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Psychedelic-Induced Mystical Experiences: effects on Purpose in Life, Ontological Addiction and Mental Health

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Abstract

Psychedelics have been part of human history for millennia. After a first wave of research into their potential for clinical purposes in the treatment of psychiatric disorders, we are now witnessing a new wave and renaissance of psychedelic research, with new studies suggesting their revolutionary potential in the treatment of a condition of disorders. Psychedelic substances are many and diverse, and their effects may vary widely, ranging from fear and panic to bliss. They can produce mystical-type experiences, which can have life-changing consequences for the individual. As such, we are led to wonder in what way the consumption of psychedelics, and the occurrence of these experiences, may promote changes in feelings of purpose in life and ontological addiction, concepts deeply intertwined with depression and anxiety. In this cross-sectional, correlational and quantitative study we gathered a sample of 221 individuals who responded to the Mystical Experience Questionnaire (MEQ-30), Purpose in Life Short-Form (PIL-SF), Ontological Addiction Scale (OAS-31), General Anxiety Disorder (GAD-7) and Patient Health Questionnaire (PHQ-9). Results showed significant correlations between the occurrence of more intense mystical experiences and higher purpose in life. Purpose in life was correlated with ontological addiction and lower scores of anxiety and depression. To our knowledge, the relationship between these variables is a novel finding in the literature of the field. Lower scores of anxiety were also found among psychedelics users.

Keywords: psychedelics, mystical experiences, purpose in life, ontological addiction, depression, anxiety.

Resumo

Os psicadélicos fazem parte da história da humanidade há milénios. Após uma primeira vaga de investigação sobre o seu potencial para fins clínicos no tratamento de perturbações psiquiátricas, assistimos agora a uma nova vaga e ao renascimento da investigação sobre substâncias psicadélicas, com novos estudos que sugerem o seu potencial revolucionário no tratamento de uma série de perturbações. As substâncias psicadélicas são muitas e diversas, e os seus efeitos podem variar muito, desde o medo e o pânico até ao êxtase. Podem produzir experiências de tipo místico, que podem ter consequências que mudam a vida do indivíduo. Como tal, somos levados a pensar de que forma o consumo de substâncias psicadélicas e a ocorrência destas experiências podem promover alterações nos sentimentos de propósito na vida e de dependência ontológica, conceitos profundamente interligados com a depressão e a ansiedade. Neste estudo transversal, correlacional e quantitativo, reunimos uma amostra de 221 indivíduos que responderam ao Mystical Experience Questionnaire (MEQ-30), Purpose in Life Short-Form (PIL-SF), Ontological Addiction Scale (OAS-31), General Anxiety Disorder (GAD-7) e Patient Health Questionnaire (PHQ-9). Os resultados mostraram correlações significativas entre a ocorrência de experiências místicas mais intensas e um maior objetivo de vida. O propósito na vida foi correlacionado com a dependência ontológica e com menores pontuações de ansiedade e depressão. Para o nosso conhecimento, a relação entre estas variáveis é um achado inédito na literatura da área. Utilizadores de psicadélicos apresentaram ainda valores mais baixos de ansiedade.

Palavras-chave: psicadélicos, experiências místicas, objetivo de vida, adição ontológica, depressão, ansiedade.

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1. Introduction

1.1. Historical View of Psychedelics

We are currently witnessing a revolution in the way mental health disorders are treated. In 2023, hundreds of studies were being made using psychedelics for the treatment of psychiatric disorders (Figueiredo et al., 2023). After decades of little advancements in the psychopharmacology of the field, psychedelic substances are a promising new hope that only recently resurfaced after a global prohibition started by the US, which spread worldwide, in the 1970s (Nutt, 2023; Teixeira, 2025). Often referred to as 'hallucinogens', the term has fallen out of favor since they do not always generate hallucinations: they produce a far larger variety of effects, not only sensorial, but also cognitive, and self-experiential, rendering the term somewhat too simplistic and incorrect (Nichols, 2016). Grinspoon and Bakalar (1979) describe psychedelics in the following manner:

> A drug which, without causing physical addiction, craving, major physiological disturbances, delirium, disorientation, or amnesia, more or less reliably produces thought, mood, and perceptual changes otherwise rarely experienced except in dreams, contemplative and religious exaltation, flashes of vivid involuntary memory, and acute psychosis (p. 09).

Modern scientific study of psychedelics began in 1943, when Albert Hoffman discovered, synthesized, and experimented firsthand with LSD and its psychoactive effects, in what became a historic moment in modern psychedelic history (Carhart-Harris & Goodwin, 2017; Figueiredo et al., 2023; Hoffman, 1980; Maia et al., 2024; Nutt, 2023).
Following his discovery, LSD began to be used for clinical purposes throughout the early 1950s, with a considerable number of patients – ranging the dozens of thousands – being treated by psychologists and psychiatrists with recourse to "psychedelic therapy" (Carhart-Harris & Goodwin, 2017). Several models of investigation with these substances were established. One of them was the Psychotomimetic Model, which held that, by inducing hallucination-like states, psychedelics gave clinicians direct insight into psychotic experiences, and that patient

self-administration could therefore enhance treatment efficacy. However, this model was ultimately discarded—unlike true psychosis, subjects retained insight into their experiences. Another model was the Psycholytic Model, which argued in favor of using low dosages as facilitators of psychotherapy. The Psychedelic Model in turn argued that mystical experiences caused by psychedelics were of therapeutic value, as they produced profound changes in the individual (Figueiredo et al., 2023).

However, these substances are still associated with a significant stigma followed by numerous misconceptions, when a politicized effort by then US President Richard Nixon's government, accusing them of causing addiction, psychosis, and traumatic flashbacks throughout the 1960s, led an international ban on these substances in 1970, on par with other drugs such as cocaine, under the Controlled Substances Act in the US which labeled them under the classification of 'Schedule I'. This ban quickly spread across the globe and is now attributed not to any real danger from these substances but instead to the way they were affecting North Americans' perspectives on the Vietnam War and political climate, as the psychedelic movement was deeply intertwined with anti-war protests and the *hippie* movement (Carhart-Harris & Nutt, 2010, 2013; Nutt, 2023; Stevens, 1987). This ban led to the impossibility of therapeutic usage of these substances - which was occurring at the time - and posed significant challenges to any potential investigation and research on them, as researchers and investigators were faced with extraordinarily high costs to obtain the smallest quantities of these substances, as well as endless bureaucracy (Bracco, 2019; Nutt, 2023).

It was not always like this, however. Out of 488 societies throughout history, 90% of them were found to have incorporated altered states of consciousness into their traditions and belief systems, although not always by the use of hallucinogenic or psychedelic substances (Bourguignon 1973; Guerra-Doce, 2015). Indeed, these substances have been consumed for thousands of years throughout the world, for somewhat similar motivations, often of a mystical and spiritual nature, as well as for sacramental and healing purposes (Schultes et al., 1969, 2001).

The oracles in ancient Greece, African shamans, native Americans, to name only a few, are documented to have used these substances in their rites and rituals, seeking to obtain secret knowledge, visions of the future, or a greater understanding of the reality (Figueiredo et al., 2023; George et al, 2022). The drink 'kykeon', which was used by the ancient Greeks for ceremonial rites in the Eleusis, was considered to be a highly strict but meaningful and

transcendental experience, in which the most distinct of Hellenic personalities partook (Figueiredo et al., 2023; Webster, 2000).

Even before, in prehistoric times, the consumption of psychedelics seems to have been part of human existence, with paintings and sculptures depicting humanoid figures exhibiting mushroom-like features (Froese et al., 2016).

By the end of the 16th century, Spanish colonizers described what they had encountered in the American continent: natives of the New World used peyote, magic mushrooms, coca, tobacco, and other psychoactive plants and substances, and Aztecs used them in rituals of human sacrifice (Ott, 1993, 1996; Wasson, 1961). The NAC (Native American Church), with currently well over half a million members, is a "living" example of such practices, as it maintains the tradition of using the psychedelic substance *peyote* to this day, under the American Indian Religious Freedom Act (AIRF) (Prue, 2014).

Consumption of psychedelic substances for a wide variety of purposes has been shown to have occurred throughout history and all over the world, ranging from Siberia to South America and India (Figueiredo et al., 2023).

According to surveys performed in 1971, an astounding 12.6% of American ***college*** students reported having consumed psychedelics, and 1.5% reported doing so regularly (weekly or every two weeks) (Rossi et al, 1972; Glenn & Richards, 1974). Among high-school students, the number of those who reported the use of LSD or mescaline was 11.7% (Johnston, 1973). More recently, a global drug survey starring over 22 thousand individuals from an international poll found that almost 40% of them had previously consumed LSD at some point, and almost 45% had consumed psilocybin/mushrooms (Linstock et al, 2017). However, according to the European Monitoring Centre for Drugs and Drug Addiction (2016), in Europe, the lifetime prevalence of LSD use was at a relatively modest 4.4%. In contrast, the past 12-month use was at an even significantly lower number of 0.2%.

Walsh *et al.* (2016) and Hendricks *et al* (2018) relate a reduced likelihood of criminality where classic psychedelics are concerned. One of the most ethically fraught episodes involved clandestine government research, as the Army and CIA branches conducted deeply unethical and disturbing research studies, by drugging civilians and military personnel without their knowledge or consent, resulting in great distress, psychotic delusions, and even suicides, to test the drug as a potential incapacitating agent (Lee & Shlain, 1992; Nutt, 2023).

According to Barrettt (2022) and Carhart-Harris and colleagues (2019), psychedelic-assisted therapy may be of particular use for patients with a higher mental rigidity - neurotic patients; however, it is not recommended for patients who suffer from psychotic disorders or have a fragile sense of self, as it may destabilize them further. Nour and colleagues (2016) compare the feeling of ego dissolution in psychedelic experiences to that of the psychotic individual, who suffers from a disrupted sense of self, though more research is necessary.

After a long hiatus, research into psychedelics started once again in the 1990s, marking the second wave of human psychedelic research (Hermle et al., 1992; Strassman & Qualls, 1994; Vollenweider et al., 1997). A large body of research and studies is now emerging, providing empirical support and evidence for the therapeutic potential of these substances (Carhart-Harris, 2017; Nutt, 2023; Kort, 2024; Teixeira, 2025; Kugel et al., 2025). We are therefore experiencing a "*renaissance*" of psychedelic therapy, with evidence showing its potential to accelerate and assist, and even deepen the therapeutic process (Lichtenstein & Hoeh, 2024).

Recently, these substances have begun to be used for the treatment of psychiatric disorders such depression, anxiety, chemical and behavioral addiction (such as gambling or substance/alcohol abuse) as well as obsessive disorders (Bogenschutz et al., 2015; Carhart-Harris & Goodwin, 2017; De Gregorio et al., 2021; Ko et al., 2023; Moreno et al., 2006; Nutt, 2023). Patients who had not previously responded to conventional forms of treatment for anxiety were observed to experience a significant reduction in symptoms when subjected to LSD (Gasser *et al.,* 2014; Holze *et al.*, 2023). Similarly, Krebs and Johansen (2012) analyzed the results of 6 studies that used LSD for the treatment of alcohol dependency and found significant results suggesting the efficacy of these treatments, showing an increase of 100% in positive outcomes at just the first follow-up.

Griffiths et al (2016) relate the effects of psilocybin in significantly reducing depression and anxiety in a variety of outcome measures, which lasted up to the follow-up session 6 months later, in a sizable experimental sample of 51 participants suffering from terminal cancer, in which a higher dosage of psilocybin resulted in greater therapeutic effects. Ross *et al.* (2016) report similar results in a smaller sample, with statistical analysis indicating that the mystical experience undergone is a significant mediator of the positive outcomes. Holze and colleagues (2023) also point towards a relation between a reduction in anxiety symptoms and the occurrence of mystical experiences.

Treatments for depression have also been developed "off-label" (relating to the prescription of a drug for a condition other than that for which it has been officially approved) using ketamine, without the psychotherapeutic component, consisting of an intravenous injection of ketamine (0.5 mg/kg) into the bloodstream 6 times over the course of 12 days (Rot et al, 2010). Results showed a significant reduction of depressive symptoms, of on average 85%, after the sixth infusion (using the Montgomery-Åsberg Depression Rating Scale- MADRS). However, it must be noted that some individuals seem to receive no benefits from this type of treatment, while others may experience adverse effects such as nausea and vomiting. Thus, combination with psychotherapy may prove key for the treatment of resistant depressive disorders (Miller et al., 2024; Drozdz et al., 2022; Wilkinson et al., 2021). Furthermore, Carhart-Harris (2017) notes that while most studies suggest a potential efficacy of these substances in treating such disorders, sample size and study design prevent conclusive demonstration of such effects.

Unlike other drugs, psychedelics have a low toxicity and have not been shown to cause organ damage or any neuropsychological deficits, although they are not without adverse effects (Dos Santos & Hallak, 2020; Gable, 1993, 2004; Halpern & Pope, 1999; McCabe, 1977; Nutt, 2023; Strassman, 1984). Besides, they are known to typically not cause addiction or dependence (at least on a chemical level), and users do not experience withdrawal symptoms as they do in other substances and drugs (National Institute on Drug Abuse, 2001, 2006; O'Brien, 2006). Indeed, Bates and Trujilo (2021) report that, unlike other drugs that produce positive reinforcement in animals, psychedelics seem to produce a mix of positive and negative reinforcement.

'Bad trips' can generally be attributed to the misuse of these substances, inappropriate environments, and the existence of previous or dormant psychiatric conditions (Strassman, 1984). In a study by Nutt and colleagues (2010), which ranked several illicit drugs and substances based on how harmful they are, by criteria such as mortality, economic damage, crime, injuries, dependence, among other categories, 'mushrooms' (psilocybin) was ranked the safest, with MDMA and LSD scoring only slightly higher in harm. In contrast, alcohol ranked the highest, scoring a total of 72 points, compared to psilocybin's 6 points. For comparison, benzodiazepines ranked significantly higher than psilocybin, LSD and MDMA. Despite belonging to different categories, the effects of Ketamine, LSD and Psilocybin in the brain are

virtually indistinguishable from one another when scanned through brain imaging: they fragment the synchronization of the brain, rendering it disorganized (Muthukumaraswamy et al., 2015).

Calvin Ly and colleagues (2018) have demonstrated that classic psychedelics and ketamine are capable of significantly increasing neuritogenesis and/or spinogenesis in the brain, promoting both the growth of neurites and dendritic spines, supporting the hypothesis that the antidepressant effects of these substances may be connected to their capacity to increase structural and functional neuroplasticity in the prefrontal cortex, through the 5HT2A receptors, attributing their fast-acting antidepressant qualities to this effect.

Carhart-Harris (2018) attributes the therapeutic effects of these substances to their capacity to reorganize the brain in a novel way. According to Carhart-Harris & Goodwin (2017), whereas typical SSRIs reduce depression by reducing limbic responsivity, which results in "emotional blunting", psychedelics create higher cortical entropy, which in turn reduces rigid thinking and promotes environmental sensitivity and emotional release.

This is consistent with the idea that the dysregulation of neural plasticity in the brain is implicated in the biological mechanisms of depression, occurring the weakening of neural synapses, atrophy of neurons, and loss of neural connectivity in key regions such as the prefrontal cortex (PFC) and Hippocampus (HPC) (Price and Duman, 2020). The administration of psilocybin reduces frontoparietal and anterior cingulate cortex connectivity (Carhart-Harris et al., 2012; Preller *et al.,* 2016), which in turn are connected to rumination processes in depression, feelings of fear and anxiety, and emotional distress (Berman et al., 2011; Preller *et al.,* 2016).

