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# Ketamine's Role in Spirituality: How One Synthetic Drug Catalyzes a Natural Experience

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## ABSTRACT

This article highlights the potential spiritual effects of a popular anesthetic, ketamine, and how these spiritual effects can be used to help promote the reconciliation of spiritual and physical health. Ketamine, like the prominent psychedelic, psilocybin, has reportedly caused feelings of spiritual revelation and “out of body experiences” that many physicians may not feel qualified to discuss with their patients. This reluctance to address ketamine-induced spiritual experiences may affect the health outcomes of the patient. The primary goal of this project is to bring academic validity to considerations of the spiritual health of patients. This paper (1) investigates the extent that ketamine-induced, non-ordinary experiences can help bring awareness to the compatibility of spiritual and physical health and (2) compares the mechanisms of ketamine and psilocybin, as well as their value to the medical community due to the spiritual experiences that they catalyze. Thus, this research seeks to demonstrate that understanding the spiritual value of ketamine may encourage better communication between the physician and patient and promote more holistic healthcare approaches.

## 1. BACKGROUND

To better understand how ketamine-induced experiences are potentially “spiritual” in nature, we first have to clarify the term “spiritual.” For the purposes of this paper, spiritual can be defined as something that is more than our typical waking reality—it is, at its most expansive, the experience of becoming one with all that exists, going beyond the boundaries of time and space. These spiritual experiences present an interesting challenge to modern medicine. As American medicine has become increasingly scientific, the focus of physicians has centered on physical and psychological care. However, there was a time that American hospitals emphasized spiritual well-being as well. According to Dr. Puchalski, in 1910, American medicine changed course. The Flexner Report laid an important foundation for American medical education's footing in the physical sciences. Unfortunately, this newfound grounding undermined the spiritual elements of patient care (Puchalski). Spirituality had a prominent role in establishing American healthcare for centuries but was quickly masked by the technological advances of the 20th century. With new treatments and diagnoses, numerous lives were saved but at the cost of once traditional medical values. American medicine soon adopted an empirical model and the once holistic field that accepted both secular and metaphysical ideologies was lost. Many Western physicians, specifically in the United States, had become intellectually advanced, but according to Puchalski, medical personnel across the country were becoming less and less equipped to pick up on the

emotional (verbal and nonverbal) language of their patients. Puchalski goes on to suggest that a part of this emotional opacity was caused by the segregation of spirituality and medicine (Puchalski). Yet, at the start of the 21st century, researchers have begun to rediscover spirituality's potential effect on physical and mental health (Puchalski).

Modern medicine has made significant progress in identifying and acknowledging the importance of spirituality and what can invoke these experiences. While there is no way to quantitatively measure a spiritual response, the qualitative data attained from these studies are important nonetheless. Some researchers, however, have found significant similarities between anesthetics and psilocybin—the active ingredient in several species of mushrooms that catalyzes psychedelic experiences—in the physical and subjective way the two affect the brain. Recent studies have begun to gather empirical data on the physical effects of psychedelics on the brain and have created theoretical frameworks for making sense of the spiritual experiences that are so often associated with the use of psychedelic substances. Namely, in the article “Altered States: Psychedelics and Anesthetics,” Eduardo E. Icaza reports, “By comparing psychedelic and anesthetic pathways that can alter or even ‘heighten’ consciousness, we may be able to identify key brain areas and networks that mediate conscious experience” (Icaza 1258). Neuroimaging techniques have shown that psilocybin decreases cerebral blood flow and have uncovered patterns of functional disconnections like many anesthetics. Psilocybin significantly decreases cerebral blood flow in the posterior

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cingulate cortex, thalamus, and anterior cingulate cortex. Furthermore, psilocybin reduces functional connectivity between the anterior and posterior regions of the cortex, similar to brain patterns found during anesthesia (Icaza 1257). For our purposes, psilocybin brain pathways compare to those of ketamine by similar decreased connectivity in the amygdala and anterior cingulate cortex. It is important to note that this similarity is based on low-dose administrations of ketamine (Icaza 1258). In anesthetic doses of ketamine, there are significant reductions of thalamus activity like what is found with psilocybin. The regulation of our waking conscious and the connectivity between our emotions, intelligence, concentration and self-awareness, as well as our spatial and visual perception are altered similarly by psilocybin and general anesthesia.

