



How Do Psychedelics Reduce Fear of Death?

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Abstract Increasing evidence suggests that psychedelic experiences, undergone in controlled conditions, can have various durable psychological benefits. One such benefit is reductions in fear of death, which have been attested in both psychiatric patients and healthy people. This paper addresses the question: how, exactly, do psychedelic experiences reduce fear of death? It argues, against some prominent proposals, that they do so mainly by promoting non-physicalist metaphysical beliefs. This conclusion has implications for two broader debates: one about the mechanisms of psychedelic therapy, and one about the potential non-medical uses of psychedelics for the alleviation of existential angst in psychiatrically healthy people. On the first count, the paper argues that the role of metaphysical belief change in fear of death supports the “Relaxed Beliefs Under Psychedelics” (REBUS) model of psychedelic therapy over alternative accounts. On the second count, the paper argues that the role of metaphysical belief change undermines the proposed use of psychedelics in the “neuroexistentialist” project of naturalizing spirituality. The best available evidence suggests that when psychedelic experiences reduce existential angst and restore a sense of meaning in life, they do so primarily by persuading people of the falsity of a broadly

naturalistic worldview, and thus do not help reconcile people to the truth of such a worldview.

Keywords Psychedelics · Spirituality · Fear of death · Death anxiety · Metaphysical beliefs · Neuroexistentialism

Introduction

What options are there for a physicalistic atheist who fears death and loves truth? Suppose this person contemplates the classic philosophical arguments that such fear is irrational, but remains unmoved. Suppose she contemplates the classic philosophical arguments for the existence of a deity, afterlife, or divine Ground of Being, but remains unconvinced. Our protagonist needs a solution to her existential dread that is both emotionally moving and intellectually convincing – one that speaks to her head *and* to her heart.

She may have heard surprising rumours that the safe, controlled ingestion of psychedelic drugs could fit the bill. Mounting evidence, we are told, suggests that a single high-dose psychedelic experience can dramatically and durably reduce anxiety and existential dread in terminally ill patients, and perhaps even in healthy people [26, 38]. Psychedelic substances such as psilocybin are reputed to induce intense and sometimes transformative experiences that can leave users with radically new perspectives on life, death, and the meaning of it all. What’s more, some have

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argued that they can do so *without* providing metaphysical consolation [21] – without, that is, promoting theistic or otherwise non-physicalistic beliefs. Are the rumours true?

In this paper I examine the evidence and argue that the rumours must be taken with a grain of salt. It is fairly clear that psychedelics *can* sometimes reduce fear of death, but exactly *how* they do so remains unclear. The lingering uncertainty around this point has interesting consequences for the so-called Metaphysical Belief Theory of psychedelic therapy – the view that psychedelics’ beneficial psychological effects result largely from increases in non-physicalist beliefs. Specifically, obituary notices for the Metaphysical Belief Theory, issued by Letheby [21], may have been premature. Albeit in a qualified and restricted form, the theory is alive and well.

I conclude the paper by reflecting on the implications of these arguments. Reductions in fear of death serve as a useful test case for general accounts of psychedelics’ therapeutic and transformative effects. One such account is the REBUS (“Relaxed Beliefs Under Psychedelics”) model proposed by Carhart-Harris and Friston [3], which holds that psychedelics alleviate pathology, and transform personality, mainly by “relaxing” abstract, high-level beliefs about self and world, facilitating their beneficial revision. I suggest that the REBUS model emerges from my discussion as the most plausible account of psychedelic transformation, being pitched at just the right level of abstraction to strike an optimal balance between generality and specificity.

Finally, I consider the implications of my arguments for debates about possible non-psychiatric uses of psychedelics. Some have proposed that psychedelic experiences of altered self-awareness could help address “neuroexistentialist” anxiety [4] in the worried well, by reconciling such people to the truth of a naturalistic worldview [20]. However, this suggestion is seriously undermined by the evidence that reductions in fear of death are, after all, caused mainly by metaphysical belief shifts. The evidence does not yet allow firm conclusions to be drawn. Nonetheless, it remains a live possibility that psychedelics offer not a way to make peace with a naturalistic worldview, but a way to become persuaded of its falsity.

Do psychedelics reduce fear of death?

