DRUGS
IN AMERICAN SOCIETY

TENTH EDITION

ERICH GOODE

Mc Graw Hill Education

Tenth Edition

Drugs in American Society

Erich Goode

Stony Brook University

Mc Graw Hill Education

DRUGS IN AMERICAN SOCIETY, TENTH EDITION

This book is printed on acid-free paper.

1 2 3 4 5 6 7 8 9 LCR 21 20 19

ISBN 978-1-259-92058-5 (bound edition)
MHID 1-259-92058-5 (bound edition)
ISBN 978-1-260-69044-6 (loose-leaf edition)
MHID 1-260-69044-X (loose-leaf edition)

Product Developer: *Francesca King*
Marketing Manager: *Nancy Baudean*
Content Project Managers: *Lisa Bruflodt, Danielle Clement*
Buyer: *Laura Fuller*
Designer: *Beth Blech*
Content Licensing Specialist: *Brianna Kirschbaum*
Cover Image: *©Vintage Tone/Shutterstock*
Compositor: *MPS Limited*

Library of Congress Cataloging-in-Publication Data

Goode, Erich, author.
Drugs in American society / Erich Goode.
Tenth edition. | New York, NY : McGraw-Hill Education, [2020] |
Includes bibliographical references and indexes.
LCCN 2018040083| ISBN 9781259920585 (student edition : bound edition) | ISBN 1259920585 (student edition : bound edition) | ISBN 9781260690446 (loose-leaf edition) | ISBN 126069044X (loose-leaf edition)
LCSH: Drug abuse—United States. | Drugs—United States. | Drug utilization—United States. | Drug abuse and crime—United States.
LCC HV5825 .G63 2020 | DDC 362.290973—dc23
LC record available at https://lccn.loc.gov/2018040083

mheducation.com/highered

About the Author

©pixhook/Getty Images

Erich Goode is Sociology Professor Emeritus at Stony Brook University. He received his Ph.D. in sociology from Columbia and a master's in nonfiction writing at Johns Hopkins. Goode has taught at Stony Brook, New York University, the University of North Carolina at Chapel Hill, and the University of Maryland at College Park, and is the author of a dozen books, mainly on drug use and deviant behavior, including *The Marijuana Smokers* (Basic Books, 1970), *Between Politics and Reason: The Drug Legalization Debate* (St. Martin's Press, 1997), *Justifiable Conduct: Self-Vindication in Memoir* (Temple University Press, 2013), *Deviant Behavior* (Routledge, 11/e, 2016), and *Taming New York's Washington Square Park: A Wild Civility* (NYU Press, 2018). He lives in New York City with his wife, Barbara Weinstein, a historian who teaches at New York University.

This page intentionally left blank

Brief Contents

©pixhook/Getty Images

Preface and Acknowledgments *xi*

1 An Introduction to Drug Use *1*
2 A History of Drug Use *39*
3 A History of the War on Drugs *65*
4 Why Do People Use Drugs? *100*
5 Drugs in the Media *134*
6 Alcohol and Tobacco *167*
7 Marijuana, LSD, Club Drugs *200*
8 Cocaine and the Amphetamines *238*
9 Heroin and the Opiates *262*
10 Drug Trafficking *299*
11 Drugs and Crime *327*
12 Drug Law, Drug Treatment *351*
13 Legalization, Decriminalization, and Harm Reduction *376*

Glossary ***G-1***

References ***R-1***

Name Index ***I-1***

Subject Index ***I-3***

This page intentionally left blank

CONTENTS

Preface and Acknowledgments *xi*

CHAPTER 1

What Is a Drug? *4*
- Medical Utility *5*
- Illegality *6*
- Psychoactivity *7*
- Defining Drugs: A Summary *8*

Drug Action Versus Drug Effect *9*
A Few Basic Pharmacological Concepts *11*
- The Acute-Chronic Distinction *11*
- The ED/LD Ratio *11*
- Drug Tolerance *12*

Factors that Influence Drug Action *13*
- Route of Administration *13*
- Dose *15*
- Potency and Purity *15*
- Drug Mixing *16*

Drug Dependence *17*
- The Classic Addiction Model *17*
- The Dependence-Reinforcement Model *18*
- Continuance or Loyalty Rates *20*