This biological approach to examining these substances was supported by Michael van Elk in his article, “Brain Mechanisms in Religion and Spirituality: An Integrative Predictive Processing Framework”. In this article, van Elk reported a five-point biological model for the relationship between religious and spiritual experiences and the brain:

1. Temporal brain areas

Brain Structures: Hippocampus, Amygdala, Superior Temporal Sulcus; Medial Temporal Lobes; Fusiform Face Area

Function: Memory retrieval; Emotional coloring of experience; Biological motion perception; Face perception

Religious and Spiritual Beliefs: Visions; Hallucinations; Deja-vu experiences

2. Multisensory Integration

Brain Structures: Temporo-Parietal Junction; Superior Parietal Lobe; Inferior Parietal Lobe

Function: Bodily self-consciousness; Multisensory integration

Religious and Spiritual Beliefs: Mystical experiences; self-transcendence; out-of-body experiences; feeling of a presence

3. Default Mode Network

Brain Structures: Posterior Cingulate Cortex; Precuneus; Inferior Parietal Lobe; Lateral Temporal Cortex

Function: Self-referential processing; Mind-wandering

Religious and Spiritual Beliefs: Mystical experiences; Ego dissolution; Reflective religious beliefs

4. Theory-of-Mind Network

Brain Structures: Medial Prefrontal Cortex; Superior Temporal Sulcus; Temporo-Parietal Junction

Function: Social Cognition; Communication; Intentionality perception

Religious and Spiritual Beliefs: Prayer; Belief in personal God; Over-attribution of agency

5. Error-Monitoring Mechanisms

Brain Structures: Anterior Cingulate Cortex; Medial Prefrontal Cortex; dopaminergic system

Function: Prediction error-monitoring; Belief-maintenance and updating

Religious and Spiritual Beliefs: Openness to religious authority and rituals

Both psilocybin and ketamine cause decreased amygdala connectivity. This promotes an emotional disconnection between what is felt during the typical, waking reality and what is felt under the influence of the psychedelic or anesthetic. Translating this to transcendental functions by van Elk’s biological model above, we see that the amygdala helps regulate religious and spiritual visions and hallucinations. In the absence of metaphysical influences, the amygdala is a part of the limbic system—mediating emotion and memory. More specifically, the amygdala is associated with positive emotions and rewarding stimuli (Salzman). When considering both the psychedelic cognitive effects of psilocybin and the supposed spiritual nature of ketamine, healthy individuals may encounter positive or relatively safe visions or hallucinations that encourage sanguine feelings in order to (1) escape external stresses or (2) find more effective ways to deal with those external stress factors. Decreased amygdala connectivity induced by both drugs, then, is the result of the individual shifting their attention from the normal conscious world of experience and entering the subconscious in order to explore emotions in a different way than they would normally be able to do. This exploration of emotions, therefore, comes in the form of hallucinations and visions that cannot be seen if amygdala connectivity had not been altered. Most importantly, feelings produced from the amygdala during both psilocybin and ketamine trips are highly likely to affect the individual after their psychedelic explorations. Regarding patient care, this can translate to better recovery outcomes due to the positive affirmations and/or the emotional security that was established by the visions during the trip.