Aleksandrova and Phillips (2021) studied the effect of ketamine and psychedelics in the treatment of neuropsychiatric disorders and concluded that changes generated by these substances in increasing neuroplasticity may be adaptive or not, depending on the specific region of the brain affected.

However, there are some clinical risks associated with this type of treatment. Physiological effects, such as an increased blood pressure and heart rate, which may lead to a series of heart complications (Hasler et al., 2004), but also dizziness, nausea, drowsiness, (infrequent) vomiting, and other such similar effects (Carbonaro et al., 2018; Nichols, 2004), but also feelings of anxiety, paranoia, dysphoria, and confusion, along with panic or fear, which may occur in what is commonly referred to as a '*bad trip'*, and in graver scenarios, a prolonged psychotic episode with delusions may occur, which may go on for months - particularly when

there is family history of such disorders (Carbonaro et al., 2016; Grinspoon & Bakalar, 1979; McCabe, 1977; Nutt, 2023; Strassman, 1984). Such reactions are, however, considered rare, and therefore these substances are generally considered safe (Bogenschutz & Ross, 2018; Dos Santos et al., 2016a).

There is also the possibility of what Sanders & Zijlmans (2021) call an "ontological shock," in which the individual, through the psychedelic experience, comes to confront their ontological reality —that is, their perception of reality and their personal beliefs. Similarly, Figueiredo and colleagues (2023) refer the phenomenon of *spiritual bypassing,* which may occur after a particularly intense mystical experience, and in which one may appropriate spiritual practices or ideas in order not to resolve their problems.

Therefore, the populations at risk of incurring the graver of these effects should be excluded from any trials and treatment procedures. Johnson, Richards and Griffiths (2008) propose several guidelines to ensure maximum safety in psychedelic research. According to the authors, the selection of volunteers for PAT research must include an extensive assessment of both physical and mental health conditions. Participants must be in generally good health; pregnant women (and those not practicing 'effective means of birth control') must be excluded from participating in these studies; subjects with high blood pressure (140 systolic and 90 diastolic, mmHG, when resting) must also be excluded for the reasons already exposed above (Johnson et al., 2008). Certain medications and supplements, such as SSRIs, may also be excluded if not relevant for the study, as these may influence the effect of psychedelics in the body. Participants must also undergo a psychiatric screening to ensure that there is no past history of schizophrenia or other psychotic disorders, as there is a risk of exacerbating previously existing psychiatric disorders and mental health conditions in individuals with such predispositions (Barrett et al., 2016; Johnson et al, 2008). Johnson and colleagues (2008) go on to emphasize the importance of having present two monitors or professionals at any time, both knowledgeable in the theory behind the process (medical and psychological markers of adverse reactions) and skilled in the relational and empathic realm.

Furthermore, the physical environment should be pleasing and inviting, as opposed to the typically overly clinical and antiseptic spaces seen in hospitals and similar settings. Indeed, Strassman (2001), for example, attributes his participants' unpleasant experiences under DMT to these factors. The authors also stress the importance of preparing the participants for the

incoming experience, of paying attention to any signs of distress or adverse reaction, and of fast response should they occur, and the need for a follow-up in the following days to ensure the well-being of the subject (Johnson et al., 2008).

1.2. Different Types of Psychedelic Substances

Psychedelics can be divided into several groups. Bates and Trujilo (2021) discern between the "dissociatives", such as ketamine, classic psychedelics, like psilocybin and LSD, and entactogens, like MDMA. Dissociatives can cause pleasure and excitement at lower doses, and anesthesia at higher ones (Bates & Trujilo, 2021).

The classic psychedelics are also often referred to as the "serotonergic psychedelics" due to how they interact with serotonin receptors, mimicking serotonin and attaching to its receptors in the brain and outside of it - they all share the fact that they are partial agonists of the 5HT2A receptors (Nichols, 2016; 2018). If one were to block these neuroreceptors, one would quickly find that many of the psychedelic effects do not occur, either in humans or animals (such as mice) (Halberstadt et al, 2011; Vollenweider et al., 1998).

Serotonin is a neurotransmitter, commonly called the "hormone of happiness". It is responsible for regulating mood and humor, as well as other fundamental brain functions. For this reason, it is the main target of SSRIs (selective serotonin reuptake inhibitors) in the psychiatric treatment of disorders such as depression and anxiety (Maia et al., 2024; Nutt, 2023). Among the **classics**, these are the most predominant:

Table 1

Description and main characteristics of classic psychedelics

LSD (D-Lysergic Acid Diethylamide)	The artificial compound synthesized from a fungus by Albert Hoffman in 1938, which he first tested on himself by accident and later on purpose. Following his discovery, LSD was patented and spread through psychiatrists and researchers around the world, racking up over a thousand scientific papers and forty thousand willing participants, before it was eventually banned. Today, it is consumed orally via tiny paper blotters

	soaked in it and then dried for consumption. Its effects are felt approximately 30 minutes after ingestion and last for 12 hours (Nichols, 2016; Nutt, 2023).
Psilocybin (magic mushrooms)	It is also consumed orally, by consuming the mushrooms either fresh, dried, or ground into tea. Like LSD, it takes about 30 minutes to start having an effect when consumed orally. It is currently the most well-positioned in becoming a viable treatment for several pathologies, such as dementia (Alzheimer's), eating disorders, dependencies and addictions, OCD, and depression and anxiety disorders (Nutt, 2023; Roseman et al., 2012).
Ayahuasca (and DMT)	It has its origins in the native tribes of the Amazon, being an integral part of the local culture and history. It can be smoked or injected intravenously, acts within seconds, and lasts around 15 minutes (Drug Science, n.d.). Ayahuasca is used in rituals with cleansing and "purifying" purposes (being referred to as '*la purga*' or 'the purge') and is often accompanied by vomiting and diarrhea. It is helpful in the treatment of disorders such as trauma and addiction (Osorio Fde et al, 2015; Nutt, 2023).
Mescaline	Having its origin in the Mexican peyote and San Pedro cacti, found in South America, it was used thousands of years ago for medical treatments and religious ceremonies (Ionanna *et al*., 2023; Jay, 2021). It is taken orally, as a powder, contained in a capsule, or as a liquid. Its effects occur within 1 to 2 hours and last for up to 12 hours. Famous authors and philosophers such as Jean Paul Sartre and Aldous Huxley are known to have consumed mescaline (Boon, 2002; Huxley, 1954; Nutt, 2023).
5-MEO ("Toad")	It is extracted from the glands of the toad *Incilius alvarius*, though it can also be extracted from plants. It has a history of being used by *shamans* for cultural and spiritual purposes. The shaman will inhale the crystals formed by the dried, poisonous secretions, and within a minute, it will lead to a trip that lasts on average 20 minutes. As a toxin, it is four to six times more potent than DMT, powerful enough to kill a fully grown large dog (Nutt, 2023). Recent studies conducted by the Johns Hopkins University School of Medicine have shown potential for the use of 5-MEO in treating anxiety

	and depression, as well as increasing overall life satisfaction (Davis, 2019; Nutt, 2023; Uthaug, 2019).

The most relevant **non-classic** psychedelics are considered, by David Nutt (2023), to be the following:

Table 3

Description and main characteristics of non-classic psychedelics

Ketamine	Which is also considered a dissociative (Bates & Trujilo, 2021) is traditionally used as an anaesthetic. It can be consumed as a white, transparent powder nasally, or administered intramuscularly or intravenously. It is beginning to be widely used for the treatment of depressive disorders, often off-label (Aleksandrova & Phillips, 2021; Nutt, 2023). It may cause great feelings of relaxation and numbness, which may lead to addictive behavior, but also nausea and distorted perception (Bates & Trujilo, 2021; Nutt, 2023). Along with its affordable cost, these effects have led to the abusive use of ketamine for recreational purposes. Ketamine dampens the glutamate system, which is responsible for the excitatory response of the brain, resulting in feelings of dissociation, detachment from the body, oneiroid states, and the production of hallucinations similar to vivid dreams and memories (Kolp, 2014; Lichtenstein & Hoeh, 2014). The user may also go through a "rebirth" or establish contact with varied figures and entities, such as deceased relatives, extraterrestrial and archetypal beings, which is also a common effect among psychedelic substances (Kolp et al. 2014). Lichtenstein and Hoeh (2024) relate a case in which the patient, under the effects of ketamine, fantasized about "*being dead (...) which paradoxically sparked her desire to live*". The effects last for about an hour.
MDMA	Also commonly referred to as *ecstasy*, it is a popular drug for recreational purposes in raves and parties. It can be taken as a pill or in powder form. It lasts for six to eight hours and causes a profound sense of well-being and friendliness (Nutt, 2023; Teixeira, 2025). For this reason, it is also considered

	an “empathogen”, promoting social connectedness and liking for others. It also reduces the feeling of anxiety and fear, which explains why it is currently being used for the treatment of Post-Traumatic Stress Disorder (PTSD) in some countries, helping the individual re-live the traumatic experience in a much more relaxed way. Despite its current fame as a psychedelic and party drug, it was once used for the treatment of asthma (Nutt, 2023; Roseman et al., 2012).
Scopolamine	It is extracted from "Brugmansia, a flower sometimes called “Devil's Breath” and “Angel's Trumpet,” and native to South America, is widely cultivated in temperate or tropical climates. When consumed in high quantities, it can be lethal. Its effects can last up to 6 hours and may cause confusion, dizziness, drowsiness, or agitation, and may lead to visual and auditory hallucinations, bizarre fake memories, and experiences. In some cases, severe self-harm has been reported, resulting in amputation or even death. Due to the unpleasant effects, this substance has not received much attention, and studies have shown inconsistent results for its potential therapeutic use (American College of Emergency Physicians, 2020; Nutt, 2023).
Ibogaine	It is a sacred plant in West Central Africa used for spiritual purposes. It can be consumed by either chewing the root bark shavings of the plant or as a brown powder. It lasts for 2 to 3 days but is most intense within the first 8 to 12 hours and may cause out-of-body experiences, dream-like states, and hallucinations, as well as ego death, along with nausea, vomiting, anxiety, and even psychosis. It can also be dangerous, as it increases blood pressure and causes irregular heartbeat, which may lead to cardiac arrest (Nutt, 2023).
Salvia divinorum (“diviner’s sage”)	It is an herb that is smoked or chewed, or taken as a tincture, belonging to the mint family. It lasts around 5 to 30 minutes, causing feelings of dissociation, sensorial disturbances and hallucinations, and physical impairment, feeling “close to death”. As such, it is considered unpleasant by most users (Nutt, 2023).
Amanita (*Amanita*	Is the red and white mushroom nearly everyone has seen before somewhere, from Super Mario to movies and TV shows. It is native to the northern

Muscaria)	European regions and colder climates. They can be consumed dry, with tea, or as a tincture, and the effects will last from 4 to 8 hours. It may cause feelings of drowsiness, relaxation, euphoria, and changes in visual perception, such as size and dimensions. This is attributed to the fact that the area of the brain responsible for the processing of this information is loaded with GABA receptors, which muscimol, the psychedelic ingredient in the mushroom, acts upon. It also contains ibotenic acid, which causes disagreeable side effects such as nausea, vomiting and diarrhea, which can be avoided by boiling it in water and consuming the tea. However, it does not seem to produce the same kind of insight as the classic psychedelics do in the worldview of the user (Nutt, 2023).

1.3. Subjective and Noetic Effects of Psychedelics

Psychedelics also produce a variety of 'subjective effects' on the user, which have a noetic (which is to say, pertaining to the mind) quality and are experienced as real, on a variety of domains, which may be divided, according to Bogenschutz and Ross (2018), into three categories: affect, perception (sensory changes are often experienced, such as visual - changes in size and distance of perceived objects, textures, colors, among many others - and hallucinatory ranging from a lights and objects to other-worldly beings and entities, but also auditory) and cognition. Girn and Christoff (2018) have proposed a taxonomy that separates the psychedelic experience into two: the 'bodily self-experience' and the 'mental self-experience'. The 'bodily self-experience' includes the body representation, body boundaries, awareness, ownership, and location, whereas the mental self-experience encompasses the autobiographical self and thought ownership.

Psychedelics can produce altered states of consciousness (ASC), a concept that, although it can be comprehended intuitively, has been hard to describe theoretically. These states can be self-induced, by consuming psychedelics, but also through meditation and hypnosis, or they may occur in everyday life, through hypnagogic states, for example, and, unlike psychiatric disorders, are short-lasting (Studerus et al., 2010).

Some of the core dimensions of ASCs are '*oceanic boundlessness'*, which refers to an "oceanic feeling of infinitude", a concept first described by Freud in his correspondence with

Romain Roland; "*dread of Ego-dissolution"*- a state of disintegration of a coherent ego, which results in feelings of loss of control over oneself and feelings of strangeness -, and "*visionary restructuralization"*, in reference to sensory and perceptive changes (Figueiredo et al., 2023).

However, a later revision by Studerus and colleagues (2010) proposed 11 new factors to measure and evaluate ASCs, such as experience of unity, spiritual experience, blissful state, disembodiment and changed meaning.

It is also common to experience what is often referred to as mystical experiences or (mystical-type experiences) (Sanders & Zijlmans, 2021), as well as feelings of dysphoria, fear, and panic, and psychotic episodes (Bogenschutz, 2018; Dos Santos, 2021).

Studies suggest that the psychedelic experience is influenced more by the **quantity** consumed than by the substance itself: In other words, the larger the dose, the more intense the trip, and the greater the experience, as measured by the number of effects reported and their duration (Holze et al., 2021; Nour et al., 2016; Nutt, 2023).

How the substance reaches the brain is also of primary concern: due to the brain's natural response of adapting to the substance in order to mitigate its effects, the less time it is given to adapt, the more powerful they are; thus, if it is injected, the brain does not have enough (or has less) time to react and compensate, becoming more susceptible to its effects, in comparison with oral consumption (Nutt, 2023). On the other hand, as previously referred, the duration of the effects may vary significantly from one substance to another, ranging from 10 to 20 minutes with DMT to 12 hours with LSD, related to how fast the metabolism can break down these substances (Wacker et al., 2017).

Several other factors influence the psychedelic experience and its subjective phenomena: the *setting* and characteristics of the individual, such as personality and latent unconscious material mobilized, their expectations, and previous experiences can have a significant impact (Bogenschutz & Ross, 2018; Figueiredo et al., 2023; Johnson et al., 2008).

The effects of psychedelics may be compiled in the following way (Bogenschutz & Ross, 2018; Nutt, 2023; Timmerman et al., 2021):

1. Humor and emotions, potentially leading to states of bliss, awe, wonder, love and connectedness, but also fear, terror and anxiety (Bogenschutz & Ross, 2018; Nutt, 2023; Timmerman et al., 2021).

2. Bodily experiences, where the subject may feel outside of their body, as if they were a spectator of themselves, but also dissolution of the body, for example, or other changes (Bogenschutz & Ross, 2018; Nutt, 2023; Timmerman et al., 2021).
3. Distortions in the experience of the self, such as ego dissolution, in which the subject may lose perception of *self* and *others*, become "one" with "everything", and change their perception and knowledge of themselves (Nour et al., 2016; Nutt, 2023; Timmerman et al., 2021).
4. Reliving and re-experiencing past memories and traumas, which may lead to a new comprehension and a deeper understanding of these, such as acceptance (Nutt, 2023; Timmerman et al., 2021).
5. Cognitive changes, resulting from increased neuroplasticity, may lead to enhanced productivity in problem-solving and creativity (Aleksandrova & Phillips, 2021; Bogenschutz & Ross, 2018; Nutt, 2023; Timmerman et al., 2021).
6. Mystical or metaphysical experiences - and changes in metaphysical beliefs, such as a shift towards pantheism or panpsychism - which are not necessarily religious. Interacting with God, or other beings such as angels, feeling like one with the universe or nature, may be considered to be among these experiences, which may have a profound effect on the individual and his perception of his *self* and purpose in life, leading to a greater sense of unity with the divine (Bogenschutz & Ross, 2018; Hoffman & Schultes, 1992; Timmerman et al., 2021; Nutt, 2023)

Sanders and Zijlmans (2021) have appealed for the mystical aspect of these experiences to be discarded and for them to be 'demystified', as the challenge of incorporating the supernatural and esoteric falls outside the empirical sciences and is far too great a challenge to be pursued within this framework. However, several authors have come to disagree with this appeal. Breeksema et al. (2021), Jylkka (2021), and Garb and Earleywine (2022) argue that these experiences, too, are valid objects of inquiry and scientific study, and that a distinction can be made between the phenomena and their apparent mystical nature as it is experienced, and their empirical study. Indeed, as was mentioned above, several authors point towards the relevance of mystical experiences in treatment (Ross, 2016; Yaden & Griffiths, 2021; Holze et al., 2023).

