

Do Heightened Creative and Cognitive Traits Predict Greater Openness Toward Psilocybin Applications? An Empirical Investigation

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Abstract

Psilocybin is a psychedelic compound, largely investigated for its potential positive properties regarding mental health and creative cognition. While theoretical frameworks cover primarily the effects on human cognition post-psilocybin administration, the psychological predispositions before even any administration occurs remain under-researched. Consequently, this research aims to identify possible correlations between cognitive traits and potential openness to hypothetical psilocybin application, as it profoundly helps to determine potential target population in further clinical research. This study utilized an online questionnaire to explore the relationships between cognitive traits (e.g. Perceived Creative Identity, Cognitive Flexibility, Divergent Thinking, Vivid Visual Imagery, Synesthetic Sensory Blending) and Individual Openness toward psilocybin applications in a sample of mostly creative individuals ($N = 34$). The questionnaire also integrated various items to measure participants' Baseline Awareness about the substance and Moral Acceptance. Results yielded a non-significant relationship between enhanced creativity scores and openness to psilocybin ($r = -0.21$). Instead, Moral Acceptance ($r = 0.42$) and Baseline Awareness ($r = 0.41$) emerged as the primary predictors of interest in psilocybin. Ultimately, these findings indicate that the link between creative potential and psychedelic openness is built rather through the deconstruction of ethical stigmas and fostering factual awareness, than through cognitive ability.

Key words: psilocybin; creative cognition; cognitive neuroscience; divergent thinking; predictors of psychedelic openness; moral attitudes

1 Introduction

Psychedelic substances have recently emerged as a primary focus of clinical research and are continually being investigated for their proposed beneficial properties within mental health in adult humans. While often associated with modern psychiatry, the very first studies linking psychedelics and mental health can be traced back to the mid-20th century (Nichols, 2020). Long before this, these substances were utilized in the Aztec culture for centuries in spiritual and religious rituals as sacred tools for altering consciousness (Nichols, 2020). This implies that through psychedelic research we are not just discovering new substances, rather, we are unveiling the dormant psychological mechanisms that have shaped human consciousness for millennia, and we are rediscovering the profound human capacity for cognitive and spiritual expansion.

One of the most typical psychedelic compounds is psilocybin, which is the subject of this research. Numerous studies have already tried to explore the underlying neurobiological

mechanisms of this substance in context of its therapeutic potential in treating a number of brain disorders (e.g. depression, addiction, anxiety). However, further research exploring this substance from various perspectives remains insufficient, as it primarily focuses on finding solutions for clinical deficits, rather than on enhancing the natural cognitive potential existing within all of us humans. In simpler terms, we tend to overly focus on what is 'broken' or lacking, instead of devoting more attention to cultivating our already present natural capabilities to their fullest potential.

Creativity is a part of every human being and can be considered one of the most essential cognitive abilities in our everyday life. It allows us to create originally, think divergently, and live authentically. While a large number of anecdotal reports suggest a link between creativity enhancement and psychedelic-induced alterations, scientific evidence is lacking. Consequently, this quantitative study aims to examine psilocybin from rather a psychological perspective, beyond clinical deficit model, identifying correlations between generally known neurobiological mechanisms of this compound and cognitive traits (divergent thinking, cognitive flexibility, vivid visual imagery) along with creative capacities in adult humans.

2 Aim and Hypotheses

One of the most common associations when it comes to psychedelics is the link to creativity and enhanced cognitive performance. These associations are likely attributable to the general ability of psychedelics to exert and support ideational fluency and generation of novel associations (Kuypers et al., 2016; Nichols, 2016). The main purpose of this research is to explore this link and indicate whether enhanced creative and artistic potential can be considered a predictor of greater openness to psilocybin and, therefore, whether individuals who naturally exhibit heightened artistic tendencies are more predisposed or inclined to express interest in exploring consciousness and altered states of mind that may be induced by psilocybin. In this study, three main hypotheses are proposed:

H1) Individuals with higher traits of Synesthetic Sensory Blending and Vivid Visual Imagery will demonstrate more favorable attitudes toward hypothetical psilocybin applications.

H2) High interest in hypothetical psilocybin applications will be associated with significantly higher scores in Divergent Thinking and Cognitive Flexibility.

H3) Lower engagement in creative/artistic activities will correlate and correspond with a decrease in openness toward psilocybin-assisted interventions.

