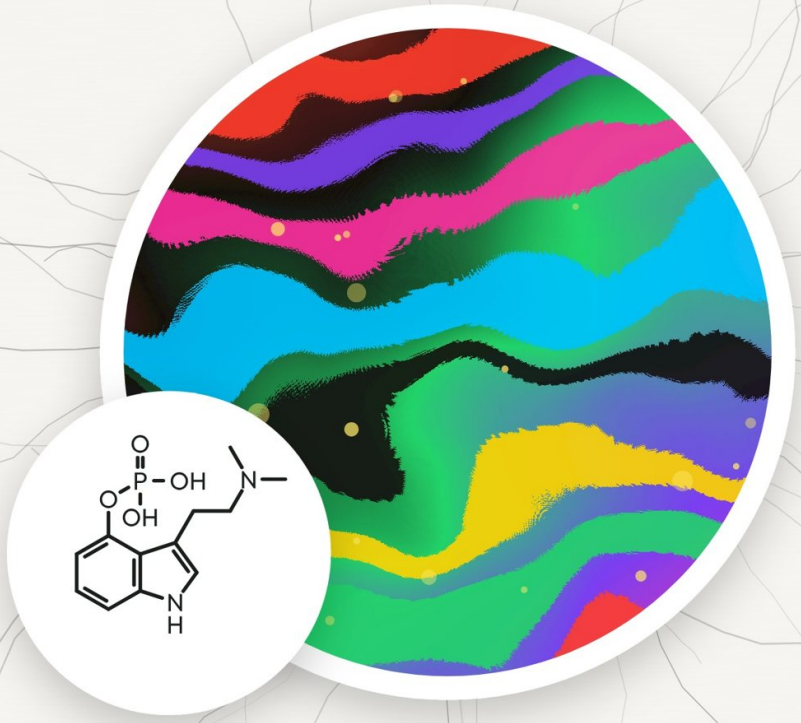
MICRODOSING

MACROBENEFITS IN HEALTH AND WELL-BEING



Your Body in Psychedelic and Non-Psychedelic Substances

SUSAN McDOWELL

Thinking School

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MEDICAL AND LEGAL DISCLAIMER

This book is intended for educational and informational purposes only. It does not constitute medical, psychological or legal advice and is not a substitute for consultation with a qualified health professional. Many of the substances discussed are controlled or illegal in many jurisdictions; nothing in this book is intended to encourage their unlawful possession or use. Always consult a doctor before starting, stopping or combining any substance or medication. The author accepts no liability for any action taken on the basis of the information in this book.

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PREAMBLE

A Field to Be Explored

IF YOU ARE CURIOUS about microdosing, you have probably met two kinds of information: glowing personal stories and stern warnings. This book sits between them. By the end of it, you will be able to tell a controlled trial from a survey of enthusiasts, and a study from a sales pitch; say which substances people microdose and how much evidence stands behind each one; name the real risks, from medication interactions to unknown long-term effects, and the legal limits where you live; and walk into your doctor's office with a written plan and a list of questions. You will also have everyday practices that are legal, inexpensive and, for the most part, well studied, whether or not you ever microdose.

What this book will not do is promise you a result. I am not a physician, this is not medical advice, and it gives no dosing instructions. I have read the studies, including who ran them and who paid for them, so that you can make your own decision better informed. A word on terms: here, a microdose means an amount too small to change perception noticeably, taken repeatedly in the hope of improving mood, well-being or thinking. The section "What counts as a microdose?" fills in the details.

How to use this book

Chapter One sets out what microdosing is, where it came from and how it might work. Chapter Two describes the substances people use, psychedelic and non-psychedelic, and ends with safety and legality, including a dated "Legal snapshot" box. Chapter Three looks at four mushroom species. Chapter Four asks how good the evidence is, and Chapter Five applies it to anxiety, depression and post-traumatic stress.

Chapter Six steps outside microdosing to look at full-dose MDMA-assisted therapy and what it teaches about trauma. Chapter Seven covers everyday

practices that support a balanced mind. Chapter Eight helps you prepare for a conversation with your doctor, and Chapter Nine lists what to watch for as the field changes. Most chapters end with a short "Try this" box and a list of key points.

If you only have one evening, read Chapter Four, the "Safety and legality" section of Chapter Two, and Chapter Seven. Together they cover most of what you need to know before you decide anything.

TRY THIS

Start here: a 24-hour baseline

Before you read further, take ten minutes today. 1. Write one sentence on why you picked up this book. 2. Rate your mood, anxiety, sleep and focus today from 0 to 10. 3. List every medication and supplement you take. 4. Look up the legal status of psilocybin and LSD where you live, using an official government source. Keep this page. You now have a starting point to compare against, and you will use it again in later chapters. It is your first pass at the W and the H of the WEIGH check below.

