Psychedelics and meditation: a neurophilosophical perspective
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ABSTRACT
Psychedelic ingestion and meditative practice are both ancient methods for altering consciousness that became widely known in Western society in the second half of the 20th century. Do the similarities begin and end there, or do these methods – as many have claimed over the years – share some deeper common elements?

In this chapter I take a neurophilosophical approach to this question and argue that there are, indeed, deeper commonalities. Recent empirical studies show that psychedelics and meditation modulate overlapping brain networks involved in the sense of self, salience, and attention; moreover, psychedelics can occasion lasting increases in "mindfulness-related capacities" for taking a non-reactive stance on one's inner experience (e.g. Sampedro et al. 2017). The self-binding theory of psychedelic ego dissolution (Letheby and Gerrans 2017) offers a plausible explanation of these findings: by disrupting self-related beliefs implemented in high-level cortical networks, both psychedelics and meditation can "unbind" mental contents from one's self-model, moving these contents along the continuum from phenomenal transparency to opacity (cf. Metzinger 2003). In other words, both psychedelics and meditation can expose and weaken our foundational beliefs about our own identity, allowing us to disidentify with these beliefs and see them as "just thoughts".

There are connections between these ideas and recent arguments suggesting that psychedelic use may have epistemic benefits consistent with philosophical naturalism (Letheby 2015, 2016, 2019). I conclude with a proposal: these connections may help in thinking about the putative epistemic benefits of meditation practice from a naturalistic perspective.

1. Introduction

The controlled ingestion of psychedelic drugs and the practice of mindfulness meditation are both ancient techniques for consciousness alteration with long histories of use in non-Western cultures. Both came to widespread attention in the Western world in the second half of the twentieth century; both have been subjected to extensive scientific study, and been touted as secular therapeutic interventions, outside of their traditional religious and spiritual contexts. This is a striking but potentially superficial set of parallels[1]. Are there deeper commonalities?

In this chapter I take a neurophilosophical approach to the question and defend an affirmative answer. I begin, in section 2, by reviewing some basic historical and phenomenological facts that suggest commonalities. In section 3 I turn to recent quantitative evidence. Several studies have found that a single controlled psychedelic experience can durably promote mindfulness-related attentional capacities. Moreover, psychedelics and mindfulness modulate overlapping neural systems involved in salience, attention, emotion, and the sense of self. Finally, controlled psychedelic ingestion can increase the beneficial effects of mindfulness practice, and vice versa.

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[1] I believe this particular set of parallels was first brought to my attention by a conference talk delivered by Katherine MacLean, entitled 'What can Buddhist meditation teach us about psychedelic science?' (https://www.youtube.com/watch?v=iV5DCVxBXdk).

In section 4 I offer an explanation of these findings in terms of common neurocognitive processes targeted by psychedelics and meditation. I have argued elsewhere that psychedelics alter phenomenal selfhood by disrupting cognitive binding processes implemented in high-level cortical networks (Letheby and Gerrans 2017). These binding processes create the phenomenal experience of being a unified, persisting subject; they also attribute salience and allocate attention in accordance with representations of the subject's goals and interests. Both psychedelics and meditation "unbind" mental contents from this self-model, rendering those contents *phenomenally opaque*: rather than being experienced as reality itself, they are experienced as mere models or representations (Metzinger 2003). In section 5 I address the implications of this account for epistemological questions. Elsewhere I have drawn on the similarities between psychedelic- and meditation-induced states to argue that the former have epistemic benefits consistent with a naturalistic worldview. I propose that a systematic investigation of their similarities and differences may likewise advance our understanding of the epistemic status of meditation.

2. Psychedelics and meditation: The idea of a connection
Clearly there are at least superficial similarities between psychedelic ingestion and meditative practice. As noted above, both are (i) ancient techniques for consciousness alteration, with long histories of use in non-Western cultures (ii) that came to widespread attention in the Western world in the late 20th century and (iii) have been touted as secular therapeutic interventions, with evidence suggesting efficacy in conditions including anxiety, depression, and addiction (Wheeler and Dyer 2020, Wielgosz et al. 2019). Does the connection run deeper than this?