3 Literature review

3.1 Background and Therapeutic Potential

Psilocybin (4-phosphoryloxy-N,N-dimethyltryptamine) is a serotonergic hallucinogenic (psychedelic) compound that alters and affects several cognitive processes (Nichols, 2016). Despite being reported to have the most favorable safety profile of all psychedelics, and reports indicating no risk of addiction development, further research remains essential to prevent the oversight of potential and unknown adverse effects (Hendricks et al., 2015). Numerous studies suggest that psychedelics may be efficient in treating alcohol dependence (Krebs and Johansen, 2012), and obsessive-compulsive disorder (Moreno et al., 2006). According to study conducted by Hendricks et al. (2015) using PET imaging, lifetime use of psilocybin (but no other psychedelic compound) may be especially

beneficial regarding psychological distress and suicidality. Furthermore, the findings suggest that psilocybin may hold promise as an innovative mental health intervention and suicide prophylaxis.

In Aztec culture, it was referred to as *teonanácatl* (flesh of the gods), emphasizing its long-standing status as a sacred tool for altering consciousness (Nichols, 2020). Psilocybin is often commonly referred to as „magic mushrooms“ and can be found naturally in numerous species of fungi (basidiomycetes). This type of fungi contain the alkaloid psilocybin that acts as a prodrug and after consumption it is rapidly dephosphorylated into psilocin (Nichols, 2016). Secondary metabolites from fungi (including psilocybin) have been recognized for their anti-infective and anticancer properties, along with treatment of central nervous system (CNS) diseases, including addiction, anxiety, and depression (Nichols, 2020). Regarding major depressive disorder, two administrations of psilocybin coupled with psychotherapy are reported to exhibit rapid and enduring antidepressant effects in comparison with typical SSRI treatments that can take months for the effects to emerge (Doss et al., 2021).

3.2 Cellular and Molecular Mechanisms

3.2.1 Pyramidal Cells

Pyramidal cells are primary excitatory glutamatergic neurons of the prefrontal cortex (the area most associated with executive function along with creative thinking) and constitute approximately 70–85% of the neuronal population in the neocortex, while being similarly vital components of the hippocampus and amygdala (Bekkers, 2011). They are characterized by a triangular soma, multiple basal dendrites responsible for cognition, memory, motor control (Bekkers, 2011), and a prominent apical dendrite that extends toward the cortical surface (Feldmeyer, 2015). 5-HT_{2A} receptors are found in the mammalian neocortex, with their highest expression on the apical dendrites of layer V pyramidal cells (Aghajanian & Marek, 1999; Bekkers, 2011).

3.2.2 Partial 5-HT_{2A} Agonism

Psychedelic substances are known to exert their effects primarily by a partial agonist action on 5-HT_{2A} receptors – which are the primary excitatory receptors for serotonin (5-hydroxytryptamine) (Nichols, 2016). Psilocybin-induced 5-HT_{2A} agonism promotes a state of metaplasticity by up-regulating BDNF (Brain-Derived Neurotrophic Factor) and enhancing glutamatergic signaling at NMDA (N-methyl-D-aspartate) receptors (Nichols, 2016). This process facilitates synaptogenesis and reopens critical periods of neurodevelopment, resulting in a prolonged window of heightened cognitive flexibility along with altered perception and cognition (Lowe et al., 2021). Altered perception and cognition occurs due to high distribution of 5-HT_{2A} receptors in high-level association regions such as the medial prefrontal cortex (mPFC) and posterior cingulate cortex (PCC) (Carhart-Harris et al., 2014). The lowest distribution of 5-HT_{2A} is known to be in the primary motor cortex, which explains why motor action is generally not affected by psychedelics (Carhart-Harris et al., 2014).

3.3. Systems Neuroscience and Cognitive Architecture

3.2.3 Increased Neural Entropy

Entropy is a dimensionless quantity utilized for measuring uncertainty and the degree of randomness (or disorder) in a system (Ben-Naim, 2012). According to Karl Friston's free-energy principle, it is assumed that during normal waking consciousness, the human mind has evolved by default to interpret the environment and sense of reality as precisely as possible, therefore, to minimize the aspect of uncertainty (i.e., entropy) (Friston, 2010; Carhart-Harris et al., 2014). This theory is consistent with the occurrence of heightened entropy during states such as REM sleep and psychedelic state, rather than during normal waking consciousness (Carhart-Harris et al., 2014). Carhart-Harris et al.'s entropic brain hypothesis (2014) proposes that any conscious state is remarkably dependent on, and resultant from, the level of system's entropy. This hypothesis is supported by data of BOLD fMRI study (Carhart-Harris et al., 2012) that aimed to measure connectivity variance within nine canonical networks (Smith et al. 2009) pre and post psilocybin administration. Findings of the conducted study reported no change in individuals who were administered placebo, whilst indicating significantly elevated network entropy stemming from psilocybin, within high-level association networks (whereas sensory and motor networks remained stable). Taking this study as evidence, psilocybin-induced alterations are linked and attributable to a high-entropy state of consciousness (Carhart-Harris et al., 2014). In the state of increased network entropy, the sequence of connectivity motifs becomes significantly less predictable (Petri et al., 2014), providing neurobiological framework for the emergence of novel associations, cross-modal integration, and heightened creativity observed during psychedelic-induced state of altered consciousness (Carhart-Harris et al., 2014).