1.4. Metaphysical and Mystical-Type Experiences with Psychedelics

Sjöstedt-Hughes (2023) too has stressed the need for metaphysics to be incorporated into psychedelic therapy and research. The author (Sjöstedt-Hughes, 2023) distinguishes metaphysics from mysticism - while the first is based on argumentation, the former is based on pure revelation - and has strongly advocated for the need of metaphysics in psychedelic assisted therapy, proposing a 'Metaphysics Matrix' to aid professionals and patients alike in better comprehending the experiences and their implications, and allowing for a more grounded theoretical approach and understanding of the subjective experience phenomena.

Metaphysics, therefore, refers to the study of concepts and questions related to abstract terms such as existence, self, and other ontological questions, which are not necessarily religious in nature (Chalmers et al., 2009).

Barrett and Griffith (2017) describe the mystical experience as a state of consciousness, extraordinary in its nature, wherein the individual finds himself to be one with God, the Universe, or whatever way in which he may choose to refer to "the ultimate and eternal reality". Mosurinjohn et al. (2023, *p. 02),* in a more comprehensive definition, describe mysticism as *"the practice of techniques that elicit experiences which are construed as enabling access to metaphysical insight based in self-transcendence and/or extrasensory perception."*

Mystical experiences generally refer to those in which the person experiences a great sense of unity with all things and beings - be it internal/introvertive or external/extrovertive -, a sense of reverence and awe towards something greater than themselves, holy and sacred even, and a belief in the truth value of the experience as something more 'real' than daily life (Stace, 1960). Stace (1960) also refers to a sense of joy, ecstasy, and similar emotions, as well as a transcendence of time and space, as if these dimensions we take for granted were to be stripped away of their meaning. A minute may feel like an eternity, and the individual may believe himself to be traveling through the most incredible distances of the cosmos while staying perfectly immobile.

The American philosopher and psychologist William James described, in the early 1900s, what he considered to be the four main characteristics or qualities of any mystical experience: ineffability, transience, passivity, and a "noetic quality". William James referred to plenty of examples in which sudden transformations had occurred under the influence of religious or spiritual forces (Miller, 2004). Such is the example of William Wilson, the co-founder of

Alcoholics Anonymous, who was caught in a truly transforming moment in which he felt the 'Presence' of God, feeling freedom and ecstasy (Kurtz, 1979).

Perhaps one of the most influential figures in the current understanding of the mystical aspect of psychedelic experiences is the writer Aldous Huxley (1954), who published his personal experiences with psychedelics in his book "*The Doors of Perception*". The publication of this book and its subsequent popularity, Mosurinjohn and colleagues (2023) argue, may be partially responsible for influencing the nature of psychonauts' experiences over the past few decades, increasing the likelihood of a mystical experience occurring with similar elements to Huxley's.

Yaden and Griffiths (2025) suggest that the only way to discard the effect of subjective and mystical experiences in a psychedelic trip would be through a subject in deep anesthesia/under heavy sedation, as their condition would impede the subjective feelings that undergo the psychedelic experience - which are considered by many as unintentional and undesirable side effects, a mere epiphenomena of the fundamental neurobiological mechanisms at work, with no real clinical relevance.

They argue thus that much of the positive results associated with higher intensity and dosage in the literature and research can be attributed to the subjective factors. Indeed, Timmerman et al (2021) and Nayak and colleagues (2022) report on significant changes, associated with the intensity of the mystical experience and other qualitative features of it, in metaphysical beliefs following consumption of psychedelic substances, concerning the nature of reality, fate, consciousness, meaning and purpose, as subjects shift from "hard physicalist" stances into panpsychism, and begin to believe in the possibility of reincarnation, telepathy, and in the consciousness of inanimate objects.

Pahnke (1963), using the 'Mystical Consciousness Typology', found that 40% of his experimental subjects who consumed psychedelics reached a completion level on this scale of 60-70%, suggestive of a 'complete mystical experience', whereas placebo subjects did not.

Garcia-Romeu, Griffiths and Johnson (2014) have pointed towards the clinical relevance of mystical experiences induced by the use of psilocybin in the treatment of tobacco addiction based on a sample of 15 subjects, of which 9 (60%) met the criteria for a 'complete mystical experience'. The results suggest that the subjective mystical phenomena experienced had a mediating effect in the cessation of tobacco consumption, even more so than the intensity of the

psychedelic drug itself, with a significant correlation found between the successful outcomes (12 participants) and the measured mystical experience, as well as personal and spiritual meaning felt in the psilocybin sessions.

The same authors (Garcia-Romeu et al., 2014) found that those who had a more powerful mystical experience in sessions with psilocybin were more likely to quit smoking. Roseman and colleagues (2018) also report on a decrease in depressive symptoms following an experience of 'oceanic boundlessness'.

Griffiths et al. (2006, 2008) administered a 30mg/70kg dose of psilocybin to a group of 36 healthy participants. They also administered a dose of methylphenidate as a control, with a 2-month interval between the two. After the psilocybin session, 61% of participants were considered to have had a complete mystical experience, as scored by the MEQ-30, whereas this number was only 7% for the methylphenidate session. In a follow-up, participants showed significant improvements in attitudes towards life and self, mood, and behaviors, two months after the psilocybin session, showing a far greater effect than the control. These changes were maintained 14 months later, and over half of the participants considered the psilocybin session to have been one of the 5 most meaningful experiences in their lives, and statistical analysis (correlational and regression) revealed that the mystical experience had had a central role in these changes. A later study by Griffiths (2011) showed that mystical experience scores increased in function of the increase of the psilocybin dose administered, ranging from 23% of participants scoring a 'complete' mystical experience in the lowest dosage (of 5mg/70kg) to 77% at the highest (30mg/70kg). Later studies reported results of 57% and 63% for the highest dosage, with the large majority of mystical experiences occurring in the higher rather than the moderate dosage (Griffiths et al., 2017; Carbonaro et al., 2018; Johnson et al., 2014).

The phenomenon of Quantum Change can be understood to encompass mystical and metaphysical experiences deriving from psychedelics. It refers to the lasting change that originates in a moment of 'mystical' or 'peak' experience. Although a similar concept to that of mystical experience, it differentiates itself by including the changes and transformations that the experience produces and results in - changing "everything", namely values and priorities, from conventional ones such as wealth, status and fame, or physical attractiveness to spirituality, personal peace, family, and honesty, among others; there are also changes in the relational world,

as people report losing tolerance for superficiality in their relationships and friendships, and a search for meaningful ones (Miller, 2004).

Thus, quantum change encompasses the entire phenomenology of the experience, as well as its subsequent consequences. It is categorized by its distinctiveness (it is felt as something extraordinary), the surprise with which it comes, the benevolence that it is felt to have, and its permanence (as in lasting consequences) (Miller, 2004).

Quantum change can be further divided into two categories: the mystical-type, which overlaps with the previously referred mystical experience phenomena and is considered to be the more 'dramatic' type, the one which was experienced by the likes of Tolstoi or Jeanne d'Arc; and the insightful-type, in which the individual may come to gain a great insight or understanding of his life (e.g., someone who suddenly realizes they are in an abusive relationship), a process more akin to traditional psychotherapy, different from the mystical type as they are not so much an 'eureka' moment (Miller, 2001; 2004).

Much like the mystical experiences themselves, the mystical type is often experienced as 'something that happens' to the person, outside of their control and volition. Although the authors point out that these experiences may be common, they do not generally have long-lasting effects, which categorize quantum change (Gallup & Lindsay, 1999; Miller, 2004).

In a more psychodynamic vein, modern research suggests that psychedelics can aid in bringing the unconscious and latent material into consciousness, as well as dampening the secondary process thinking and connecting the person more deeply to primary process experience (Carhart-Harris & Friston, 2010; Carhart-Harris et al., 2019). According to Fischman (2019, 2023), who draws from varied sources such as infant observation, social psychology and psychoanalysis, in milder psychedelic states, partial ego dissolution may occur, along with increased feelings of acceptance which in turn lead to a significant reduction in psychological defenses and boundaries, as (he claims) there is a disruption on the expectations of the individual, allowing for the individual to be flooded by the information openly as if witnessing the world for the first time, instead of it being codified with basis on prior experience.

There is also a greater sense of connectedness. In more extreme states, a complete dissolution of the ego may occur, and the person may feel detached from their body and mind, leading to a mystical experience (Fischman, 2019, pp. 59–67). He thus establishes a parallel with the infant consciousness, devoid of biographical history.

Psychedelics also reproduce a similar experience to that of the transitional space described in psychoanalytic literature, in which are related “oceanic feelings of connectedness”, and “smallness [within the vastness]” which may also constitute mystical or metaphysical experiences for the psychedelic user (Fischman, 2019, pp. 59–67). According to Yaden *et al.* (2017), the feeling of awe and unity in this experience is comparable to that of the infant child.

The occurrence of mystical experiences and other subjective phenomena in psychedelic substances can be measured through several instruments. One of the most prominent is the Mystical Experience Questionnaire (MEQ-30), developed in trials involving the use of psilocybin. This questionnaire consists of 30 questions across 4 subscales, which are considered representative of mystical experiences, having demonstrated excellent reliability with Cronbach’s alpha in each (Barrettt et al., 2015). This instrument was employed in this study and will be further described and elaborated upon in the Methodology section. Other instruments used to assess mystical experience and other subjective phenomena objectively include: the Hallucinogen Rating Scale (HRS), a 100 item questionnaire by Strassman and Kellner (1994), which thoroughly and systematically interviewed study participants exposed to DMT in order to assess its effects; as well as Hood’s Mysticism Scale (HMS) by Ralph Hood Jr. (1975), composed of 32 items across eight categories of mysticism. Unlike the previous instruments which were developed in psychedelic contexts, the HMS is used for the study and investigation of mystical experiences in religious contexts in general.

1.5 Models of Psychedelic Assisted Psychotherapy

Currently, the basic model of psychedelic-assisted psychotherapy involves a limited number of sessions which include preparation [for the psychedelic experience and its effects, such as hallucinations], dosing, in which the substance is introduced to the subject and experienced in a safe and controlled environment with professionals, and integration, in which the experience is finally broken down into something that the client can comprehend with the help of a therapist (Hulser-Morris & Pilecki, 2024); in this phase, a reflective process takes place that seeks to reconcile the psychedelic experience as it is remembered with the current view of objective reality (Nayak & Johnson, 2020). Johnson *et al.* (2019) recommend using eyeshades to

reduce visual stimuli during the experience and playing music carefully selected to orient the psychedelic experience.

Although most research has been conducted using the cognitive behavioral therapy model, other theoretical approaches have been used regarding PAT, such as the psycho-dynamic or the transpersonal models, while some call for greater inclusion of evidence-based practices in this area (Greń et al., 2024), arguing that traditional methodology may not be appropriate for such an unconventional type of therapy.

In response to this, Brennan and Belser (2024) propose the EMBARK model, designed to capture the broad spectrum of common experiences and factors in PAT, targeting a variety of potential clinical and theoretical approaches and orientations. This model is thus composed of six clinical dimensions: Existential-Spiritual, Mindfulness, Body-Aware, Affective-Cognitive, Relational, and Keeping Momentum (EMBARK). According to the authors, each of these dimensions should be taken flexibly, as they may hold varying levels of relevance for each client or patient. (Brennan and Belser, 2024; Hulser-Morris & Pilecki, 2024).

Besides the six domains, EMBARK also holds four cornerstones of ethical care (making it a '6+4' structure), which are: trauma-informed care, culturally competent care, ethically rigorous care, and collective care. The purpose of these four cornerstones is to protect both therapist and client from unintentional abuse that may occur in such a complicated state of consent during the psychedelic experience. So, for instance, even if that is not the focus of the treatment, trauma may easily resurface at this time, and it is important for the therapist to be aware of this possibility (Brennan & Belser, 2024; Hulser-Morris & Pilecki, 2024).

One of Lichtenstein and Hoeh's (2024) case studies suggests the need for longer-term therapeutic processes beyond psychedelic treatment, as it may not be very effective with short-term patients. This is particularly so for those with attachment issues and fear of abandonment, who may benefit significantly from a longer form of therapy. Such was the case for Fey, a 41-year-old Chinese American woman who struggled with persistent symptoms of depression. Her migration to the United States left deep scars that revealed themselves in the first session of ketamine administration. By simply holding her hand at this time, the experience proved transformational, as both unraveled the past trauma of her life.

Lichtenstein and Hoeh (2024) relate, however, how in follow-up sessions, she experienced great ambivalence towards the treatment and some reluctance to show her vulnerability. The

therapist remarks that several months after the initial treatment, she appeared distant and uninvested in the work. These facts, attributed to the short-term duration of the treatment, seem to have resulted in little therapeutic gain for Fey.

1.6 Ontology and Philosophy in Psychedelic States and Therapies

Quasti and Sisti (2024) have argued in favor of the role philosophers have to play in psychedelic-assisted psychotherapy, namely those who specialize in the philosophy of the mind, metaphysics, ethics, religion, and phenomenology. The possible role of philosophers in PAT is varied. Hood's Mysticism Scale (Hood, 1975), for example, which is used to measure mystical and religious experiences, received a direct contribution from Walter Stace, a philosopher of religion.

Ethics may also play an important role in the informed consent part, given that, although the individual may consent before being administered psychedelics, once under the effect of these substances he finds himself in a vulnerable and unconsenting position, raising doubts as to the validity of this kind of intervention and the supposed consent; thus, the philosopher may aid in formulating a more ethical informed consent procedure and guidance. (Quasti & Sisti, 2024).

The philosopher of the mind may appropriately respond to ego dissolution and other bodily experiences by facilitating discussions and understanding of specific topics related to personal identity and consciousness; the phenomenologist may, on the other hand, facilitate the understanding of phenomena such as hallucinations and other experiences; the philosopher's knowledge may therefore prove instrumental in the integration process, providing clarity through better understanding and capacity to communicate such understandings through a more accessible and comprehensive language for the patient regarding metaphysical shifts in understanding, for instance (Quasti & Sisti, 2024).

The authors argue, therefore, that the philosopher may serve either as an external consultant, referred to the patient by the psychotherapist, or as an integral part of a multidisciplinary team, participating in the informed consent and integration processes.

1.7. Ontological Addiction

Buddhist thought has had a profound influence on Western psychology and psychotherapy over the years, particularly in relation to cognitive-behavioral theory (Howells et al., 2010; Shonin *et al.*, 2012, 2014). In Buddhist theory, suffering and addiction have their origin in attachment and desire, these being the root cause of all addictions, and thus these are considered to be undesirable qualities (Sahdra et al, 2010; Shonin et al, 2012, 2014). While many maladaptive behaviors and disorders may be an attempt to fill 'the void', Buddhism postulates that rather than trying to escape from this void, one should accept it, for it is within this void that lies the solution (Shonin *et al*., 2012, 2014).

