

Theron Boerner

Offidani-Bertrand

SOSC 14200/1

12 March 2018

Mechanisms of Psychedelics, Personality, and Identity

Modern interest in psychedelics has undeniably been the result of Albert Hofman's discovery of the psychedelic effects of lysergic acid diethylamide (LSD) in 1943 (Das, Barnwal, Ramasamy, Sen, & Mondal, 2016). Subsequently, psilocybin, the active chemical in "magic" mushrooms was discovered to have similar properties. Research into both chemicals, though primarily LSD, was heavily conducted up until (and less so shortly after) the Controlled Substances Act was passed in 1970 and classified LSD, psilocybin and other psychedelics as schedule I, meaning that there was no medical use and a high potential for abuse, despite LSD being non-addictive and research showing potential highly-effective treatment for alcoholism (Das et al., 2016). Because of this, psychedelic research was rare up until very recently. These new studies, being a product of modern scientific research, are held to higher standards than what can best be described as the "sloppy" research of the 60s and 70s.

Meaning-making, which has been well established as important to an individual's well-being (Hammack, 2008; Kroger, 2017; McLean, Breen, & Fournier, 2010), appears in many studies of psychedelics (Berg, 2016; Hartogsohn, 2018; Preller et al., 2017). With this new research knowledge in mind, a careful consideration of the purported benefits, mechanisms, and risks of psychedelics provides insight into how meaning-making is facilitated in relation to an understanding of the self.

The first phenomenon to be examined is the ability of psychedelics to facilitate meaning-making. Hartogsoh (2018) shows that psychedelic experiences can facilitate meaning-making. However, other studies make a less-direct claim. For example, MacLean, Johnson, & Griffiths (2011) show that psilocybin can induce “mystical experiences” that correlate with an increase in the openness personality trait. Additionally, the authors show that these experiences still show an effect a year after the experience. At a biological level, it is difficult to explain this phenomenon. The primary method of action of psychedelics is activation of the 5-HT_{2A} serotonin receptor (Halberstadt, 2017; Preller et al., 2017). However, attempts to explain how exactly at the biological level the agonistic properties of psychedelics on this receptor result in these experiences has not been very fruitful. Despite this, models have been proposed that connect the noted biological effects of psychedelics with a psychological model that provide insight on a higher level of analysis to the mechanism of these effects.

Letheby & Gerrans (2017) argue that self-models do not actually support the existence of a self, but rather a “useful Cartesian fiction” (Letheby & Gerrans, 2017, p. 1). In this sense, they equate self-models to those of conceptual structure proposed by other authors such as Archambault, O’Donnell, & Schyns (1999); Carey (2004); and Medin (1989). Archambault et al. (1999) demonstrate that the level of categorization an object is learned at affects an individual’s perception when changes occur to that object. This expands on the theoretical background by Medin (1989) which is that new concepts form out of similarity, become defined by strict properties, and then are revised into complex theories when it becomes apparent that the strict properties are inadequate. The crucial insight from these studies on conceptual understanding is that concepts are not intrinsically descriptive of an underlying truth, but rather are constructs that serve a use. As demonstrated by Archambault et al. (1999), if an object is not learned at a

particular level of categorization, an individual can be blind to changes in the object. In this study, however, the level of categorization at which an individual learned the object was artificially chosen. Therefore, the conceptual understanding had no explicit use to the individual, and the study instead demonstrated how the arbitrariness of experience has an impact on an individual's perception.

Thus, the argument presented by Letheby & Gerrans (2017) is that the self-model is just that, a model that serves a use. The basis of their argument relies on the idea of ego-dissolution which is an effect of psychedelics. A general definition of ego-dissolution is the sensation that the self is not distinct from the rest of the world (Berg, 2016; Hartogsohn, 2018; Lebedev et al., 2016; Letheby & Gerrans, 2017; Tagliazucchi et al., 2016). Ego-dissolution is a phenomenon, and in some sense could be considered the mechanism, that allows for an understanding of the ability for “mystical experiences” (the two terms are used quite interchangeably) induced by psychedelics to facilitate personality change as well as other effects discussed later.