KEY CONCEPT

The WEIGH check

The "Try this" boxes in this book add up to one habit, which I call the WEIGH check. Use it for any substance, supplement or new routine, before you decide anything. W – Why: what do you hope will change, and how would you know if it did? E – Evidence: what kind of study stands behind the claim, and did it test this substance at this dose? I – Interactions and risks: your medications, your health history, what is really in the product, and the law where you live. G – Get advice: take your notes to a doctor or pharmacist and ask your questions. H – Have a record: keep a simple log, so you judge any change against a baseline rather than memory. Each later box works on one or two of these steps, and the four-week plan in the Conclusion puts them together.

What full doses suggest, and why that is not the same as microdosing

Most headlines about psychedelics come from research on full doses, given once or a few times in a clinic with preparation and support. The results are promising but uneven. A 2022 trial funded by the company Compass Pathways and published in the New England Journal of Medicine found that a single 25 mg dose of psilocybin, with psychological support, lowered scores in treatment-resistant depression more than a 1 mg dose after three weeks. In 2024, by contrast, the US Food and Drug Administration declined to approve MDMA-assisted therapy for PTSD.

Brain imaging gives a glimpse of what a full dose does. In 2024 a team from the University of Liège and Maastricht University, with Sepehr Mortaheb as first author, reanalyzed scans from 22 volunteers who had taken psilocybin and 27 who had taken a placebo. Under psilocybin the brain kept slipping into a "hyperconnected" pattern, and that pattern tracked changes in the sense of self, such as a loosening boundary between "me" and the world, more closely than it tracked hallucinations. The study was small and shows an association, not a cause.

Animal studies go further. In a 2023 study in Nature led by Romain Nardou and Gül Dölen at Johns Hopkins University, one dose of psilocybin, LSD, MDMA, ketamine or ibogaine let adult mice learn again a social lesson that mice normally learn only when young, as if a "critical period" had reopened. In Hungary, Nardai, Frecska and colleagues reported in 2020 that rats given DMT after an induced stroke had less damaged brain tissue and recovered movement better.

In people, a 2018 pilot trial led by Alicia Danforth and Charles Grob, funded by MAPS, a nonprofit that promotes MDMA-assisted therapy, found that social anxiety fell more in eight autistic adults given MDMA with therapy than in four given a placebo.

None of this is evidence about microdosing, for three reasons. The doses differ: one or a few full doses with professional support, not small repeated doses at home. The species often differ: when Daniel Hackam and Donald Redelmeier followed up 76 of the most widely cited animal studies, only about a third had been confirmed in randomized trials in people. And the human studies are tiny, or involve people with a particular illness. These findings are

reasons to keep researching, not to act. Keeping full-dose and microdose evidence apart is the first habit this book asks of you: the E of the WEIGH check.

Ancient roots

Interest in microdosing draws on two sources at once: the long ceremonial history of some of these plants and fungi, and a recent wave of laboratory and clinical research. The two do not always say the same thing, and this book tries to keep them apart.

Psilocybin mushrooms, peyote, ayahuasca and related plants have long histories of ceremonial and healing use among Indigenous peoples of the Americas, including the Mazatec, Huichol (Wixárika) and Shipibo, and in pre-Columbian societies such as the Aztec.

That knowledge was suppressed for centuries, first by colonial authorities and the Inquisition, later by modern drug prohibition. It has resurfaced only in recent decades, mostly among non-Indigenous researchers and users who see in these substances a possible way to treat mental illness.

Most of that attention has gone to full doses, the kind that transform perception for hours. Microdosing, taking amounts too small to cause those effects, caught on later: first in online communities and the press, and only more recently in the laboratory.

Among the Mazatec of Oaxaca, Mexico, the use of psilocybin mushrooms in night-long healing ceremonies, called veladas, is well documented. You will sometimes read that Mazatec healers also used much smaller amounts for everyday physical and emotional troubles, such as sadness, anger or agitation. I have not been able to trace that claim to a primary ethnographic source, so I treat it as unconfirmed.

What counts as a microdose?

There is still no agreed scientific definition of a microdose. A 2019 review in the *Journal of Psychopharmacology*, led by Kim Kuypers of Maastricht University with David Nutt and others, described three features most accounts share: a dose too small to cause obvious changes in perception, taken repeatedly, with the aim of improving well-being or thinking. Psilocybin mushrooms and LSD are by far the most common choices. In the largest survey so far, described

below, about 85 percent of microdosers used psilocybin and about 11 percent used LSD.