Third-wave CBT approaches have increasingly come to resort to Buddhist principles for the treatment of an extensive range of psychological and psychiatric disorders, and Buddhist-inspired meditation exercises, such as mindfulness, have become mainstream over the years (Kelly, 2015; Shonin *et al*., 2012, 2014). BDIs (Buddhist-derived interventions), used in third-wave CBT, focus on acceptance through mechanisms of 'transformative meditative awareness' and 'perceptual re-distancing' (Shonin et al, 2012, 2014).

According to Van Gordon and colleagues (2013), the success of Buddhism in mainstream psychotherapeutic approaches may be attributed to the fact that Buddhism is more of a philosophical and practice-based system than a system of passive religious worship.

Based on Buddhist theory and philosophy, Shonin and colleagues (2012, 2014, 2016; Van Gordon et al., 2018) have proposed the concept of '*ontological addiction'*, in addition to the already previously existing categories (of substance and behavioral addiction), as a metaphysical model for the understanding of psychopathology in humans.

According to the authors, ontological addiction refers to "*the unwillingness to relinquish an erroneous and deep-rooted belief in an inherently existing 'self' or 'I' as well as the 'impaired functionality' that arises from such a belief*" (Shonin et al, 2012, p. 64). In more concrete terms, it posits that humans are prone to forming deep-rooted beliefs about themselves and their *self*: what is traditionally referred to as 'core beliefs' in CBT (Shonin et al., 2016), albeit of a more 'persistent' nature, and which can become addictive and lead to choices that further reaffirm these beliefs. In other words, it refers to the maladaptive belief that the individual inherently exists as an independent and autonomous entity, and everything outside of themselves exists peripherally only (Shonin et al., 2016; Van Gordon et al., 2018). They then

crave objects, situations and experiences which they believe will advance the interests of this intrinsic self, which will be felt as gratifying, relieving, or experienced in other positive ways, thus feeding back into the addictive loop (Shonin et al., 2016). One who considers, for example, that riches are a key value of their existence will then become 'addicted' to attempting to achieve great wealth, even if this behavior turns out to be maladaptive (Van Gordon et al., 2018).

The fundamental premise of ontological addiction theory is that there is no such thing as an "inherent" 'self' and 'other', as the self cannot be separated from its causes and attributes, the same way a vehicle only exists as a whole with its parts, which exist also individually by themselves - but not as a car -, or like a tree, which cannot exist without air, nutrients and sunlight - which in a dualistic view would be said to be the 'other' in relation to it (Shonin *et al.*, 2012, 2014).

According to Griffiths (2005), there are six key elements in any addiction, either to drugs activities, or objects, these being the salience (wherein the substance takes primordial importance within the subject's thoughts and life), modification of the mood, the development of tolerance towards the object of addiction, symptoms of withdrawal, conflict (be it interpersonal, with those around them, at work, etc., or intra-psychic, such as the feeling of loss of control), and eventual relapse. Shonin et al. (2016) argue that the concept of 'ontological addiction' meets these criteria, albeit somewhat differently. According to the same authors, symptoms of ontological addiction include, but are not limited to: the presence of other psychiatric disorders as per the DSM-5 (excluding those of organic origin, such as neurodevelopmental and neurocognitive disorders), a blind focus on achieving great material success, lack of death awareness, an excessive embroilment in constant quarrels and scheming against others, a tendency towards being easily offended, excessive gloating and pridefulness, superiority or inferiority complexes, and the belief in intrinsic existence of anything.

This last point relates to the fact that according to the Ontological Addiction theory, phenomena is "empty of an independent self" (Van Gordon et al., 2018), and as such nothing exists intrinsically or independently: a tree, the example given by the authors, can only exist by relying upon external phenomena such as the existence of water, soil, nutrients, sunlight, air – if any of these were absent, the tree could not be.

The individual afflicted by ontological addiction is therefore one who is self-oriented and regards everyone else outside of him, without whom he could not exist, as peripheral. Inversely,

the authors argue that those who experience less attachment to the self experience less distress, are healthier (both psychologically and physically), experience less pain, exhibit increased prosocial behavior, and experience greater self-acceptance and well-being (Van Gordon et al., 2018).

The authors estimate that prevalence rates within the mild-to-moderate level, may be above 99% worldwide, due to the vast range of symptoms that relate to this type of addiction - such as anger, hatred and desire – many of which can be considered core traits of humanity (Shonin et al., 2016).

They further argue that the development of this pathology throughout childhood and progressing to adulthood is chronic unless proper intervention is taken. A lack of spiritual values and beliefs is considered to be a risk factor, which may premeditate the onset of the pathology, or increase its severity; in fact, Buddhism postulates that biological, psychological and social factors are secondary determinants for the development of mental illness, whereas spiritual factors take the primary role. The authors argue that without the development of spiritual and competencies valued by the Buddhist doctrine, such as compassion and kindness (which are 'other-centered' rather than 'self-centered') the individual may develop a range of mental illnesses, including depression, anxiety, and psychosis (Shonin et al., 2013; 2016).

According to Ontological Addiction Theory (OAT), attachment is 'a thirst that can never be quenched', leading to fatigue, resentment, stress, and ruminative thinking, among others. As no number of desirable conditions can ever sate this thirst, dissatisfaction is set to reemerge constantly, leading to the pursuit of new commodities and experiences which will seem attractive. This strategy is therefore maladaptive, as satisfaction can never be reached and any efforts to preserve or augment selfhood will lead to further suffering (Van Gordon et al., 2018).

Generically speaking, treatment for ontological addiction must include the gain of awareness of the imputed 'self', its deconstruction, and reconstruction according to a dynamic of a non-dual dynamic self (Shonin, 2016), and training of Buddhist qualities such as ethical awareness, meditation, and wisdom, which are referred to as "*trishiksha*" (Shonin et al., 2014; Van Gordon et al., 2018).

Based on this concept, Barrows and colleagues (2022) produced the Ontological Addiction Scale (OAS). The prototype for this scale consisted of 31 items, whereas the final and recommended version comprises 24 of the original 31 items. However, other scales, such as the

Non-Attachment Scale (NAS) (Chio et al., 2018; Sahdra et al., 2010) and the Non-Attachment to Self Scale (NTS) are also used for the assessment of similar constructs deriving from Buddhist theory of non-attachment (Whitehead et al., 2018).

1.8. Purpose in Life

In today's modern society, many people find themselves uncertain about their life's purpose. Writers and philosophers such as Dostoevsky, Martin Heidegger, Jean-Paul Sartre, Albert Camus, and many others have sought to answer this question in recent centuries (Yalom, 1980). The existential school of thought has influenced renowned psychotherapists worldwide and has had a lasting impact on psychotherapy.

According to Viktor Frankl (1946) humans are uniquely motivated by a search for meaning in their lives. He introduces the concept of *'noogenic neurosis,' arguing that this condition is responsible for most neuroses* of today. This condition is a result of the 'existential vacuum' experienced by most people in their daily lives, as traditional purposes related to religion and family have been lost to time and change, resulting in existential frustration. Frankl argues that meaning can be achieved in three ways: by enduring great suffering; through building 'something'; and by loving someone (Frankl, 1946). Yalom (1980) elaborates on the idea, and distinguishes between two possibilities: cosmic meaning and secular meaning. Cosmic meaning refers to traditional Judeo-Christian religion, where Man is meant to emulate and follow the teachings of God.

Contrarily, Secular Meaning refers to the absence of cosmic meaning – life in an absurd world, as Albert Camus put it. Secular meaning may be achieved through altruism, dedication to a cause greater to one-self, creativity, hedonism, the humanistic self-actualization and self-transcendence through one's offspring (Yalom, 1980).

According to Crumbaugh, 'purpose in life' may be described as "the ontological significance of life from the point of view of the experiencing individual" (Crumbaugh, 1964, p. 201). Other authors describe it as a general sense of direction and aim in life, like a compass that directs one towards their goals and guides their decisions (Boreham & Schutte, 2023; McKnight & Kashdan, 2009; Ryff, 1989). Though meaning and purpose are often used interchangeably, Yalom (1980) distinguishes between meaning and purpose in life. Whereas meaning refers to sense of coherence, he says, purpose refers to 'intention, aim, function'.

In order to measure the feeling of purpose in life in a quantifiable way, Crumbaugh and Maholick (1964) developed the Purpose in Life test, a 22-item questionnaire, which correlated highly with a questionnaire developed by Frankl himself on the concept while simultaneously correlating negatively with traditional measures of pathology, such as the MMPI, suggesting construct validity. Schulenberg and Buchanan (2011) later developed a smaller, 5-item version of this test, which showed stronger psychometric validity, as described further in the methodology section.

However, there are other instruments, such as the MLQ, a 10-item questionnaire developed by Steger and colleagues (2006). The 10 items are divided by two sub-scales, allowing to measure both the existence of meaning and the search for it. It has shown valid psychometric qualities, along with high convergent correlations with other measures of purpose and meaning in life, while simultaneously not correlating excessively with potentially confounding variables such as affect, religiosity, depression and anxiety, suggesting it is a strong measure of meaning or purpose in life.

A relation between purpose in life and depression, as well as anxiety, has been found across several studies throughout the past decades (Boreham & Schutte, 2023; Davison et al., 2012; Ishida & Okada, 2006; Nierenberg et al., 2010; Ruini et al., 2003; Ryff, 1989; Wood & Joseph, 2010), and studies show participant groups scoring significantly higher in purpose in life measures after treatment for both these disorders (Rafanelli et al., 2000).

Considering the high correlation between purpose in life and depression, Crumbaugh and Maholic (1964) speculate that there is a circular causality between the two: "*It is likely that lack of meaning can be both a cause and an effect of depression, and that both lack of purpose and depression can result from other causes."*. While an individual may have a great sense of meaning, he may be unable to achieve it. In contrast, without meaning, existence "*may become boring and not worth the struggle to overcome obstacles"* (p. 205).

The question of whether psychedelic substances may influence the sense of purpose and meaning in life has been explored by Móró and colleagues (2011). In their study, they compared the use of 'problematic' and 'non-problematic' drugs (psychedelics) concerning purpose in life. Although a negative correlation was found between problematic drugs and purpose in life, and psychedelic drug consumption resulted in greater scores in the *Intrinsic Spirituality Scale*, no correlation was found between psychedelic use and purpose in life. However, one must wonder if

recent changes in how psychedelics are perceived, along with a more informed and therapeutic-oriented consumption, as well as changes in methodology, may yet bring to light a relation between the two.

2. Methodology and Instruments

2.1. Sample and Design

For the purpose of this study, a cross-sectional and correlational design was used. Quantitative measures with established psychometric properties were picked. Due to abnormality, data were analyzed using non-parametric tests, including the Mann-Whitney U test for group comparisons and Spearman's rho correlation analyses to examine associations between the instruments. Sampling methods could be categorized as convenience sampling as well as snowball sampling. The goal of this study was to better understand the impact of mystical experiences, induced by psychedelic substances, on the mental health of users, and their understanding of the *self*, others, and the world around them, and in what way these mystical experiences could impact it. To measure the impact on the self, several instruments were used, namely the *Ontological Addiction Scale* (OAS31), *Purpose in Life Short-Form* (PIL-SF), as well as more conventional means of assessing mental disorders such as anxiety – via the *General Anxiety Disorder* scale (GAD7) and the *Patient Health Questionnaire* (PHQ9). In order to assess the occurrence of mystical experiences and subjective phenomena within the context of psychedelic use, the *Mystical Experience Questionnaire* (MEQ30) was utilized.

Several hypotheses were made in order to better explore and understand the connection between these concepts and experiences.

H1a: Higher scores on the Mystical Experience Questionnaire (MEQ30) will correlate with lower scores on the Patient Health Questionnaire (PHQ-9) for depression.

H1b: Higher scores on the Mystical Experience Questionnaire (MEQ30) will correlate with lower scores on the General Anxiety Disorder Scale (GAD-7).

H1c*:* Higher scores on the Mystical Experience Questionnaire (MEQ30) will correlate with lower scores on the Ontological Addiction Scale (OAS31).

H1d: Higher scores on the Mystical Experience Questionnaire (MEQ30) will correlate with higher scores on the Purpose in Life Scale (PIL-SF).

H1e: Scores on the Ontological Addiction Scale (OAS31) will be positively correlated with scores on the depression (PHQ-9) and anxiety (GAD-7) scales.

H1f: Scores on the Purpose in Life Short-Form (PIL-SF) will be negatively correlated with scores on the Ontological Addiction Scale (OAS31), Patient Health Questionnaire (PHQ9) and General Anxiety Disorder (GAD7)

H2: The use of different psychedelic substances will lead to statistically significant differences in scores on the variables measured, including depression (PHQ-9), anxiety (GAD-7), ontological addiction (OAS31), and purpose in life (PIL-SF).

H3: Religious views will significantly impact scores on the variables measured, these being depression (PHQ-9), anxiety (GAD-7), ontological addiction (OAS31), purpose in life (PIL-SF), and the Mystical Experience Questionnaire (MEQ30).

For this study, an online survey was created using the platform Qualtrics through which participants were recruited. It was shared via a hyperlink and QR Code in and through platforms such as (a) ***Reddit*** communities (r/PsychedelicStudies; r/PsychedelicSpirituality; r/Psychedelics; r/SampleSize; r/Spirituality), (b) messaging platforms such as ***Whatsapp*** and ***Instagram,*** *and* (c) ***Discord*** servers used for mental health support, spirituality and psychedelic discussion and activities (such as "*TripSit*"; ''*Bluelight.org*"; "*Psytrance & Chill"; "Celestial"; "Whiteroom 5.0"* and "*Guardians Mental Health"*), and also *'SurveyCircle'* and *'SurveySwap'*, which are platforms specifically designed for the sharing of surveys. A total of 221 responses were obtained.

To ensure the validity of the responses, a reCAPTCHA was embedded at the beginning of the survey. IP logins were used to flag for potential duplicate submissions. Flagged responses were analyzed individually to ensure they were not *bots,* and no submissions were invalidated.

After clicking the link, participants were informed about the purpose of the study, their anonymity and data protection were ensured, and they were asked to provide informed consent, which they had to agree to in order to proceed. To meet the inclusion criteria, participants had to be able to understand English and be at least 18 years old.

Afterwards, all participants responded to a short sociodemographic section (age, country of origin, gender, religious beliefs, and self-rated English proficiency).

Participants who reported to, at some point in their lives, have consumed psychedelic substances, were asked to specify which psychedelic substances had been consumed, and were presented with the Mystical Experience Questionnaire (MEQ-30) section. Non-users skipped this section automatically. This yielded two comparison groups: Psychedelic Users (n=126) and Non-Users (n=95).

Table 3

Characterization and Distribution of the Sample	N	*%*
	221	
Age		
18-24	103	47%
25-34	52	24%
35-44	34	15%
45-54	23	10%
55-64	9	4%
Gender		
Male	116	52%
Female	91	41%
Non-binary/Other	12	5%
Prefer not to say	2	1%
Education		
Less than high school	3	1%
Highschool graduate	72	33%
Bachelor’s Degree	84	38%
Master's Degree	8	24%
Doctorate	8	4%
Country of origin		

Portugal	93	42%
USA	43	20%
United Kingdom	14	6%
Italy	13	6%
Germany	7	3%
Canada	5	2%
Australia	3	1%
Brazil	3	1%
France	3	1%
India	3	1%
Poland	3	1%
Spain	3	1%
Sweden	3	1%
Others	24	11%
Religious Views		
Atheism	68	31%
Agnosticism	64	29%
Catholicism	48	22%
Buddhism	13	6%
Hinduism	6	3%
Islamism	2	1%
Judaism	2	1%
Other	50	23%
Total Religious	99	45%
Practicing	50	51%
Non-practicing	49	49%
Have not Consumed Psychedelics	95	43%

Have consumed psychedelics	126	57%
Psylocibin	99	45%
MDMA	80	36%
LSD	80	36%
Ketamine	51	23%
DMT	40	18%
Ayahuasca	28	13%
Other	40	16%

2.2. Ontological Addiction Scale (OAS31)

The Ontological Addiction Scale (OAS31; Barrows, 2022) is a 31-item scale that combines modern models of addiction with a thousand-year-old Buddhist theory. It suggests that individuals tend to form ontological beliefs which are erroneous in nature, to which they get attached in an addictive way, which in turn results in them becoming overtly absorbed in narrow ways of being and behaving, which are generally egotistical.

