved only marginally when
compared to placebo. Many psychiatrists and doctors claim the substantial benefits
offered through antidepressants to the millions that take them. As such, numerous
medical professionals refuse to cast them as ineffective (Penn and Tracy, 2012). Medical
professionals due to inadequate training and pressure from pharmaceutical companies
continued to prescribe antidepressants, despite the surmounting evidence against them.
Studies and metanalyses have shown that antidepressants increase the likelihood of
depressive relapse. Patients are even more likely to experience remission via other means,
even just a placebo (Kirsch et al., 2008). Therefore, the allopathic medical approach stands in stark contrast to the metanalyses performed on antidepressant effectiveness.

**Overprescribed Antidepressants:**

Dr. Shimazawa discusses issues surrounding overprescription in detail throughout her work. She highlights the matter in considering that the most politically influential and profitable industry in the United States is the pharmaceutical industry, which provides an answer for research bias. Shimazawa goes on to point out that conflicts from publication bias and financial interest have been found more prevalent among psychiatry than other domains of medicine (Shimazawa and Ikeda, 2014). Once more, the concept returns to a western mindset regarding medication through pharmacological means over introspection. Too frequently psychiatrists feel obligated to prescribe antidepressants at their patients’ request. Medical professionals, particularly doctors, do not typically ask their patients personalistic types of questions when seeing patients for depression. They do not ask the “why” but instead in orthodox allopathic fashion, prescribe medication to subside affective symptoms regarding depression. Due to overprescription, more people have gone onto prescription medications and has led to approximately 13% or 32,300,000 Americans ages 12 and older taking antidepressant medications from 2011-2014. These statistics further show an increase of 11% from 2005-2008 (Sifferlin 2017). Antidepressants serve as the third most prescribed medication in America. In the United Kingdom, prescriptions for antidepressants increased by 9.6% in 2011, to now include 46 million patients. Dr. Des Spence, a general practitioner, asserts that the medications have become overprescribed and for too long of periods. With that, he states that they are only
useful for a small number of individuals. However, many medical professionals and physicians think them effective. Non-psychiatrists prescribe 70-80% of antidepressant prescriptions (e.g., general practitioners, obstetricians, cardiologists), despite inadequate training. A situation has consequently emerged that leads to a lack of patient follow-ups and around one-half of all patients stop taking their medications due to unwanted side effects (Atkins, 2008). Spence captures the controversy, stating, “questioning current care is considered ‘stigmatizing’ towards mental illness and ‘populist’ anti-medicine rhetoric” (Spence, 2013). There is indeed no question of depression’s importance, but western medicine’s definition remains too vague, which causes over-prescription to occur.

The Diagnostic and Statistical Manual of Mental Disorders – Fourth Edition (DSM-5) manual, which aids health professionals in classifying psychological disorders, does not include information on the causes or treatment for depression. Instead, the DSM-5 subcategorizes depression under mood disorders. DSM’s subcategories contain specific criteria, assessed through symptoms, not underlying causes, which provide type determination and severity (DSM-5, 2013). For example, after following this procedure for moderate to severe depression, even bipolar disorder, it states medication as the most effective and psychotherapy as a possible secondary option. Treatments under the western paradigm, following the introduction of MAOIs and TCAs, have not shown any breakthroughs in addressing mental health. The pharmaceutical industry, along with medical professions, wants antidepressants with faster mechanisms, higher response rates, and increased remissions (Pinder and Wieringa, 2007). Drug investigations and manufacturing over the last few decades have remained based upon increasing safety, decreasing side effects, and less focused on efficacy. Regarding this fact, pharmaceutical companies should not persist concentrated on funneling millions into research to reduce
side effects of statistically ineffective compounds. Instead, they seek out new approaches, such as psychotherapy combined with psilocybin usage. Despite their focus set upon decreased side effects, modern-day antidepressants are still notoriously known for severe side effects, addiction, and withdrawal symptoms (Belmaker, 2008). This inability to effectively come up with treatments based on modes of biological, naturalistic causality should cause medical professionals to become more open to alternative medicines.