The anterior cingulate cortex is a “meeting place” for the limbic system, that mediates emotion, and the prefrontal cortex, that mediates cognition. The anterior cingulate cortex, therefore, is likely to regulate an individual’s ability to control and manage uncomfortable emotions (Stevens). In van Elk’s biological model for spiritual experiences, the anterior cingulate cortex helps regulate error-monitoring mechanisms and belief maintenance. In terms of spiritual beliefs, the anterior cingulate cortex promotes openness to religious authority and rituals. As Icaza reported, both ketamine and psilocybin influence the brain by decreasing anterior cingulate connectivity. A healthy individual’s ability to control, avoid,

and regulate painful emotions are mediated by the ACC. If these connections are altered—and more specifically decreased by the activity of psilocybin and ketamine—this allows more abstract approaches to dealing with such emotions to be utilized. Therefore, under spiritual influences such as those that are at times provided by ketamine, authoritative religious figures or beliefs can be a determining factor in how the individual reacts to stresses after their psychedelic experience.

These similarities in the biological mechanisms of the two drugs are supported in the post-psychedelic recollections of several healthy individuals. Although van Elk established a biological model for making sense of general spiritual experiences, Dr. Eli Kolp provided a different approach to studying the effects of spiritual experiences on the brain. Dr. Kolp, with the assistance of other physicians and researchers, studied the conscious effects of ketamine in a psychedelic psychotherapy study, focusing on the phenomenology and clinical applications of the profound mystical effects of the drug. Psychedelic psychotherapy typically occurs while the patient is under the influence of a psychedelic. From this study, Dr. Kolp reported that when using:

“...one-sixth to one-tenth of the dose used for general anesthesia, ketamine can create psychedelic experiences with disconnection from surroundings, perception of floating becoming disembodied as a mind or soul, and even dying and going to a different world...loss of reality contact appears more pronounced than with other psychedelics” (Kolp, et al).

These sub-anesthetic doses of ketamine can produce the shifts in conscious thought that encourage spiritual experiences. Dr. Andrew Bowdle, author of “Psychedelic Effects of Ketamine in Healthy Volunteers: Relationship to Steady-state Plasma Concentrations,” stated “ketamine produced dose-related psychedelic effects”—supporting that different doses of ketamine can produce significantly psychedelic, and thus, spiritual experiences (82). Dr. Bowdle also reported, “Awareness of these effects may help clinicians using subanesthetic doses of ketamine improve their management of patients, particularly with regard to effective communication with patients” (86). Specifically, the effects that Dr. Bowdle refers to are explicitly stated in Dr. Kolp’s article, “Ketamine Psychedelic Psychotherapy: Focus on Its Pharmacology, Phenomenology, and Clinical Applications.” According to Dr. Kolp, the ketamine-induced, non-ordinary experiences may include:

Emotionally intense visions (deceased relatives, angels, spirits)

Encounters with archetypal beings (Christ, Buddha, Krishna)

Feelings of cosmic unity with the Universe and God

Sense of sacredness

Feelings of interconnectedness with all people and nature

The above components of ketamine-induced experiences directly align with ketamine’s involvement in altering the amygdala (emotionally intense visions, encounters with archetypal beings) and the anterior cingulate cortex (feelings of cosmic unity with the Universe and God) as reported by Dr. Icaza.

At high doses, ketamine experiences can induce an ego-dissolving, transcendental experience for the patient, including:

Feelings of interconnectedness with all people (or sense of experiencing collective consciousness)

Feelings of becoming God, frequently experiences as an ocean of brilliant white light

Profound sense of sacredness of the experience

These ego-dissolving, transcendental experiences can generate some resolution of the patient’s addictive illnesses, psychological problems, and personality disorders, including spontaneous healing from chronic psychosomatic illnesses (Kolp, et al). It is important to note that transcendental experiences can occur with subanesthetic and high doses of ketamine.

## 2. METHODOLOGY

This project is constructed as a literature review. Specifically, it analyzes previous studies on the spiritual aspect of ketamine and how these ketamine experiences can help establish a more holistic healthcare system. This project also compares the spiritual experiences between ketamine and psilocybin, a classic psychedelic that has also been reported to provide “spiritual” effects. The mystical experiences induced by psilocybin have been found to have enormous value, specifically in psychotherapy. This comparison will be used to question whether ketamine-induced experiences should be deemed valuable as well. Finally, the comparison of ketamine to psilocybin as well as testimonies of ketamine users will be used to argue the necessity of reconciling spiritual and physical health.