Many studies relate ego-dissolution and positive psychological effects: meaning-making and personality changes previously mentioned (Berg, 2016; Hartogsohn, 2018; Lebedev et al., 2016; Preller et al., 2017; Tagliazucchi et al., 2016), a significant decrease in anxiety (Berg, 2016; Das et al., 2016; Hendricks, Johnson, & Griffiths, 2015; Hendricks, Thorne, Clark, Coombs, & Johnson, 2015; Leary, Metzner, & Dass, 2008; Liechti, 2017; Schmid & Liechti, 2018), as well as general decrease in psychological-distress and suicidal ideation (Hendricks, Johnson, et al., 2015; Hendricks, Thorne, et al., 2015).

Tagliazucchi et al. (2016) provide a biological explanation for ego-dissolution. The authors show that psychedelics increase global functional connectivity which was then correlated with reports of ego-dissolution. Lebedev et al. (2016) show that LSD increases brain entropy,

effectively the same as global functional connectivity, and, when combined with reports of ego-dissolution, predicts subsequent personality change in the trait of openness (Lebedev et al., 2016).

From the psychological level of analysis, Berg (2016) provides an existential psychology perspective on ego-dissolution. Berg's argument relies on the assumption that death is the ultimate source of anxiety, levels of psychological defenses are developed by an individual starting from childhood to avoid facing this anxiety in its pure form, and that ego-dissolution forces an individual to face this ultimate anxiety in its pure form. This theory is not new in the study of psychedelics, in fact, it is probably the most widely known theory in popular culture, although, presented under a very different premise. In their 1964 book, *The Psychedelic Experience: A Manual Based on The Tibetan Book of the Dead*, Leary, Metzner, & Ram present ego-dissolution (termed "ego-death" by the authors) as part of a death and rebirth cycle. While in no way a scientific perspective (although it should be noted that the authors all had PhDs in psychology from Berkeley, Harvard, and Stanford respectively; additionally, it should be noted that Leary was fired by Harvard for giving undergraduate students LSD), the book does align with much of Berg's argument that the therapeutic effects of psychedelics result from a forced confrontation of existential anxieties. This is particularly relevant at the social/cultural level of analysis which presents a number of surprising phenomena.

From a historical point of view, the cultural aspect of psychedelic use is perhaps the most significant factor that has determined their current place in modern society: mostly classified as schedule I drugs (exceptions are mostly research chemicals that have not widely made their way to the illicit market) and considered taboo by much of the general public. While popular culture has well-documented the heydays of psychedelic use, for example, in the 1968 book *The Electric*

Kool-Aid Acid Test, the relationship between academic research and this culture is often overlooked. Blacker, Jones, Stone & Pfefferbaum (1968) is one such example of a study that is more of a cultural snapshot than academic research. Titled “Chronic Users of LSD: The ‘Acidheads,’” the study aimed to describe the effects of chronic use of LSD, an amicable goal and a serious consideration given the proliferation of recreational LSD around that time. However, the study merely performed tests on chronic users of LSD without a control group for comparison and without adequate information of the participants’ life before use of the drug to make a valuable comparison. Such observations as “One believed that thoughts can set fires miles away” (Blacker, Jones, Stone, & Pfefferbaum, 1968, p. 348) are neat observations, but provide no insight into the drug itself, since these things can just as easily be explained by the culture surrounding LSD, such as the aforementioned book by Leary et al.

In modern research of psychedelics, these problems have been acknowledged and researchers have avoided these cultural snapshots, instead focusing on legitimate data-driven studies. While the benefits of psychedelics have been explored, there are associated risks, and when examined from a cultural level of analysis, the conflict between what appears to be an incredibly valuable drug for treating mental illness and society’s general opposition to them can be made sense of.

