

Open Psyence: Using the Pillars of Open Science to Enhance Translational Psychedelic Research

Interest and investment in psychdelic research is growing, largely motivated by psychiatric potential. However, a combination of typical and novel risks are ariseing. In the current pre-market stage, Open Science offers a means to mitiage these risks before malpractice and mistreatment are embedded in patient care.

Background

Indigenous Use
Natural psychedelic compounds are central to several indigenous cultures. Understadning and respecting their orihinal use aids the potential of these substances in new clinical practices.

Ceremonial use connects a wide range of practices and compounds:

- The Mazatecs consume psilocybin with 'curanderos' to experience deviity.
- The Shipibo people in the upper Amazon us Ayahuasca to better see reality with shamans
- Iboga is native to Central West Africa where it is used in religous contexts to initiate, heal, and explore death.

The spirituality of these experiences has promoted the term entheogen to capture aspects of experience which can be missed in western perspectives.

1950s - 1960s Research
Initial research with LSD began in the 1950's following it's discovery by Hoffman. The clinical potential of psychedelics was notable, with trials looking at Addiction, Depression, and Anxiety treatment. Research stopped in the 1960's following changes to drug legislation. Despite initially highlighting the safety of LSD, Cohen emphasised the risks of psychedelics in 1962. This was preceded by pseudoscience, poor substance control, and sensational reporting - some of which appear in the current field too.

Current Research
Recent psychedelic research is accelerating. New research groups and businesses are blossoming internationally, with legislation poised for medicalisation. Clinical trials are increasing (Fig 1.), looking at psilocybin as a treatment for depression, anxiety, eating disorders, and fibromalgia. MDMA has been positioned as an effective treatment for PTSD. Trials of LSD to treat anxiety and depression are underway.

Mechanism
With improved scientific tools, the mechanisms of psychedelics have been better explored. 5HT-2A receptor binding underpin the action of these substances. At a global level, changes to brain dynamics have been observed and paired with short- and long-term effects.