Most sources were collected from the PubMed National Library of Medicine database. Search terms included “spirituality and medicine,” “spirituality and health,” “spirituality and ketamine,” “ketamine and psychedelics,” and “psychedelics and medicine.” The peer-reviewed journal of the American Society of Anesthesiologists was employed as well. Search terms from this journal included “anesthetics and spirituality,” “anesthetics and mystical experiences,” and “anesthetics and psychedelics.”

## 3. RESULTS

The spiritual testimonies of recreational ketamine users were compelling. One user reported:

“I rose into the Light and found myself having an unspoken interchange with the Light, which I believed to be God, about matters which seemed to be of central importance to my Life and who I was. I didn’t believe in God, which made the [ketamine] experience even more startling. That experience seriously shook the basis of my belief” (Jansen 99).

Another user revealed,

“[Ketamine] was very upsetting, and it did shake my atheism, very much so. I’m just really pleased that I found it when I did because I think it was a Godsend actually. I regard [ketamine] as a sort of spiritual enhancer” (Jansen 101-105).

Those who have had experience with ketamine insist that the events they encounter are real—they are not hallucinations or dreams. These first-hand accounts do support the hypothesis that ketamine experiences are spiritually valuable. To offer a description of how influential ketamine-induced experiences are to patient care, and thus, the reconciliation of spiritual and physical health, I employ a room-door metaphor illustrating the importance of recognizing this transcendental phenomenon to the physical body:

If we consider the physical body to be a door leading to a room, the room will symbolize the subconscious. Within this room holds our ability, or capacity, to have, maintain, and regulate transcendental experiences. When we think of a room, we presume the door is a part of the room. The two are not dissociated, or separate from one another, but are instead, considered to be distinguishable. An individual is only ever to acknowledge the subconscious when he or she separates themselves from the conscious, waking reality. Ketamine is an avenue to promote this separation.

The physical mechanisms that are affected by ketamine in anesthetic practices directly affect the state of the conscious mind by increasing subconscious activity. With heightened subconscious awareness, the capacity to welcome and understand spiritual concepts is increased, and the result of doing so can affect how the patient chooses to physically manage their recovery process.

There are other side effects of ketamine. “K pains” are severe stomach pains that can hospitalize the user. Karl Jansen reported in his book, *Ketamine: Dreams and Realities*, that these “K pains” are a form of irritable bowel syndrome (Jansen 271). These stomach pains may be the physiological result of emotional stress that occurs when the user is undergoing a powerful ketamine-induced psychedelic experience. Other physiological responses due to ketamine-induced, non-ordinary experiences can include chest pain and rapid heartbeat, increased blood pressure, and increased susceptibility to infection (Schneiderman). Physicians, specifically anesthesiologists, should consider these experiences important to their patients’ health in that neurotic experiences often have physiological effects. However, as Dr. Bowdle notes, “anesthesiologists tend to associate the psychedelic effects of ketamine with emergence from anesthesia, after use of ketamine as an induction agent, which is often referred to as ‘emergence reactions’” (Bowdle, et al). Roughly 55% of those administered ketamine will experience an emergence reaction that mimics schizophrenia and increases that patient’s risk of injury (Aroke, et al). The misattribution of these spiritual experiences as emergence phenomena accredited to mental illness, and the physician’s subconscious treatment of post-ketamine reactions as such, can arguably create unintended roadblocks in the patient’s treatment.