In light of the western medical paradigm regarding depression, should treatment not become based on the risk of harm and most importantly, effectiveness? The options cannot remain narrowed to risky and questionably efficient antidepressants, but instead, expanded to incorporate alternative therapeutics. In respect to not knowing a physiological, naturalistic causality for depression, why keep treating it as such? Drs. Pinder and Wieringa encapsulate depression treatment as decreasing the ability of effectiveness in Neuropsychiatry Disease a Treatment. They state that modern neuropharmacology and pharmaceutical techniques, analogous to combinatorial chemistry, “have made less likely the identification of truly novel agents” (Pinder and Wieringa 2007, 519). However, western science only needs to acknowledge the cultural understanding of personalistic causality and will then receive a novel approach. Aesthetic medicine and recent research into psilocybin, have demonstrated a compound with maximal benefits and minimal side effects, shown capable of drastically affecting symptoms and causes of depression and anxiety. Allopathic treatments for depression remain too focused on the biological underpinning of the causality, instead of a personalistic approach. Depression is not merely a biological imbalance but induced through negative thought patterns, which embed themselves within the mind.

Experiential options need adding to the available treatments to better treat these negative
thought patterns. Therefore, neuroplastic changes do contribute to depression manifestation and these neural pathways.

Both environmental and biological factors are determinate in the course of physiological and cognitive developments, which invariably lead to either damaging or healthful mentalities. This consistent approach taken by allopathic, western medicine has subsequently led to depression currently remaining under-treated, inappropriately diagnosed, and untreated in approximately half of all depressed individuals (Nutt et al., 2012). Western society’s failure to effectively treat depression emerges from deep-rooted stigmatization towards mental health, in seeing it as a disease that needs to be cured, not talked through or about. Evidence for this comes from standard orthodox treatments consisting of prescription medications, without either complementary psychological or psychotherapeutic approaches. Through antiquity, cognitive introspection has been the emphasis in treating psychosomatic ailments such as depression and anxiety. Therefore, depression is not merely biological but also experiential, in that it is different for each person. Depressed individuals do not share the same lives, traumas, heartaches, or losses that form negative thought patterns that become embedded in their minds.

Environmental factors have caused rewiring neuronal networks that drive depression, consequently impairing neuroplasticity. Therefore, personal interventions must become made to change the thought patterns, thus altering their fixed neural plasticity. Hyper-connective changes caused induced through psilocybin can modify and then overwrite these detrimental pathways (Nutt et al., 2012). From the ethnographic and neuroscientific data collected, psilocybin posits itself as an effective treatment for depression when used correctly.
~Chapter 3~

Psilocybin’s Medical Effectiveness

"It takes a huge effort to free yourself from memory."
-Paulo Coelho

Psilocybin’s Cultural Context:

The term Homo sapiens, from the Latin meaning “wise man,” appears befitting when looking at the historical account of humans in correlation with medicinal plant usage (Homo 2018). During a relatively short existence, early cultures grasped the ability to somatically and psychosomatically heal in ways that modern science has yet to fully understand. Shamanic healers in ancient societies held a plethora of knowledge concerning medicinal plants that over time have dwindled down. However, traditional medicine is making a gradual comeback among the medical sciences. This rejuvenation is not only isolated to developing countries but developed countries as well. In the United States, traditional medicine has taken on the acronym CAM, which stands for Complementary and Alternative Medicine. Under the World Health Organization’s (WHO’s) Essential Medicines and Health Products Program they outline complementary and traditional medicine as being,

“Traditional Medicine is the total of the knowledge, skills, and practices based on the theories, beliefs, and experiences indigenous to different cultures, whether explicable or not, used in the maintenance of health as well as in the prevention, diagnosis, improvement or treatment of physical and mental illness” (WHO 2016).
With this, ethnobotanical research has revealed the intertwined history of medicinal plants and traditional lifestyles. Humans since antiquity have simultaneously existed alongside the use of medicinal plants. Cultural knowledge well known among other cultures but not among western societies. Today, “medicinal plants” are referred to in an array of overarching names such as holistic medicine, folk medicine, naturopathy, alternative medicine, or natural medicine. Aside from the various nomenclatures, the use of medicinal plants has been ascending in the medical researcher’s awareness.

