

7. Flashbacks in Theory and Practice

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Hallucinogenic drugs have been used by humankind for at least five thousand years. In our society during the past thirty to fifty years there has been tremendous growth of interest in and use of psychoactive substances. The most common use of hallucinogenic drugs today is recreational, although they have also been used in therapeutic and religious settings. The popular press, governmental and law enforcement agencies, and some researchers have reflected society's concerns about possible dangers of drug use. The fact that hallucinogenic drugs lack addictive qualities has led to a focus on possible long term effects such as flashbacks, a reappearance of the drug experience, possibly years later. Among the issues we will discuss in this article are what might constitute a flashback, current clinical definitions, some research into the phenomena, and the implications for therapeutic and recreational uses of hallucinogens. Making sense of flashback phenomena can be difficult because it involves issues of definitions, consciousness, how we recognize qualities of our own mental processes, and interactions between physiological and psychological functioning.

We attempt to understand the world through our conscious experience. Most people take it for granted that their perceptions are a direct and reliable reflection of reality. However, how we perceive the world is a function of both what we take in through our senses and how our brains process our perceptions. Without conscious effort, we habitually compensate for irregularities in our perceptual processing. For example, if a myopic person removes their glasses, they don't normally assume that the world has actually become fuzzy. We recognize that a stick in the water is

not really bent, although it may look that way. We must remember, though, that our ability to accommodate perceptual variations depends on factors such as cognitive development, brain chemistry, personality, previous experience, and our internal models of reality.

As we think about the issues raised by perceptual variations such as optical illusions, a number of questions come to mind: what is "normal" consciousness? To what extent can we assume that our experiences are similar to those of others'? Is there an objective reality independent of our experience and perception? What role do social and cultural systems and expectations play? To what extent and in what ways do our senses and cognitive processes filter our perceptions and, given the overwhelming variety and quantity of perceptual stimuli available to us, how important are those filters? How are we aware of variations in our own consciousness? Might there be reasons to actively alter our consciousness either through drugs, meditation, or other means?

These questions, and many others, gain additional importance as we try to understand the effects of what have been called mind-altering drugs, and possible long term consequences of their use. Among known hallucinogenic substances are LSD, mescaline, peyote, psilocybin, ayahuasca, and ololiuqui. There is a conservative estimate of one million hallucinogen users in the United States alone (Ott, 1993). The number of students, both in high school and college, who have used LSD is rising. These current reports have further contributed to concern about safety issues and possible adverse consequences resulting from drug use.

Generally, hallucinogenic drugs are so classified largely because of their ability to alter visual perceptions, with eyes open or closed, inducing experiences such as geometric patterns, trails of moving objects, rippling effects, intensification of colors, and spontaneous formation of objects. However, users frequently report a variety of other psychological and perceptual changes including alteration of time sense, intense experience of emotion (e.g., anxiety, ecstatic experiences), mood changes (e.g., euphoria, fear), a feeling of unreality or dissociation (out of body experience), and alterations in the other sensory systems of smell, taste, touch, and hearing. Combination or crossing of sensory experiences, sometimes called synesthesia (e.g., "seeing" sounds), has also been reported.

As can be seen in the above list, experiences may be reported as positive, negative, or both. A variety of internal and external factors are known to influence a drug experience. One of the most common factors influencing a person's response to psychoactive substances is the situation associated with the drug experience. The user's expectations about the drug experience are known as the "set," with the physical location of the experience known as the "setting." These conceptions help to explain some of the variation in subjective reports of hallucinogen effects. If one expects to feel relaxed after smoking marijuana or expects enlightenment via a mystical experience after ingesting psilocybin, then a set has been established. In addition, the expectations and attitudes toward a drug experience may be shared among a group and this may have an effect on experiences of members of the group as well as on inexperienced users joining the group.

Other psychological effects that can be experienced with any drug are known as placebo effects. That is, a person may experience psychological

and/or physical effects from a substance, independent of the usual physiological effects of the substance. This may include responses to inactive substances (e. g., sugar pills) or unusual responses to active substances. For example, heavy users of marijuana may get high smoking marijuana from which all of the active THC ingredient had been removed. This expectation or presumption of effect can be powerful and may influence an individual's response to a drug. In the 1960s when hallucinogen use was becoming mainstream, inexperienced users were given instructions to facilitate a positive mental set and careful consideration was given to the setting in which the drug experience occurred. Some researchers have suggested that many of the negative experiences with hallucinogens (bad trips) occurred in users who were not as careful in their attention to set and setting. Negative experiences have been said to include acute adverse psychological reactions, chronic persistent anxiety, and long term physiological or perceptual changes.