The partial agonism of 5-HT_{2A} receptors, mentioned in the previous section, causes temporary disintegration of the Default Mode Network (DMN), resulting in increased neural entropy (Carhart-Harris et al., 2014). In accordance with the REBUS model (Relaxed Beliefs Under Psychedelics), this state allows for the revision of rigid beliefs (Zeifman et al., 2025), suggesting increased neural plasticity (Grieco et al., 2022). Likewise, the REBUS model propounds promising findings after four weeks post-psilocybin administration (25mg), in context of significant reduction in pessimism, hopelessness, and negative self-belief (Zeifman et al., 2025). Therefore, it is relevant to consider the findings as tentative evidence for psilocybin's potential positive psychological outcomes supported and fueled by increased neural entropy (Zeifman et al., 2025).

3.2.4 The Default Mode Network

The DMN represents the ego's usual hold on reality. While it is reported to exhibit enhanced activity during passive task states and is associated with convergent thinking and internal monitoring, its downregulation is what allows for the unconstrained idea generation seen in divergent thinking (Carhart-Harris et al., 2012; Carhart-Harris et al., 2014). The DMN consists of widely distributed regions in the parietal, temporal, and frontal cortex – the areas that demonstrate decreased activity during attention-demanding tasks and increased activity in complex cognition (memory, abstract thought) (Smallwood et al., 2021). DMN plays a significant role in self-reflective and introspective functions, and its overactivity often leads to substantially increased trait neuroticism (Andrews-Hanna et al., 2012) and depressive rumination (Berman et al., 2011). The theory that DMN's primary function is to support metacognition (Carhart-Harris et al., 2014) corresponds with the phenomenon of „depressive realism“ that was originally proposed by Alloy and Abramson (1979). Generally, classic psychedelic compounds are known to acutely decrease functional connectivity with the DMN, while increasing between-network connectivity (Nichols, 2016;

Lebedev et al., 2015; Gattuso et al., 2022). Results of the study conducted by Carhart-Harris et al. (2012) using arterial spin labeling (ASL) perfusion fMRI propose that psilocybin decreases cerebral blood flow (CBF) and oscillatory power within the DMN's core hubs – the mPFC and PCC. Moreover, these findings suggest that by reducing the metabolic dominance of the DMN, psilocybin facilitates a shift toward unconstrained cognition, explorative thinking and novel, divergent associations, due to significantly increased cross-network communication (Carhart-Harris et al., 2014).

3.2.5 The Medial Temporal Lobes and Their Decoupling from the DMN

The medial temporal lobe (MTL) consists of the amygdaloid complex, the hippocampal formation, and the parahippocampal region (Frankó et al., 2012), while a proliferation of data proposes its key role in cognitive processes like memory, social behavior, and spatial navigation (Squire et al., 2004; Amaral, 2003). The MTL is also defined as the combination of the parahippocampal region and hippocampus (Frankó et al., 2012), which are paramount areas for the formation of declarative memories (Squire et al., 2004). According to Andrews-Hanna et al. (2010), the MTL is rather a primary subsystem within the broader DMN than simply a separate structure. Andrews-Hanna et al. (2010) furthermore suggest that the MTL functions in close coordination with the DMN, implying that the MTL-DMN coupling is the core aspect of metacognition and, therefore, essential for maintaining normal waking consciousness in adult humans. However, enormous range of scientific evidence proposes that during psilocybin experience, the MTL-DMN functional coupling notably decreases, facilitating the emergence of unconstrained mental imagery (Carhart-Harris et al., 2014). The MTL-DMN decoupling is consistent with a reduction in high-level priors and autobiographical constraints on cognition, potentially leading to more unconstrained mode of conscious experience (Carhart-Harris et al., 2014).

3.2.6 The Locus Coeruleus and the Breakdown of Latent Inhibition

The Locus Coeruleus (LC) (also referred to as „blue spot“) is a relatively small nucleus in the brainstem, serving as the primary source of the neurotransmitter norepinephrine (noradrenaline) in the central nervous system (CNS) (Caestecker et al., 2025). It is vital to emphasize the LC-NE system's critical involvement in the integration of multimodal information and in the widespread regulation of brain states and behavior (Schwarz et al., 2015, Caestecker et al., 2025). The release of norepinephrine is paramount for regulating and mediating numerous cognitive processes, while psilocybin is reported to disrupt the norepinephrine-mediated signaling by altering the activity in the LC, potentially inducing a more stimulus-responsive state, characterized by reduced tonic activity, along with enhanced phasic responses to sensory stimuli (Schwarz et al., 2015; Nichols, 2016, Rasmussen & Aghajanian, 1986). Phasic noradrenergic bursts are thought to exert task-relevant focus and improve cognitive performance by increasing signal-to-noise ratio (SNR), hence facilitating the detecting process of certain neural signals (Caestecker et al., 2025). SNR is a process largely modulated by the LC-NE activity and refers to the brain's ability to distinguish relevant stimuli from irrelevant background activity (Welvaert & Rosseel, 2013).