A survey conducted in 2002 by the National Health Interview Survey (NHIS) found that 30% of Americans over the age of eighteen had used CAM in some format (Barnes, Bloom, and Nahin 2008). Mistakenly people believe that alternative medicines are attempting to overtake the medical field, but instead, complement biomedical treatment as non-prescription based additives. 60-70% of allopathic doctors in Japan prescribe traditional medicine for their patients. In China, traditional medicine makes up 40% of their overall healthcare. Whereas in the western biomedical domain in increasing order found that 38% of Belgian, 42% of American, 48% of Australian, 70% of Canadian, and 75% of French have employed, at least once, traditional medicine in their healthcare (Bussman and Sharon, 2006). Findings have shown that South American’s practice are much higher than those found in western medical systems. Two national reports found that 71% of Chilean’s and 40% of Colombian’s use traditional medicine along with CAM regularly, not just at least once as in the other reports (Bussmann and Sharon, 2006). Cultures have, however, historically employed alternative medicines effectively among their medical practices.
Psilocybin’s Deep Time History:

Anthropological and biological analyses into the pattern of hominid evolution cannot avoid the prevailing eminence given by the presence of human intelligence. From the onset of hominid evolution, the brain’s larger not only in size but also in integrative complexity juxtaposed to those of great apes. This trend continued alongside the emergence of Homo sapiens. The modern human brain exists three times the size of the gorilla brain, even though the gorilla is three times the weight of an average human (Farb, 1978). Ever since the medieval era, anatomists have remarked upon the similarity between the human brain and walnut. Held within the shell is the nutmeat consisting of two bi-halves that are wrinkled and linked via a thick central stem. In correspondence to the human brain, two bulging cerebral hemispheres are resultant from the most recent evolution. Just like the walnut, the cortex also covers the brain, centrally connected though the corpus callosum, the thick nerve stalk tissue. The wrinkling and fissuring of the brain are what has allowed human consciousness to expound and store tremendous amounts of information into such a small area in the cortex (Why 2016). With this astounding evolutionary trend, there arose cephalization in the brain. Cephalization, deriving from the Greek word “kephale” for the head, simplistically means the centralization of nervous tissue into a single organ, with the furthered organization of sensory regions developed in the anterior as opposed to the posterior part (Abramson, 2018). Anterior cephalization, in turn, gave primates the advantage of compartmentalization and expanded brains that encompassed uncommitted cortex.

Cephalization allowed for the shift of smell to sight, accompanied alongside superior eye-hand coordination. Homo sapiens brains subsequently followed a path far
divergent from other primates. The distinctive physiological features that evolved led to alterations of the mind and brain, wherein the mind now had the ability “to bestow arbitrary meanings upon objects and ideas” (Farb, 1978, 67). Subsequently, when hallucinogenic plants became integrated into medicinal and shamanic practices, they would bestow upon the particular arbitrary, idiosyncratic meanings to what they saw. Psychoactive plants within the conventions of each culture remained profoundly valued for their therapeutic properties.

The most effective psychoactive plants were those able to transport the human mind into different measurements of awareness. At the forefront of the mind, alteration and shamanic therapy resides psilocybin. Psilocybin taken from ethnobotanical literature has had the most profound impact historically on cultures among the psychedelics (Rätsch 2005, 620). Humankind has utilized psilocybin in a controlled “set and setting” for centuries to receive benefit from the phytochemicals’ less investigated anxiolytic, antidepressant, and physical healing properties that do not result in the detrimental side effects associated with antidepressants. Societies of antiquity did not know about neuropharmacology, serotonin reuptake, or monoamine oxidase inhibitors, but instead realized the anxiolytic and antidepressant properties of psilocybin through personalistic causalities.