More general social and cultural factors may also play a significant role in drug experiences. Various cultures have integrated hallucinogen use into their religious and social practices. In these cultures the set and setting of drug use fit into a larger context. Visionary and mystical experiences are expected and considered an important and positive outcome. There are few reports of long term negative consequences of hallucinogen use in these cultures. This may be a function of adequate preparation to take these types of drugs, or it may be that such long term effects occur but either are not considered adverse, are not noticed, or are not reported because of limited opportunities for investigation or treatment. In general, our culture, particularly through the popular press, has come to interpret possible long term perceptual or psychological changes experienced by hallucinogen users to be consequences of drug use,

and typically they are considered adverse effects.

One of the reported primary long term effects occurring with previous hallucinogen use is sudden and unexpected recurrence of some or all of the drug experience, called a flashback. The phenomena associated with hallucinogenic drug flashbacks have been reported to include relived intense emotion, a feeling of unreality, and visual distortions such as geometric patterns, trails of moving objects, or a rippling effect. Wesson and Smith (1976) classified flashbacks from self-reports of patients as including perceptual, somatic, and emotional types.

The current clinical definition of a drug flashback is Hallucinogen Persisting Perception Disorder (HPPD) described in the Diagnostic and Statistical Manual, 4th edition (DSM-IV), of the American Psychiatric Association (1994). The definition specifies the re-experiencing of perceptual symptoms, primarily visual, which must also cause significant social, occupational, or other distress before this diagnosis can be made. The visual disturbances listed include geometric hallucinations, flashes of color, false perceptions of movement in the visual field, intensified color, trails of images of moving objects, halos around objects, positive afterimages, macropsia and micropsia. The DSM-IV diagnosis is not applicable when the symptoms are associated with another general medical or mental condition such as visual epilepsy or schizophrenia. It is worth noting that other symptoms reported in research, or which have been associated in the popular press with flashback phenomena such as anxiety, fear, paranoia, suicidal thoughts, or other emotional or sensory experiences, are not included in the diagnostic criteria. The HPPD diagnosis appears to be based almost exclusively on research by Abraham and his colleagues (1982; 1983; 1988; 1993).

Abraham suggests, based on his research, that visual disturbances occur at a higher rate in people with a history of LSD use. Abraham (1982) examined the possibility of impairments in color discrimination after prior exposure to LSD. Volunteers selected from the outpatient adult psychiatric department at Massachusetts General Hospital in Boston were given a color discrimination test that involved identifying a white disk, surrounded by a yellow halo, as being white. The distance at which the correct identification was made was recorded. Following the test, a drug history was taken and the 77 volunteers were divided into three categories: nonusers of LSD (31), and users with and without a clinical history of LSD-related flashbacks (10 & 34, respectively). LSD users were defined as persons who reported having used any drug called LSD and having had subsequent changes in mood and perception lasting at least 6 hours. Those who had ever used LSD needed to be significantly closer to the target to identify it as white compared to controls; however there was no significant difference between LSD users with and without reported flashbacks. Abraham interpreted these results as suggesting that some LSD users have chronic, irreversible impairments in color perception. In 1988, Abraham and Wolf published an additional study of direct measures of visual perception in which they found that compared to a control group of 20 psychiatric outpatients, 24 LSD users, primarily from the same clinic, had impairments in peripheral vision function and had more difficulty adjusting to a dark environment.

In a 1983 paper that foreshadowed what he later defined as HPPD, Abraham reports on data collected a decade earlier. In two phases, he had interviewed 123 people with a history of LSD use. All participants were referred to the study in response to a notice in the Acute Psychiatric Service