Although harmful side effects can occur, ketamine-induced, non-ordinary experiences can encourage

stable recovery from illness and injury by promoting patients’ psychospiritual growth (Ketamine-Enhanced Psychotherapy). Spirituality can be utilized as a method to relieve physical symptoms and to confront and endure the emotional distress that can accompany physical illness. Patient recovery is largely dependent upon the individual’s ability to relate to their self, to others, and to the physical world. For example, transcendental experiences can stabilize emotional responses to external stressors, such as physical injury. Without healthy emotional responses, the body cannot respond properly because that unhealthy emotional response has become an acute, or in severe cases, chronic, stressor. For the purposes of this paper, these unhealthy emotional responses can occur because of distressing or off-putting visions or hallucinations while undergoing a ketamine trip. These can induce a vascular response, specifically, increasing blood pressure through constriction (Schneiderman). Minimizing the effect spirituality has on physical recovery can risk the progress of a patient’s return to health.

Dr. Matthew Johnson conducted a study analyzing psilocybin and its mystical effects during several therapeutic trials related to the psychological distress and depression catalyzed by cancer. His analysis suggested that the positive therapeutic outcomes are mediated by the drug’s ability to produce spiritual experiences (Johnson 95). These non-ordinary, mystical experiences produced from psilocybin include changes in perceptual, cognitive, and affective thinking (Griffiths). Psilocybin is a part of a serotonin-mediated class of hallucinogens, along with lysergic acid diethylamide (LSD) and N,N-dimethyltryptamine (DMT). Prominent themes of serotonergic-hallucinogenic experiences include (Strassman):

Timelessness

Ineffability

Contact and unification with an authoritative presence

Experience of a white light

Certainty that consciousness continues after physical death

Firsthand knowledge of the ‘facts’ of creation, existence, and consciousness

Prominent themes of ketamine-induced, non-ordinary experiences include (Kolp, et al):

Feelings of becoming God

Sense of sacredness

Feelings of cosmic unity with the Universe and God

Encounters with archetypal beings

Emotionally intense visions

Similarities between the synthetic drug, ketamine, and the plant-produced psilocybin include euphoria, peacefulness, spiritual awakening, and quickly changing emotions. More apparent similarities are depersonalization, and distorted thinking and/or rationales. These similarities are characterized by their abruptness and by their ability to be sustained over significant periods of time. This research also indicates that ketamine-induced experiences do not produce lasting effects as consistently as psilocybin-induced experiences. In a dose-dependent psilocybin study analyzing the long-term psychological effects of hallucinogenics, researchers found that high-dose psilocybin (20-30 mg/70Kg) produced acute and persisting effects after six months. Participants in the study experienced lasting feelings of interpersonal closeness, death transcendence, daily spiritual experiences, and religious faith and coping (Griffiths, et al). Typical therapeutic psilocybin dosage is 25 – 30 mg/70kg. The similarity in therapeutic and non-therapeutic psilocybin dosage, and lack thereof for ketamine, can explain why ketamine-induced experiences have not been understood to be as psychologically valuable as the experiences catalyzed by psilocybin. The lack of research regarding dose-related ketamine-induced experiences in various sets and settings, in addition to positive therapeutic results attributed to psilocybin due to its capacity to produce these mystical experiences, helps establish psilocybin's effectiveness but does not signify ketamine's relevance in a bio-spiritual context. With more research, it may be possible for ketamine-induced experiences to also be medically valuable.

Regarding the need for spiritual concern in medicine, Dr. John Tarpley examined public opinion polls and surveys that showed that the majority of patients want their physicians to inquire about their spiritual concerns and health. However, studies also indicated that many physicians were uncomfortable discussing spiritual issues (Tarpley 644). Additionally, Doctor Elaine Yuen proposed that spiritual and religious practices have benefited those with physical conditions such as kidney disease, cancer, cardiovascular disease, HIV, and diabetes mellitus. Religion and spirituality also support psychological coping mechanisms, addressing the physical discomfort that accompanies illness and injury (77). Effective communication practices regarding patients' spiritual health and experiences do require physicians to be more present as a person, rather than as a physician. It is important to the patient's health and to the overall patient-physician relationship for the physician to be more attentive to all possible causes of patient suffering, and in some ways, to separate themselves from their profession in order to gain better insight about the patient. This willingness of a physician to be a fellow human welcomes patient vulnerability and allows the physician to familiarize themselves with the patient's personal experiences, which, if need be, can be appropriately incorporated into their treatment plan.