A glance at recent headlines could lead one to the conclusion that psychedelics reduce fear of death as reliably as aspirin reduces headaches. Here is a sample: “Hallucinogenic drugs help cancer patients deal with their fear of death” – *Science* magazine [17], “Facing Death Without Fear: Psychedelics for End-of-Life Care” – *WebMD* [28], “Psilocybin: A Journey Beyond the Fear of Death?” – *Scientific American* [35], “Curing the Fear of Death: How “Tripping Out” Could Change Everything” – *Salon* [16], and “Taking Psychedelics Could Make People Less Afraid of Dying” – *Time* magazine [18]. What evidence is there for these claims?

For one thing, first-person reports establish fairly clearly that, in at least some cases, a moderate-to-high dose of a “classic” (serotonin-2a agonist) psychedelic – my sole topic in this paper¹ – can durably reduce fear of death. Consider this report from NFL quarterback Aaron Rodgers concerning his use of the classic psychedelic psilocybin and the psychoactive beverage ayahuasca (which contains the classic psychedelic N,N-dimethyltryptamine [DMT]):

“I definitely had a fear of death,” the Green Bay Packers star continued. “And ayahuasca, and psilocybin actually, really helped me with that and relieved a lot of the stress around the idea of needing to accomplish things before I actually die ... and taking away some of that fear. I think when you’ve seen the other side, it makes the idea of death more of a passage and less of an ending.”

Rodgers said that his fear of death led him to worry about not being able to experience goals in his life such as playing in the NFL or getting married. But using psychedelics made it easier for him to confront his own mortality. [14].

Consider, also, this report from a patient with terminal cancer who received the classic psychedelic

¹ Various psychoactive substances with different neuropharmacological targets have also sometimes been classified as “psychedelic”, in a broader, phenomenologically-based sense; I do not discuss them here.

dipropyltryptamine (DPT) as part of a research study in the 1970s:

I seemed to transcend time and space and I lost complete identification with the ‘real’ world. The experience seemed to me to be as if I was going from this world back to another world before this life had occurred . . . I felt that I had been in that mass of energy at one time before. When I was there everything seemed to make sense . . . It was a very beautiful world, one in which love was very much a part . . . The basic theme that I perceived . . . was that life continues to go on and we are basically some form of essence from a Supreme Being and we are part of that Supreme Being . . . The results of the use of the hallucinogenic drug on my life have been very profound. I seem to have a much deeper understanding of life and death. I don’t have the fear of death that I once had . . . I have found that everyday living seems to be much more enjoyable . . . I am a much more content individual, having had the great opportunity to just glimpse for a very short moment the overall thinking of God . . . to be reassured that there is a very beautiful, loving masterful plan in this Universe for all of us. [33], p. 124).

Or, finally, this account from a patient who received psilocybin in a 21st-century clinical trial, investigating its effects on psychological and existential distress in patients with a life-threatening illness:

[The psilocybin] just opens you up and it connects you . . . it’s not just people, it’s animals, it’s trees—everything is interwoven, and that’s a big relief . . . I think it does help you accept death because you don’t feel alone, you don’t feel like you’re going to, I don’t know, go off into nothingness. That’s the number one thing—you’re just not alone. [39], p. 499).

Such examples could be multiplied. Of course, the evidential limitations of first-person reports must be borne in mind. But there is no good reason that I know of to think that *all* such reports reflect cognitive biases, demand characteristics, or placebo effects. The answer would seem to be that psychedelics can, indeed, reduce fear of death – at least sometimes. But

we still may wonder: how reliably, for whom, and in what circumstances?

When we turn to quantitative evidence for answers, an important point should be noted: Not every study examining the therapeutic use of psychedelics in end-of-life or palliative care contexts has explicitly measured fear of death. Landmark trials by Grob et al. [12] and Gasser et al. [6] provided preliminary evidence that psychedelic ingestion can reduce *anxiety and depression* in people who have a terminal diagnosis. Moreover, comments from patients in these studies certainly suggested that fear of death was reduced as part of the process. But no explicit, quantitative measures of fear of death were used in these studies (cf. [15]).