Psilocybin and LSD have been shown to have long-lasting anxiety-reducing effects (Hendricks, Johnson, et al., 2015; Hendricks, Thorne, et al., 2015; Liechti, 2017), but authors have noted transient increases in anxiety (Liechti, 2017) as well as episodes while on psychedelics commonly referred to as “bad trips” that resemble a psychotic state (Das et al., 2016). These negative risks have made their way into the mainstream conception of psychedelics and have an obvious effect on questions of legality and ethics of use of these drugs. A

comparison on public perception of risks can be made between psychedelics and selective serotonin reuptake inhibitors (SSRIs). In the early 2000s, the FDA began requiring SSRIs to carry a black-box warning on the risks of suicidal thoughts associated (particularly in children and adolescents) during the first few weeks of administration, before the drug has taken full effect. Researchers found that the effect of the FDA's requirement was a decrease in prescription rates of SSRIs for children and adolescents and a subsequent increase in suicides (Gibbons et al., 2007; Gibbons, Hur, Bhaumik, & Mann, 2006). The FDA had not shown a correlation between SSRI prescription rates and suicides, only in suicidal thoughts. Thus, the effect their decision had was exactly what they intended to prevent.

In relation to psychedelics, as mentioned earlier, part of psychedelic treatment does involve an initial increase in anxiety and other negative effects, and instead of viewing these as side-effects, they should be seen as challenges to overcome (Berg, 2016). This is not to imply that SSRIs act in the same way, but only that the cultural perception of this phenomena, that treatment should not have a period where effects worsen, can result in having the opposite effect than desired.

In a similar vein, Hendricks, Thorne, et al. (2015) showed that, lifetime psychedelic use was associated with a decrease in psychological distress, suicidal thinking, and suicide attempt, in direct contrast to use of other illicit drugs which have increased outcomes of all of those metrics. Studies such as Covault et al. (2007), thus need to differentiate between psychedelics and other illicit drugs when attempting to find a correlation between well-being and use of substances. In that study it is particularly relevant since it concerns serotonin transporter 5-HTTLPR polymorphisms, which may influence how psychedelics, which act on serotonin receptors, affect a particular individual.

In conclusion, much of our understanding of the mind is still being developed, but the reemergence of psychedelic research provides valuable insight into both treatment of psychological conditions as well as an understanding of the extent to which personality is malleable.

Works Cited

- Archambault, A., O'Donnell, C., & Schyns, P. G. (1999). Blind to object changes: When learning the same object at different levels of categorization modifies its perception. *Psychological Science*, 10(3), 249–255.
- Berg, S. H. (2016). Psychedelic therapy from an existential psychological viewpoint: a theoretical analysis. Retrieved from <https://brage.bibsys.no/xmlui/handle/11250/2400110>
- Blacker, K. H., Jones, R. T., Stone, G. C., & Pfefferbaum, D. (1968). Chronic Users of LSD: The “Acidheads.” *American Journal of Psychiatry*, 125(3), 341–351.
<https://doi.org/10.1176/ajp.125.3.341>
- Carey, S. (2004). Bootstrapping & the origin of concepts. *Daedalus*, 133(1), 59–68.
- Covault, J., Tennen, H., Armeli, S., Conner, T. S., Herman, A. I., Cillessen, A. H., & Kranzler, H. R. (2007). Interactive effects of the serotonin transporter 5-HTTLPR polymorphism and stressful life events on college student drinking and drug use. *Biological Psychiatry*, 61(5), 609–616.
- Das, S., Barnwal, P., Ramasamy, A., Sen, S., & Mondal, S. (2016). Lysergic acid diethylamide: a drug of ‘use’? *Therapeutic Advances in Psychopharmacology*, 6(3), 214–228.
<https://doi.org/10.1177/2045125316640440>
- Gibbons, R. D., Brown, C. H., Hur, K., Marcus, S. M., Bhaumik, D. K., Erkens, J. A., ... Mann, J. J. (2007). Early Evidence on the Effects of Regulators’ Suicidality Warnings on SSRI Prescriptions and Suicide in Children and Adolescents. *American Journal of Psychiatry*, 164(9), 1356–1363. <https://doi.org/10.1176/appi.ajp.2007.07030454>