However, psilocybin-induced alterations may dysregulate this mechanism, reducing the effective filtering and, therefore, allowing previously irrelevant stimuli to be processed, which may potentially contribute to decreased latent inhibition (Carhart-Harris et al., 2014; Spitzer et al., 1996, Miller et al., 2022). Latent inhibition (LI) is a cognitive inhibitory mechanism, in which stimuli that were previously experienced as irrelevant are subsequently processed less (Miller et al., 2022). While reductions in LI have been generally associated with the tendency towards psychosis, Carson et al. (2003) propose that decrease in LI might also be related to individual's heightened creative and cognitive abilities,

particularly in combination with high IQ. The study suggests that high lifetime creative achievers were approximately 7 times more likely to have lower LI scores, compared to low creative achievers. The findings imply that individuals exhibiting enhanced cognitive flexibility, divergent thinking, and creativity, also tend to have significantly lower LI scores, enabling novel associations and unconstrained cognition. Notably, more evidence postulates that low LI scores are also linked to the personality trait Openness to Experience, which has been consistently associated with trait creativity and divergent thinking, along with creative achievement (Carson et al., 2003; Peterson, Smith, & Carson, 2002; McCrae, 1987). Altogether, these implications are consistent with the subject of this research, suggesting partial overlap with cognitive mechanisms and features observed during psilocybin-induced alterations.

3.2.7 Psychoplastogens and Synaptic Plasticity in Ego Dissolution

Ego dissolution (disintegration) has been described as the experience of perceived union with nature (or a higher power), the loss of boundaries between the subjective and objective world, and the breakdown of one's sense of self (Lebedev et al., 2015; Stolicker et al., 2022). As formerly mentioned, DMN denotes the usual sense of ego and, therefore, the DMN's disintegration reported during psychedelic experience contributes to the widely recognized phenomenon of ego dissolution. Study conducted by Tagliazucchi et al. (2016) suggests that the increase in global connectivity induced by LSD correlated with subjective reports of ego dissolution, presumably proving the link between psychedelics and ego dissolution. Another study conducted by Subramani et al. (2026) identifies the DMN reorganization during psychedelic-induced state (particularly LSD) as a neural correlate of ego disintegration. Furthermore, the findings of this study provide electrophysiological evidence that this disintegration emerges from a frequency-dependent relaxation of structural constraints on brain activity, specifically involving the gamma-band decoupling of core DMN regions.

Since ego dissolution is generally thought to reduce precision of previously held beliefs, it has been hypothesized that this phenomenon can be considered therapeutic (Gattuso et al., 2023; Stolicker et al., 2022). Moreover, this disintegration of the self-concept creates a window of opportunity for profound neural organization, which is a process fundamentally driven by psilocybin's classification as a psychoplastogen (Carhart-Harris et al., 2014; Olson, 2018). Psychoplastogens are neurotherapeutic compounds that rapidly induce neuroplasticity after a single dose, leading to long-lasting changes in behavior, tentatively proposing a new approach to treating brain disorders (Olson, 2018; Grieco et al., 2022).

In the context of neural plasticity, it is vital to mention two frequency-dependent mechanisms, the long-term potentiation (LTP), and the long-term depression (LTD). LTP may facilitate the process of indelibly imprinting novel and divergent ideas into one's memory, as it is the activity-dependent long-lasting enhancement of synaptic efficacy (Abraham et al., 2024). N-methyl-D-aspartate (NMDA) glutamate receptors are known to be vital for the induction of LTP, without contributing to basal synaptic transmission (Abraham et al., 2024). As previously mentioned, psilocybin is known to exert the glutamatergic signaling at NMDA receptors via 5-HT_{2A} partial agonism, leading to heightened state of metaplasticity (Nichols, 2016).

Simultaneously, LTD may facilitate the process of unlearning of rigid and maladaptive thought patterns by weakening the synaptic efficacy (Collingridge et al., 2010; Wang, 2023). The induction of LTD is known to be modulated primarily by calcium signaling, however, it can also occur and be modulated by metabotropic glutamate receptors (mGluRs), NMDA receptors, dopamine receptors, serotonin (5-HT) receptors, and norepinephrine (Wang, 2023). Both LTD and LTP are thought to play crucial roles in learning, memory, and overall

brain function (Wang, 2023; Lømo, 2025). These frequency-dependent mechanisms propose that the expanded perspective obtained during ego dissolution is not a transient state, but a lasting structural reorganization of the brain's creative and cognitive capacities.