However, two larger subsequent trials did include such measures. Using the Death Transcendence Scale and the Death Acceptance subscale of the Revised Life Attitudes Profile (LAP-R), Griffiths et al. [9] found significant reductions in death anxiety and increases in positive attitudes toward death, lasting six months after a single dose of psilocybin. Ross et al. [34] reported more mixed findings using the same measures:

In the short-term... psilocybin was not significantly associated with decreased death anxiety or increased death transcendence. However, at the 26-week... final follow-up assessment, while death anxiety... continued to demonstrate no significant reductions, there was a significant improvement in attitudes and adaptations towards death... in the psilocybin first group compared to the niacin first group... [34], p. 1175).

These 21st-century studies follow in the footsteps of earlier investigators. Schimmers et al. [36] reviewed several 1960s and 70s studies of psychedelic therapy for patients with a terminal diagnosis, reporting that many of these studies used explicit measures of fear of death and found substantial and lasting reductions. (These authors also note, though, that many such studies have significant methodological limitations.)

Other studies suggest that this effect may generalize beyond psychiatric populations. Moreover, the exact findings of these studies provide intriguing clues about possible mechanisms. Griffiths et al. [8] administered multiple doses of psilocybin to

18 healthy volunteers, and used various measures, including the Death Transcendence Scale, to quantify their lasting effects. The Death Transcendence Scale has five subscales: Mysticism, Religious, Nature, Creative, and Biosocial. The only one of these to show a significant change at 14-month follow up was the Religious subscale, which assesses “a sense of continuity after death” [8], p. 660.

It is potentially significant that the Religious subscale, but not the Mysticism subscale, showed a significant increase. The Religious subscale contains items that explicitly probe belief in an afterlife or supreme being, such as “I believe in life after death” and “There is a Force or Power that controls and gives meaning to both life and death.” Items from the Mysticism subscale, however, refer to having had an experience in which one “felt everything in the world to be part of the same whole” or “realized the oneness of [oneself] with all things”. This is in line with how constructs such as mystical-type experience are operationalized in psychedelic research, following the work of William James and Walter Stace and emphasizing feelings of unity or oneness rather than specific metaphysical interpretations of such experiences. The items on the Religious subscale, in contrast, are far less metaphysically ambiguous.

The same group found similar results in a study assessing the combined effects of psilocybin administration and spiritual practices, such as meditation, in healthy volunteers [10]. Here they administered both the Death Transcendence Scale and the LAP-R Death Acceptance subscale. The only significant changes on either measure six months post-psilocybin were increases in the Mysticism and Religious subscales of the Death Transcendence Scale. So, these two studies suggest that psychedelics may reduce fear of death in healthy people – specifically, *by inducing mystical or religious ideas*.²

² Griffiths et al. report that before screening, this group of volunteers had a mean score of 28.72 on the Religious subscale, increasing to 31.28 at 14-month follow-up. This would seem to be a relatively small increase, which complicates the conclusion that a psychedelic experience could reduce fear of death by instilling non-physicalist ideas in someone deeply sceptical of such ideas. Future prospective experimental research should examine what effects, if any, psychedelic administration can have on fear of death and on religious/metaphysical beliefs in explicitly atheistic or physicalistic subjects.

It should also be noted that this evidence alone merely suggests, rather than establishing, a causal pathway leading from changed metaphysical beliefs to reduced fear of death. To the

Retrospective survey studies also provide evidence of an effect. Using a single-item measure, Griffiths et al. [11] found that 70% of respondents who reported having had a “God encounter experience” on psychedelics agreed that their fear of death had been reduced by the experience. (Interestingly, only 57% of respondents reporting a non-drug-induced “God encounter experience” agreed to this.) Sweeney et al. [38] surveyed people who reported having had an experience, psychedelic-induced or otherwise, that changed their beliefs about death. Unsurprisingly, a very high proportion of respondents in both (drug and non-drug) groups showed reduced fear of death as measured by the Revised Death Attitude Profile (DAP-R). Moreton et al. [25] administered various measures to people who reported having had a “meaningful” psychedelic experience, and found reductions in fear of death as measured by the Fear of Death subscale of the DAP-R; these reductions correlated with improved subjective well-being. Finally, Moreton et al. [27] surveyed people who reported having had a “significant” psychedelic experience, and found reductions in fear of death as measured by the revised Collett-Lester Fear of Death Scale; these reductions correlated with reduced symptoms of obsessive–compulsive disorder.