Drug Use and Drug Abuse *24*
A Classification of Drugs and Their Effects *24*
- Stimulants *26*
- Sedative-Hypnotics *26*
- Opiates *27*
- Hallucinogens *28*
- Marijuana *29*
- Ecstasy *30*
- Disassociative Anesthetics: PCP and Ketamine *30*

Summary *31*
Account: Interview with John, an Advertising Executive *34*
Questions *38*

CHAPTER 2

Rates and Patterns of Drug Use: The Basics *41*
- Overall Prevalence Rates *41*
- Continuance or "Loyalty" Rates *43*
- Consumption Levels *44*
- Life-Cycle Rates *45*

Three Eras of Drug Use *48*
- The Natural Era *48*
- The Transformative Era *49*
- The Synthetic Era *49*

Alcohol Consumption: 1790s–1919 *50*
Alcohol Consumption During Prohibition *52*
Repeal: Alcohol Consumption, 1933–Present *53*
Drug Use Trends Over Time: 1960–1979 *55*
Drug Use, 1980s–Present *57*
Summary *60*
Account: Interview with Jimmy, a Former Heroin Addict *62*
Questions *64*

CHAPTER 3

Drug Use in Nineteenth-Century America *67*
- Medical Drug Use *67*
- Cocaine-Based "Soft" Drinks *69*
- Medical, Scientific, and Technological Innovations *70*

Numbers of Addicts and Abusers *70*
The Movement to Prohibit Alcohol: 1784–1920 *71*
Early Anti-Opium Legislation *74*
The Pure Food and Drug Act of 1906 *75*
The Shanghai Commission and the Hague Conference *76*
The Harrison Act of 1914 *77*
The Marihuana Tax Act of 1937 *81*
The Controlled Substances Act *83*
The Backlash Gathers Strength: The Carter Years *87*
The Reagan Years *89*
The Nixon/Reagan Offensive Leaves Its Legacy *92*
Summary *94*
Account: My Experiences with Barbiturates *98*
Questions *99*

CHAPTER 4

Biological Theories *103*
Genetic Theories *103*
Metabolic Imbalance *104*
Psychological Theories *104*
Reinforcement *105*
Inadequate Personality *107*
Problem-Behavior Proneness *108*
Sociological Theories *110*
Social Disorganization and the Chicago School *111*
Anomie Theory *112*
Social Control and Self-Control Theory *113*
Social Learning and Subculture Theory *116*
Selective Interaction/Socialization Theory *119*
Conflict Theory *122*
Broken Windows and Collective Efficacy *126*
Summary *127*
Account: Multiple Drug Use *131*
Questions *133*

CHAPTER 5

Are the News Media Biased? *135*
Four Theories of Media Bias *138*
The Social Construction of a Social Problem *139*
Sensationalism in the Media: The Drug Story *142*
A Brief History of Drugs in the Media *144*
Marijuana in the 1930s *145*
LSD in the 1960s *146*
PCP in the 1970s *148*
Crack in the 1980s *150*
Methamphetamine in the Late 1980s to the 2000s *157*
The Media Cover the Opiate Epidemic *159*
The Twenty-First Century: Do the Media Glorify Drugs? *160*
Summary *163*
Account: Goth Girl Speaks Out About Alcohol in the Media *166*
Questions *166*

CHAPTER 6

Alcohol *169*
Acute Effects of Alcohol *169*
Alcohol Consumption Today *171*
Alcohol Abuse and Risky, Deviant Behaviors *172*
Death on the Highway *174*
Alcohol and Violence *177*
Alcohol Consumption and Sexual Victimization *180*
Alcohol and Drug Use *183*
Has Under-21-Year-Old Drinking Increased? *184*
Alcohol Consumption: A Brief Overall Assessment *186*
Tobacco *187*
Tobacco: Medical Harm *187*
Tobacco: A Brief History *189*
The Decline of Smoking *190*
Are Cigarettes Sublime? *194*
Summary *195*
Account: The Bar Scene *197*
Questions *199*

CHAPTER 7

Marijuana: An Introduction *201*
Marijuana Production and Availability *203*
Use of Marijuana *204*
Acute Effects of Marijuana *205*
Chronic Effects of Marijuana *207*
Contradictory Research Findings *207*
Is Marijuana a Dangerous Drug? *210*
Who Uses Marijuana? *211*
The Progression to More Dangerous Drugs *214*
The Mainstreaming of Marijuana *220*
LSD and the Hallucinogens *220*
Subjective Effects of Hallucinogenic Drugs *222*
LSD and Genetic Damage *225*
LSD: Continuance Rates and Frequencies of Use *226*