#### 4. DISCUSSION

This paper aims to provide a context to examine the extent that ketamine-induced, non-ordinary experiences can help bring awareness of the compatibility of spiritual and physical health. To study this principal question,

comparisons were made between the anesthetic ketamine and a serotonergic hallucinogen, psilocybin. In addition, the validity of these ketamine-induced spiritual experiences was examined. To fully understand the capacity that ketamine possesses to help reconcile spiritual and physical health, it is crucial that spiritual health, as distinct from spirituality, be better defined in any future research.

Physical, mental, and social perspectives all make up the human experience. However, the aspects of human existence that cannot be rationalized within these contexts make up individual spiritual health. Spiritual health is an actualization of the differing capacities of human existence. It is how well the individual functions in a shared, waking reality with others based on their individual knowledge of what they perceive to exceed this shared reality. Spiritual health, at its essence then, is the balance between the physical and emotional aspects of existence. It is how we tangibly and cognitively perceive ourselves in relation to other existing possibilities as we know them. Spiritual health does not require constant internalization of positive feelings or belief in a higher power. Instead, it requires individual discernment of all possible forms of existence. The idea of being spiritually unhealthy, therefore, is the result of dissonance between the individual's understanding of transcendent ideas and their everyday, waking reality.

Ketamine can be utilized to promote the reconciliation of spiritual and physical health by (1) encouraging the patient to challenge traditional social constructs and belief patterns at the cost of discovering personal revelations; (2) inducing psychological stressors that can have physical effects; and (3) allowing for more open patient-physician conversations. As Kolp described, "...the ego-dissolving transcendental experiences [of ketamine] sometimes generate some resolution of the patient's addictive illnesses, psychological problems, and personality disorders, including of spontaneous healing from chronic psychosomatic illnesses" (Kolp, et al). It is clear that discussing personal experiences such as these can at times create discomfort for the physician and/or patient; however, the vulnerability experienced during these conversations could have substantial positive outcomes on the patient's ability to manage physical injury. These types of conversations would require an intimate relationship between the patient and physician in order to discuss the aftermath of ketamine-induced, non-ordinary experiences, and the willingness of the physician to consider those experiences in their treatment plans.

Ketamine is of special interest in integrating spirituality and modern medicine because of its role in pain management. Pain perception is composed not only of physical mechanisms and response, but emotional factors as well. Spiritual stressors can catalyze pain responses, and ketamine-induced, non-ordinary experiences at anesthetic doses can alter patients' pain perception. Subsequently, pain management options should reflect these non-physiological factors. To efficiently assign pain treatment options, however, physicians must possess a comprehensive understanding of these ketamine-induced experiences.

Patients' capacity to tolerate and accept disease and injury requires multiple levels of experience and thought (Dedeli). The psychedelic effects associated with ketamine encourages a detachment from these thoughts processes—

bringing forth a sense of intense and often overwhelming spiritual vulnerability for the patient. Therefore, an individual's perception of pain may be significantly altered by ketamine because he or she is not experiencing typical, waking-reality thought processes but is instead experiencing unfamiliar, subconscious levels of thought. That is to say, these spiritual experiences are ordinarily invisible to us and are inaccessible using our normal states of consciousness (Strassman 54). Consequently, these spiritual-in-nature, ketamine variables may alter the patients' response to various pain experiences, thus affecting their recovery options (Dedeli).

## 5. CONCLUSION

This paper does not encourage the recreational use of ketamine, nor does it propose ketamine should be utilized as a therapeutic substance. However, this paper aims to raise questions regarding training improvements for medical students. It is important to objectively measure the level of "spiritual training" necessary to become knowledgeable with spiritual health, and therefore how to improve the patient-physician relationship. Going further, future studies would need to objectively measure the direct relationship specifically between ketamine-induced experiences and the physical outcomes of treatment to provide a more stable argument for the compatibility of spiritual and physical health.

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