To better understand the medicinal and therapeutic properties of cultural practices, the Yaqui shaman Don Juan’s meaning of shamanism will come under examination. This definition was taught to his mentee Carlos Castañeda and remained regarded as perhaps one of the best perspectives on shamanism. The description set forth is as follows: “a power capable of transporting a man beyond the boundaries of himself” (Castañeda, 1998, 168). Dr. Douglas C. Sharon, an expert in Peruvian entheogenic and
medicinal plants, expounds this perception in understanding that shamans focus on “the idea of power,” no matter where it exists. He clarifies in stating how many cultural practices view the world as interconnected. They perceive that underlying the inanimate and animate elements of the world resides a vital essence, “from which they emerge and by which they are nurtured” (Sharon 2015, 49). Sharon recognizes that among these societies and curanderos (shamans), everything ultimately befalls this sense of an “ineffable,” indefinable unknown. Through the various expressions of religion, civilizations have sought to grasp this encompassing power in a practical and meaningful manner (Sharon, 2015). Humanity has remained cognizant of this power and its use through traditional medicinal plants, mainly employing it through psychoactive means (compounds). Their therapeutic properties could, therefore, become an impetus for a radical modification of depression treatment studies in western medical societies.

Altered states, which psychoactive substances are typically ingested to achieve, have been cross-culturally revealed as focal points in traditional medical practices. Psilocybin, a chemical compound contained within mushrooms, has had a profound impact on the history of cultures. It remains highly regarded in shamanic practices and has gradually ascended among biomedical research (Schultes, Evans, and Smith, 2006). Psilocybin, 4-phosphoryloxy-N, is the primary compound found within hallucinogenic mushrooms that cause psychedelic experiences and conformational changes to the brain. Biochemically, psilocybin is the prodrug, a biologically inactive compound that becomes metabolized in the body to produce a more bioavailable drug known as psilocin (Carhart et al., 2012). From the ethnobotanical records, psilocybin has been used ritualistically for over 3000 years in Mexico and is still conventionally used today. Mesoamerican societies, among others, have safely employed psilocybin in controlled settings for centuries to
receive benefit from the less investigated psychosomatic healing properties that do not seem to exhibit the detrimental side effects associated with antidepressants (Tylš, Palenicek, and Horáček, 2014). In western society, the phytochemical properties for inducing a “trip” are well known, whereas the traditional medical benefits remain disregarded. Nevertheless, psilocybin’s recorded use in healing ceremonies as a conventional and therapeutic component has slowly gained more attention through the emergence of its deep time history.

The word ambrosia may sound familiar, as it comes from the Greek meaning “food of the gods.” In times of antiquity, the assertion that “mushrooms are the food of the gods” was well known. Discussion on the earliest uses of psilocybin remains debated, but the earliest written record of fungi comes from Euripides in 480-406 BC (Kiple and Ornelas, 2008). However, the earliest representations for ritualistic mushroom usage were discovered and documented in the form of cave paintings. They were found depicting shamanic healing practices involving the use of mushrooms in what is now North Africa. From archaeological work and radiocarbon dating, the cave art dated to around 7000-8000 BCE. These therapeutic mushroom depictions were 4800 years before the emergence of the first officially recognized civilization, the Sumerians, which dates back to 3200 BCE. It appears that humankind has shared a long history with mushrooms, most notably the relationship found in the caves of Tassili N’Ajjer. They found presentations demonstrating shamanic uses among the caves in Southern Sahara’s Tassili plain, which dated back to the Neolithic period (Woolfe 2013). Subsequently, they are thought to be the earliest demonstrations of entheogenic mushroom rock wall paintings. Discovered within the caves of Tassili were over 15,000 pieces of exceptional ceramic, petroglyphic, and pictographs of that culture’s former existence along with therapeutic practices (World
Heritage List, 2016). Most of the parietal art did not pertain to shamanic use or even mushrooms but exhibited a range of human activities from paternalistic practices to the hunting of large wild animals. However, the most impressive is that of anthropomorphized mushrooms running and dancing with mushrooms held in their hands (Figures 1 and 2). Some of the clay figures found show a group of individuals sitting in a circle around a mushroom at the center (Figure 3) (Rätsch, 2005). Following a presentation of reverence among early cultures, it becomes evident the profound impact that psychedelics, markedly psilocybin, could continue to have upon developing cultures.
Bernardino de Sahagun, a Franciscan missionary, compiled the Historia General de las Cosas de Nueva Espana document over the years 1529-1590. Within its contents are what is thought to be the oldest graphic illustration of mushroom ingestion during a ritual (Rätsch, 2005). Undoubtedly, back then these were not termed “magic mushrooms,” but rather teonanácatl, meaning “divine flesh” in the Aztec language (Schultes, Evans, and Smith, 2006). So hallowed were these mushrooms among the Aztecs that they were used only in the most sacred of ceremonies. Among the Aztecs, this practice existed predominantly before Europeans pulled ashore in the 1500s (Rätsch, 2005). In the course of his expedition, Friar Bernardo ethnocentrically denounced the Aztec’s ritualistic and sacramental use of teonanácatl. In his famous chronicle, Codex Florentino, Bernardo expresses this through his depiction of a “demon-like spirit” illustrated above (Figure 4) (Schultes, Hoffman, and Rätsch, 2006).