Before addressing this question I must define my terms. In accordance with increasingly common scientific practice, I will use the term "psychedelic" exclusively to refer to the serotonin-2a (5-HT2A) agonist "classic" psychedelics[2], of which lysergic acid diethylamide (LSD), psilocybin, mescaline, and N,N-dimethyltryptamine (DMT) are the best-known examples. At moderate-to-high doses these drugs can induce transient but dramatic changes to conscious experience, including perception, emotion, cognition, and the senses of space, time, body, and self (Letheby 2021). One typical and highly relevant effect is the dramatic disruption to the sense of self known as "drug-induced ego dissolution" or "DIED" (Millière 2017).

For present purposes I will use the term "meditation" exclusively to refer to practices of *mindfulness* meditation (also known as "Vipassana" or "insight" meditation) drawn from the various Buddhist traditions. Such practices typically involve a combination of "focused attention" exercises aimed at developing meditative concentration, and "open awareness" or "open monitoring" exercises in which the practitioner attempts to attend in an open, alert, curious, and non-reactive manner to thoughts, feelings, sensations, and all the passing contents of consciousness. In the context of the traditional Buddhist path, a major objective of this practice is to foster direct, experiential insight into the putatively liberating truths of *anicca* and *anatta*: the transience and insubstantiality of all phenomena, including the self (Albahari 2014). Thus, dramatic alterations to the ordinary sense of self are both a typical effect of psychedelic ingestion and a central goal of meditation practice, in the relevant senses of these terms.

Notwithstanding some sporadic earlier interest, psychedelics came to widespread attention in Western society after Albert Hoffman's 1943 discovery of the potent psychoactive effects of LSD (Hofmann 1980). Ten years later, Aldous Huxley ingested a fateful dose of mescaline; within another year, he had written and published *The Doors of Perception*, a seminal text that laid the intellectual groundwork for the Western encounter with psychedelics (Huxley 1954). In his earlier

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[2] Also sometimes known as "serotonergic hallucinogens".

work Huxley (1945) had articulated a conviction that the world's wisdom traditions constitute diverse paths to a single, underlying, ineffable divine Reality; as such, it is no surprise that he drew liberally on Buddhist, Hindu, and Christian language and imagery to describe and conceptualize his mescaline experience (Osto 2016, pp. 22-24). Following in Huxley's footsteps, Alan Watts (1960, 1962) interpreted his LSD-induced experiences in terms of the Buddhist and Hindu meditative practices to whose study and exposition he was already devoted. In 1964, Timothy Leary and colleagues published *The Psychedelic Experience: A Manual Based on the Tibetan Book of the Dead* (Leary et al. 1964), and the idea of a connection between psychedelics and Eastern contemplative practice was cemented in the popular imagination.

Based on this potted history, one might suspect that the idea of a connection is a historical artifact, a coincidence deriving from the intellectual proclivities of those who happened to influence the early Western conceptualization of psychedelic experience (Sebastián 2020). This explanation seems especially appealing in light of the well-known variability of the psychedelic experience, and its susceptibility to "set and setting"—the psychological state of the individual taking the drug, and the environment in which they take it (Zinberg 1984). If people taking psychedelics often experience a seemingly direct encounter with an unbounded "pure consciousness", or the "death" of the ego, perhaps this is because they have absorbed (knowingly or otherwise) the idea that this is what happens to people who take psychedelics. This hypothesis is bolstered by anthropological evidence that psychedelic experiences, in some traditional contexts of use, are "all about meeting spirits and getting power and knowledge from them, without reference… to ego-dissolution or mystical union" (Sebastián 2020, p. 21)

However, in my view this explanation is insufficient. While cultural transmission and priming may play some role, it is implausible to attribute all phenomenological overlap between psychedelic and meditative states to such factors. For one thing, Western investigators were describing the effects of mescaline in terms of "depersonalization" and changes to ego boundaries long before the now-canonical writings of Huxley, Watts, and Leary (Guttmann 1936). Changes to the sense of self were similarly emphasised in early scientific reports on LSD, some of which were contemporaneous with the publication of Huxley's *Doors* (reviewed by Millière et al. 2018). Moreover, multiple senior Buddhist teachers were inspired to begin the practice by experiences with psychedelics. After decades of dedicated practice, some maintain that their psychedelic experiences afforded genuine glimpses, however transient and unstable, of the experiential territory disclosed by meditation (Kornfield 1996, Das 2002).