The amounts people report vary widely. The 2019 review described a microdose as roughly one-tenth to one-twentieth of a recreational dose, and noted that at the upper end of the usual LSD range some people already notice perceptual effects. Because mushrooms vary in strength and illicit LSD is rarely tested, many people do not know how much they are actually taking. Schedules vary too, from every few days to daily.

KEY CONCEPT

Microdose

A small, usually sub-perceptual amount of a substance, roughly one-tenth to one-twentieth of a standard dose, taken on a repeating schedule. Commonly reported amounts are 5–20 µg of LSD or a few tenths of a gram of dried psilocybin mushrooms, but potency varies so much that the real dose is often unknown.

Stacking: combining substances

Beyond psychedelics alone, many microdosers practice what is called stacking: combining a microdose, usually of psilocybin mushrooms, with other substances in the hope of boosting the effects. In the 2021 survey led by Joseph Rootman, more than half of microdosers said they stacked, most often with Lion's Mane mushroom (39 percent), niacin (18 percent) or chocolate (5 percent).

KEY CONCEPT

Stacking

Combining a psychedelic microdose, most often psilocybin, with non-psychedelic substances such as Lion's Mane, cocoa or niacin, in the hope of enhancing its effects. The practice is popular but largely untested.

Mixing mushrooms with other things is not new. Spanish chroniclers of Aztec Mexico, such as the friar Bernardino de Sahagún, described gatherings where mushrooms were eaten with honey and chocolate was drunk through the night.

A Nahuatl word, cacahuaxochitl, is sometimes quoted as meaning "chocolate mushrooms," but it translates as "cacao flower" and usually refers to a flower used to flavor chocolate drinks.

Chocolate remains a popular partner for psilocybin today, while adding Syrian rue (*Peganum harmala*), Lion's Mane (*Hericium erinaceus*) or niacin appears to be a more recent habit.

As with microdosing in general, stacking seems to have spread through enthusiastic personal accounts rather than evidence. The only direct test I know of is a 2022 follow-up study by the same research group, which tracked 953 psilocybin microdosers and 180 non-microdosers for about a month. Adding Lion's Mane and niacin made no difference to mood or mental health. In older participants it was linked to a small gain on a finger-tapping test of motor speed, a finding the authors say needs to be repeated.

It is also worth knowing who ran this research. One coauthor, the mycologist Paul Stamets, owns a company that sells Lion's Mane supplements and is named on pending patents for combining psilocybin mushrooms, Lion's Mane and niacin, and several other authors had ties to the app company that collected the data. They disclosed these interests, as they should; readers can weigh them.

The reasoning behind stacking goes roughly like this. Lion's Mane has been proposed to support mood, memory and the growth of nerve cells, mostly on the basis of animal and small human studies, and cocoa is a traditional companion to mushrooms. Syrian rue contains harmine and harmaline, which block the enzyme monoamine oxidase A. Compounds like these, known as MAOIs, are used in ayahuasca to keep DMT from being broken down, which prolongs and intensifies its effects. Lion's Mane is also sometimes described as an MAOI, but I have found no good evidence that it acts this way in people.

KEY CONCEPT

MAOI (monoamine oxidase inhibitor)

A compound that blocks the enzyme which breaks down serotonin, dopamine, other monoamines and DMT. MAOIs prolong and intensify the effects of some psychedelics, but they can interact dangerously with many medications and with certain foods.

Niacin causes a harmless but noticeable flushing of the skin, and some promoters claim this helps psilocybin reach the body's tissues or even discourages misuse. Neither idea has been tested in people. Most of what is known about the individual stacked substances comes from animal studies.

PLEASE NOTE

A word of caution

Claims that stacked substances boost psilocybin's effects in people have not been shown. Some combinations also carry real risk. Syrian rue and ayahuasca contain MAOIs, and MAOIs combined with other drugs that raise serotonin, including many antidepressants, can cause serotonin toxicity, which can be life-threatening. Warning signs include muscle jerks or rigidity, high fever, agitation and seizures, and they need emergency care. Anyone taking prescription medication should talk to a doctor or pharmacist before combining it with any of these substances.

Who microdoses, and why?

Microdosing seems to have become much more common over the past decade, and researchers have begun to describe who does it. The largest survey so far, led by Joseph Rootman and published in Scientific Reports in 2021, collected answers through a smartphone app from 4,050 people who microdosed and 4,653 who did not, most of them in the United States and Canada. The two groups were broadly similar in background, although microdosers tended to be a little older and more likely to live in cities. Microdosers were more likely to report a history of mental health concerns. They were also less likely to drink alcohol often and more likely to use cannabis.