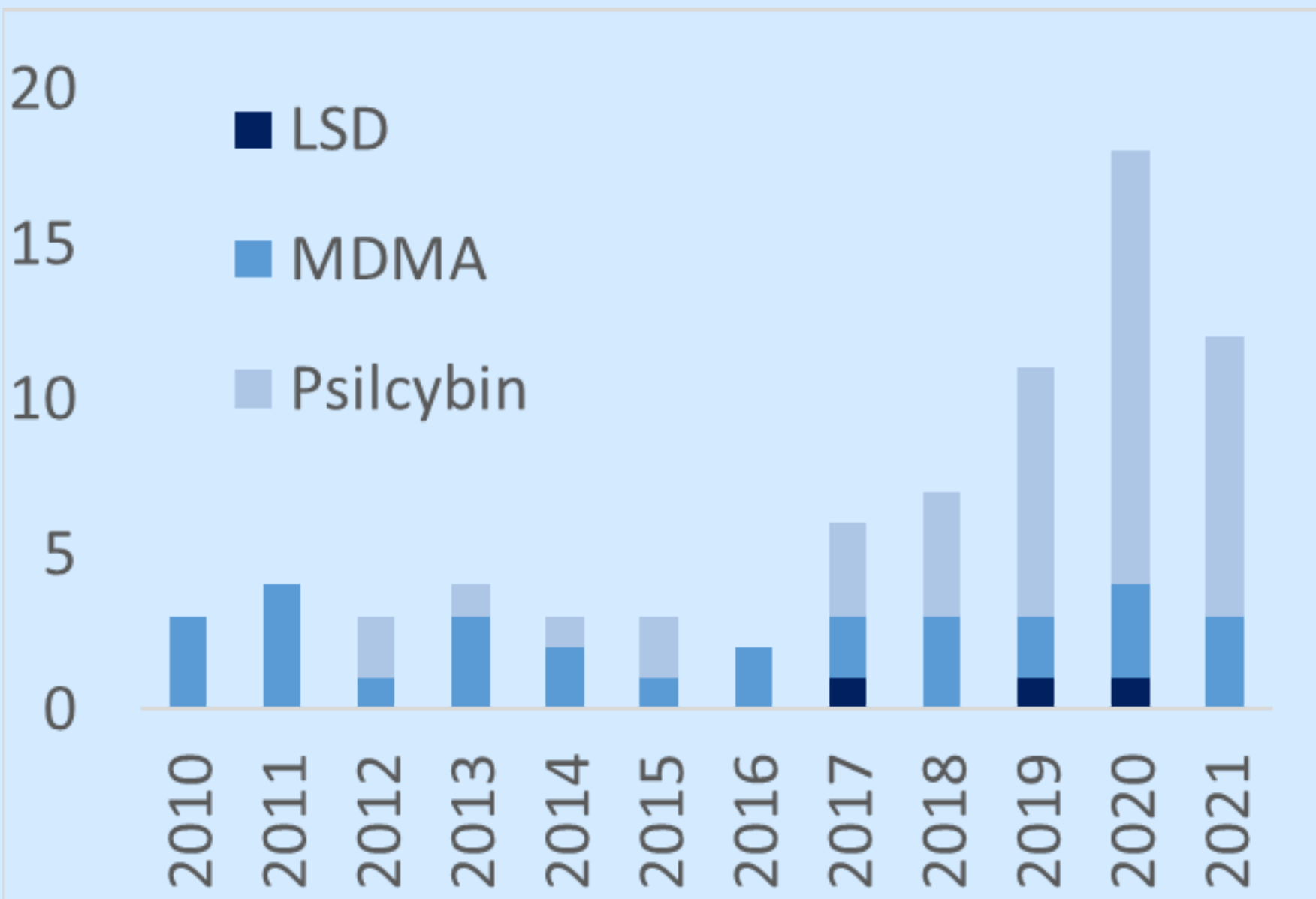


Figure 1.Graph showing the number of clinical trials undertaken over the last decade

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McCulloch, D., Knudsen, G., Barrett, F., Doss, K., Carhart-Harris, R. & Rosas, F. (2022)

Luoma, J.B., Chwyl, C., Bathje, G.J., Davis, A.K. & Lancelotta R. (2020)

Newham, M., & Vokinger, K.N. (2022)

Tagliazucchi, E., Carhart-Harris, R., Leech, R., Nutt, D. & Chialvo, D.R. (2014)

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Marks, M. & Cohen, I. (2022)

Fanelli D (2009)

Psychdelic Therapy


Psychedelic therapy refers to the practice of using psychedelic compounds to assist mental health treatment. Also termed-psychedelic assisted therapy, substances are used in combination with other methods of therapy to imporve mental well being.

Open Science

A collborative approach to research, underpinned by transparency and accessibilty.


This aims to improve accountability, scientific rigour, and reproducibilty of research.

The Outcomes




1.Replicability

The *Replication Crisis* has made headlines in recent years, with Psychology and Medicine being highlights. Clinical psychedelic research straddles these fieds, leaving iit vulnerable to the same issues of absent replication. Half of psychedelic neruoimaging data comes from two labs, with N <20).



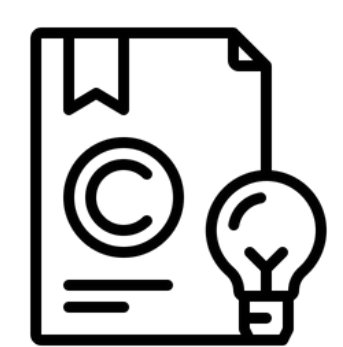
2. Abuse

Reports of abuse during clinical trials have recently surfaced, both from victims and businesses. Given the target population for psychedelic therapy includes vulnerable people safe-gauridng measures are crucial. thi only amplified by the nature of psychedelic compounds which increase suggestibilty.



3. Sensationalism

By the mid 1960's psychedelics were reported as cures for a range of ailments, with hype existing both within and outside the scientific community. A similar degree of excitment can be seen in current research given increased investment, new business formation, changing legislation, and media reporting.



4. Aggressive Patenting

Patenting is a source of recent criticism due to ethical, social, and legal implications ownership of methods founded on indigenous practices with transformative potential. Patenting of psychedelic doses, combinations, and methods of use increases cost, and stratifies healthcare at a price to the patient.

The Problems

Solutions

To address these problems, the concept of Open Science must be applied to every step of research - from bench to bedside.

Transparency
Collaboration
Accessibility

Implication

Proactive policy development which intersects research quality and patient care is consequently necessary, infomed by lessons from first-wave research and adjacent fields. Errors from the past are still present in today's research landscape, which suggest a vulnerable future for psychedelic research if left unaddressed.

Transparency
With transparency of methods, policy, and practice research groups are unable to neglect internal reviews of sessions, labs can share best practice, and a culutre of openness can grow. this improves patient safety and research quality.

Collaboration
Collaborative approaches to research enable multi-centre research, facilitate replication of studies, and cross-pollinates scientific theory.

Accessibility
Acessibilty enables transparency and collaboration between research groups, businesses, and service users. This reduces risk of abuse, sensationalism, and aids valid reporting.