It is composed of six subscales which represent modern criteria for addiction: *salience* (7 items)*, euphoria* (5 items)*, tolerance* (5 items)*, withdrawal* (4 items)*, dysphoria* (4 items) and *relapse* (6 items)*,* which were also based on the *eight mundane concerns* of Buddhist theory. Responses are rated on a five-point Likert scale (0= never, rarely, sometimes, often and 4= always), and scores can range from 0 to 124. A higher score indicates a higher ontological addiction (Barrows, 2022). Examples of questions include “Felt you needed more money or material possessions” and “Felt you needed to try harder in order to receive praise or avoid criticism?”.

The scale was validated against several criterion measures, including the Five-Factor Narcissism Inventory (FFNI-32), the Non-Attachment Scale (NAS), and the Non-Attachment to Self Scale (NTS). These instruments were chosen for their relation to ego-centeredness and attachment, which are key to Buddhist philosophy. Relations with depression, anxiety, and self-esteem were also measured via the Patient Health Questionnaire (PHQ-9), Generalized Anxiety Disorder (GAD-7), and the Rosenberg Self-Esteem Scale (RSES), respectively (Barrows, 2022).

Cronbach's Alpha for the development of this scale was 0.902 and 0.920 for the first and second run, respectively, suggesting excellent internal consistency for the 31-item version of the scale as well as the alternatives. Furthermore, test-retest reliability was observed within a 15-minute interval between each procedure, yielding a reliability score of 0.875, which is considered very good. Besides OAS-31, which was used as a prototype, 24-item (OAS24) and 12-item (OAS12) versions were validated, yielding similar psychometric results, with OAS24 being recommended by the authors (Barrows, 2022).

For this study, the Ontological Addiction Scale–31 (OAS-31) was administered to 221 participants. Four questionnaires contained excessive missing data and were excluded, leaving 217 valid cases (98.2%). Internal-consistency reliability was examined for each of the six subscales using Cronbach's α. Reliability coefficients were in the acceptable range for Salience ($M = 23.26$, $SD = 4.45$, $\alpha = .78$), Tolerance ($M = 14.64$, $SD = 3.82$, $\alpha = .77$), Withdrawal ($M = 10.89$, $SD = 2.91$, $\alpha = .72$), Dysphoria ($M = 11.96$, $SD = 3.04$, $\alpha = .79$), and Relapse ($M = 12.11$, $SD = 3.62$, $\alpha = .78$). The Euphoria subscale yielded a somewhat lower coefficient ($\alpha = .63$); although marginal by conventional .70 guidelines, it was retained because it is theoretically important and only slightly below the recommended threshold.

Both normality tests indicated a significant deviation from normality for all 6 subscales of the OAS-31; the **Salience** sub-scale: Kolmogorov–Smirnov, $D(217) = 0.094$, $p < .001$, and Shapiro–Wilk, $W(217) = 0.97$, $p < .001$; **Tolerance**: $D(217) = 0.098$, $p < .001$, and $W(217) = 0.985$, $p = .025$; **Dysphoria**: $D(217) = 0.094$, $p < .001$, and $W(217) = 0.981$, $p = .004$; **Euphoria**: $D(217) = 0.100$, $p < .001$, and $W(217) = 0.967$, $p = .025$; **Withdrawal**: $D(217) = 0.114$, $p < .001$, and $W(217) = 0.981$, $p = .006$; **Relapse**: $D(217) = 0.100$, $p < .001$, and $W(217) = 0.970$, $p < .001$.

2.3. Mystical Experience Questionnaire (MEQ30)

The Mystical Experience Questionnaire (MEQ; Barrett, 2015) was developed to measure the occurrence of mystical experience phenomena in an individual after exposure to psychedelic substances. It is composed of a subset of scales that seek to measure the common denominators in these experiences, such as the inability to portray the experience through words (ineffability), a sense of great unity with something of a higher order, sacredness, as well as a noetic quality.

The final version (MEQ30) is constructed from a subset of 30 items from the MEQ43 (MacLean et al., 2012), and is comprised of four factors: mystical (15 items, including from the internal unity, external unity, noetic quality, and sacredness scales of the MEQ43), positive mood (6 items), transcendence of time and space (6 items), and ineffability (3 items) (Barrett, 2015). This scale includes items such as the following: "Freedom from the limitations of your personal self and feeling a unity or bond with what was felt to be greater than your personal self.", and "Feeling that you experienced something profoundly sacred and holy."

The four-factor structure of the MEQ30 was the product of exploratory and confirmatory factor analyses of the initial item pool of the MEQ43 and displayed excellent reliability, calculated using Cronbach's alpha (α mystical=0.97, α positive mood=0.92, α transcendence time/space=0.86, α ineffability=0.90). Subjects reporting scores ≥ 60% in every subscale are considered to have experienced a 'complete mystical experience'. Items are scored based on a 6-point Likert scale, ranging from '1= None/Not at All' to '6= Extreme' (Barrett, 2015).

Of the 221 participants, 124 participants which reported previous consumption of psychedelic substances (56.1%) responded to the Mystical Experience Questionnaire (MEQ-30). Internal-consistency reliability was examined for each of the four MEQ-30 subscales using Cronbach's α. The *Mystical* (M = 60.24, SD = 14, α = .896) subscale obtained 'very good' internal-consistency reliability results; Positive Mood (M =25.68, SD =6.42, α = .773), Ineffability (M =13.9, SD =3.53 , α = .744) and Transcendence (M =26.7, SD =6.1, α = .778) can be considered acceptable by conventional guidelines (α ≥ .70).

All four subscales of the MEQ-30 showed significant deviations from normality, as determined by Shapiro-Wilk and Kolmogorov-Smirnov tests. Mystical scale $D(124)= .138$, $p < .001$, $W(124)= .952$, $p < .001$; Positive Mood $D(124)= .093$, $p=.011$, $W(124)= .956$, $p < .001$; Ineffability $D(124)= .162$, $p < .001$, $W(124)= .887$, $p < .001$; Transcendence $D(124)= .107$, $p = .001$, $W(124)= .937$, $p < .001$.

2.4. Purpose in Life (PIL-SF)

The Purpose in Life test was developed by James Crumbaugh (1964, 1969) with the goal of assessing one's feeling of purpose and meaningfulness in life, having been based on the work

and concepts of Viktor Frankl and Logotherapy. Originally composed of 20 items, the original version of the PIL Test was struck by several criticisms that the scale measured other concepts beyond meaning, such as depression. As such, a shorter, 4 item version ('Short-Form') was developed by Schulenberg and Buchanan (2011), containing the original items 3, 4, 8 and 20, which were determined by confirmatory factor-analysis to fit together. Internal validity of this test was scored at a = 0.84, proving itself sufficiently robust to be used.

In one of the items, "My personal existence is…", for example, responses range from "1= Utterly meaningless without purpose" to "7= very purposeful and meaningful".

In the present study, 217 valid responses were obtained for the PIL-SF (98.2%), and a good internal-consistency score was obtained ($\alpha = .86$).

However, significant deviation from normality was shown, as $D(217)= .094$, $p < .001$, $D(217)= .954$, $p < .001$.

2.5. Patient Health Questionnaire (PHQ9)

The Patient Health Questionnaire (PHQ9; Kroenke, 2001) is a brief, 9 items, depression severity measure which can aid both in diagnosis of depressive disorder and its severity. Internal consistency with Cronbach's alpha was well beyond 0.80 in all development and validation runs, suggesting a very good consistency by conventional standards. Test-retest reliability too was at 0.84, suggesting very solid psychometric qualities and validity.

Scores range from 1 to 27, as items are scored on a four-point Likert scale, from 0 (=Not at all) to 3 (=Nearly Everyday), with cut-out points at the 5, 10, 15 and 20 threshold. This scale includes items such as "Trouble falling or staying asleep, or sleeping too much" and "Little interest or pleasure in doing things".

For the present study, 217 valid responses (98.2%) to the PHQ9 were collected and yielded an alpha of 0.691, which is only slightly below what would conventionally be considered acceptable. As such, and for the purpose of this study, these data were considered sufficiently valid. Deviation from normality was once again shown with $D(217) = .081$, $p = .001$ and $W(217)= .972$, $p < .001$.

2.6. Generalized Anxiety Disorder (GAD7)

The Generalized Anxiety Disorder scale (GAD7; Spitzer, 2006) is composed of 7 items meant to reflect the criteria for diagnostic of anxiety disorder, with the intent of assessing symptoms, with scores ranging from 0(=not at all) to 3(=nearly every day) for each item, and ranges thus from 0 to 21 total score. Initially composed of 13 items, the 7 items which now compose this scale were pooled based on having the highest correlations with each other (r = 0.75-0.85). Convergent validity was also good, with correlations higher than .70 with other common measures such as the Beck Anxiety Inventory ($r= 0.72$) and SCL-90. ($r= 0.74$). This scale obtained a Cronbach $\alpha = .92$, which is considered to be excellent, along with a good test-retest reliability at .83. Items in this scale include "Feeling nervous, anxious, or on edge" and "Feeling afraid, as if something awful might happen".

For the present study, internal-consistency was scored at 0.913 through Cronbach's alpha, suggesting excellent internal validity. Normality was shown to be lacking, as it scored $D(217)= .132$, $p < .001$ and $W(217)= .904$, $p < .001$.

3. Results

3.1. Scale Correlations

A statistically significant Spearman correlation was found between the Mystical Experience Questionnaire (MEQ-30) and the Purpose in Life Short-Form (PIL-SF) indicative of a small positive association between the two variables, $\rho(124) = .236$, $p < .008$ (*two-tailed*), which can be considered small (Cohen, 1988).

The Purpose in Life test also showed statistically significant negative Spearman rank-order correlation with the PHQ9 ($\rho(217) = -.384$, $p < .001$ and the GAD7 scale ($\rho(217) = -.363$, $p < .001$), both of which can be considered moderate, as well as a small negative correlation with the OAS31 scale ($\rho(217) = -.272$, $p < .001$). Furthermore, positive correlations were found between the OAS30 scale and the PHQ9, $\rho(217) = .368$, $p < .001$ and GAD7 scale, $\rho(217) = .537$, $p < .001$, which can both be considered moderate (Cohen, 1988).

Significant positive Spearman correlations were also found between the PHQ9 and GAD7 $\rho(217) = .602$, $p < .001$, which is considered a large correlation (Cohen, 1988). Below is a table presenting all the correlations between the major variables:

Table 4

Table of Correlations between the MEQ30, OAS31, PIL-SF, PHQ9 & GAD7

	MEQ30	OAS31	PIL-SF	PHQ9	GAD7
MEQ30					
Correlation Coefficient	-	-.030	.236**	-.172	-.135
Sig. (2-tailed)	-	.741	.008	.056	.135
N	-	124	124	124	124
OAS31					
Correlation Coefficient	-.030	-	-.272**	.368**	.537**
Sig. (2-tailed)	.741	-	<.001	<.001	<.001
N	124	-	217	217	217
PIL-SF					
Correlation Coefficient	.236**	-.272**	-	-.384**	-.363**
Sig. (2-tailed)	.008	<.001	-	<.001	<.001
N	124	217	-	217	217
PHQ9					
Correlation Coefficient	-.172	.368**	-.384**	-	.602**
Sig. (2-tailed)	.056	<.001	<.001	-	<.001
N	124	217	217	-	217
GAD7					
Correlation Coefficient	-.135	.537**	-.363**	.602**	-
Sig. (2-tailed)	.135	<.001	<.001	<.001	-
N	124	217	217	217	-

Note: **. Correlation is significant at the .01 level (two-tailed).

3.2. Substances x MEQ30, OAS31, PIL-SF, PHQ9 & GAD7

The Mann-Whitney U test and Kruskal-Wallis H test (which are considered mathematically equivalent when handling two groups (k=2), with the H test being however more appropriate when k > 2 (k being the number of categorical groups) were used to assess further associations between ordinal variables, as no normality was found to exist.

Through the Mann-Whitney U test, a statistically significant difference was found on the Withdrawal sub-scale of the OAS-31 between psychedelic users and non-users. Participants who reported using psychedelics (n= 124, mean rank = 100.91) reported lower withdrawal scores than non-users (n=93, mean rank= 119.78), U = 6 769.00, z = −2.21, p = .027 (two-tailed), r = -.15, indicating a small effect.

Further differences were found on GAD7 scores using the Mann-Whitney U test, U = 7 329.50, z = 3.43, p < .001, as psychedelic users (n = 124, mean rank = 96.39) reported statistically significant lower scores of anxiety when compared to non-users (n = 93, mean rank

= 125.81). The effect size is at .23, representing a small-to-medium effect according to Cohen (1988).

The consumption of specific substances, namely Ayahuasca, DMT, LSD, and Psilocybin, also revealed statistically significant differences when compared to the consumption of other substances on the MEQ-30 (and all its sub-scales), GAD-7, and PHQ-9 using the Mann-Whitney U test. Those who reported consumption of Ayahuasca (n=27) scored higher in the MEQ30 and PIL-SF, while scoring lower in Salience and Withdrawal from the OAS31, as well as the PHQ9 and GAD7 scales, when compared to those who did not consume Ayahuasca (Table 5).

Table 5

Effects of the Consumption of Ayahuasca - Users vs Non-Users

	U	*Mean Rank Users*	*Mean Rank Non-users*	*p*	*r*
MEQ30	2 008.5	88.39	55.29	< .001	.38[a]
PIL-SF	3 277.5	135.39	105.25	.019	.16[b]
Salience	1794.5	80.46	113.06	.011	.17[b]
Withdrawal	1831.5	81.83	112.86	.016	.16[b]
PHQ9	1 644.5	74.91	113.84	.003	.20[b]
GAD7	1 610.0	73.63	114.03	.002	.21[b]

Note. U = Mann–Whitney's U; r = effect size ($z/\sqrt{N}$); all tests two-tailed; n_1 = 27 (users), n_2 = 190 (non-users)
[a] Large effect ($r \geq .30$); [b] Small effect ($.10 \leq r < .30$).

Additionally, those who consumed Psilocybin (n=97) reported lower scores on Withdrawal and anxiety (GAD7), and higher on the MEQ30 (table 6), while both DMT (n= 38) and LSD (n= 78) users only scored lower on anxiety and higher on the MEQ30 (table 7 and 8, respectively).

Table 6

Effects of the Consumption of Psilocybin - Users vs Non-Users

	U	*Mean Rank Users*	*Mean Rank Non-users*	*p*	*r*
MEQ30	5 010.5	67.48	44.59	.078	.12[b]
Withdrawal	4 696.0	97.41	118.37	.014	.17[b]
GAD7	4 003.0	90.27	124.14	< .001	.27[b]

Note. U = Mann–Whitney's U; r = effect size ($z/\sqrt{N}$); all tests two-tailed; n_1 = 97 (users), n_2 = 120 (non-users)
[b] Small effect ($.10 \leq r < .30$).