Further evidence comes from qualitative research into the phenomenology of intensive meditation practice. Kornfield (1979) conducted interviews with people engaged in a secluded three-month *Vipassana* retreat. His informants reported the following categories of unusual experiences:

> CATEGORIES OF UNUSUAL EXPERIENCES REPORTED
> Somatic experiences
> 1. Spontaneous movement
> 2. Alterations in body image
> 3. 'Energy' flow experiences
> 4. Other proprioceptive changes such as temperature, weight, etc.
> 5. Unusual breathing patterns
> 6. Unusual experiences during walking
> 7. Changes in perception of pain
> Visual experiences
> 8. Eyes open
> 9. Eyes closed

10. Auditory experiences
11. Gustatory and olfactory experiences
Mental experiences
12. Strong emotions and mood swings
13. Rapture and bliss
14. Psychological insights
15. Equanimity
16. Insights into basic mental and physical life processes
17. Dream changes
18. Time changes
19. Concentration changes
20. Effortless awareness
21. 'Out-of-the-body experiences'
22. Other general perception changes including creativity and psychic phenomena
(Kornfield 1979, pp. 44– 45).

Some examples of these categories include: feeling one's body divided in half or one's torso expanding; feeling one's body 'heavily pulled in all directions', or feeling as though floating when one was really 'stone still'; experiencing one's body growing 'huge, then tiny, tiny'; seeing 'still objects moving', 'colours more intense', 'hallucinations while walking', and 'LSD melting- like visions'; and seeing 'camera- like flashes of light', '[visions] of Buddha', and 'images of body cells [and] organs' (Kornfield 1979, pp. 46– 47). Practitioners also routinely reported:

> visual thoughts, dream- like images, mental pictures— moving and still— and patterns of colours and visions, from simple subjects to complex visual mandalas. Also, it is commonly reported that certain visual themes appear regularly in meditators' minds, such as visions of Buddha or Christ or various religious imagery, or for some, visions of bodies and corpses and death. For others, spontaneous visions of violence or of lustful scenes and other vivid visual material is often reported as associated with strong emotional discharges. (Kornfield 1979, p. 47).

Clearly, none of these phenomena would be out of place in a psychedelic experience report. But there is no reason to think that all of these meditatively-induced experiences are due to practitioners' familiarity with psychedelic experience, or to culturally absorbed ideas about a connection between psychedelics and meditation. Indeed, unusual experiences of this kind are documented in traditional Buddhist meditation texts that are quite independent of any psychedelic influence (Lindahl et al. 2014).

Thus, there is considerable qualitative and anecdotal evidence that psychedelic ingestion and mindfulness meditation affect overlapping psychological processes, beyond what mere suggestibility and cultural transmission can account for. This case is bolstered by recent quantitative evidence, to which I now turn.

3. Recent quantitative evidence
Psychometric scales have been developed to quantify the effects of mindfulness training. These have been validated and shown to be sensitive to the effects of mindfulness practice. The Five Facet Mindfulness Questionnaire (FFMQ) measures mindfulness capacities in terms of five distinct subskills: 'observing, describing, acting with awareness, nonjudging of inner experience, and nonreactivity to inner experience' (Baer et al. 2008, p. 329), while the Experiences Questionnaire (EQ) measures the construct of *decentering*: the ability to 'observe one's thoughts and feelings as temporary, objective events in the mind, as opposed to reflections of the self that are

necessarily true' (Fresco et al. 2007, p. 234). This development of psychometric questionnaires has occurred in the context of a vast wave of meditation research across the mind and brain sciences (Brandmeyer et al. 2020).