It seems that a moderate-to-high dose of a psychedelic can reduce fear of death fairly reliably in healthy people, as well as in terminally ill patients. There is a reasonable chance, then, that a carefully conducted psychedelic experience will speak to the heart of our hypothetical physicalistic atheist; will move her emotions; will actually, that is, decrease her fear of death. Furthermore, the physical and psychological safety of controlled psychedelic administration, when adequate precautions are taken, has been documented extensively by now [37]. Assuming that she has access to safe and legal contexts of use, which exist in some places, our protagonist has no major worries on that score. She is in good physical and mental health, and is happy to accept some relatively minor risks for the sake of obtaining a potentially enormous psycho-existential benefit.

Footnote 2 (continued)

extent that we are justified in concluding that such a causal pathway exists, this conclusion is supported not by any piece of evidence in isolation, but by an inference to the best explanation of the total body of evidence that I review here.

Our protagonist's major outstanding question, then, is whether the method will speak to her head as well as her heart. Do psychedelic experiences reduce fear of death merely by inducing what she would (atheistically, physicalistically) regard as "metaphysical hallucinations" [5] or "comforting delusions" [31]? Or do they do it by some other method instead? [20, 21].

How do they do it?

On the most basic level, I will assume that psychedelic drugs reduce fear of death by inducing *experiences* that reduce fear of death. This is not totally uncontroversial. Some have suggested that the therapeutic effects of psychedelic administration might be caused mainly by non-experiential, purely neurobiological effects of the drugs [30]. However, as others have emphasized, the many strong correlations between aspects of the acute psychedelic experience and lasting psychological benefits are most readily explained if the latter are caused primarily by the former [44].

This argument is bolstered by the existence of non-drug-induced experiences (mystical, meditative, near-death, and so forth) that seem to share significant phenomenological features and psychological benefits with psychedelic experiences [19]. Assume that a certain broad type of experience is typically followed by certain specific psychological benefits, irrespective of how the experience is induced. Assume also, as seems eminently likely, that when not drug-induced, the experience itself causes the benefits. It would then seem quite improbable – an unwarranted and unpar-simonious hypothesis – that this very same type of experience, when drug-induced, does *not* cause the benefits, but is instead related to the latter as a distinct effect of a common cause (i.e. drug administration). So, the question I will ask is: How do psychedelic *experiences* reduce fear of death?

Here is one obvious answer: They do it by instilling a deep, profoundly moving, experientially-backed conviction that "there is more to the universe—and to consciousness—than a purely materialist world view would have us believe" [31]. This answer is what Letheby [21] calls the "Metaphysical Belief Theory" of psychedelic therapy, and many people who use psychedelics, including patients in clinical trials, endorse it quite explicitly. Consider, for example, the

terminal patient quoted above who received DPT in a 1970s clinical trial. This patient described the "basic theme" of his experience as being that "life continues to go on" (after death, presumably) and that "we are basically some form of essence from a Supreme Being". He reported not having "the fear of death that [he] once had", having been "reassured that there is a very beautiful, loving masterful plan in this Universe for all of us" [33], p. 124). Rodgers, the NFL quarterback, commented that "when you've seen the other side, it makes the idea of death more of a passage and less of an ending" [14].

Similar accounts can be found from participants in recent clinical trials. A patient with terminal cancer who received psilocybin in a study at NYU described the peak of his experience as follows:

I was not here anymore; I was not with my body . . . I thought to myself that that is death, and it was scary, but I remember I said to myself, "Oh if this is death, it's not that bad—at least there is something." . . . It was exotic and unknown, mysterious, something *I would not mind being in because I would love to explore that.* [39], p. 499, my emphasis.

Another patient in the same trial directly linked her reduced fear of death to an apparent revelation, during the drug experience, that some kind of postmortem experience awaits us:

Brenda also felt as if she experienced her own death on two separate occasions during the experience and emerged both unafraid of death and viewing it as a beautiful component of existence. On the first occasion, she said, "I went into this black area and it was just wonderful... I just thought to myself... I think this might be *what people experience when they die.*" Her second encounter with death included seeing, "This brick thing that was a lot of bricks, and I realized this was a kind of crematorium... *I was just part of this big beautiful world... and that's what's going to happen when I die... maybe death is a beautiful thing.*" [23], p. 5, my emphasis.