Table 7

Effects of the Consumption of DMT - Users vs Non-Users

	U	*Mean Rank Users*	*Mean Rank Non-users*	*p*	*r*
MEQ30	2 421.5	83.22	53.34	< .001	.38[a]
GAD7	2 660.0	89.50	113.14	.034	.14[b]

Note. U = Mann–Whitney's U; r = effect size ($z/\sqrt{N}$); all tests two-tailed; n_1 = 38 (users), n_2 = 179 (non-users)
[a] Large effect ($r \geq .30$); [b] Small effect ($.10 \leq r < .30$).

Table 8

Effects of the Consumption of LSD - Users vs Non-Users

	U	*Mean Rank Users*	*Mean Rank Non-users*	*p*	*r*
MEQ30	2 405.5	70.34	49.21	.002	.28[b]
GAD7	4 401.0	95.92	116.34	.021	.16[b]

Note. U = Mann–Whitney's U; r = effect size ($z/\sqrt{N}$); all tests two-tailed; n_1 = 78 (users), n_2 = 139 (non-users)
[b] Small effect ($.10 \leq r < .30$).

3.3. Gender x Scales

The Kruskal-Wallis H Test also showed statistically significant differences between the different genders (male, female, non-binary, and 'prefer not to say') in Dysphoria, $H(3) = 9.34$, $p = .025$, $\varepsilon^2 = .03$ (small effect), with Dunn–Bonferroni post-hoc tests showing that the female group scored significantly higher than the male group ($p = .012$, $r = .21$), while no other differences between groups were detected;

The Relapse sub-scale also showed small but significant differences across groups, $H(3) = 7.87$, $p = .049$, $\varepsilon^2 \simeq .023$ (small), however, although the omnibus H test suggested gender differences in Relapse-OAS, no specific gender pair differs at the corrected α level when performing Dunn's pairwise tests with Bonferroni correction.

Similarly, statistically significant differences were found for the Purpose in Life Short Form across genders, $H(3) = 9.84$ (ties adjusted), $p = .020$, $\varepsilon^2 \simeq .03$ (small effect), with the only significant contrast between groups occurring between Male and Female (after the Bonferroni

adjustment to Dunn's pairwise comparisons, p = .041), revealing higher scores for purpose in life in women when compared to men.

3.4. Religion x Scales

The Mann-Whitney U Test was further used to assess statistical differences between religious groups. For most religions, no differences between believers and non-believers were found across the scales.

Atheists:

According to the Mann-Whitney U Test, Atheists (N= 67, mean rank= 92.60) scored significantly lower when compared to non-atheists (N= 150, mean rank= 116.33) in **Purpose of Life** (U = 3 926.0, Z = –2.579, p = .010, r= 0.18), and also in Mystical Experience scores (assessed by the MEQ30) with atheists (mean rank = 49.01) scoring once again significantly lower when compared to non-atheists (mean rank= 68.46) suggesting stronger and more intense mystical experiences among non-atheists upon the consumption of psychedelic substances (U = 1 121.5, z = –2.778, p = .005, r= 0.25).

Buddhists:

The Mann-Whitney U Test was also used to assess differences between Buddhists (N=13, mean rank = 59.81) scoring significantly lower on the **Ontological Addiction Scale** (OAS-31) than non-Buddhists (N= 204, mean rank = 112.13) (U = 686.5, Z = –2.915, p = .004, r ≈ .20).

Similarly, significant differences were found in depression (**PHQ9**) scores (U = 725.0, Z = –2.743, p = .006, r = 0.19) and anxiety (**GAD7**) (U = 772.0, Z = –2.532, p = .011, r = 0.17), with Buddhists reporting significantly lower scores in both scales than non-Buddhists.

4. Discussion

Contrary to what was initially expected in hypotheses H1a–c, MEQ-30 scores were uncorrelated with PHQ-9, GAD-7, and OAS-31. Although prior studies in experimental settings

have reported negative correlations between mystical-type experiences and both depression and anxiety (Griffiths et al., 2006, 2008, 2011; Garcia-Romeu et al., 2014), but we have found no evidence of these links. Furthermore, to the best of our knowledge, no prior research has examined the relationship between mystical experience intensity and ontological addiction. Although theory and past work suggest that ontological addiction covariates with depression and anxiety (Shonin et al., 2016; Van Gordon et al., 2018; Barrows et al., 2022), MEQ-30 and OAS-31 scores were seemingly uncorrelated in our sample, representing novel null evidence in this domain.

As predicted by H1e, OAS-31 scores correlated positively with both PHQ-9 and GAD-7, indicating that higher ontological addiction aligns with greater depression and anxiety. This finding replicates earlier work demonstrating associations between these variables, supporting the theory that ontological addiction and anxiety, as well as depression, go hand in hand (Barrows et al., 2022).

As was predicted by H1d, a significant positive correlation emerged between MEQ-30 total scores and PIL-SF, confirming the hypotheses. Participants who reported more intense mystical-type experiences also reported higher levels of life purpose and meaningfulness. To the best of our knowledge, this is the first study to directly investigate the relationship between the MEQ-30 and the PIL-SF. However, in line with Móró et al. (2011), we observed no difference in PIL-SF scores between psychedelic users and non-users. This pattern suggests that psychedelics enhance life purpose only insofar as they elicit more intense mystical experiences and are not directly associated with purpose in life. This finding is consistent with previous studies by Timmerman et al. (2021) and Nayak et al. (2022), which report changes in metaphysical beliefs, specifically purpose and meaning, associated with the qualitative features of the psychedelic experience. This is consistent with the ways in which one may find meaning according to Yalom (1980); by promoting mystical experiences, psychedelics allow for the opportunity to find a secular meaning; but they also promote creativity, for example, which is another way in which one may find meaning (Bogenschutz and Ross, 2018). Other psychedelics such as MDMA promote connectedness, which could play into the altruistic route to meaning.

We also found a significant negative relationship between PIL-SF and anxiety, depression, and ontological addiction, thereby confirming **H1f**. To our knowledge, ours is the first study to document an inverse association between life purpose and ontological addiction.

This finding is consistent with prior work showing that a strong sense of meaning is linked to lower depression and anxiety and to healthier coping strategies (e.g., Schulenberg & Buchanan, 2011). The fact that Purpose in Life is negatively correlated with depression and anxiety is hardly a novel discovery, as the concept is, in its origin, intricately connected with these concepts (Frankl, 1946; Crumbaugh, 1964; Yalom, 1980). People with lower purpose in life tend to experience higher symptoms of depression, as their life seems meaningless and without reason for being, a *'raison d'être'*. In fact, meaning has been a target of existential literature and psychotherapeutic interest for a while now, being considered by Yalom (1980) one of the four existential concerns of every human being, along with death, freedom and isolation.

Although the relation between ontological addiction and purpose in life is not absolutely clear, it would appear that an excessive focus on and attachment to the self leads to an impairment in the ability to find a greater meaning or purpose in one's life. If we consider how one may find meaning, according to Frankl (1946), it becomes perhaps clearer why that is. Meaning can be found through loving another outside of oneself, which counters ontological addiction, where the focus is on the self. It can also be found by 'doing something' or enduring great suffering. It may well be that individuals who experience higher ontological addiction are never truly satisfied with their accomplishments, and thus cannot feel fulfilled by them; it may also be explained that in ontological addiction, the individual focuses too much on his own suffering and as a part of himself, whereas individuals with lower ontological addiction may be able to better understand the suffering as a necessary part of daily life that occurs outside of them, thus allowing for a greater view of suffering as something that can have a purpose by the external circumstances, rather than something that one simply experiences.

As predicted by **H2**, Ayahuasca users differed markedly from non-users: they reported lower depression (PHQ-9), anxiety (GAD-7), and Withdrawal and Salience (OAS-31), alongside higher MEQ-30 and PIL-SF scores (see Results). Users of psilocybin also reported lower Withdrawal and anxiety, and higher on the MEQ30. DMT and LSD users reported higher on the MEQ30 and lower on anxiety.

In contrast, when comparing all psychedelic users to non-users, the only significant group differences emerged on the OAS-31 Withdrawal subscale and anxiety (GAD-7), with users scoring lower on both measures (see Results). Furthermore, for some substances, no differences were found between those who consumed them and those who did not.

The **Salience sub-scale** refers to activities related to ego-centeredness, such as accumulation of wealth and seeking validation from others; **Withdrawal** refers to the unpleasant feeling, similar to that which occurs in other addictions, when such activities and behaviors [which are ego-centered] are reduced. As such, we are led to believe that psychedelics and mystical experiences shift the focus of the individual from ego-centered activities to others, which in turn means subjects care less deeply about these activities and experience less withdrawal.

It is also noteworthy that all substances that produced positive effects on mental health also resulted in more intense mystical experiences, and vice versa. This is consistent with the hypothesis that subjective phenomena and mystical experiences are crucial components of the psychedelic experience and not only positive, but perhaps essential in the clinical and therapeutic setting. Mystical experiences can be profound and life-changing for users, and allow for a shift in how the subjects view themselves, others, and the world around them, are led to reflect to a greater degree, and experience these dimensions of their phenomenological intentionality in novel ways, allowing them to establish new ways of thinking and perceiving reality in enduring ways (Garcia-Romeu, 2014; Griffiths, 2006, 2008, 2011, 2018; Miller, 2001, 2004). If we take into consideration some of the effects of psychedelics, wherein one feels to be one with the cosmos and the earth, unveiling a hidden truth behind the veil, or believes to communicate with other-worldly beings, and the ineffability that accompanies it, along with the belief in its absolute veracity, it is not surprising that such experiences would produce radical changes in one's purpose in life (Nutt, 2023; Teixeira, 2025).

These findings suggest that not all psychedelic compounds yield equivalent psychological outcomes, though the general consumption of psychedelic substances may yield lower scores in anxiety. Ayahuasca in particular may catalyse more profound mystical experiences and attendant gains in life purpose while alleviating distress and rigid self-attachment, effects not observed for other substances in our sample. Future work should investigate which pharmacological or contextual factors (e.g., setting, dosage, traditional ritual) drive these substance-specific profiles.

H3 was also confirmed. Buddhists scored significantly lower on the OAS-31 (Withdrawal subscale) and on the GAD-7 anxiety scale (see Results). This pattern is entirely consistent with the Buddhist origins of ontological-addiction theory—longstanding practitioners appear less prone to rigid self-attachment and the anxiety that often accompanies it. Atheists also

scored lower on mystical experiences (MEQ30) and Purpose in Life (PIL-SF) when compared to non-atheists. The same did not, however, happen to agnostics.

We hypothesize that this may be because, whereas agnostics are open to the possibility of a higher entity or being, atheists firmly believe in the nonexistence of such. This broader view from agnostics may allow for a fuller and more intense experience of the mystical upon consumption of psychedelics and acceptance of the possibility of non-conventional spirituality.

Chan et al. (2018) argue that religion can provide people with a greater sense of understanding and control over the world around them, as well as counter the loss of purpose resulting from social isolation and loneliness, by providing them with a 'substitute' who cares deeply about them, provides constant support and emotional strength through his everlasting presence, experiences akin to those of being in connection with other human beings. In this way, religion and religious views may serve to increase purpose in life for the individual.

Furthermore, considering that religious people tend to experience greater levels of purpose in life (Chan, 2018; Reynolds, 2022; Adamczyk, 2022), and that mystical experience phenomena seems to be positively correlated with purpose in life, atheists, who are neither religious nor have such intense mystical experiences, also present lower feelings of purpose in life.

As for Ontological Addiction, one may take into consideration that psychedelic substances have been used to treat addictions of a wide variety in clinical settings (Nutt, 2023; Teixeira, 2025; Krebs, 2012); as such, and being a concept constructed around the clinical understanding of addiction (Shonin, 2013; Van Gordon, 2018), it is agreeable that a positive effect was to be expected on this novel and different type of addiction as well.

Furthermore, although it was not initially expected, significant **gender differences** were found between the groups, as the Female group reported lower on Dysphoria and Relapse (OAS31) and higher on Purpose in Life (PIL-SF) than the remaining groups, namely the Male group. This could perhaps be attributed to societal changes in recent history, with gender roles changing drastically in modern times and Western societies. While traditional gender roles have become less and less significant and genders "come together" functionally, it may be hypothesized that many men have lost what they considered to be their purpose as the 'provider' and 'protector' in society.

These results are consistent with Xi and colleagues (2022), who studied gender differences in purpose in life and the mediating effect of altruism; their results also show an increased purpose in life in women, and the authors argue that the traditional role of women as caregivers fosters altruism and empathy, constructs which in turn result in a greater sense of fulfillment and purpose in life. This is also consistent with the idea that one may find purpose by loving another, as love does not necessarily have to be of the romantic type. Lasota and Shekhar (2024) also report similar results, with Indian and Polish women scoring higher in purpose in life, with gender also being a significant moderator of the relationship between gender and PIL, as women were more grateful than men, showing greater appreciation for the little pleasures in life.

Griffiths and colleagues (2008) also refer to the capacity of psychedelics to increase empathy in users. As such, it would be expectable that an increase in empathy would also cascade into a greater feeling of purpose in users of these substances.

5. Conclusion

This study was aimed at better understanding the impact of mystical experiences induced by psychedelics in the self and mental health, through variables such as ontological addiction and purpose in life. A sufficiently large and diverse sample of participants was gathered from a wide variety of geographic regions, cultural backgrounds, ages brackets and religious affiliations.

Results from this study revealed several novel associations among previously unexamined constructs. First, greater intensity of mystical-type experiences (MEQ-30) was positively associated with life purpose (PIL-SF)—to our knowledge, the first direct evidence of this link. Second, higher life purpose was inversely related to ontological addiction (OAS-31), depression (PHQ-9), and anxiety (GAD-7), suggesting that a strong sense of meaning buffers against both rigid self-attachment and psychological distress. Third, ontological addiction itself showed positive associations with depression and anxiety and a negative association with life purpose, corroborating H1e. Finally, the absence of any MEQ-30–OAS-31 correlation—despite theoretical expectations and the centrality of both constructs to well-being—constitutes novel null evidence, underscoring that “no effect” can be as informative as “an effect.”

Overall, psychedelic use alone was linked only to reduced anxiety and withdrawal symptoms, whereas specific substances like Ayahuasca, that elicited stronger mystical-type experiences (higher MEQ-30 scores) produced a broader spectrum of benefits, including enhanced life purpose and reduced depression, anxiety, and ontological addiction.

5.1. Limitations and future studies

A few limitations to this study were found, along with possibilities for future study:

Sample composition: a large percentage of participants originated from two countries: Portugal (PT) and the United States of America (USA). Although responses from dozens of countries were collected, these were fewer in number. As such, it is hard to generalize these findings to the wider international population, even more so when we take into consideration that psychedelic use may vary widely in its nature between different cultures: whereas in some they may serve recreational purposes, in others they may serve deeply significant religious and cultural purposes. **In future studies**, it could be interesting to gather data from concrete populations in order to assess geocultural and historical differences.

Different types of usage: environment and purpose behind the usage of psychedelics is an influential factor in the ensuing experience. As such**, in a future study**, it would be pertinent to assess the context and purpose in which these substances were consumed in order to better understand the dynamics at play. Distinguishing participants by recreational, therapeutic (non-clinical) and clinical use may prove useful in better understanding the relation between the variables in this study and others, while also gathering a better understanding of in what way psychedelics are being used today.

'Other' religions: those who responded with 'Other' as to what religious views they identify with were limited in number and their answers were highly varied. While some reported being non-Catholic orthodox, others responded more unconventionally (e.g., one reported the belief in "Gaia"). As such it was impossible due to the limited number of responses combined with their wide variety, to categorize these based on possible similarities, and therefore they had to be analyzed as a whole, despite significant variance between responses. **Future studies** could take it a step further by better understanding the impact of psychedelics in religious views, particularly non-conventional ones, and the way in which these views may interact with the remaining variables in study.