In parallel to the recent explosion of meditation research, the early 21st century has seen a "renaissance" of psychedelic research using human subjects (Sessa 2012). A spate of rigorous clinical trials has shown that moderate-to-high doses of psychedelics can be administered safely to carefully screened and prepared volunteers in carefully controlled conditions. These trials have also found intriguing preliminary evidence of lasting antidepressant, anti-addictive, and anxiolytic effects from one—or very few—psychedelic sessions conducted in this fashion (Andersen et al. 2021). Other studies have found evidence of lasting psychological benefits in healthy subjects following controlled psychedelic administration (Gandy 2019). Thus, it is a plausible scientific hypothesis that one, or very few, carefully conducted psychedelic sessions can lead reliably to psychological benefits lasting months or even years, without serious or lasting adverse effects (Aday et al. 2020). Interestingly, such lasting benefits seem to be predicted by the occurrence of a "mystical-type" experience of oneness or cosmic unity, or an experience of "psychological insight", during the drug effects (Letheby 2021). Meanwhile, neuroimaging studies have begun probing the biological mechanisms involved in these remarkable effects (dos Santos et al. 2016).

One consequence of the psychedelic renaissance is that the putative connection between psychedelics and meditation has now been subjected to rigorous quantitative investigation. Studies using such instruments as the FFMQ and the EQ have found that a single carefully conducted psychedelic experience, or very few such experiences, can significantly increase mindfulness-related capacities—that is, capacities for decentering, non-judging, and so on—for weeks or months (Mian et al. 2020, Murphy-Beiner and Soar 2020, Soler et al. 2016, 2018, Sampedro et al. 2017, Uthaug et al. 2018, 2019, 2020, Madsen et al. 2020, González et al. 2020). This coheres with findings that psychedelic experiences can durably increase *psychological flexibility*, a construct that is closely related to decentering (Davis et al. 2020, Watts and Luoma 2020). It is worth emphasising that most of these studies include no explicit mindfulness training. It seems that, somehow, psychedelic experience itself can promote some of the attentional capacities cultivated in meditation practice.

Quantitative evidence for a connection comes also from neuroimaging studies. Due to their complex and heterogeneous effects, both psychedelics and meditation present challenges for neuroimaging research. However, at a sufficiently coarse level of grain, some commonalities are apparent. In particular, both methods seem to modulate activity and connectivity in two much-discussed neural systems: the Default Mode and Salience networks. The Default Mode Network (DMN) is so-called because it tends to be highly active in conditions of task-free, wakeful rest. Its major hubs are densely connected, high-level association areas in the brain's cortical midline whose activity typically quietens during externally-oriented or impersonal cognitive tasks. High levels of DMN activity have been observed during introspective, social, and self-referential tasks, leading to the association of this network with social cognition, mental time travel, and narrative or autobiographical forms of self-representation (Davey et al 2016). Meanwhile, the Salience Network (SN) is named for its putative role in attributing salience (i.e. importance or behavioural relevance) to stimuli across multiple modalities and flagging these stimuli for further processing (Seeley 2019). The SN is centred on cortical midline regions implicated in a multitude of functions, including emotion, interoception (sensing the internal condition of the both), nociception (pain perception), and error detection.

A detailed review of relevant neuroimaging studies is beyond the scope of this chapter. However, several studies have found that psychedelics affect the activity and connectivity of the DMN. In

some cases these neural changes correlate with experiential effects of the drugs—in particular, with changes to the sense of self, such as the experience of "ego dissolution" or reductions in self-referential thinking (e.g. Muthukumaraswamy et al. 2013, Speth et al. 2016, Mason et al. 2020). Lasting functional and structural changes to DMN nodes have been found to correlate with durable psychological changes following a psychedelic experience (Bouso et al. 2015)—including, importantly, increases in mindfulness-related capacities (Sampedro et al. 2017, Smigielski et al. 2019a). Similarly, changes to SN nodes have been linked to acute (Lebedev et al. 2015, Tagliazucchi et al. 2016, Smigielski et al. 2020) and lasting (Lebedev et al. 2016, Sampedro et al. 2017, Mertens et al. 2020) effects of psychedelics—especially effects on the sense of self.