![Figure 4](image)

Afterward, when the Spaniards conquered Mexico, they were appalled that these indigenous people glorified the use of psychoactive inebriation in reverence of their
deities. Religious authorities from Europe found this starkly offensive, and furthermore sought to eradicate the conventional practice among the natives (Fitzpatrick, 2018). Such hegemonic acts carried out by incoming Spaniards assisted in driving a wedge between western and indigenous peoples and their traditions. Psilocybin’s practice was not publicly practiced again until the 1950s when the Mazatec shaman, Maria Sabina, initiated the ethnic mycologist, Robert Gordon Wasson, into her nocturnal cult. Maria, now deceased, is seen in hindsight as being a “saint” of the psychedelic movement. Among the Mazatec, psilocybin-containing mushrooms have remained highly regarded for their ability to transport individuals into the spiritual world of deities, retrieve the souls of the sick, and foretell the future. The Mazatec call the mushrooms nti-si-tho, where nti refers to a particle of endearment and reverence (Schultes, Evans, and Smith, 2006). One Mazatec shaman put the ceremonial use of mushrooms this way, “The words come only when the mushroom is in my body. A wise man does not learn by heart that which he must say in his ceremonies. It is the sacred mushroom that speaks. The wise man lends it his voice” (Rätsch 2005, 620).

One such ritual in which this takes place among the Mazatec is the velada or “the night watch.” It consists of a nocturnal meeting where the participants sit in a circular orientation. Incense is then lit and breathed while prayers begin to emanate while consumption of the mushrooms commences. The shaman initiates and continues to further the trance through a series of songs, which draw them inwardly deeper (Rätsch 2005, 621). However, today, the entheogenic mushroom culture is not accepted or even centralized. The system is archaic and does not abide by religious or political boundaries, but instead transcends them. In a somewhat humorous way, the ritualistic use of mushrooms has come to resemble the mushrooms themselves; networks of underground
and intercalated systems of people much like the roots and mycelium. The fruiting bodies themselves appear at the right time and place, often in a circle.

Despite extensive cross-cultural and historical usage, western science did not become acquainted with psilocybin until Wasson, due to Sabina, discovered them while conducting mycology research in Mexico. This discovery was then later enhanced when Dr. Roger Heim systematically ranked the compound (Aboul-Enein, 1974). Then in the years 1958-59, Albert Hofmann isolated and synthesized the compound of psilocybin (Hofmann, 1958). However, it was the 1960s that saw psilocybin rise and fall in the public domain. In this period, it became used in experimental research among prestigious universities and some psychotherapists. When awareness of psilocybin’s mind-altering capabilities reached the public, it became quickly disseminated as a popular recreational “drug” (Metzner, 2005). Subsequently, the 1960s western world underwent a revolution into an exploration of the consciousness, a phenomenon that took hold most prominently in the United States. It was also during this period that Albert Hoffman came to serendipitously create LSD, in researching a cardiovascular drug (Farb, 1978).