OAS31: although smaller versions of this scale exist with similar psychometric qualities, the 31-items version was used with the expectation that some of the additional items compared to smaller versions may bring further insights into the understanding of the relationship between ontological addiction and remaining variables. However, this is considered by the authors as a 'prototype' version and not the final version of the Ontological Addiction Scale.

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Anexos

Annex A- Qualtrics Questionnaire

Start of Block: Introduction

Effect of Mystical Experiences on Mental Health through the use of Psychedelic Substances

The purpose of this study is to investigate the impact of psychedelics in the occurrence of mystical experiences and its impact on mental health factors such as anxiety and depression, and the feeling of life purpose and ontological addiction. We request that you answer honestly and as accurately as you can. Participation in this study will include completion of a survey that may ask you questions about your past use and experience with psychedelics (if there is any), feeling of meaning in life, ontological addiction and humor and anxiety symptoms. Participation in this study will take you about 8 minutes to complete.

End of Block: Introduction

Start of Block: Consent

Informed Consent

This study is being conducted for the purpose of a master's thesis in Clinical Psychology in the University of ISPA, Lisbon, Portugal. You may withdraw from the study at any time. All of your responses will be kept confidential, and will not be linked to your name or identifying information. There are no benefits to you from participating in this study, besides the advancement of the knowledge on the area of psychedelics and psychedelic assisted therapy. If you have any questions or complaints, you can contact the responsible for this research via the email: joaovazpadeiro@gmail.com

I am at least 18 years old and I consent to participate in this study

- ○ Yes (1)
- ○ No (2)

Skip To: End of Survey If I am at least 18 years old and I consent to participate in this study = No

What is your age?

- ○ 18 - 24 (1)
- ○ 25 - 34 (2)
- ○ 35 - 44 (3)
- ○ 45 - 54 (4)
- ○ 55 - 64 (5)
- ○ 65 - 74 (6)
- ○ 75 - 84 (7)

Which gender appropriately describes you?

- ○ Male (1)
- ○ Female (2)
- ○ Non-binary / Other (3)
- ○ Prefer not to say (4)

What's your level of education?

- ○ Less than high school (1)
- ○ High school graduate (2)
- ○ Bachelor's degree (3)
- ○ Master's degree (4)
- ○ Doctorate (5)

What country are you from?

_____

Is english your native language?

- ○ Yes (1)
- ○ No (2)

Skip To: QID132 If Is english your native language? = Yes

How would you rate your english comprehension level?

- ○ Proficient (C2) (1)
- ○ Advanced (C1) (2)
- ○ Intermediate (B2 and B1) (3)
- ○ Elementary (A2) (4)
- ○ Beginner (A1) (5)

Which of the following better describes your religious views?

- [ ] Atheism (1)
- [ ] Agnosticism (2)
- [ ] Catholicism (3)
- [ ] Islamism (4)
- [ ] Buddhism (5)
- [ ] Judaism (6)
- [ ] Hinduism (7)
- [ ] Other: (8) _____

Skip To: End of Block If Which of the following better describes your religious views? = Atheism
Skip To: End of Block If Which of the following better describes your religious views? = Agnosticism

Do you practice your religion?

- ○ Yes (1)
- ○ No (2)

End of Block: Consent

Start of Block: MEQ-30

Have you consumed any psychedelic substances? If so, which ones?

- ☐ Psilocybin (mushrooms) (1)
- ☐ LSD (2)
- ☐ MDMA (3)
- ☐ Ayahuasca (4)
- ☐ DMT (5)
- ☐ Ketamine (6)
- ☐ Other: (7) _____
- ☐ I have NOT consumed any psychedelic substances (8)

Skip To: End of Block If Have you consumed any psychedelic substances? If so, which ones? = I have NOT consumed any psychedelic substances

Page Break

Looking back on the entirety of your psychedelic experience, please rate the degree to which at any time you experienced the following phenomena. Answer each question according to your feelings, thoughts, and experiences at the time.

	None / Not at All (1)	So Slight Cannot Decide (2)	Slight (3)	Moderate (4)	Strong (5)	Extreme (6)
Freedom from the limitations of your personal self and feeling a unity or bond with what was felt to be greater than your personal self. (1)	○	○	○	○	○	○
Experience of pure being and pure awareness (beyond the world of sense impressions). (2)	○	○	○	○	○	○
Experience of oneness in relation to an “inner world” within. (3)	○	○	○	○	○	○
Experience of the fusion of your personal self into a larger whole. (4)	○	○	○	○	○	○
Experience of unity with ultimate reality. (5)	○	○	○	○	○	○
Feeling that you experienced	○	○	○	○	○	○

eternity or infinity (6)						
Experience of oneness or unity with objects and/or persons perceived in your surroundings. (7)	○	○	○	○	○	○
Experience of the insight that “all is One.” (8)	○	○	○	○	○	○
Awareness of the life or living presence in all things. (9)	○	○	○	○	○	○
Gain of insightful knowledge experienced at an intuitive level. (10)	○	○	○	○	○	○
Certainty of encounter with ultimate reality (in the sense of being able to “know” and “see” what is really real at some point during your experience. (11)	○	○	○	○	○	○
You are convinced now, as you look back on	○	○	○	○	○	○

your experience, that in it you encountered ultimate reality (i.e., that you “knew” and “saw” what was really real). (12)						
Sense of being at a spiritual height. (13)	○	○	○	○	○	○
Sense of reverence. (14)	○	○	○	○	○	○
Feeling that you experienced something profoundly sacred and holy. (15)	○	○	○	○	○	○
Experience of amazement. (16)	○	○	○	○	○	○
Feelings of tenderness and gentleness. (17)	○	○	○	○	○	○
Feelings of peace and tranquility. (18)	○	○	○	○	○	○
Experience of ecstasy. (19)	○	○	○	○	○	○
Sense of awe or awesomeness.	○	○	○	○	○	○

(20)						
Feelings of joy. (21)	○	○	○	○	○	○
Loss of your usual sense of time. (22)	○	○	○	○	○	○
Loss of your usual sense of space. (23)	○	○	○	○	○	○
Loss of usual awareness of where you were. (24)	○	○	○	○	○	○
Sense of being “outside of” time, beyond past and future. (25)	○	○	○	○	○	○
Being in a realm with no space boundaries. (26)	○	○	○	○	○	○
Experience of timelessness. (27)	○	○	○	○	○	○
Sense that the experience cannot be described adequately in words. (28)	○	○	○	○	○	○
Feeling that you could not do justice to your experience by describing it in	○	○	○	○	○	○

words. (29)						
Feeling that it would be difficult to communicate your own experience to others who have not had similar experiences. (30)	○	○	○	○	○	○

End of Block: MEQ-30

Start of Block: PIL-SR

In life I have:

- ○ 1 = No goals or aims at all (1)
- ○ 2 (2)
- ○ 3 (3)
- ○ 4 = Neutral (4)
- ○ 5 (5)
- ○ 6 (6)
- ○ 7 = very clear goals and aims (7)

My personal existence is

- 1 = Utterly meaningless without purpose (1)
- 2 (2)
- 3 (3)
- 4 = Neutral (4)
- 5 (5)
- 6 (6)
- 7 = very purposeful and meaningful (7)

In achieving life goals I have

- 1 = made no progress whatever (1)
- 2 (2)
- 3 (3)
- 4 = Neutral (4)
- 5 (5)
- 6 (6)
- 7 = progressed to complete fulfillment (7)

I have discovered

- 1 = no mission or purpose in life (1)
- 2 (2)
- 3 (3)
- 4 = Neutral (4)
- 5 (5)
- 6 (6)
- 7 = clear-cut goals and a satisfying life purpose (7)

End of Block: PIL-SR

Start of Block: OAS

Rate on a scale from 1 (Never) to 5 (Always) how common you experience the feeling described

	Never (1)	Rarely (2)	Sometimes (3)	Often (4)	Always (5)
Felt you needed to receive more attention or affection from a person you care about? (1)	○	○	○	○	○
Thought about how others see you? (2)	○	○	○	○	○
Thought about increasing or protecting your wealth or material possessions? (3)	○	○	○	○	○
Thought about how you could avoid experiencing discomfort? (4)	○	○	○	○	○
Felt the need for more attention or recognition? (5)	○	○	○	○	○
Thought about what someone you care about thinks of you? (6)	○	○	○	○	○
Thought about seeking pleasurable experiences? (7)	○	○	○	○	○

Felt uplifted when you were praised? (8)	○	○	○	○	○
Felt superior to others? (9)	○	○	○	○	○
Felt uplifted when you experienced financial or material gain? (10)	○	○	○	○	○
Felt good when you experienced fewer challenges? (11)	○	○	○	○	○
Felt elated when things were going well? (12)	○	○	○	○	○
Felt you needed to try harder in order to receive praise or avoid criticism? (13)	○	○	○	○	○
Felt you needed to do better in order to avoid shame or humiliation? (14)	○	○	○	○	○
Felt you needed more money or material possessions (15)	○	○	○	○	○

Felt an increasing need to occupy yourself to avoid being on your own? (16)	○	○	○	○	○
Felt an increasing need to do things that normally bring you pleasure (/comfort)? (17)	○	○	○	○	○
Found it hard to accept your mistakes and shortcomings? (18)	○	○	○	○	○
Found it hard to overcome rejection? (19)	○	○	○	○	○
Found it hard to give something away? (20)	○	○	○	○	○
Found it hard to live more simply? (21)	○	○	○	○	○
Felt low when you were criticized? (22)	○	○	○	○	○
Felt inferior to others? (23)	○	○	○	○	○
Felt low when you encountered financial or material loss? (24)	○	○	○	○	○

Felt low when you encountered difficult circumstances (25)	○	○	○	○	○
Stopped being kind to somebody you care about because they offended you? (26)	○	○	○	○	○
Felt worried about not being recognized after having acted in others' interests? (27)	○	○	○	○	○
Felt regret after having given a gift? (28)	○	○	○	○	○
Stopped helping others because it was causing discomfort or inconvenience? (29)	○	○	○	○	○
Felt regret about giving something away? (30)	○	○	○	○	○
Felt regret about doing something good for somebody? (31)	○	○	○	○	○

End of Block: OAS

Start of Block: PHQ-9

Over the last 2 weeks, how often have you been bothered by any of the following problems:

	Not at All (1)	Several Days (5)	More than half the days (2)	Nearly everyday (3)
Little interest or pleasure in doing things (1)	○	○	○	○
Feeling down, depressed, or hopeless (2)	○	○	○	○
Trouble falling or staying asleep, or sleeping too much (3)	○	○	○	○
Feeling tired or having little energy (4)	○	○	○	○
Poor appetite or overeating (5)	○	○	○	○
Feeling bad about yourself or that you are a failure or have let yourself or your family down (6)	○	○	○	○
Trouble concentrating on things, such as reading the newspaper or watching television (7)	○	○	○	○
Moving or speaking so slowly that other people could have noticed. Or the opposite	○	○	○	○

being so fidgety or restless that you have been moving around a lot more than usual (8)				
Thoughts that you would be better off dead, or of hurting yourself (9)	○	○	○	○

If you checked off any problems, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?

- ○ Not difficult at all (1)
- ○ Somewhat difficult (2)
- ○ Very difficult (3)
- ○ Extremely difficult (4)

End of Block: PHQ-9

Start of Block: GAD-7

Over the last two weeks, how often have you been bothered by the following problems:

	Not at all (1)	Several days (2)	More than half the days (3)	Nearly everyday (4)
Feeling nervous, anxious, or on edge (1)	○	○	○	○
Not being able to stop or control worrying (2)	○	○	○	○
Worrying too much about different things (3)	○	○	○	○
Trouble relaxing (4)	○	○	○	○
Being so restless that it is hard to sit still (5)	○	○	○	○
Becoming easily annoyed or irritable (6)	○	○	○	○
Feeling afraid, as if something awful might happen (7)	○	○	○	○

If you checked any problems, how difficult have they made it for you to do your work, take care of things at home, or get along with other people?

- ○ Not difficult at all (1)
- ○ Somewhat difficult (2)
- ○ Very difficult (3)
- ○ Extremely difficult (4)

End of Block: GAD-7

Annex B – Cronbach's α for the Scales

Annex B1 - Cronbach's α for the MEQ30

Figure B1.1 – Internal Consistency (α) for Transcendence (MEQ30)

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.778	.784	6

Figure B1.2 – Internal Consistency (α) for Positive Mood (MEQ30)

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.773	.779	6

Figure B1.3 – Internal Consistency (α) for Mystical (MEQ30)

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.896	.897	14

Figure B1.4 – Internal Consistency (α) for Ineffability (MEQ30)

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.744	.745	3

Annex B2 – Cronbach's α for the Ontological Addiction Scale (OAS31)

Figure B2.1 – Internal Consistency (α) for Dysphoria (OAS31)

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.792	.793	4

Figure B2.2 – Internal Consistency (α) for Euphoria (OAS31)

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.632	.629	5

Figure B2.3 – Internal Consistency (α) for Relapse (OAS31)

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.776	.781	6

Figure B2.4 – Internal Consistency (α) for Salience (OAS31)

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.775	.774	7

Figure B2.5 – Internal Consistency (α) for Tolerance (OAS31)

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.767	.765	5

Figure B2.6 – Internal Consistency (α) for Withdrawal (OAS31)

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.719	.717	4

Figure B3 – Cronbach's α for the PIL-SF

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.863	.863	4

Figure B4 – Cronbach's α for the PHQ9

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.691	.699	10

Figure B5 – Cronbach's α GAD7

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.913	.913	8

Annex C – Normality of the scales

Annex C1 – MEQ30 Subscale normality

Figure C1.1 – Normality for Ineffability

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
IneffabilityMean	.162	124	<.001	.887	124	<.001

a. Lilliefors Significance Correction

Figure C1.2 – Normality for Mystical

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
MysticalMean	.138	124	<.001	.952	124	<.001

a. Lilliefors Significance Correction

Figure C1.3 – Normality for Positive Mood

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
PositiveMoodMean	.093	124	.011	.956	124	<.001

a. Lilliefors Significance Correction

Figure C1.4 – Normality for Transcendence

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
TranscendenceMean	.107	124	.001	.937	124	<.001

a. Lilliefors Significance Correction

Annex C2 – OAS31 Normality

Figure C2.1 – Normality for Dysphoria

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
DysphoriaOAS	.094	217	<.001	.981	217	.004

a. Lilliefors Significance Correction

Figure C2.2 – Normality for Euphoria

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
EuphoriaOAS	.100	217	<.001	.967	217	<.001

a. Lilliefors Significance Correction

Figure C2.3 – Normality for Relapse

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
RelapseOAS	.100	217	<.001	.970	217	<.001

a. Lilliefors Significance Correction

Figure C2.4 – Normality for Salience

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
SalienceOAS	.094	217	<.001	.972	217	<.001

a. Lilliefors Significance Correction

Figure C2.5 – Normality for Tolerance

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
ToleranceOAS	.098	217	<.001	.985	217	.025

a. Lilliefors Significance Correction

Figure C2.6 – Normality for Withdrawal

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
WithdrawlOAS	.114	217	<.001	.981	217	.006

a. Lilliefors Significance Correction

Figure C3 – Normality for PIL-FS

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
PILMean	.094	217	<.001	.954	217	<.001

a. Lilliefors Significance Correction

Figure C4 – Normality for PHQ9

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
PHQ9Mean	.081	217	.001	.972	217	<.001

a. Lilliefors Significance Correction

Figure C5 – Normality for GAD7

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
GAD7Mean	.132	217	<.001	.904	217	<.001

a. Lilliefors Significance Correction

Annex D – Correlations between variables

Figure D1 – Correlation table between variables

Nonparametric Correlations

Correlations

			MEQMeanTotal	PHQ9Mean	GAD7Mean	PILMean	OASMeanTotal
Spearman's rho	MEQMeanTotal	Correlation Coefficient	1.000	-.172	-.135	.236**	-.030
		Sig. (2-tailed)	.	.056	.135	.008	.741
		N	124	124	124	124	124
	PHQ9Mean	Correlation Coefficient	-.172	1.000	.602**	-.384**	.368**
		Sig. (2-tailed)	.056	.	<.001	<.001	<.001
		N	124	217	217	217	217
	GAD7Mean	Correlation Coefficient	-.135	.602**	1.000	-.363**	.537**
		Sig. (2-tailed)	.135	<.001	.	<.001	<.001
		N	124	217	217	217	217
	PILMean	Correlation Coefficient	.236**	-.384**	-.363**	1.000	-.272**
		Sig. (2-tailed)	.008	<.001	<.001	.	<.001
		N	124	217	217	217	217
	OASMeanTotal	Correlation Coefficient	-.030	.368**	.537**	-.272**	1.000
		Sig. (2-tailed)	.741	<.001	<.001	<.001	.
		N	124	217	217	217	217