4 Methodology

4.1 Materials and Measures

This quantitative study utilized an online survey in order to gather primary data via subjective self-report scales. The survey instrument underwent several rounds of pre-testing by the lead researcher to ensure technical functionality, logical flow, and prevent participant fatigue. The survey consisted of 31 researcher-developed items in total, with 27 questions being measured using 5-point Likert scale (1 = Strongly Disagree; 5 = Strongly Agree). The remaining items consisted of an optional open-ended qualitative question, and demographic inquiries. To prevent response bias and ensure internal validity, seven reverse-scored items were strategically integrated into the survey. The survey was structured to measure the following aspects:

4.1.1 Creativity and Artistic Engagement

Firstly, an artistic profile of each participant was developed and assessed through a multi-part scale. Participants initially identified their primary creative domains and the frequency of their practice. Subsequently, Perceived Creative Identity was measured using 5 items on a 5-point Likert scale.

4.1.2 Cognitive and Imaginative Traits

Moreover, this section of the survey focused primarily on five distinct psychological domains: Cognitive Flexibility, Novelty Seeking, Divergent Thinking, Vivid Visual Imagery, and Synesthetic Sensory Blending. Each of these five variables was measured via 3 survey items, using a 5-point Likert scale. It is crucial to note that these scales were designed to capture subjective self-assessment and self-concept rather than objective cognitive performance.

4.1.3 Attitudes Toward Psilocybin

Finally, the last section of the survey measured participants' attitudes toward psilocybin and its potential applications in therapeutic or recreational settings, under controlled regulation. To ensure that all the items regarding psilocybin were properly understood, participants were presented with a brief contextual summary of this substance, which included key definitions and its status in clinical research. Thereafter, three primary variables were assessed:

- **Baseline Awareness** and prior knowledge regarding psilocybin,
- **Moral Acceptance** and perceived moral stigma in context of psychedelic research,
- **Scientific Value and Individual Openness**, assessing participants' personal willingness to consider hypothetical psilocybin applications in a controlled setting

Notably, one optional, open-ended qualitative item was included to capture participants' immediate word associations with psilocybin, aiming to identify common themes and linguistic patterns that might provide deeper context for the quantitative attitude scores.

4.2 Materials and Measures

The study employed a convenience sampling method, resulting in a final sample of 34 participants ($N = 34$). The majority of participants (88%) consisted of young adults, primarily students, aged from 18-25. Of the total population, 79% ($n = 27$) identified as female, 18% ($n = 6$) as male, and 3% ($n = 1$) preferred not to identify the gender. Recruitment was conducted via social media platforms and academic networks. Inclusion criteria required participants to be at least 18 years of age. Before data collection, all respondents were informed about the voluntariness and anonymity of their participation. Notably, the recruited sample demonstrated already high baseline for perceived creative self-concept ($M = 3.91$, $SD = 0.89$), suggesting a high degree of homogeneity. Participants were most engaged in Visual Arts (73.5%), followed by Literary Arts (50%), and Auditory Arts (44.1%), (see Figure 1). It is important to emphasize that participants were able to select multiple options in this particular survey item. On average, participants reported active engagement in 2.7 different artistic domains.

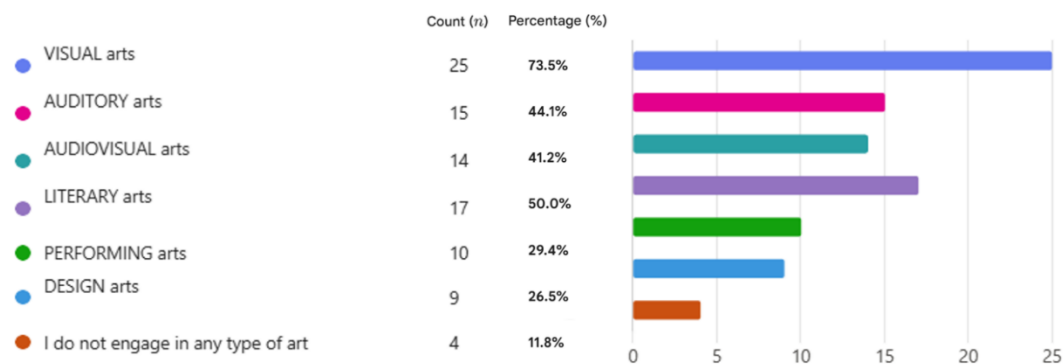


Figure 1.
Artistic Engagement Across the Sample

Participants were asked to indicate all types of art they engage in. Percentages reflect the proportion of the total sample ($N = 34$) involved in each discipline, with many participants reporting engagement in multiple categories. Visual arts emerged as the most prominent discipline (73.5%).

