



Review of *Mind-Altering Drugs: The Science of Subjective Experience* (ed.) John Earleywine

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With a title like “Mind-Altering Drugs: The Science of Subjective Experience”, it is easy to presume that this book is yet another fanciful pseudoscientific journey through the myriad of drug induced human experiences. This is no such book. Instead, Mitch Earleywine has succeeded in putting together a collection of writings by a group of experts that emphasize the science of subjective methods. In many respects a more appropriate title might have been “The Science of Subjective experience: A Survey of Mind-Altering Drugs.” Only a few chapters deviate from this general framework.

The content covered in the collected chapters is broader than the title’s emphasis on drugs might lead you to suspect. Accompanying the prerequisite chapters on hallucinogens, opioids, stimulants and alcohol etc, Earlywin also includes contributions on choice theory and the non-drug induced changes in consciousness associated with neurofeedback. Together the authors provide a comprehensive review of scientific studies that have attempted to classify and measure the effects of mind-altering drugs. Importantly, additional issues such as the influence of gender, previous drug exposure and personality type on subjective experience is also assessed. While some of the authors do describe a selection of their own research results in detail, for me the main contribution of this book is the general overview of the field and survey of the literature that it provides.

In contrast to the breadth of subject matter covered, the methodology adopted in the studies reported is restricted to subjective-based research. For those not familiar with this type of research it is worth describing in a few sentences. The mainstay of subjective-based research is the questionnaire. The two big differences between separate studies are: (1) the questions asked, and (2) the type of report given. If your interest is in the quantification of subjective conditions then it is crucial that you are asking questions that are most relevant to the condition in question. If you are interested in the effects of hallucinogens, you may ask questions such as, “do you see colored patterns if you close your eyes”. Alternatively, you may be provided with a series of adjectives (happy, frustrated, energetic etc) and are asked to rate how applicable these words are to your current state. Other methods of report require subjects to quantify their experiences by selecting a predefined response category (i.e. 1 = never, 2 = rarely, 3 = sometimes, 4 = commonly, 5 = always etc) or to place a cross on a line to indicate where on a particular subjective dimension their experience currently lies. The experimenter will then collate the answers and divide the questions into different categories in an attempt to get a subjective profile with scores for dimensions (i.e. anxiety, visual distortions, arousal and positive mood etc).

Earleywine appears to have aimed the book towards researchers and clinicians. However, it is easy to also see how the book might provide the basis for an undergraduate psychology course, particularly any course that looks specifically at the use of subjective questionnaires for research or in clinical settings. Most chapters of this book concentrate more on the results of such subjective measures and the differences in the scores obtained across different populations or across different drug experiences. However, a couple of chapters also describe the development of the questionnaire in some detail. Coming from a background in psychology and physiology, I can appreciate the value of these types of subjective measures. However, I would have appreciated more discussion of the accompanying objective measures of performance or physiological arousal. Whether this focus on “the science of subjective experience” is the book’s greatest virtue or flaw depends on your perspective.

In contrast to the book’s general focus on measures of subjective experience, the opening chapter by Christopher Correia titled *Behavioural Theories of Choice* asks questions such as “Why do people use drugs”? “Why don’t we all use drugs”? This chapter reviews some of the theories about why some, but not all individuals become trapped in a cycle of drug addiction and, more importantly, how these theories have been used to develop a variety of different therapies. By reviewing the behavioral choice perspective on drug use, Correia shows how drug use and drug-related reinforcement are related to a broader environmental context that includes the availability and utilization of drug-free alternatives.

The psychedelic states are covered by Ralph Metzner, a psychologist who worked at Harvard University in the 1960’s with Timothy Leary, looking at the applications of psychedelic drugs. Metzner discusses measures of altered states induced by a variety of means (including drugs, foods, fasting, hypnotic inductions, sounds, drumming, breathing methods, trance dance and wilderness isolation). A large portion of this chapter is dedicated to describing how the alterations in consciousness induced by these means can be considered with respect to three dimensions: (a) arousal versus sedation, (b) pleasure

versus pain and (c) consciousness expansion versus contraction. Using stylized pie charts and tables to classify and compare states of consciousness, Metzner proposes that psychedelic drugs may act therapeutically to counter clinical symptoms of psychosis and behavioural disorders. In another chapter, Rick Strassman gives an account of some more recent attempts to classify the effects of hallucinogens.

Three chapters discuss the subjective effects of alcohol, two of which are written by Kenneth Sher, Mark Wood and colleagues. In their first chapter they discuss a range of factors that can influence an individual's experiences with alcohol and the tendency for alcohol use and misuse. This part includes a review of some of the different theoretical models of the causal mechanisms through which these contextual effects can shape the alcohol experience. The second chapter focuses more on differences between individuals in respect to "alcoholizability", focusing on pharmacological/genetic and social factors that increase vulnerability. The final chapter on alcohol, contributed by Travis Cook and Tamara Wall, follows this theme of individual differences looking at the influence of ethnicity. Going beyond the simple race categories, they review the pathway of alcohol metabolism and the associations of ALDH2, ADH2 and ADH3 gene variations in respect to alcohol-related behaviour associated with different racial groups.

In his own chapter Mitch Earleywine, the book's editor, discusses the subjective effects of cannabis. Beyond the relevant descriptions of the marijuana experience, he advocates future research in this area as a means of improving education about drug use in order to reduce its harmful effects. Following Earleywine's chapter and subsequent chapters about methylphenidate (by Scott Kollins) and nitrous oxide (by Diana Walker and James Zacny), David Lenson offers a short philosophical treatise on the cause of depression in today's society and the role our consumerist ideals play in promoting the use of antidepressants such as prozac. While this paper tends towards an unconstrained rant (for which Lenson appears unapologetic), it offers some honest and insightful commentary on the author's own experiences with depression and subsequent antidepressant treatment.

Like the opening chapter, the final chapter on neurofeedback diverges a little from the book's general themes. However, coming from a background in neuropharmacology, I found it fascinating. Neurofeedback is a method by which the participant receives feedback (visual, auditory or tactile) on the relative state of EEG oscillations being recorded from their cortex. Siegfried Othmer and colleagues discuss the historical developments behind the clinical and recreational uses of this technique. They go on to provide a descriptive account of the distinctive subjective effects and therapeutic benefits generally associated with training in either the lower (5-11Hz) or higher (12-18 Hz) frequency.

In summary, this book does a great job of achieving its aim. While being far from exhaustive, together these chapters provide good sampling of the type of subjective-state research that has been done in the past and discusses how this work may influence future studies. My only word of caution is to readers that might be expecting either a new and improved version of Aldous Huxley's "Doors of Perception" or a detailed neurophysiological account of drug induced altered states. If you are expecting either of these things then you might be disappointed. Otherwise, I can highly recommend "Mind-Altering Drugs: The Science of Subjective Experience".