Meanwhile, a large body of research has found changes in the structure and function of DMN and SN nodes resulting from meditation practice (Brandermeyer et al. 2020). In an important review paper, Millière et al. note that

> attenuation of either activity or functional connectivity in the default mode network (DMN)… was shown… in many studies of mindfulness meditation (combining [focused attention] and [open monitoring] in different degrees). These studies reported a decrease of activity in key nodes of the DMN, particularly in the medial prefrontal cortex… and in the posterior cingulate cortex… compared to meditation-naïve controls or within-group resting state… While DMN deactivation is not specific to mindfulness meditation, it has been found to be more pronounced during meditation than during other cognitive tasks… (Millière et al. 2018, p. 4).

Thus, there is evidence that: (i) psychedelic ingestion can durably elevate mindfulness-related attentional capacities, and (ii) psychedelics and meditation affect overlapping neural systems involved in emotion, attention, salience, and the sense of self. A third and final line of evidence comes from intriguing studies on the synergistic effects of psychedelics and meditation.

Griffiths et al. (2017) tested the combined effects of psilocybin and spiritual practices such as meditation on healthy subjects. There were three groups in this study. One group received a very low dose of psilocybin, plus a moderate level of support and encouragement to engage in spiritual practices. A second group received a high dose and the same moderate level of support. A third group received a high dose of psilocybin and a high level of support. At six month follow-up, both high-dose psilocybin groups showed far greater improvements than the low- dose group on various positive outcome measures. Group 3 showed even larger improvements than group 2, suggesting that spiritual practices contributed somewhat to the outcomes—but the psilocybin experience seemed to make a larger contribution. Persisting positive effects correlated with both degree of engagement in spiritual practices and psychometric ratings of mystical experiences under psilocybin. Interestingly, several subjective effects of psilocybin were rated more strongly by those in group 3 than group 2, suggesting that engagement in spiritual practices affects the kinds of experiences one has on psychedelics.

This last idea receives further support from a remarkable study conducted by Smigielski et al. (2019a). These researchers administered psilocybin or placebo, in double-blind fashion, to experienced practitioners of mindfulness meditation (in the Zen tradition) on the fourth day of a five- day silent group retreat. Subjects who received psilocybin underwent self-transcendent experiences of 'oceanic boundlessness', with unusually low levels of anxiety. These researchers concluded that meditative proficiency

seems to enhance psilocybin's positive effects while counteracting possible dysphoric responses . . . [highlighting] … the role of emotion/ attention regulation in shaping the experiential quality of psychedelic states.
(Smigielski et al. 2019a, p. 1).

All participants in this study showed increases in mindfulness capacities and various measures of well-being from pre- to post-retreat. However, the increases were larger in the psilocybin group than the placebo group. Like the findings of Griffiths et al., this suggests that psychedelic administration and meditation practice together can produce greater psychological benefits than either alone. This is highly suggestive of some common psychological factor(s) targeted by these consciousness-altering techniques.

4. Unbinding, decentering, and opacity

What common psychological factor or factors are affected by psychedelics and meditation? And how do they both affect these factors, given that they seem like such different practices? In light of current evidence, my answer to the first question is that both methods promote (a) the unbinding of mental contents from the self-model, (b) a decentered mode of introspection, and (c) a shift of self-related mental contents from phenomenal transparency to opacity. However, they cause this cluster of interrelated effects from different directions, as it were. According to the title of a recent paper, "Mindfulness training encourages self-transcendent states by decentering" (Hanley et al. 2020); in my view, psychedelics encourage decentering by inducing self-transcendent states. Clearly, this all requires some unpacking.

In collaborative work, Philip Gerrans and I have proposed a neurocognitive account of the experience of psychedelic ego dissolution—the dramatic disruption to the phenomenal sense of self often induced by psychedelics. Users of psychedelics often report that their sense of being a self or "I" has diminished or altogether dissolved. However, this much-discussed state of "ego dissolution" is actually a heterogeneous category, encompassing such distinct phenomena as the blurring of bodily boundaries, the loss of a sense of agency over thoughts, and the loss of the sense of bodily ownership (Girn and Christoff 2018). Perhaps, in some rare cases, psychedelics can induce a total abolition of all forms of self-consciousness (Letheby 2020, Millière 2020). This heterogeneity is mirrored at the level of neural implementation: As we saw above, some studies link ego dissolution to modulation of the DMN, and others to modulation of the SN.