requesting any person ever having used LSD. All referrals were made by residents in the Department of Psychiatry of Massachusetts General Hospital in the acute service and the inpatient unit. The volunteers had drug abuse as the most common diagnosis. The 53 volunteers in the first phase underwent unstructured, open ended interviews about any and all conditions they considered resulting from the use of LSD. Of all the symptoms reported, 16 visual disturbances considered by Abraham most compatible with reports in the literature of flashbacks were chosen for study in phase two, essentially excluding all other reported symptoms from further study. These visual disturbances included phenomena such as geometric hallucinations, illusions of movement, trails, flashes of color, and prolonged intensification of color. In phase two, 70 additional volunteers from the same clinic and a control group of 40 individuals matched for a variety of variables were given a questionnaire. About 54% of the 70 users reported having had subjective symptoms which they labeled as flashbacks. A number of issues make it difficult to assess Abraham's interpretation of these data. Of the 16 targeted visual disturbances, ten were reported significantly more often in users than in nonusers. Abraham then selected the top four and found them to have a significant positive correlation with the participants' clinical description of flashbacks, but he may have also decided thereafter to use these four items as *his* criteria for "flashback". Interpretation of his further analyses of variables such as number of uses of LSD and time since last use and their correlation with "flashback" becomes problematic since it is unclear if he means the four visual symptoms or the participants' own definition of flashback.

This lack of clarity points to a variety of methodological concerns regarding the interpretation of these

studies. A major methodological concern is the makeup of the sample populations. For example, the majority of the participants in these studies were white males and either psychiatric inpatients or people who had sought acute psychiatric treatment. Number of times the drug was taken and time since last use varied considerably. Many were polydrug users and were currently receiving treatment for substance abuse or other acute psychiatric problems. Other long term physiological or psychiatric problems may have been present. These factors contribute to a lack of generalizability of the results to the general population of hallucinogen users.

Abraham interprets his results as implying a causal link between a history of LSD use and impairments in color discrimination and peripheral vision. However, these individuals may or may not have had these visual disturbances prior to their drug use. Since no pre-test was completed, this is impossible to determine. It is also possible that the dramatic perceptual changes during acute hallucinogen intoxication allow the individual later to recognize more readily, non-pathologic, transient changes in ordinary perception. Finally, while differences in perceptual factors may be present, it was not determined if they were actually interfering with the person's occupational or social functioning in any way.

The DSM-IV classification of HPPD is problematic for a variety of reasons. First is the parenthetical labeling denoting HPPD as "flashbacks". While Abraham's research shows a statistically significant correlation between ever having used LSD and the visual disturbances listed under HPPD, the explanatory power of this correlation, that LSD is the sole factor involved in these visual phenomena, is only about 10% of the variance. In other words, other factors might have explained his findings in 90% of the cases, including genetic,

environmental, psychological and personality factors, etc. Furthermore, at no time does he tie a currently experienced "flashback" to a difficulty in discerning visual stimuli during testing. The common conception of a drug flashback is a sudden, unexpected reoccurrence of the drug experience that is disabling or significantly disturbing. His research, which apparently forms the basis for the DSM-IV classification of HPPD, shows no evidence for this sort of phenomenon and he specifically remarks on the stability of the disturbances over time. Second, the classification suggests any of the hallucinogens may be implicated when the majority of Abraham's work has focused solely on LSD use.

In determining other possible long term physiological effects, the time since the drug was last used (as well as other drugs used) may be important. For example, users who refrained from using LSD for at least 48 hours before testing scored lower on spatial orientation and visual perception tests when compared to nonusers (Cohen & Edwards, 1969). However, when these tests were administered to LSD users who had not used within one year prior to testing, no significant differences were found between the users and nonusers (McGlothlin et al. 1969). This lack of support for the former study suggests that visual and perceptual effects may persist for a short time following LSD use, but are not permanent.

We should also consider other factors that may contribute to both acute and long term responses to hallucinogens. Naditch (1974) concluded that adverse reactions to marijuana, LSD, and/or mescaline were related to psychopathology. Others have reported that people at highest risk for adverse reactions tend to have a history of psychiatric illness, typically ingest high doses more frequently, and are polydrug users (e. g., Robbins et al. 1967; Smart & Bateman, 1967; Ungerleider et al. 1968).

In a 1967 study of 25 emergency room patients seen for LSD-related disorders, over half of them had diagnoses falling within the schizophrenia spectrum (Blumenfield & Glickman, 1967). Individuals who may be predisposed to schizophrenia or who have disorganized thought processes are at the highest risk for LSD-related disorders. Conversely, this danger appears to be low when hallucinogenic drugs are used by emotionally stable individuals in a safe, protected setting (McWilliams & Tuttle, 1973). An understanding of other personality characteristics that may be related to drug experiences, reports of long term effects, similar symptom reporting in nonusers, and even likelihood of drug use itself, is important.

