

## **Psychedelics and the meaning of life: Can psychedelics induce transformative mystical experiences?**

The word *psychedelic* originates from the Greek words *psych* and *delos*, translating into *mind* and *visible*, respectively. It was first coined by Humphrey Osmond in 1956 (Gossop, 2007). For thousands of years psychedelic substances, such as mescaline and ayahuasca, have been in religious ceremonies to promote mind opening experiences and as an aid to encounter spirits (Nutt, 2014). Subjective reports suggest that the psychedelic experiences are *mystical* - causing feelings of unity, sacredness, peace and joy, transcendence of space and time, ineffability and belief that the experience is a source of truth about the nature of reality (McLean, Johnson & Griffiths, 2011). Broadly speaking, it is an individual's direct experience of fundamental reality involving states of *noesis* (knowledge and insights), which differs from normal human perception and cognition (Daniels, 2005). Whether psychedelics induce genuine spiritual experiences have been widely debated throughout the years. The present essay briefly discusses the historic use of psychedelic substances. Then, it attempts to explain mystical experiences, by evaluating and drawing from psychology, philosophy, and neurosciences' theory and research. Lastly, the essay reviews and critically evaluates arguments in a support and against the authenticity of substance induced mystical experiences.

The mysteries of Eleusis lasted from about 1500 BCE to the 4th century, to honour Demeter, the goddess of agriculture and fertility. Demeter's daughter, Persephone was kidnapped by the god of the underworld - Hades. According to the legend, in her anger Demeter cursed humans with horrible droughts, causing them suffering and starvation and depriving the Gods from worship and sacrifice. As a result, Zeus ordered Hades to return Persephone to her mother. Upon Persephone's return, Demeter instructed the kings of Eleusis to celebrate the rites, which were to be mysteries. Among the participants in the rites were

Aristotle, Plato, and Sophocles, who described their experience of the rites as visions of the beginning and end, birth and death.

The Eleusian mysteries involved drinking of a sacred potion – *kykeon*. Some scientists believe the substances used to prepare the sacred drink were psychedelic (Wasson, Hofman & Ruck, 1978). In fact, Hofmann (1997) speculates that the psychoactive component in *kykeon* was ergot - a grain fungus found in wild grass. His suggestion stems from the use of ergotamine - a substance from the ergot family of alkaloids - in the synthesis of lysergic acid diethylamide (LSD) (Hofmann, 1997; Wasson, et al., 1978). Thus, a couple of fundamental questions emerge, namely: can psychedelic substances induce mystical experiences, and if so, how.

The “March Chapel Experiment” or the “Good Friday Experiment” was conducted in 1962 by Walter Pahnke. Pahnke’s experiment investigated whether psilocybin (a psychedelic compound) would serve as an entheogen in individuals with religious predisposition. He found that the majority of the participants in the experimental group, experienced profound religious experience, and thus, provided early empirical evidence for the notion that psychoactive substances facilitate mystical experiences. However, how do psychedelic substances facilitate such experiences, is open to debate.

Turning to proposed models of consciousness may be one way of understanding the underlying mechanisms of substance induced mystical experiences. For example, Tart’s (1983) system model of consciousness assumes that any psychological state is a result of the function and interaction of multiple psychological and neural processes such as perception, attention, and emotion. Therefore disturbing perceptual and cognitive processes by inducing an altered state of conscious, through ingestion of psychedelic substances, may yield an understanding of the normal working state of consciousness.

Some psychedelics, such as psilocybin, LSD, and dimethyltryptamine (DMT), stimulate certain serotonin receptor subtypes, by mimicking the action of serotonin. This leads to the excitation of layer 5 pyramidal cells and decreases the oscillatory activity in the cortex, resulting in a desynchronized activity in cortical structures (Carhart-Harris, Koelen & Nutt, 2014). The decreased activity is associated with characteristic changes in consciousness caused by psychedelic substances, which allows for a rather unconstrained mode of operation. Thus, the psychedelic state of consciousness is more disordered in comparison to the normal working state of consciousness, allowing for greater operational flexibility (Carhart-Harris, Erritzoe, & Williams, et al., 2012). Furthermore, EEG evidence suggests that ayahuasca may allow individuals to explore their unconscious feelings and memories, by inducing a hypnagogic state (theta), while simultaneously keeping them conscious in a dream like state (alpha) (Hoffmann, Keppel-Hesselink, Yatra, & DaSilveira, 2001). Indeed, ayahuasca has widely been used among indigenous people throughout the Amazon and Northern South America, for self-exploration and healing (Bell, 2014).

Ayahuasca comes from the Quechua language and means “Vine of the soul” or “Vine of death”. Its psychoactive component is DMT found in *Psychotria viridis* bush leaves. The leaves are combined with *Banisteriopsis caapi*, containing monoamine oxidase (MAO) inhibitor, which makes ayahuasca orally active (Kjellgren, Eriksson, & Norlander, 2009). Following the indigestion of the brew, participants in the ceremonies, typically describe going through frightening states of chaos and complete loss of self-control, followed by a sudden transformation-like experience from hell to heaven, where everything is limitless and indescribable. Reports of encounters with spiritual world or greater entities and of scenes of death and rebirth are also common (Kjellgren et al., 2009).