4.3 Ethical Statement

Participation was entirely voluntary and all respondents were informed beforehand about the utter anonymity and confidentiality, as the survey did not collect any personal or identifying information. Respondents were free to withdraw the participation in the survey at any time with no consequences. Due to ethical considerations surrounding psilocybin, the participation was restricted to individuals aged 18 or older. This study did not involve any administration, encouragement, or endorsement of psychedelic substances. Respondents were not asked about current or past drug use. The study's objectives are strictly educational and exploratory, with no intent to promote any substance use.

5 Results

The intercorrelations between all primary study variables, including means and standard deviations, are presented in Table 1.

Descriptive statistics indicate a sample with a high baseline for Perceived Creative Identity ($M = 3.91$, $SD = 0.89$) and Novelty Seeking ($M = 3.92$, $SD = 0.79$). The highest variance value in the sample was demonstrated in the aspect of Baseline Awareness of psilocybin ($M = 2.47$,

$SD = 1.46$), suggesting that psilocybin may be a relatively new topic for many of the respondents. Pearson correlation coefficients were calculated to test each proposed hypothesis and examine the link between cognitive traits and psilocybin attitudes.

Hypothesis 1 (H1) predicted a positive correlation of sensory traits (Vivid Visual Imagery and Synesthetic Sensory Blending) with greater psilocybin openness. H1 was not supported, as neither Vivid Visual Imagery ($r = -0.14, p > .05$) nor Synesthetic Sensory Blending ($r = -0.06, p > .05$) showed positive relationship with Individual Openness toward potential psilocybin applications.

H2 proposed that higher scores on Divergent Thinking and Cognitive Flexibility scale would correspond with higher scores obtained in Individual Openness toward psilocybin applications. This hypothesis was again not supported, since both Divergent Thinking ($r = 0.12, p > .05$) and Cognitive Flexibility ($r = 0.06, p > .05$) did not demonstrate statistical significance as predictors of heightened openness.

Lastly, H3 suggested that low creative achievers, or individuals who demonstrated lower scores on the Perceived Creative Identity scale, would simultaneously obtain significantly lower scores in Individual Openness toward psilocybin applications. H3 did not disappoint to follow the trend of unsupported hypotheses, and interestingly, Perceived Creative Identity demonstrated, in fact, a weak negative correlation with Individual Openness ($r = -0.21, p > .05$), implying that stronger artistic self-concept predicted rather a decrease in openness toward psilocybin.

While the primary hypotheses were rejected, two other variables emerged as significant predictors of Individual Openness; Moral Acceptance ($r = 0.42, p < .05$) and Baseline Awareness ($r = 0.41, p < .05$). These interesting and unexpected findings postulate that the openness to psilocybin is still rather driven by the educational factors, moral aspects and perceived societal status of this compound, than by the creative and cognitive traits themselves (see Figure 2). While psilocybin or other similar psychedelic compounds may cause heightened creative and cognitive performance, this relationship presumably does not function in the opposite direction, suggesting that heightened creative and cognitive traits in individuals may not necessarily predict openness to psilocybin.

Furthermore, several internal correlations within the cognitive and creative domains were significant. Remarkably, a strong positive correlation was found between Cognitive Flexibility and Novelty Seeking ($r = 0.64, p < .05$), indicating that participants with the mental capacity to easily shift between perspectives are also those who are the most motivated to seek out novel stimuli, and perhaps find new perspectives. Another positive correlation was found between Perceived Creative Identity and Divergent Thinking ($r = 0.38, p < .05$). This result confirms the significant relationship between creativity and the ability to generate multiple ideas.

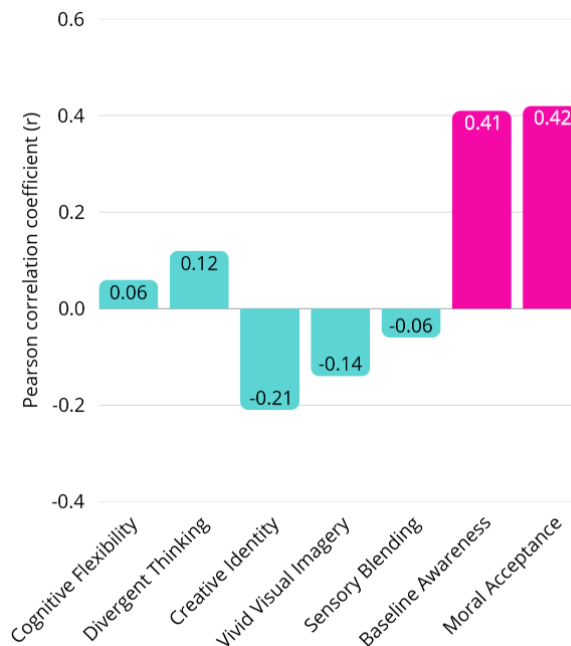


Figure 2.