Of course, it is possible that at least some people giving these reports are using figurative language, rather than reporting literal metaphysical convictions. However, in my view, there is nothing in the reports

quoted here to suggest such an interpretation; these people appear simply to be reporting, in a straightforward fashion, beliefs about reality (however confident or tentative) derived from their experiences of altered consciousness. This point is bolstered by a growing body of quantitative evidence that people's metaphysical beliefs can, indeed, be altered significantly by a psychedelic experience [29, 40]. Indeed, one such study found not just changes in general metaphysical views such as physicalism, dualism, and idealism, but increases in more specific beliefs concerning post-mortem survival of consciousness, reincarnation, and paranormal communication with the dead by the living [29].

In light of such evidence, both quantitative and qualitative, how could anyone doubt that psychedelic experiences reduce fear of death – when they do – mainly by inducing comforting non-physicalist metaphysical beliefs?

A limited defence of the metaphysical belief theory

Letheby [21] doubts this claim. His central argument against the Metaphysical Belief Theory appeals to first-person accounts of psychedelic therapy that do *not* emphasize the acquisition or strengthening of non-physicalist beliefs. He quotes the following examples from recent clinical trials (some in end-of-life, others in depression):

I feel like a whole bunch of crap has been dumped off the surface. This stuff that made my world shut down so much and made me look at the ground and watch the clock numbers clicking by. There's life and so many things going on, just watching that tree over there blowing in the breeze, seeing people in the street, and all the different people in vehicles rushing by! I just feel good about being alive . . . It's always there; we just don't notice, and I'm trying to notice and not forget that I can see it at any time. I can hear it any time. It's like waking up in the most profound way, that this is really what life is, it's really like this. We're just not noticing.

[2], p. 22.

It was less about my illness. I was able to put it into perspective . . . Not to see oneself with one's sickness as centre. There are more impor-

tant things in life . . . The evolution of humankind for example . . . Your Inner Ego gets diminished, I believe, and you are looking at the whole . . . you are indeed starting to build relations with plants or with the entire living world around. You think less about yourself, you are thinking— across borders.

[7], p. 62.

It was like when you defrag the hard drive on your computer, I experienced blocks going into place, things being rearranged in my mind, I visualized as it was all put into order, a beautiful experience with these gold blocks going into black drawers that would illuminate and I thought: 'My brain is [being] defragged, how brilliant is that!'

[43], p. 10.

As Letheby says, these “do not sound like people deriving emotional comfort from their newly acquired or strengthened belief in transcendent metaphysical dimensions of reality” (2021, p. 71). He reasons as follows: if these people really had undergone compelling apparent encounters with profoundly important non-physical realities, they would be emphasizing this in their retrospective accounts of the therapy. Since they are not emphasizing such experiences, we can assume that they did not occur.

Letheby bolsters this argument by pointing to several other facts that sit uneasily with the Metaphysical Belief Theory. One is the finding that, in a qualitative study of psilocybin treatment for depression, a large majority of patients emphasized experiences of connectedness and acceptance as therapeutically relevant, while a relatively small proportion emphasized spiritual- or metaphysical-type experiences. Another is the finding, in some studies, that ratings of *psychological insight* (or similar constructs) during a psychedelic experience predict good therapeutic outcomes more strongly than do ratings of *mystical-type experience* (or similar constructs). This suggests to Letheby that the real causal story has to do with changes to mental representations of the self – the main factor common to psychological insight experiences and unitive mystical-type experiences. He expands this idea into a “self-unbinding” theory of psychedelic therapy, which says that psychedelics alleviate symptoms of various pathologies by disintegrating rigid and pathological mental representations of the self, thereby

facilitating the subsequent beneficial revision of these representations [21], cf. [22].

Any application of this reasoning to reductions in fear of death, however, would depend on a contentious assumption: that psychedelics reduce fear of death and various (other) psychiatric symptoms *by a single psychological mechanism*. None of the quantitative evidence cited by Letheby concerns reductions in fear of death; it all concerns reductions in other undesirable psychological phenomena such as symptoms of depression, addiction, and so forth. So even if he is right about how these specific benefits are caused, extrapolating to reductions in fear of death relies on the substantive and controversial premise that a single mechanism underlies the many varieties of psychedelic transformation.