The research examining the flashback phenomenon provides conflicting reports of incidence, ranging from 15 to 77 percent among LSD users. Typically, the samples have been gathered from clinical populations and studies have focused on psychopathology. In the extant literature, information from less restricted populations is sparse. Little research has explored the relationships between more general personality characteristics and symptoms associated with drug experiences.

Our recent study (Watkins et al. 1995) in a nonclinical sample found that of 207 users 21% report ever having had a drug flashback, while 3.3% of the 153 nonusers also reported having had a drug flashback. Users were defined as anyone who had reported having ever used an hallucinogen. Over half of the users reporting drug flashbacks said they were not disturbed by them and none reported being unable to function. In contrast, within the nonuser group, those reporting drug flashbacks were all either moderately bothered or unable to function. Overall, the incidence of flashback reports in this sample is at the low end of the range described in the literature.

Interestingly, we found that the frequency of hallucinogen use, time since last hallucinogen use, and total number of uses had little or no relationship to drug flashback reports. Time since last use was significantly negatively correlated with reports of HPPD symptoms and not related to self reports of flashbacks. We also examined how personality variables were related to a variety of symptoms from a sample of DSM-IV diagnostic categories, including HPPD symptoms, and found that in users, scoring higher on measures of fantasy and openness to experience were related to reports of having experienced more HPPD symptoms. This study will be reported more fully elsewhere, but underscores the importance of studying nonclinical samples and investigating other variables that may be relevant to flashback phenomena.

In this short review we have raised some important issues relevant to future research into hallucinogen flashback phenomena. Examples of some of the research in this area that we have reviewed should underscore the need for caution in assuming we already know what the long term positive or negative effects of hallucinogen use may be. Much of the published literature (see for example Strassman's 1984 review for a summary) concerning persistent organic changes or alterations of personality or attitudes remains controversial but tends to suggest that most such possible changes are relatively benign. As previously mentioned, in our study of nonclinical participants who were hallucinogen users none reported having experienced flashbacks which rendered them unable to function, and most considered the experience not to be bothersome. While care must certainly be taken in the use of psychoactive substances of any type in therapeutic, experimental, and recreational contexts, concerns about devastating flashback experiences

appear not to be warranted from current research reports.

References

- American Psychiatric Association. (1994). *Diagnostic and Statistical Manual for Mental Disorders*, (4th ed.). APA, Washington, D. C.
- Abraham, H. D. (1982) A chronic impairment of color vision in users of LSD. *Brit J Psychiat*, **140**, 518-520.
- Abraham, H. D. (1983) Visual phenomenology of the LSD flashback. *Arch Gen Psychiat*, **40**, 884-889.
- Abraham, H. D. and Wolf, E. (1988) Visual function in past users of LSD: Psychosocial findings. *J Abn Psych*, **97**, 443-447.
- Abraham, H. D. (1993) Adverse consequences of lysergic acid diethylamide. *Addiction*, **88**, 1327-1334.
- Blumenfield, M. and Glickman, L. (1967) Ten months' experience with LSD users admitted to a county psychiatric receiving hospital. *NY State J Med*, **67**, 1849-1853.
- Cohen, S. and Edwards, A. (1969) LSD and organic brain impairment. *Drug Dependence*, **2**, 1-4.
- McGlothlin, W., Arnold, D., and Freedman, D. (1969) Organicity measures following repeated LSD ingestion. *Arch Gen Psychiat*, **21**, 704-709.
- McWilliams, S. and Tuttle, R. (1973) Long-term psychological effects of LSD. *Psych Bull*, **79**, 341-351.
- Naditch, M. (1974) Acute adverse reactions to psychoactive drugs, drug usage, and psychopathology. *J Psychoactive Drugs*, **22**, 305-311.
- Ott, J. (1993) *Pharmacotheon*. Kennewick, WA. Natural Products, CO.
- Ungerleider, J. and Fisher, D. (1967) The problems of LSD-25 and emotional disorders. *Cal Med*, **106**, 210-211.
- Watkins, S., Carter, T. J., and Myers, L. S. (1995) *Hallucinogen flashbacks:*

Reality or myth? Poster (88.5) presented at the Society for Neuroscience meeting, November, 1995.

Wesson, D. R. and Smith, D. E. (1976) An analysis of psychedelic drug flashbacks. *Amer J Drug Alcohol Abuse*, 3, 425-438.