Comparison of Cognitive versus Moral and Educational Predictors of Psilocybin Openness

Bars indicate Pearson correlation coefficients (r). Significant positive correlations ($p < .05$) were observed for Moral Acceptance and Baseline Awareness (shown in pink), while cognitive traits (shown in teal) yielded non-significant or negative relationships.

Table 1.

Correlation Matrix of the Study Variables

Correlation Matrix of the Study Variables (N=34)											
VARIABLES	Mean	SD	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. Perceived Creative Identity	3,91	0,89	---								
2. Cognitive Flexibility	3,45	0,69	-0,01	---							
3. Novelty Seeking	3,92	0,79	0,18	0,64*	---						
4. Divergent Thinking	3,62	0,54	0,38*	0,43*	0,18	---					
5. Vivid Visual Imagery	3,71	1,08	0,27	0,26	0,32	0,23	---				
6. Synesthetic Sensory Blending	3,29	1,21	0,23	0,37*	0,30	0,12	0,46*	---			
7. Baseline Awareness (of Psilocybin)	2,47	1,46	0,18	0,20	0,16	0,18	0,07	-0,02	---		
8. Moral Acceptance	3,47	1,1	-0,08	-0,14	0,07	0,06	-0,21	-0,37	-0,08	---	
9. Individual Openness	3,48	0,88	-0,21	0,06	0,12	0,12	-0,14	-0,06	0,41*	0,42*	---
Note: * $p < .05$											

Pearson correlation coefficients (r), means, and standard deviations are reported in this table. The most significant correlations ($p < .05$) are observed between Cognitive Flexibility and Novelty Seeking ($r = 0.64$), Individual Openness to psilocybin applications and Moral Acceptance ($r = 0.42$), and between Baseline Awareness of psilocybin and Individual Openness to its use ($r = 0.41$).

6. Discussion

Creativity – the very subject of this study, the cognitive trait that is critical for our daily functioning – is defined as the act and capability of producing novel, unique, and inventive ideas (Grin et al., 2020, Boden, 2007). This definition is consistent with the moderate positive correlation found between Perceived Creative Identity and Divergent Thinking ($r = 0.38$, $p < .05$). While several theoretical discussions have proposed that the presence of

cognitive flexibility sets the essential base for dynamics of creative thinking, the findings of this study did not support this link. The relationship between Perceived Creative Identity and Cognitive Flexibility yielded negligible results ($r = -0.01, p > .05$), thus null relationship between these traits can be concluded. Regarding the aspect of cognitive flexibility, Doss and colleagues (2021) have found significant enhancement of cognitive flexibility 4 weeks post-psilocybin therapy in patients with major depressive disorder, describing psilocybin as a tool for investigating creativity and enhancing cognitive flexibility.

A content analysis conducted by Lea et al. (2020) proposes motives of individuals for psychedelic self-administration, including self-management of mental health issues and improvement of psychosocial wellbeing, along with cognitive enhancement. Furthermore, enhanced self-insight, reduced depression and anxiety, improved outlook on life and cognitive and creative enhancement occurred to be the most frequent self-reported benefits of psychedelic self-administration (Lea et al., 2020). These findings imply that creative and cognitive performance enhancement should thus be naturally considered a general property of psychedelic substances. However, a recent study found no changes in cognition in healthy participants at 8, 29, or 85 days post-psilocybin therapy (Rucker et al., 2022). Numerous studies have disproved the link between psychedelic intake and cognitive enhancement, contributing to the ongoing stigmatization and unclarity regarding this matter.

While a proliferation of literature has examined the effects of psilocybin on cognitive enhancement, majority of these studies have focused exclusively on post-administration outcomes. As a result of this, there remains a significant gap in our understanding of the baseline psychological profile of potential candidates for psilocybin therapy or recreational use of this substance. By focusing on the creative profile and cognitive traits of participants before any administration occurs, this study aimed to shift the focus from the drug's effects to the user's predispositions. Understanding these pre-administration links is critical, as it may help to determine and identify new target populations. In context of this study, the prediction of heightened creative traits and cognitive performance correlating positively with greater individual openness toward psilocybin application was not supported. The findings that Moral Acceptance ($r = 0.42$) and Baseline Awareness ($r = 0.41$) were the primary predictors in psilocybin openness imply that the interest in psilocybin may not be an act of cognitive predisposition, rather a societal and ethical choice shaped by one's obtained knowledge and moral attitudes.