- Gibbons, R. D., Hur, K., Bhaumik, D. K., & Mann, J. J. (2006). The Relationship Between Antidepressant Prescription Rates and Rate of Early Adolescent Suicide. *American Journal of Psychiatry*, 163(11), 1898–1904. <https://doi.org/10.1176/ajp.2006.163.11.1898>
- Halberstadt, A. L. (2017). Hallucinogenic Drugs: A New Study Answers Old Questions about LSD. *Current Biology*, 27(4), R156–R158. <https://doi.org/10.1016/j.cub.2016.12.058>
- Hammack, P. L. (2008). Narrative and the cultural psychology of identity. *Personality and Social Psychology Review*, 12(3), 222–247.
- Hartogsohn, I. (2018). The Meaning-Enhancing Properties of Psychedelics and Their Mediator Role in Psychedelic Therapy, Spirituality, and Creativity. *Frontiers in Neuroscience*, 12. <https://doi.org/10.3389/fnins.2018.00129>
- Hendricks, P. S., Johnson, M. W., & Griffiths, R. R. (2015). Psilocybin, psychological distress, and suicidality. *Journal of Psychopharmacology*, 29(9), 1041–1043. <https://doi.org/10.1177/0269881115598338>
- Hendricks, P. S., Thorne, C. B., Clark, C. B., Coombs, D. W., & Johnson, M. W. (2015). Classic psychedelic use is associated with reduced psychological distress and suicidality in the United States adult population. *Journal of Psychopharmacology*, 29(3), 280–288. <https://doi.org/10.1177/0269881114565653>
- Kroger, J. (2017). Identity Development in Adolescence and Adulthood. *Oxford Research Encyclopedia of Psychology*. <https://doi.org/10.1093/acrefore/9780190236557.013.54>
- Leary, T., Metzner, R., & Dass, R. (2008). *The Psychedelic Experience: A Manual Based on the Tibetan Book of the Dead*. Penguin.

- Lebedev, A. v., Kaelen, M., Lövdén, M., Nilsson, J., Feilding, A., Nutt, D. j., & Carhart-Harris, R. I. (2016). LSD-induced entropic brain activity predicts subsequent personality change. *Human Brain Mapping, 37*(9), 3203–3213. <https://doi.org/10.1002/hbm.23234>
- Letheby, C., & Gerrans, P. (2017). Self unbound: ego dissolution in psychedelic experience. *Neuroscience of Consciousness, 2017*(1). <https://doi.org/10.1093/nc/nix016>
- Liechti, M. E. (2017). Modern Clinical Research on LSD. *Neuropsychopharmacology, 42*(11), 2114–2127. <https://doi.org/10.1038/npp.2017.86>
- MacLean, K. A., Johnson, M. W., & Griffiths, R. R. (2011). Mystical experiences occasioned by the hallucinogen psilocybin lead to increases in the personality domain of openness. *Journal of Psychopharmacology, 25*(11), 1453–1461.
- McLean, K. C., Breen, A. V., & Fournier, M. A. (2010). Constructing the Self in Early, Middle, and Late Adolescent Boys: Narrative Identity, Individuation, and Well-Being. *Journal of Research on Adolescence, 20*(1), 166–187.
- Medin, D. L. (1989). Concepts and conceptual structure. *American Psychologist, 44*(12), 1469–1481. <https://doi.org/10.1037/0003-066X.44.12.1469>
- Preller, K. H., Herdener, M., Pokorny, T., Planzer, A., Kraehenmann, R., Stämpfli, P., ... Vollenweider, F. X. (2017). The Fabric of Meaning and Subjective Effects in LSD-Induced States Depend on Serotonin 2A Receptor Activation. *Current Biology, 27*(3), 451–457. <https://doi.org/10.1016/j.cub.2016.12.030>
- Schmid, Y., & Liechti, M. E. (2018). Long-lasting subjective effects of LSD in normal subjects. *Psychopharmacology, 235*(2), 535–545. <https://doi.org/10.1007/s00213-017-4733-3>
- Tagliazucchi, E., Roseman, L., Kaelen, M., Orban, C., Muthukumaraswamy, S. D., Murphy, K., ... Carhart-Harris, R. (2016). Increased Global Functional Connectivity Correlates with

LSD-Induced Ego Dissolution. *Current Biology*, 26(8), 1043–1050.

<https://doi.org/10.1016/j.cub.2016.02.010>

Wolfe, T. (1999). *The Electric Kool-Aid Acid Test*. New York: Bantam Books.