Encounters reported during the ayahuasca experience can be classified in six categories, according to Shanon (2002): (1) mystical beings such as gnomes and fairies, (2) chimeras and hybrids, (3) extra-terrestrial, (4) angels and celestial beings, (5) semi-divine being, (6) demons, monsters, and beings of death. The reports of encounters with non-human beings leads to a debate regarding the authenticity of the psychedelic reality, and perhaps could be explained by environmental cues or cultural differences. For instance, different cultures that use ayahuasca in their ceremonies have different interpretation about their experiences and encounters. Interestingly, the Coshinahua view ayahuasca as a substance providing them with guidance through hallucinatory experiences (Kensingel, 1973); the Siona people consider ayahuasca as a gate to an alternative reality (Longdon, 1979); and the Schuar people consider all human experiences as hallucinations, and ayahuasca as a window to the true reality (Obiols-Llandrich, 2009). Broadly, the interpretations of such experiences can be summarised in three categories: (1) hallucinations, (2) creatures appearing as unknown part of the self, and (3) experiences of other worlds occupied by independent intelligent creatures (Luke, 2015). Alternatively, philosophical views and theory may also provide some insight to the understanding of why particular types of entities are being encountered.

The Jungian theory of the collective unconscious is a psychic system of collective, universal knowledge, shared among individuals. Jung argues that it is inherited and consists of pre-existent forms, defining certain psychic content as archetypes. Archetypes are universal patterns and images and include events such as birth and death, union of opposites, figures of the great mother and father, god, devil, old wise man/woman, tricksters, heroes, and motifs of apocalypse and creation (Jung, 1996, p43). The Jungian theory was extended by Joseph Campbell (1949), who introduced the concept of the Hero's journey. There have been many variants of the basic structure of the Hero's Journey published throughout the years (Cousineau, 1990; Leeming, 1981; Vogler, 2007). Broadly, these can

be summarized into ten main stages: (1) introduction to an unfamiliar world, (2) a call for adventure, (3) a refusal of the call (4) a meeting with a mentor, (5) crossing the threshold, (6) encounters with allies and/or enemies, (7) approaching the inmost cave, (8) facing death, (9) rebirth and transformation, and (10) atonement and return. Interestingly, the Hero's Journey is fundamentally similar to the Transcendental Cycle described by ayahuasca users (Kjellgren et al., 2009).

Kjellgren et al. (2009) used the Empirical Phenomenological Psychological Method (Karlsson, 1995) and identified six stages of the ayahuasca experience: (1) motivation and aim, (2) contractile frightening stage, (3) sudden transformation of the experience, (4) limitless expansive states with transcendental experience, (5) reflections about the experience, and (6) changed worldview and new orientation to life. This "Transcendental Cycle" seem to share fundamental similarities with the Hero's Journey, particularly, the stages of rebirth, transformation, reflection and return to the new world. The latter, appears to be driven by an intense transformative experience of the self. The concept of personal transformation is elusive, given the complexity of individuals' subjective experiences. Nevertheless, by adhering to Wolfson's (2011) definition of transformation - *a change in one's conceptual and physical structure that interrupts the prior sense of self and induces a persistent altered sense of self* - it is possible to attempt to evaluate personal transformation. This could be achieved through examination of the neurobiology of *ego-death*, assuming that ego-death is operationally defined as a complete loss of self-identity.

Carhart-Harris et al. (2014) found a decrease in brain activity, in the default mode network (DMN), in participants on psilocybin while they were describing 'ego-death' experiences. These findings can be seen as a support of Laughlin, McManus and D'aquili (1990) hypothesis that in an experience of transcendence, the right hemisphere rush of emotion induces powerful sense of validity, without the sense being analysed by the left

hemisphere. Similarly, studies of meditation have found a decrease in the DMN activity, and reduced mind-wondering during meditation (Brewer, Worhunskya, Grayb, Webered, & Kobera, 2011). Furthermore, D'aquili and Newberg (1993) provide evidence that during meditation, signals from the pre-frontal cortex represent intent to eliminate thoughts. To achieve this, signals pass to the right posterior and superior parietal lobes, then to the right hippocampus and right amygdala, the ventromedial structures of the hypothalamus, and lastly the brain stem. Finally, the signal goes back to the right amygdala, the hippocampus, and the pre-frontal cortex. The researchers observed maximum arousal, resulting from continuous meditation, which stimulates the lateral hypothalamus and the median fore-brain, causing an ecstatic, blissful state. The total input on the posterior-superior parietal lobes then appears to result in sensations of "pure space", experienced as unity and 'death' of the self. Therefore, it appears that spontaneous and substance induced transformative mystical experiences, share overlapping neural processes. However, whether psychedelics induced mystical experiences are genuine is ambiguous.