**. Correlation is significant at the 0.01 level (2-tailed).

Annex E – Teste Mann-Whitney para Consumo de Psicadélicos

Annex E.1 – Mann-Whitney Test: comparison of consumers and non-consumers

Figure E1.1 – Mann-Whitney Consumers-Withdrawal

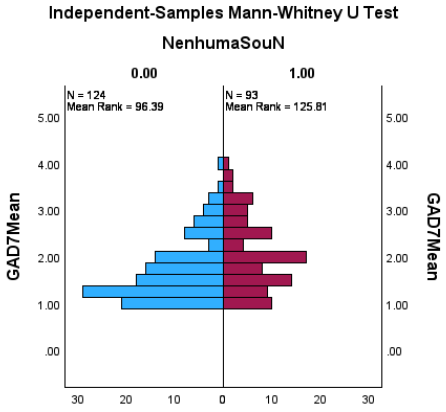
WithdrawlOAS across NenhumaSouN

Independent-Samples Mann-Whitney U Test Summary	
Total N	217
Mann-Whitney U	6769.000
Wilcoxon W	11140.000
Test Statistic	6769.000
Standard Error	454.911
Standardized Test Statistic	2.205
Asymptotic Sig.(2-sided test)	.027

Figure E1.2 – Mann-Whitney Consumers-GAD7

GAD7Mean across NenhumaSouN

Independent-Samples Mann-Whitney U Test Summary	
Total N	217
Mann-Whitney U	7329.500
Wilcoxon W	11700.500
Test Statistic	7329.500
Standard Error	456.231
Standardized Test Statistic	3.427
Asymptotic Sig.(2-sided test)	<.001



Annex E.2 – Mann-Whitney Test for Ayahuasca

Figure E2.1 – Mann-Whitney Ayahuasca - Saliência (OAS31)

SalienceOAS across AyahuascaSouN

Independent-Samples Mann-Whitney U Test Summary

Total N	217
Mann-Whitney U	1794.500
Wilcoxon W	2172.500
Test Statistic	1794.500
Standard Error	304.216
Standardized Test Statistic	-2.533
Asymptotic Sig.(2-sided test)	.011

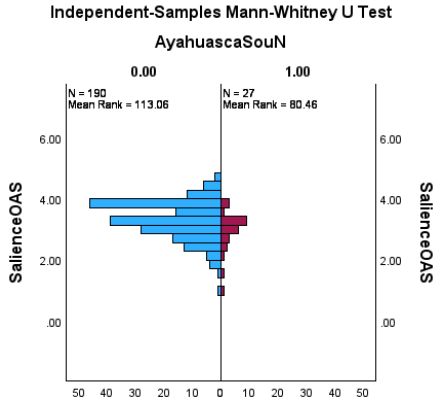


Figure E2.2 - Mann-Whitney Ayahuasca - Withdrawal (OAS31)

WithdrawlOAS across AyahuascaSouN

Independent-Samples Mann-Whitney U Test Summary

Total N	217
Mann-Whitney U	1831.500
Wilcoxon W	2209.500
Test Statistic	1831.500
Standard Error	303.412
Standardized Test Statistic	-2.418
Asymptotic Sig.(2-sided test)	.016

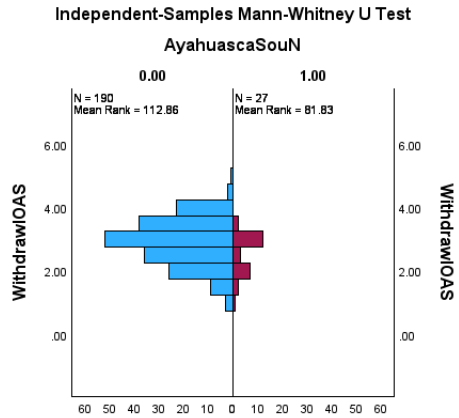


Figure E2.3 – Mann-Whitney Ayahuasca - PIL

PILMean across AyahuascaSouN

Independent-Samples Mann-Whitney U Test Summary

Total N	217
Mann-Whitney U	3277.500
Wilcoxon W	3655.500
Test Statistic	3277.500
Standard Error	304.503
Standardized Test Statistic	2.340
Asymptotic Sig.(2-sided test)	.019

Figure E2.4 – Mann-Whitney Ayahuasca -PHQ9

PHQ9Mean across AyahuascaSouN

Independent-Samples Mann-Whitney U Test Summary

Total N	217
Mann-Whitney U	1644.500
Wilcoxon W	2022.500
Test Statistic	1644.500
Standard Error	304.785
Standardized Test Statistic	-3.020
Asymptotic Sig.(2-sided test)	.003

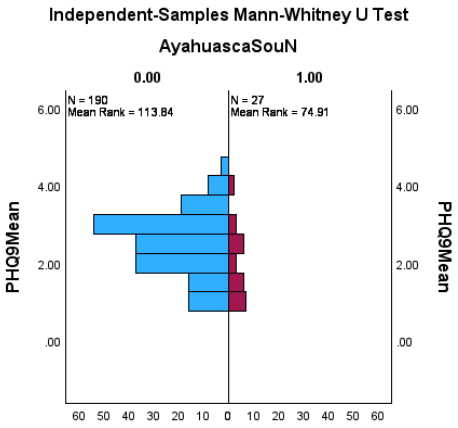


Figure E2.5 – Mann-Whitney Ayahuasca - GAD7

GAD7Mean across AyahuascaSouN

Independent-Samples Mann-Whitney U Test Summary

Total N	217
Mann-Whitney U	1610.000
Wilcoxon W	1988.000
Test Statistic	1610.000
Standard Error	304.293
Standardized Test Statistic	-3.138
Asymptotic Sig.(2-sided test)	.002

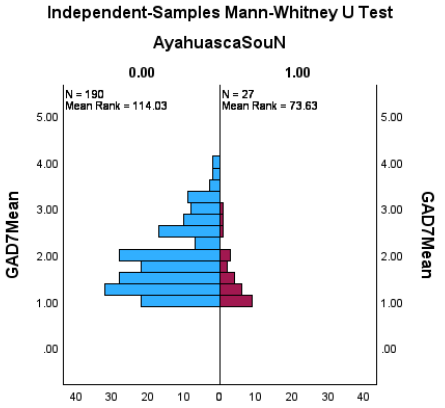


Figure E2.6 – Mann-Whitney Ayahuasca- MEQ30

MEQMeanTotal across AyahuascaSouN

Independent-Samples Mann-Whitney U Test Summary

Total N	124
Mann-Whitney U	2008.500
Wilcoxon W	2386.500
Test Statistic	2008.500
Standard Error	165.137
Standardized Test Statistic	4.233
Asymptotic Sig.(2-sided test)	<.001

Annex F – Kruskal-Wallis Test for Gender differences

Figure F.1 – Kruskal-Wallis Gender-Dysphoria (OAS31)

DysphoriaOAS across Which gender appropriately describes you?

Independent-Samples Kruskal-Wallis Test Summary

Total N	217
Test Statistic	9.344[a]
Degree Of Freedom	3
Asymptotic Sig.(2-sided test)	.025

a. The test statistic is adjusted for ties.

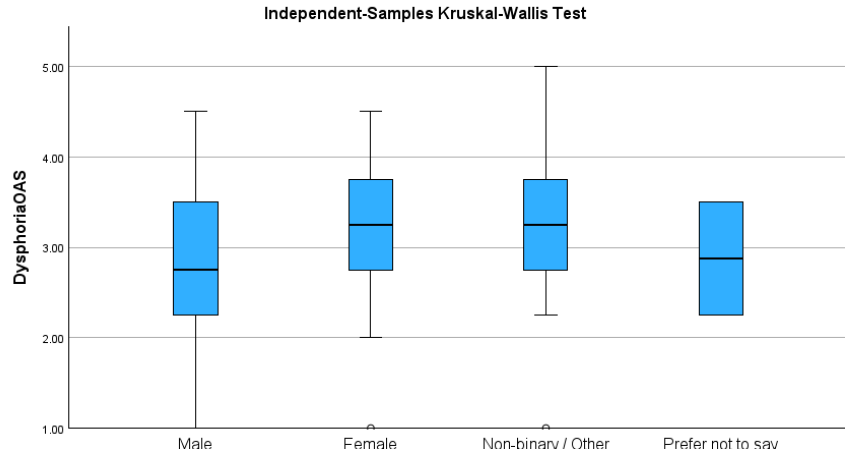


Figure F.2 – Kruskal-Wallis Gender-Relapse (OAS31)

RelapseOAS across Which gender appropriately describes you?

Independent-Samples Kruskal-Wallis Test Summary

Total N	217
Test Statistic	7.871[a]
Degree Of Freedom	3
Asymptotic Sig.(2-sided test)	.049

a. The test statistic is adjusted for ties.

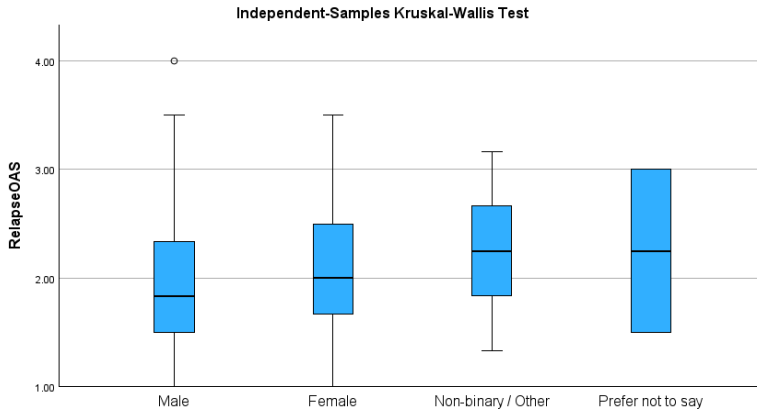


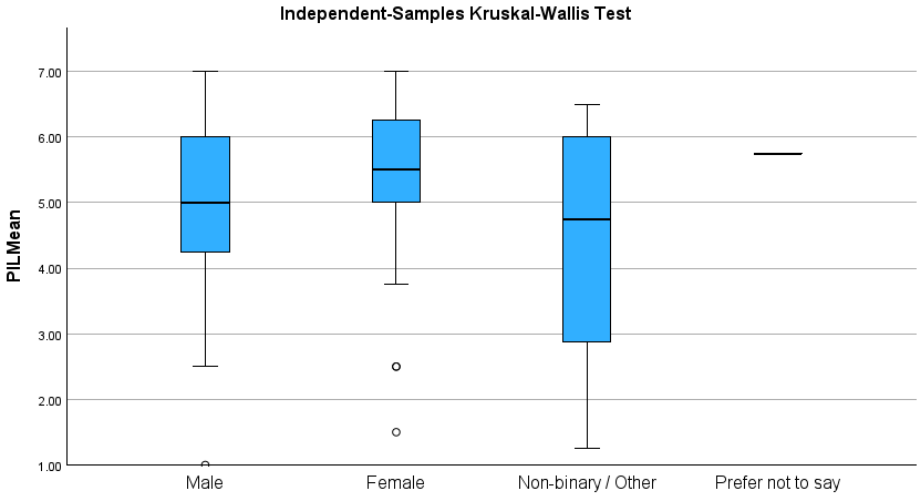
Figure F.3 – Kruskal-Wallis Gender-PIL

PILMean across Which gender appropriately describes you?

Independent-Samples Kruskal-Wallis Test Summary

Total N	217
Test Statistic	9.835[a]
Degree Of Freedom	3
Asymptotic Sig.(2-sided test)	.020

a. The test statistic is adjusted for ties.



Annex G – Mann-Whitney Test for Religious Differences

Anexo G.1 – Mann-Whitney for Atheism

Figure G1.1 – Mann-Whitney Atheism-PIL

Independent-Samples Mann-Whitney U Test Summary

Total N	217
Mann-Whitney U	3926.000
Wilcoxon W	6204.000
Test Statistic	3926.000
Standard Error	426.202
Standardized Test Statistic	-2.579
Asymptotic Sig.(2-sided test)	.010

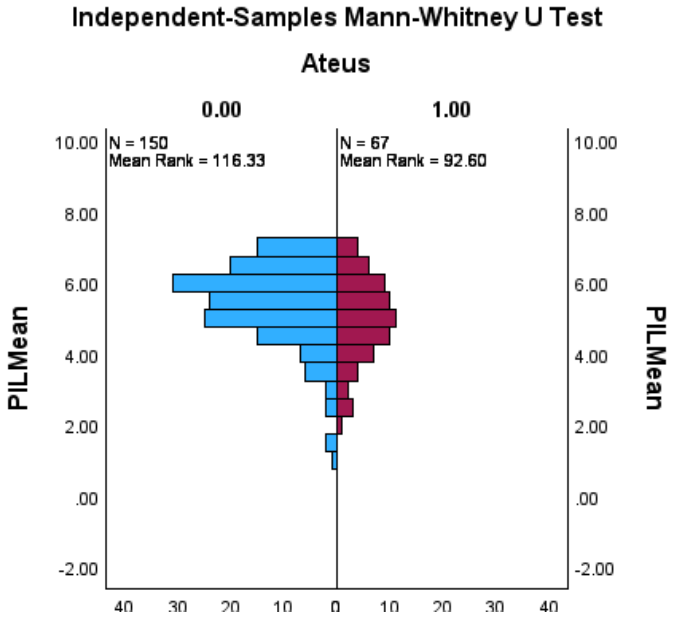


Figure G2.2 – Mann-Whitney Atheism-MEQ30

Independent-Samples Mann-Whitney U Test Summary

Total N	124
Mann-Whitney U	1121.500
Wilcoxon W	1862.500
Test Statistic	1121.500
Standard Error	184.467
Standardized Test Statistic	-2.778
Asymptotic Sig.(2-sided test)	.005

Anexo G2 – Mann-Whitney for Buddhism

Figure F2.1 – Mann-Whitney Buddhism-OAS31

Independent-Samples Mann-Whitney U Test Summary

Total N	217
Mann-Whitney U	686.500
Wilcoxon W	777.500
Test Statistic	686.500
Standard Error	219.415
Standardized Test Statistic	-2.915
Asymptotic Sig.(2-sided test)	.004

Figure G2.2 – Mann-Whitney Buddhism-GAD7

Independent-Samples Mann-Whitney U Test Summary

Total N	217
Mann-Whitney U	772.000
Wilcoxon W	863.000
Test Statistic	772.000
Standard Error	218.786
Standardized Test Statistic	-2.532
Asymptotic Sig.(2-sided test)	.011