Why do people microdose? In that survey, the most common reasons were to become more mindful, improve mood, boost creativity and help learning. People with mental health concerns more often said they wanted to reduce anxiety, lift their mood or cut down on other substances. Women more often mentioned mood and anxiety; men more often mentioned learning and sociability.

This suggests that many people who microdose are, in effect, trying to treat themselves. In surveys, microdosers report less stress, better mood and fewer symptoms of depression and anxiety. In a 2019 survey of 410 microdosers with a

diagnosed condition, led by Nadia Hutten at Maastricht University, respondents rated microdosing as more effective than their conventional treatment, especially for anxiety and ADHD. These are self-reports from people recruited on psychedelic forums who chose to keep microdosing. They tell us what people believe, not what the substance does.

Studies that follow people over time show the same mix of promise and caution. In a 2019 study by Vince Polito and Richard Stevenson in Australia, 98 microdosers tracked themselves for six weeks: their depression and stress scores fell and their attention improved, but neuroticism rose slightly, which they had not expected. A 2019 survey led by Thomas Anderson at the University of Toronto found that microdosers scored lower than non-microdosers on dysfunctional attitudes and negative emotionality. None of these studies used a placebo, and when researchers added one, the picture changed.

In 2021 Balázs Szigeti and colleagues at Imperial College London ran a clever "self-blinding" study in which 191 people who already microdosed prepared their own capsules, some containing their usual microdose and some empty, without knowing which they took on a given day. Both groups improved, and the differences between them were not significant; people felt better when they believed they had taken a microdose, whatever was in the capsule.

A 2022 double-blind trial in Argentina, led by Federico Cavanna and Enzo Tagliazucchi, found that psilocybin mushroom microdoses produced noticeable effects and changes in brain waves, but no improvement in well-being, creativity or thinking. And in a 2023 trial in New Zealand led by Robin Murphy and Suresh Muthukumaraswamy, 80 healthy men took 10 micrograms of LSD or a placebo every three days for six weeks. The LSD group felt somewhat better on dosing days, but there were no lasting changes, and anxiety led four people in the LSD group to drop out.

Where researchers have compared microdosers with people who do not microdose, I report what they found and how they found it, because a survey of enthusiasts, a self-blinded experiment and a placebo-controlled trial answer very different questions.

The elephant in the room

There is also an elephant in the room: addiction. For someone caught in it, the pull is not only the high. It is the contrast between the lows and the highs. Each

drop makes the next lift feel more urgent, until the person is chasing relief from their own despair as much as pleasure, and the cycle becomes hard to break.

Neuroscience offers a simple way to understand this pull. Dopamine, the brain's chemical of anticipation, drives us toward rewards that might turn out better than expected. When a substance or behavior delivers those rewards again and again, the brain adapts, and more stimulation is needed to feel the same pull. We return to this idea, and to practical ways of working with it, in Chapter Seven.

It is also worth remembering that legal status is a poor guide to harm. The psychopharmacologist David Nutt of Imperial College London, a former chair of the UK government's Advisory Council on the Misuse of Drugs, led an analysis published in *The Lancet* in 2010 that ranked twenty drugs by the harm they cause to users and to others. Alcohol, legal and widely accepted, came out as the most harmful overall, ahead of heroin and crack cocaine. Nutt is no teetotaler; he has written about his own drinking. His point is that honest, evidence-based information about risk should apply to every substance, legal or not. That is the spirit in which this book discusses microdosing.

This book is not a definitive guide. It is a map of a young field, drawn as honestly as I can: what is known, what is guessed, and what is still missing. I hope it helps you make informed, careful decisions about your own well-being, and understand a little more about the mind that is making them.

KEY TAKEAWAYS

- Most psychedelic research uses full doses given in clinics, or animals; it is the backdrop to microdosing, not evidence for it.
- Brain imaging suggests that, at a full dose of psilocybin, changes in the sense of self track a "hyperconnected" brain pattern more closely than hallucinations do.
- A microdose is a small, usually sub-perceptual dose taken on a schedule; LSD and psilocybin are the most common.
- "Stacking" combines psilocybin with other substances; the one direct test found no added benefit for mood, and some combinations, such as with Syrian rue, carry real risks.
- Placebo-controlled trials suggest that much of the benefit people report from microdosing comes from expectation.
- Legal status is a poor guide to harm; honest, evidence-based information about risk should apply to every substance, legal or not.
- The WEIGH check (Why, Evidence, Interactions and risks, Get advice, Have a record) is the habit behind every "Try this" box in the book.