Consequently, recreational psilocybin usage led to its classification as a Schedule 1 drug in 1970. After this classification, all experiments concerning psychedelics steadily discontinued along with a dramatic perceptual change. Then in the late 1990s, interest again piqued over its ability to expand consciousness and potential to help in understanding mental health (Nutt et al., 2013). Renewed interest has led to alternative approaches in depression research but has not addressed cultural perceptions on psychedelics.
Cross-Cultural Examination:

Cross-culturally psilocybin has been used traditionally and ultimately viewed as sacred. When used in the correct setting, psilocybin will induce an unagitated mood and have lasting effects on depression and anxiety, resulting in alleviation (Schultes, Hoffman, and Rätsch, 2006). Through a trance set forth by the shaman and mind-altering characteristics of psilocybin, the individual becomes detached from the overpowering oppression and becomes “surrounded by the glowing and shining images of an excessively amplified imagination” (Rätsch 2005, 9). Therapeutic properties attained through psilocybin ingestion have a cross-cultural history for treating depression, anxiety, and PTSD around the world. However, admittedly, these are western terms for set conditions, for which other cultures have different terminologies. Therefore, these practices should become incorporated into biomedical treatments as complementary and furthermore lead to an impetus for a revolutionary approach to treating such conditions (Tylš et al. 2014).

In doing this, it would allow for more interconnectedness between different fields in approaching depression. Among the sciences, it happens too often that research becomes so specified that the fields lose tangibility with themselves, resulting in very detailed work that lacks direct correlation.

People all around the world today, ranging from indigenous to dominant western societies ingest psychoactive plants daily. Amazonian natives in South America use stimulant plants daily. At the time typical Amazonian aboriginal rises in the morning, he will drink guarana, cacao, or mate. These plants known as stimulants means that they cause stimulations to the mind, incite initiative, and even create euphoria. However, these elements do not affect perception. Occasionally, the individual will consume all three
stimulants together. Subsequently, when the Amazonian has finished with breakfast, he will place a pinch of one of three substances in his mouth where it will remain until evening unless he is to replace it with a new pinch (Schultes and Smith, 2006). Once the sun is high, and noon has set in, they will then shift to ingesting a fermented beverage concocted with maize, corn, or manioc, a starchy tuber annually harvested in tropical and subtropical regions. Later in the afternoon, the Amazonian may then decide to inhale some powder containing tryptamines through the nostrils. In the later evening, ayahuasca may then be used (Rätsch 2005, 9).

With an examination of these daily activities, it goes without saying that within this culture, psychoactive plants are widely and casually utilized daily. However, western societies deem these actions as “primitive,” when, in reality, this example provides similarity to western culture. It can be seen as an exoticized mirror example, a mirror in which western society is unable to accept its appearance. Instead, western society upholds this façade that it is only these exotic, indigenous people who intake stimulants and psychoactive drugs daily. In reality, western civilization does the same, the difference being in how western society defines the substances. Alcohol, coffee, Prozac, and nicotine are all scientifically defined as psychoactive drugs. Each one produces a change in behavior and mood (Brick, 2013). After describing current societal activities under the same scientific definition, the use of stimulants and psychotropic substances is familiarized and becomes easier to see the resemblance in the mirror. This ethnocentrism and markedly medico-centricity, has given rise to antidepressants in the suppression of other therapeutic options. European annexation of fundamental philosophies is what continually happened when European settlers traveled around and came into contact with indigenous peoples.
Psychoactive mushroom misrepresentation is very similar to what Gananath Obeyesekere argued in his famous debate with Marshall Sahlins. Obeyesekere argued that throughout history European settlers had instilled their own fabricated stories upon other cultures in a manner to show “dominance” over “primitiveness” by spreading this idea that using these substances was a sacrilegious and a “savage” mindset, residing below the Europeans (Borofsky, 1997). Despite attempting to eradicate psychedelic practices, Europe most certainly had its indigenous mushroom cults. In the medieval ages, mushroom rings became associated with the meeting places of witches, female magicians, and elves. They believed that witches and demons caused the mushrooms to grow. Therefore, mushrooms were deemed perilous. These same notions soon were also found to have taken part in the idea of mushrooms of Japan as well as many other places. Recorded in the 720 AD text, “Nibongi,” it tells of the mushrooms presented to their Emperor Ojin in 288 AD (Wasson et al., 1975). Among the Japanese, they were thought to be the food of the long-nosed goblins known as “tengus” (Kiple and Ornelas, 2008). It is not all that unlikely that these are resultant from altered states of consciousness while on the mushrooms. However, over the centuries, due to colonial hegemony, psilocybin’s use was forced underground and hidden from scientific exploration. In juxtaposition to past hegemonic actions, further research into psychedelics and psilocybin shows that it is imperative for modern society, through science as well, to learn much about these psychoactive plants for use in future therapeutics (Fitzpatrick, 2018).