One way of investigating the problem of authenticity of substance induced mystical experiences would be to ask individuals who have experienced both. Walsh (1982) found that participants, who experienced both types, were unable to distinguish between the experiences and reported them as to be identical. However, Smith (1964) argues that substance induced mystical experience cannot be genuine due to the following reasons: (1) there is no such thing as substance induced experience per se, as the experience is as a result of the right mix of substance, set and setting, (2) mystical experiences are a gift from god and cannot be under human control, (3) drug induced mystical experiences occur too easy and quickly, and thus cannot be compared to experiences following years of preparation, (4) after effects from drug induced experiences are less beneficial and last less longer.

There is evidence in support of Smith's (1964) first observation that substance induced experiences are anything but mystical given the right mix of substance, set and setting (Zinberg, 1984). However, it must be noted that *se'* refers to individuals' psychological state and *setting* to the environment, in which the substance is taken (Baker, 2005). Thus, the substance may be more likely to lead to mystical experiences in individuals who are prepared for it and are in the right environment. For example, Mexican Indians believed that, the LSD like *ololiuqui*, taken by unprepared individual can cause insanity or even death (Hofmann, 1997). Furthermore, it can be argued that even spontaneous mystical experiences are not truly 'spontaneous' as they often require years of preparation as pointed out by Smith, himself. In fact, as identified Kjellgren et al. (2009), even substance induced experiences usually involve an extensive stage of preparation and motivation.

The second argument, that mystical experiences are given by god and cannot be under human control, will be appealing only to individuals who hold certain theological views (Walsh, 2003). Furthermore, while Christianity is about godly power, external to individuals, in Eleusis, for instance, mystical experiences were sought for personal transformation. Therefore, there is a capacity for mystical experience within each individual (Hofmann, 1997).

The third argument provided by Smith (1964) is that substance induced experiences occur too easily and quickly, and thus cannot be compared to experiences following years of preparation. However, as mentioned above, substance induce experience do require a level of preparation. Moreover, 'ego-death' experiences that elicit personal transformation, share similar neural basis regardless of being substance induced or spontaneous (Brewer et al., 2011; Carhart-Harris et al., 2014), and thus, it appears that there is no difference between spontaneous and induced experiences, at least on neurobiological level. Therefore one may be tempted to apply the *principle of causal indifference*: if two experiences are entirely same in

a phenomenological way, they are considered to be from the same type, and thus cannot be described as genuine or not, just because they have different causes (Walsh, 2003).

However, whether substance induced and spontaneous mystical experiences are entirely the same phenomenologically is debatable. Further research could perhaps look into investigating the phenomenology of both types of experiences by adopting an empirical paradigm such as the Empirical Phenomenological Psychological Method (Karlsson, 1995).

Lastly, Smith (1964) argues that drug induced mystical experiences are less beneficial and short-term. However, such conclusion is rather audacious considering current empirical evidence. For example, in a double blind study, 79% of 30 healthy, educated, religiously or spiritually active individuals reported those psilocybin sessions were one of the five most important events in their lives. Moreover, 30% report it as the single most important event (Hayes, 2007). In addition, Griffiths, Richards, McCann, and Jesse (2006) found that after a single session with psilocybin, where mystical experiences were reported, positive correlation with positive changes in behaviour were observed more than a year later, as reported by subjective reports and participant's acquaintances. A significant increase in openness after a single high dose session with psilocybin was also observed. Participants who reported complete mystical experiences, scored higher on openness than the base line, for a year after the session (McLean, Johnson & Griffiths, 2011). It must be noted however, that is not always the case. Mogar and Savage (1964) tested 60 patients receiving psychedelic therapy and followed them up, two and six months later. Significant positive changes were observed after two months; a single experience was followed by significant decrease in pathology associated with emotional conflicts, neurotic symptoms and damaged self-esteem. However, at the six months point positive changes in some patients decreased while increased in others. Researchers concluded that this result was dependent on the magnitude and the stability of personality changes as well as severity of illness and defence patterns.



While there is sufficient evidence in support of the positive changes occurring following substance induced mystical experiences (Dublin, 1991; Kjellgren et al., 2009; Lernes & Lyvers, 2006) it worth mentioning that mystics having spontaneous experiences will probably lead more spiritual lives altogether. Even though it may be the case that psychedelic substances are used as tools to reach insight and motivated by personal growth (Kjellgren et al., 2009) that does not necessarily mean that individuals who pursue them lead a spiritual life. Thus, beliefs as well as lifestyle following the experience will determine how enduring the change is (Walsh, 2003) and a comparison between mystics and substance users may not always be reliable or conclusive, and should be interpreted with caution.

To conclude, psychedelics have been used and still are, as a tool of gaining access to deeper knowledge and for encountering and communicating with spirits. The answer to the question, if psychedelics induced mystical experiences are genuine, is yes - sometimes, in some people, in some circumstances (Walsh, 2003). Subjective experiences, being spontaneous or substance induced, are too vast and sophisticated to be merely labelled as genuine or unauthentic. The neural basis of these experiences, visions, and spirits that individuals encounter are not fully understood, and further research is needed to elaborate on these issues. Despite the ongoing debates of the authenticity of substance induced experiences, plethora of evidence suggests positive long term effects of the use of psychedelic substances for recovering from trauma, discovering the self, spiritual transformation, and positive personality change.

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