Likewise, it is crucial to take into consideration the fact that psilocybin's primary neurobiological mechanism involves the modulation of DMN, increasing global functional connectivity, therefore setting the vital foundation for unconstrained and divergent cognition (Carhart-Harris et al., 2014). The sample presented in this study demonstrated already high baseline scores of divergent thinking linked to their creative profile ($r = 0.38$). However, the lack of correlation in this study between cognitive traits (e.g. Divergent Thinking, Cognitive Flexibility...) and Individual Openness may suggest a gap between neurobiological potential and psychological intent. These claims imply that even if a participant's neural architecture seems to be optimized for psychedelic-induced alterations and flexibility, the decision to engage with the substance appears to be still primarily mediated by the constraints of socialized ethics and factual knowledge. It can be tentatively concluded that no matter how flexible the cognitive and creative capabilities are, they cannot override decades of social conditioning unless they are first met with factual education.

Another explanation for the weak negative correlation between Perceived Creative Identity and Individual Openness ($r = -0.21$) might potentially be the protectiveness of natural talent. Artists may not see psilocybin as a tool for expanding consciousness and

enhancing creativity, but perhaps as a threat to their authenticity. Introducing a pharmacological catalyst could be perceived as devaluing the nature of their output.

Taking all these considerations into account, I would like to propose the Paradox of the Psychedelic Brain. To elaborate, both psychedelic-induced states and creative ideation are characterized by a breakdown in the modularity of DMN, and a subsequent increase in global functional connectivity (Carhart-Harris et al., 2016), providing space for novel associative thinking, ideational fluency, and heightened cognitive flexibility (Gonen-Yaacovi et al., 2013). It is therefore possible that for high creative achievers, this “psychedelic-like” state of unconstrained cognition may be already familiar, rendering a psychedelic compound unnecessary, or even redundant for the creative process of high-baseline creative achievers. This “creativity canceling out creativity” effect tentatively implies that there may be an optimal threshold for cognitive flexibility.

Consequently, the very individuals whose neural architecture is most “psychedelic-like” in its baseline sober state, may potentially be the ones who demonstrate the most significant resistance to external creative maximization. To support this claim, participants in this study demonstrated a noteworthy link between their Perceived Creative Identity and actual cognitive performance (e.g. Divergent Thinking), ($r = 0.38$), suggesting that they likely trust their natural artistic capabilities enough to feel that external enhancement is unnecessary, or even counterproductive. This proposed Paradox of the Psychedelic Brain might presumably explain the lack of significant correlation between cognitive traits and psychedelic openness in this study. Due to insufficient resources and several limitations, further research and investigation of this speculative phenomenon is highly recommended.

6 Limitations

While this study provides valuable insights, it is subject to several limitations. The sample size ($N = 34$) can be considered relatively small for quantitative research, contributing to the insignificant and reduced statistical power in this study. Furthermore, the recruitment strategy managed to target individuals within artistic and creative circles, resulting in a homogenous sample. The lack of significant correlations may be due to “Ceiling Effect” within the sample, suggesting insufficient variance in the data. Future research should include a larger, more diverse sample to see if these traits correlate differently in populations with more varied attitudes. It is also vital to note that this study relied primarily on subjective self-report scales, which may lead to social desirability bias or lack of self-awareness among the sample. For this reason, future study should also incorporate objective cognitive tasks (such as the Alternate Uses Task).

As this was an independent study conducted by a student researcher, it was not possible to utilize neuroimaging (fMRI/EEG) or clinical substance administration. Therefore, the connection between psychological traits and neurobiological mechanisms remains theoretical, based on existing literature rather than direct observation.

7 Conclusion

This study aimed to identify whether cognitive and sensory traits associated with creativity could predict an individual's openness to hypothetical psilocybin applications. The findings of this study indicate that the proposed cognitive traits (e.g., Divergent Thinking, Cognitive Flexibility, Vivid Visual Imagery, Synesthetic Sensory Blending) do not significantly drive the intent to use the substance, despite appearing to be potentially aligned with the alterations observed during a psychedelic state. Instead, the primary mediators of

psychedelic openness appear to be rooted in moral settings and factual awareness, considering that openness to psilocybin was almost exclusively predicted by Moral Acceptance and Baseline Awareness of psilocybin. Moreover, while psilocybin or similar psychedelic compounds are thought to induce states of heightened creative and cognitive performance, this association and relationship do not seem to function in the opposite direction. The results postulate that heightened creative and cognitive traits in individuals do not necessarily predict greater openness to psilocybin, indicating that the phenomenon of “psychedelic creativity” is not inherently bidirectional.

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