We will return to this controversial premise shortly. For now, I want to emphasise that if we bracket other psychological benefits of psychedelic experiences and focus exclusively on reductions in fear of death, we find the Metaphysical Belief Theory in quite a strong position. The main piece of evidence Letheby adduces against this theory is the failure of some patients, even in end-of-life contexts, to emphasize metaphysical themes. But this is just one piece of evidence. It may be difficult to account for on the Metaphysical Belief Theory, but it is not impossible; there is no logical inconsistency. And when we cast a broader evidential net, we find many pieces of evidence – including some that were unavailable to Letheby [21] – that seem clearly to favour the Metaphysical Belief Theory over the self-binding account. We find, in other words, many pieces of evidence that strongly implicate metaphysical belief change in the process by which psychedelics reduce fear of death.

For one thing, we have all the qualitative reports and first-person testimonies from patients and subjects who *do* explicitly attribute their reductions in fear of death to apparent non-physicalist metaphysical apprehensions. These have to be counterbalanced against the reports and testimonies from those who do not emphasize such themes – leading, perhaps, to a tie on this particular count.

Breaking the tie, however, there is considerable *quantitative* evidence favouring the Metaphysical Belief Theory over the self-unbinding theory, and none that I am aware of pointing in the opposite direction. Consider the findings of Griffiths et al. [8] in healthy volunteers: the only changes in attitudes

towards death after a psilocybin experience came from the “Religious” subscale of the Death Transcendence Scale, which assesses a sense of “continuity after death”. Consider, too, the similar findings of Griffiths et al. [10] in healthy volunteers: the only changes in attitudes towards death after psilocybin experiences in conjunction with meditation training came from the “Religious” and “Mystical” subscales of this same measure. No subscales measuring more “naturalistically acceptable” forms of death transcendence showed significant changes.³ This coheres with at least one survey study by the same group; as we saw, Griffiths et al. [11] found that 70% of those reporting a psychedelic-induced “God encounter experience” also reported a reduced fear of death. It is hard to believe that the latter was not caused mainly by non-physicalist metaphysical ideas present in the former.

Finally, the retrospective survey studies by Moreton et al. provide intriguing and highly specific evidence. Recall one of Letheby’s arguments for favouring a self-representation account of psychedelic therapy over a metaphysical belief account: in some studies, constructs such as psychological insight predict good outcomes more strongly than do constructs such as mystical-type experience. When it comes to reductions in death anxiety, however, the findings of Moreton et al. point in *the exact opposite direction*. In their study of “meaningful” psychedelic experiences, Moreton et al. [25] found that ratings of acute mystical-type experience correlated significantly with reductions in fear of death, but ratings of acute psychological insight did not. Furthermore, while both mystical-type experience and psychological insight correlated significantly with increased subjective well-being, the former correlation was mediated by reductions in death anxiety, while the latter was not. Similarly, in their study of “significant” psychedelic experiences, Moreton et al. [27] found that acute

³ Of course, findings like this cannot establish conclusively a causal pathway leading from psychedelic experience to altered metaphysical beliefs and, in turn, to reduced fear of death. Various other causal pathways might be hypothesized. But the total body of evidence – including such quantitative findings as these, qualitative findings and first-person reports discussed earlier, and mediation analyses to be discussed shortly – can be explained very neatly by the central ideas of the Metaphysical Belief Theory.

mystical-type experience, but not acute psychological insight, correlated significantly with reductions in fear of death. Both acute variables correlated significantly with reductions in obsessional and compulsive symptoms – but only the effects of mystical-type experience were mediated by reductions in death anxiety.

Thus, when we narrow our focus to the question “how do psychedelics reduce fear of death?”, the evidential landscape appears to be the precise opposite of that depicted by Letheby. Mystical-type experience comes to the fore and psychological insight recedes into the background. Intuitively, this landscape can accommodate the Metaphysical Belief Theory much more readily than it can accommodate the self-unbinding account.

REBUS Redux

What are we to make, then, of Letheby’s arguments as they pertain to *other* psychological benefits of psychedelic experiences? Nothing I have said has challenged his claim that reductions in depressive and addictive symptoms are caused mainly by changes to self-representation, rather than changes to metaphysical belief; I have simply argued that this claim cannot easily be generalised to fear of death. This leaves us with two ideas needing to be reconciled: (i) that reductions in fear of death are caused mainly by metaphysical belief shifts, and (ii) that reductions in depressive and addictive symptoms are caused mainly by changes to self-representation.