Letheby and Gerrans (2017) propose an explanation of these findings along the following lines: The DMN and the SN encode distinct layers of a hierarchical model of the self: a *hierarchical self-model* (cf. Metzinger 2003). The SN models the bodily and affective dimensions of selfhood that give rise to the "minimal self": the bare feeling of being an embodied subject of experience, independent of any specific personality traits or autobiographical details (Gallagher 2000). Meanwhile, the DMN generates the complex, diachronically extended representations that collectively constitute the so-called "narrative self": the sense of being a specific individual with a distinctive set of traits, goals, and interests, and a particular trajectory through life (*ibid.*). Together, these systems give rise to the ordinary sense of unified selfhood by integrating or "binding" (Sui and Humphreys 2015) information, across multiple modalities and levels of processing, into a representation of a coherent and persistent underlying entity: the self. These processes generate a phenomenology as of Cartesian selfhood by representing the existence of a simple substance or bare particular underlying the changing flow and flux of experience.

One key function of the self-model on Letheby and Gerrans' account is to regulate the attribution of salience and the allocation of attention. Both the DMN and the SN have been implicated in representing the personal meaningfulness or relevance of various stimuli and coordinating

effective and appropriate behavioural responses. Indeed, in recent work Wanja Wiese has described the hierarchical self-model as a *hierarchical salience model*: a complex representation of the relative importance to the organism of various classes of stimuli at multiple levels of abstraction (Wiese 2019). On this view, a key function of self-modelling is to filter or parse incoming stimuli into self-relevant and self-irrelevant, thereby determining what is attended to and what is ignored; what attracts valuable metabolic and attentional resources. In Letheby and Gerrans' (2017) terms, the self-model is a "centre of representational gravity" (cf. Dennett 1991) that governs and constrains cognitive processing and the construction of mental representations across modalities and levels of processing.

This account offers a straightforward explanation of the phenomenon of psychedelic ego dissolution, as well as the durable increase in mindfulness-related capacities observed after psychedelic administration. On the first count, by disrupting the coherent functioning of neurocognitive systems such as the DMN and SN, psychedelics disrupt the computational function of self-binding implemented by these systems: that is, the integration of multimodal stimuli into a representation of a unified and persistent underlying entity. This disruption to self-modelling leads to the reported experience of the diminution, alteration, or total dissolution of the ordinary sense of self. Moreover, psychedelics can disrupt different neural systems to different extents, influenced no doubt by set and setting—the prior psychological state of the subject, and the environment in which they receive the drug—and this accounts for the many "varieties of selflessness" (Millière 2020) that psychedelics can induce: disruptions to narrative self-awareness, bodily boundaries, the experience of bodily ownership, and so forth.

What, then, of the lasting increase in mindfulness-related capacities? In ordinary waking consciousness, representations that are bound to the self-model – including our deeply-held, often unconscious beliefs about ourselves and our lives – typically do not attract explicit, critical attention or reflection; they are experienced as reality itself, or as that with which we see the world, rather than part of the world that we see. When the binding of these stimuli into the self-model is disrupted, we disidentify with them, in a very straightforward sense: they are no longer experienced as part of *me*, but as something separate, an object or appearance in consciousness to which I can attend with some sense of critical distance and suspension of judgement. This, of course, precisely describes an increase in decentering: the ability to "observe one's thoughts and feelings as temporary, objective events in the mind, as opposed to reflections of the self that are necessarily true" (Fresco et al. 2007, p. 234; cf. Soler et al. 2016, Franquesa et al. 2018, Murphy-Beiner and Soar 2020). This also plausibly accounts for the experiences of psychological insight frequently reported during the acute psychedelic experience (Davis et al. 2020).