Culture plays a significant role in perceptions and experiences of illness and health. In the United States, exists “mental illness,” while within the context of another culture, it signals as a favor from God. Nonetheless, understanding these variables appears to be contingent on societal class and position within that society (Sobo, Janine,
Research into psilocybin will take medical pluralism and an understanding of multi-cultural knowledge to utilize the compound best. Altruistic research must be done through cultural relativism of both cultures, as championed by Franz Boas (Sobo, Janine, and Loustaunau, 1997). Psychopharmacology studies show how drugs affect the brain through their chemical mechanisms, use, and effect on behavior. One of the sub-categorical studies for psychopharmacology is dealing with how hallucinogenic compounds have been utilized cross-culturally throughout history (Brick, 2013). Cross-cultural usage is considered significant in the fact that it validates with proper handling, setting, and knowledge of psilocybin; it can be utilized efficiently and appropriately within society. Therefore, it is not an ethically corrupted type of conduct or behavior within a culture, only connoted as such in some, including American society (Schultes, Hoffman, and Rätsch, 2006). The use of such compounds has been riddled with detrimental misrepresentations, when in fact, quite the opposite of the matter should be exploited, not nourishing the pessimism of the ill-informed. Held at the core of these substances is a regenerative force, a chemical connection, which maintains humanities evolutionary relationship with them and psilocybin.

However, in regard to anthropological data, it is not only the phytochemicals responsible for the medicinal effectiveness but is further enhanced with shamanic psychotherapy. Juxtaposed to contemporary western views in that assuming a pill will fix the issue. Therefore, psilocybin could be effective therapeutics coupled with psychotherapy. The compound interacts with 5-HT/serotonergic receptors in agonistic signal transduction. Unlike antidepressants, serotonin reuptake inhibitors (SSRI), Bupropion, and Benzodiazepines, it does not directly stimulate dopaminergic receptors (Beaulieu, 2011). Direct stimulations that have paradoxical effects among individuals in
neural circuits. Dopaminergic drugs have been found to cause individuals impairment while helping others (Cools, 2008). These dopaminergic compounds produce a critical problem for neuropsychiatry in that individuals become vulnerable to the adverse effects on motivation and cognition. With depression and anxiety, the complications are both biomedical and experiential. The consumption of medications cannot treat this ailment. Often in psychoanalysis, there is a subconscious dilemma that causes the anxiolytic symptoms that stem from the medial prefrontal cortex (mPFC), a sub-region of the default mode network (DMN) (Harris, 2013).

Peruvian shamanic practices have shown highly effective in treating depression, with cognitive restructuring as the primary focus of their treatments. To achieve this, the shaman remains much like a doctor in being a rational, empirical guide, as they lead them precariously through their darkened thought patterns. Along the way, they instruct the individual on how to deal with the matter rather than suppress the emotions, memories, or traumas that plague their minds. Over time, these shamans have honed and crafted their forefather’s knowledge of charisma, medicinal plants, and psychology to achieve such feats (Bussman 2006). Shamans can diagnose illness as being “naturalistic” or “personalistic” by the personal experience told. Under the administration of phytochemical concoctions, the shamanic healers will help the client to construct a healthier mindset and thought patterns, which will allow their mind to keep from slipping back into depression. However, this entails a focus on discovery into methods of altering and restricting irrational beliefs and eliminating negative self-talk.
Psilocybin and Neural Correlates:

In 2012, at Imperial College London, a study led by Dr. David Nutt mapped out the human brain under the influence of psilocybin. Nutt’s laboratory stands as part of a select group of elite researchers authorized to study the effects of psilocybin. Within this study, he utilized a functional magnetic resonance imaging (fMRI) technique that measured the “resting-state network” and functional thalamocortical connectivity (FC) after a clinical test volunteer was administered psilocybin at controlled dosages (Robin L., 2012). Nutt has examined how the brain is affected by varying dosages of psilocybin concerning neural correlates in a psychedelic state (Carhart et al., 2012). Nutt ran a series of tests to map the progression of blood flow in the brain, as seen in Figure 6. For the experiment, he gave the subjects psilocybin and ran a task-free functional MRI (fMRI) protocol to measure the effects. The fMRI is designed to capture the transition from ordinary waking consciousness to the psychedelic state. He utilized what is known as “Arterial spin labeling perfusion and blood-oxygen-level-dependent (BOLD) fMRI” (Carhart et al., 2011). These tests were run to capture the neuroanatomical blood flow, starting from the entry of blood at the base of the skull, along with changes in the venous (vein blood) oxygenation prior and post infusions of the psilocybin. What that means is that Nutt was tracking when psilocybin absorbed into the bloodstream and where the blood then flowed. He was also assessing where the blood flowed or did not as indicating areas of increased or decreased neural functioning.
Nutt hypothesized that when measured, there would be an observed increase in the levels of consciousness, meaning increased blood flow. However, he found that blood flow decreased, the reverse of his hypothesis. Changes in the cerebral flood were more heavily accented in specific regions, like the thalamus and anterior and post cingulate cortex (ACC and PCC). This finding was consistent in the medial prefrontal cortex (mPFC), a sub-region of the default mode network (DMN). When interconnected, the magnitude of decreased blood flow is an indication of the personal effects of the psychedelic. After this portion, a “cross connective analysis” was conducted (Carhart et al., 2011). The results revealed a decrease in the connectivity of the mPFC and PCC. Nutt’s results demonstrated the hyperfunctioning of cognition in the brain, coupled with the decreased activity, which enables for unconstrained cognition. The use of psilocybin has been shown to “shut off” the part of the brain that focuses on the past and the future known as the default mode network. With the ability to shut this part of the brain off, it
allows for decreased anxiety and stress in patients. Psilocybin, unlike antidepressants, does not need to balance out the chemicals in the brain (Sharp et al., 2012). However, despite these findings, it remains imperative for the cultural acceptance of the therapeutic powers of psilocybin. Not only in the ability to clinically use this compound but also, as seen in traditional cultural use, the setting is essential to the implementation. In Peruvian shamanic therapeutics cognitive restructuring is a central focus of treatment. The shaman remains much like a psychotherapist in being a rational, empirical guide. They combine their knowledge of botany, phytochemicals, and psychology (Bussman 2006). Along with the administration of phytochemical concoctions the shamanic healer will help the client construct a healthier mindset, which entails a focus on discovery into methods of altering and restricting irrational beliefs and eliminating negative self-talk which causes neuroplastic changes to occur.
~Conclusion~

Humankind in traditional settings has used psilocybin for centuries to receive under-investigated anxiolytic and physical healing properties that do not result in the detrimental side effects associated with antidepressants. To gain a better understanding of not only the neurobiological but psychological workings of depression and anxiety, the effects pertaining to psilocybin are imperative. These effects entail more than merely an intellectual inquiry and could continue to have profound effects on people’s cognitive ailments. However, it cannot undergo ethnocentric research. Ethnobotanical research must not become connected with the tenets of biomedicine and seen as less than western medications. Anxiolytic research cannot remain seen only through generalized biomedical symptoms but through the patient’s subjective and personalistic treatment. With depression and anxiety, the complications are both biomedical and experiential. Research into psilocybin needs to take on an understanding incorporating all cultural aspects related the compound to best become utilized. Regardless of trusting humanity’s admission of psychedelic drugs in aboriginal or western social orders, they have assumed a large part of the human culture and most likely will continue to do so. This knowledge should therefore become understood within its cultural context, not ethnocentrically discarded, then coupled with biomedical studies to gain a complete comprehension of these physically and socially powerful stimulants. When properly researched and used the therapeutic properties of this psychoactive substance could continue to become an impetus for anxiolytic research in depression and anxiety studies around the world.


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World heritage list, Tassili n'Ajjer, http://whc.unesco.org/en/list/179/ (Downloaded: 23 April 2016)