One obvious response would be to embrace mechanistic pluralism about psychedelic therapy, holding that controlled psychedelic ingestion simply causes different psychological benefits by different causal pathways [13, 41], cf. [1]. But a strong form of pluralism would struggle to explain the robust and consistent correlation between ratings of mystical-type experience and various *quite different* benefits in both healthy and patient populations. As Letheby emphasises, this correlation needs explaining, and suggests that at *some* level of abstraction, informative generalizations can be made; at some level of analysis, a single mechanism is at play. Of course, we could say that psychedelics induce psychological benefits by inducing psychologically beneficial experiences, and simply leave it at that. This would be maximally general

but minimally interesting and informative. Can we do better?

I think the moral to draw from my arguments in the previous section is this: If we follow Letheby all the way to the self-unbinding model, we may go *too far down* the hierarchy of abstraction. What we gain in specificity or informativeness, we end up losing in generality, since our account now plausibly fails to explain reductions in fear of death. Also, as Hans van Eyghen [42] has recently emphasized, there are many sorts of beliefs that can play a role in the genesis and maintenance of psychiatric pathology, and not all of these are importantly related to the self. It seems we need to move back up the ladder of abstraction to regain the generality we have lost.

Van Eyghen’s own solution is that successful psychedelic therapy involves *contextual belief recalibration* – revising subjects’ beliefs to make them better suited (or calibrated) to the contexts that subjects inhabit. I want to suggest that even this may be too specific. Perhaps, in light of the evidence that changes in metaphysical beliefs explain reductions in death anxiety while changes in self-representations (i.e. self-related beliefs) explain reductions in depression and addiction., the best balance we can strike is to say that psychedelics transform people by *changing their* (relatively abstract, high-level) *beliefs* – by changing their minds, as Pollan [32] puts it.

This, in essence, is the REBUS (“Relaxed Beliefs Under Psychedelics”) model of psychedelic action proposed by Carhart-Harris and Friston [3]. The core claim of REBUS is that most of the distinctive and interesting effects of moderate to high dose psychedelic use result from a fundamental mechanism of belief relaxation. Carhart-Harris and Friston argue that the drugs’ neuropharmacological action disrupts the coherent functioning of high-level cortical “association areas”. The cognitive result, informally put, is to decrease the brain’s confidence in its most abstract and general (typically unconscious) beliefs about self and world – beliefs that constrain and structure our ordinary conscious experience. This belief relaxation both (a) causes many of the typical features of acute psychedelic experience and (b) provides an opportunity to revise the beliefs themselves.

Letheby [21] argues that the REBUS model is too far up the ladder of abstraction, it may be true and quite general, he says, but it is insufficiently informative. In his view, a useful theory of psychedelic

therapy needs to say what specific types of beliefs are revised in the process, and he argues that the answer is “beliefs about the self”. The upshot of my discussion here is that, contra Letheby, the REBUS model seems to be pitched at precisely the right level of abstraction to generalize as informatively as possible. If we ask what is common to the processes through which psychedelics reduce fear of death, depression, anxiety, addiction, obsessions, compulsions, and so forth, perhaps all we can say is that they involve the relaxation and revision of relatively abstract and high-level beliefs about self and/or world. The beliefs in question may concern the ultimate metaphysical nature of reality, or the postmortem fate of human consciousness; they may not [21]. They may directly and importantly concern the self; they may not [42]. The revisions in question may best be described as aligning the beliefs with the subject’s context; they may not. *Belief revision facilitated by belief relaxation* may be the most general and informative mechanistic description that we have. Psychedelics dissolve or disintegrate our mental models of the world (including the self), allowing those models to be revised, for better or worse, depending on contextual and other factors [24].

It might be argued that even this hypothesis is insufficiently general. Moreton et al. [26] propose that psychedelic experiences may reduce fear of death through a variety of psychological mechanisms, with different mechanisms making different contributions in different people. Furthermore, it is not clear that all the mechanisms they hypothesize can be subsumed under the REBUS model:

We believe that psychedelics may typically reduce death anxiety through varied combinations of the following related factors: (a) forcing confrontations with one’s mortality involving exposure to, and processing of, typically unconscious fears of death; (b) generally reducing focus on the self and its concerns; (c) shifting meta-physical beliefs regarding the nature of human consciousness; (d) amplifying religious faith; and (e) increasing feelings of connectedness and perceptions of the meaningfulness of life. The exact contribution of these factors may depend on the preexisting psychological structures of the individual (e.g. religious beliefs). Thus, the magnitude of the effects of psyc-

delics on death anxiety should also be expected to vary as a function of these individual differences. [26], p. 25).