After the acute experience subsides, however, cognitive business-as-usual does not immediately resume. Subjects often report an "afterglow" period of somewhere from two weeks to two months, during which they feel lighter, freer, full of energy and optimism, and unburdened from previous worries and concerns (Majić et al. 2015). This coincides fairly closely with the reported durations of elevations in mindfulness capacities. An obvious explanation is that the unbinding of the self-model has lingering cognitive and phenomenological effects. By disrupting the integration of information into a model of the self, psychedelics diminish the brain's confidence in its most fundamental hypotheses about who and what "I" am and how I relate to everything that is not-me. The afterglow and the increase in mindfulness capacities are due to the fact that a degree of this uncertainty outlasts the acute experience. When it comes to lower-level, more cognitively impenetrable dimensions of self-representation, such as bodily ownership and boundaries, business as usual resumes pretty quickly—which is no bad thing. However, when it comes to higher-level, more flexible (emotional/autobiographical/narrative) dimensions, after a psychedelic experience there can be a period during which we are not quite as sure as usual about exactly who

we are. This is because mental representations are being bound less tightly, or with lower probabilities, to the self-model; thus, rather than being experienced automatically and unthinkingly as reality itself, they are seen for what they are: contingent and fallible models, representations, or hypotheses, not the immutable essence of *who I am*. Decentering persists.

This leads to the third and final cognitive commonality that I am positing between psychedelic state and meditative practices: the induction of *phenomenal opacity*. The concepts of phenomenal transparency and opacity have been defined in many different ways. According to a simple definition given by Thomas Metzinger, conscious mental representations are transparent when "they are not experienced as representations". In such cases:

> the subject of experience feels as if [they are] in direct and immediate contact with [the] content [of the representations]. Transparent conscious representations create the phenomenology of naïve realism. An opaque phenomenal representation is one that is experienced as a representation, for example, in . . . lucid dreams.
> (Metzinger 2014, p. 123).

The applicability of this notion to the psychedelic-induced disruption of cognitive binding and promotion of decentering should be obvious from the foregoing discussion: A central aspect of decentering is the conferral of phenomenal opacity on the representations in question. These representations are no longer experienced naively or transparently as reality itself, but are recognised *as* models: as constructed, virtual, simulatory, and therefore mutable. This direct experiential insight into the possibility of change is plausibly central to the mechanisms by which psychedelics bring about therapeutic effects (Letheby 2021).

By now the meditative half of the story should be reasonably obvious, too. We have already seen that increases in decentering and changes to the sense of self are both traditional aims and typical effects of meditation (Fresco et al. 2007, Lindahl and Britton 2019). The induction of phenomenal opacity into mental models, especially self-models, has also been described as a traditional aim of meditation (Metzinger 2003, p. 566, Lutz et al. 2019) and is closely related to decentering. Regarding the mechanisms at play, my conjecture is this: Psychedelics directly disrupt processes of self-representation, which often has the flow-on effect of promoting decentering and rendering mental representations opaque. Meditation practice, however, works from the other direction: By cultivating decentering and promoting opacity, the practice gradually disrupts the binding processes that generate the ordinary phenomenal self.

Preliminary evidence for this conjecture comes from a recent study in which 26 participants were randomized to a course of five mindfulness training sessions or to an active control condition involving "active listening". Mindfulness training promoted both decentering and the frequency of *self-transcendent experiences*, defined as experiences involving the dissolution of ego boundaries and a sense of unity. Importantly, increases in decentering at the mid-point of the training course predicted increases in self-transcendent experiences by the end of the course. According to the authors, despite various limitations, this study provides "the first empirical evidence that mindfulness training can, indeed, cultivate self-transcendent experiences through the process of decentering from internal phenomena" (Hanley et al. 2020, p. 8).

Thus, here is a speculative hypothesis about the cognitive commonalities between psychedelic experience and meditation practice that is consistent with the available evidence: Meditation promotes self-transcendent experiences via decentering and phenomenal opacity, while psychedelics promote decentering and phenomenal opacity via self-transcendent experiences.