The subsequent survey studies conducted by Moreton and colleagues provide further evidence relevant to the question. On my reading, this evidence points clearly to a central role for metaphysical belief change. However, to draw any very confident conclusions, prospective experimental studies will need to be designed carefully, using a variety of measures, to allow precise discrimination between competing hypotheses. At best, the available evidence justifies a *tentative* conclusion that the promotion of non-physicalist beliefs is the primary mechanism through which psychedelic experiences reduce fear of death.

Suppose tentatively, then, that this conclusion is correct; what follows?

The truth of this conclusion would have significant implications for Letheby’s [20, 21] contention that psychedelics show the contours of a viable *naturalistic spirituality*. Letheby draws on the work of Flanagan and Caruso [4], who argue that advances in neuroscience are leading to a new and distinctive wave of existential anxiety, which they dub “neuro-existential anxiety” – a dysphoric reaction to the increasingly apparent reality that humans are merely evolved, mortal animals existing in a purposeless universe. Flanagan and Caruso propose, in response, a *neuroexistentialist project* which involves looking to the mind and brain sciences themselves – the putative sources of this predicament – to find potential solutions. Answering this call, Letheby [20] argues that the psychiatric and neuroscientific study of psychedelic experiences can contribute to the neuro-existentialist project by revealing a way to “make peace with” a naturalistic worldview, as opposed to “becoming persuaded of its falsity” [20]. The idea is that transformative psychedelic experiences illustrate a way of overcoming (neuro) existential angst *without* adopting non-physicalist beliefs: a loosely Buddhist way in which the influence of self-representation on the contents of one’s conscious experience is attenuated. This is supposed to lead to the experience of an *un-self-centred* (phenomenal) world featuring new modes of attention and salience attribution, liberated from a constant, tacit situating of oneself at the meta-physical and axiological centre of things. In terms

of the mechanisms proposed by Moreton et al. [26], this corresponds most closely to “generally reducing focus on the self and its concerns”.

It is an appealing picture, especially to the naturalistically inclined among us. But it sits uneasily with the evidence surveyed in this paper, which suggests that when psychedelic experiences reconcile people to their mortality and restore their sense that life has meaning, they do so mainly by providing subjectively convincing intimations that “there is more to the universe – and to consciousness – than a purely materialist world view would have us believe” [31]. If our physicalistic, atheistic protagonist is unshakably convinced that such intimations are “metaphysical hallucinations” or “comforting delusions”, then her search for a method that will speak to her head, as well as her heart, may not be over yet.

Conclusion

Evidence suggests that psychedelic experiences, in the right conditions, can substantially and durably reduce fear of death. Letheby [20, 21] has argued that they do so not mainly by promoting non-physicalist metaphysical beliefs, but rather by changing mental representations of the self, and that this fact has implications for debates over neuroexistentialism and naturalistic spirituality. As such, examining this mechanistic claim more closely provides an opportunity to advance these debates, in tandem with theoretical debates about the mechanisms of psychedelic therapy. Based on the available evidence, I have argued that psychedelics typically reduce fear of death by promoting non-physicalist metaphysical beliefs, whereas they may well typically reduce symptoms of depression and addiction by changing self-representations. In light of this conclusion, the mechanism of *belief relaxation and revision* posited by the REBUS model would seem to provide the best general account of psychedelic transformation, striking an optimal balance between specificity and generality. This conclusion also undermines Letheby’s [20, 21] proposed role for psychedelics in the neuroexistentialist project and the search for a naturalistic spirituality. It is important to emphasize, however, that this conclusion can only be drawn tentatively at present. We should be wary of issuing more premature obituary notices. Only further empirical research – cleverly designed,

philosophically informed, and carefully interpreted – can determine whether a naturalistic psychedelic spirituality, or a psychedelic neuroexistentialism, are genuine possibilities.

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