5. Epistemological implications

Understanding the cognitive nature of self-consciousness and its alterations is of independent philosophical interest. However, it also promises to shed light on other philosophical issues. In this section I consider how the commonalities between psychedelics and meditation might inform an important project: the epistemological analysis of these two practices.

In other work I have undertaken a detailed investigation of the epistemic status of the psychedelic experience. Subjects who receive moderate-to-high doses of psychedelics often claim to gain some kind of knowledge from their experiences, but the knowledge in question often has to do with the existence of a divine Ground of Being, a cosmic consciousness, or "another Reality that puts this one in the shade" (Smith 2000, p. 133). In light of this, I have been concerned to evaluate the epistemic status of psychedelic experience within the constraints of a *naturalistic* worldview that denies the existence of another Reality beyond this one. Here I understand naturalism simply as the conjunction of (i) a generic physicalism or materialism about the mind with (ii) a denial of the existence of "paradigmatically nonnatural *entities* such as God, angels or Cartesian souls or non-natural *properties*" (Horst 2009, p. 225; emphasis original).

The conclusion I have reached is that, given naturalistic assumptions, psychedelic experience has real epistemic risks, but also offers genuine epistemic benefits that are often unavailable by any other means (Letheby 2016). The epistemological analysis that led to this conclusion was informed by a comparison and contrast of psychedelic experience and meditation practice. Most notably, I have argued from the psychedelic promotion of mindfulness-related capacities to the conclusion that psychedelic experiences can foster a kind of *knowledge how* (cf. Shanon 2010). Some reports by psychedelic patients and subjects are independently suggestive of this idea. Here is a patient who received psilocybin-assisted therapy for treatment-resistant depression:

> I saw negative patterns in my life where if something bad happens, I used to just put it [to the back of my mind]. Afterwards, I allowed myself to experience everything—even if it is sadness. *Now I know how to deal with my feelings* rather than repress them.
> (Watts et al. 2017, p. 541; my emphasis).

And here is a healthy volunteer's description of her third supervised psilocybin session:

> Now there was a familiarity to this inner space, and I found I was able to navigate much more easily than during the previous sessions. I felt no fear and was able to keep an even keel emotionally and psychologically, and to largely maintain the role of observer. I told [one of the supervising therapists] *it was like learning to ride a bicycle* and leaning into the turns.
> (Estevez 2013, p. 128; my emphasis).

In my view, the evidence concerning psychedelic-meditation commonalities supports the conclusion that, through their psychedelic experiences, these volunteers are gaining a very specific kind of knowledge how: Knowledge how to attend to their own thoughts and feelings in the open, curious, accepting, and non-reactive manner that is deliberately cultivated in mindfulness practice (Letheby 2021).

I have also used comparisons and contrasts between psychedelic experience and meditative practice to argue for other naturalistically-acceptable epistemic benefits of psychedelic experience, such as the acquisition of certain forms of *knowledge by acquaintance* (Letheby 2015) and *new knowledge of old facts* (Letheby 2021). In light of this, I want to conclude with a simple proposal: If we wish to understand better the presumably complex epistemic status of meditation practice, especially within the confines of a naturalistic worldview, then this endeavour might be informed by

systematic comparisons and contrasts of meditation with other consciousness-altering methods, such as psychedelic ingestion, that also stimulate noetic feelings and are often regarded as epistemically beneficial by those who practice them.

6. Conclusion

Ever since psychedelics and mindfulness meditation came to widespread attention in Western culture in the 1960s, the idea of a connection between them has persisted in the popular imagination. Here I have argued that the connection is real, deep, and not solely due to cultural framing, suggestibility, or interpretive bias. It consists, at least partly, in the fact that psychedelics and meditation can both disrupt self-binding processes, promote decentering, and confer phenomenal opacity on (self-related) mental contents, though the causal pathways involved are, in a sense, mirror images of each other. The similarities and differences between psychedelics and meditation have informed the project of epistemologically analysing psychedelic experience within naturalistic constraints; thus, we ought to consider whether they might inform the parallel project of epistemologically analysing meditation practice within such constraints.

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