Club Drugs *227*
Summary *230*
Account: Chronic Marijuana Use *233*
Questions *237*

CHAPTER 8

Cocaine *240*
A Brief History of Cocaine *240*
Route of Administration and Effects *243*
Origin, Quality, Availability, Price, and Usage *244*
Is Cocaine Addicting? *246*
Crack *250*
An Introduction to Crack *250*
Crack: Myth versus Reality *251*
The Amphetamines *253*
Trends in Use *254*
Physical and Psychological Effects *255*
Methamphetamine *256*
An Introduction to Meth *256*
Is There a Meth Epidemic? *257*
Summary *258*
Account: Using Crack Cocaine *260*
Questions *261*

CHAPTER 9

Opiate Drugs: An Introduction *263*
The Use and Abuse of Opiates Today *266*
Why Turn On? The User's Perspective *267*
Heroin Addiction *270*
Kicking Heroin *271*
Heroin Addiction: Myth and Reality *272*
Controlled Opiate Use *274*
The Misuse and Abuse of Prescription Opiates *276*
Fatal Heroin, Fentanyl, and Opioid Overdoses *278*
Summary *286*
Account: Becoming Addicted to OxyContin *288*
Questions *297*

CHAPTER 10

Availability, Price, Purity, and Source *301*
The Myth of Market Centralization *303*
Is the Drug Trade A Pure Economic Liability? *304*
Where Do Illicit Drugs Come From? *306*
Heroin *308*
Cocaine *309*
Marijuana *309*
Methamphetamine *311*
Ecstasy *311*
LSD *312*
Factors That Facilitate the Drug Trade *312*
The Street-Level Economics of Heroin Abuse *315*
Class and Ethnic Styles of Dealing *318*
How the Drug Trade Harms Source Countries *320*
Summary *321*
Account: Dealing Cocaine *324*
Questions *326*

CHAPTER 11

What's the Nature of the Drugs-Crime Link? *328*
The Relationship Between Drug Use and Crime *330*
Drugs and Crime: Three Models *332*
The Enslavement Model *333*
The Predisposition Model *333*
The Intensification Model *333*
The Drugs-Violence Nexus: Three Models *335*
The Psychopharmacological Model *335*
The Economic-Compulsive Model *335*
The Systemic Model *336*
Which Model Makes the Most Sense? *336*
The Role of Cocaine Use in Violent Behavior *337*
Heroin Addiction and Violence *338*
Alcohol and Violence *340*
Summary *343*
Account: Drug Use and Crime, One Ex-Convict's Story *346*
Questions *350*

CHAPTER 12

Drug Use, the Crime Rate, Arrest, Incarceration *352*
Prohibition: Two Punitive Arguments *356*
Drug Control: The Current System *358*
Three Categories of Drugs *358*
The Punitive Approach *360*
The Bottom Line *361*
Does Prohibition Work? *361*
Drug Courts: Treatment, Not Punishment *364*
Drug Treatment *367*
Evaluating Program Effectiveness *368*
Types of Programs *369*
Summary *371*
Account: Arrest and Incarceration *372*
Questions *375*

CHAPTER 13

Legalization: An Introduction *377*
Is Drug Criminalization a Failure? *378*
Four Proposals to Reform the Drug Laws *381*
Legalization *382*
Decriminalization *383*
Prescription and Maintenance Models *384*
Harm Reduction *385*
What About Marijuana? *386*
Will Drug Use/Abuse Rise under Legalization? *387*
National Alcohol Prohibition (1920–1933) *388*
Legalization and Use: Two Issues *389*
Worst-Case Scenario *390*
Factors in the Legalization-Use/Abuse Equation *390*
What Is to Be Done? *399*
Summary *401*

Glossary G-1

References R-1

Name Index I-1

Subject Index I-3

Preface and Acknowledgments

The most recent story of "drugs in American society" is divisible into two parts pointing in opposite directions. We can caption the first of these two stories, *"the mainstreaming of marijuana"*—which *Time* magazine referred to in its 2017 standalone publication, *Marijuana Goes Main Street*. The legalization and decriminalization of cannabis, its commercialization, its legal use as medicine in more than half the states of the United States, all express the conventionalization, normalization, and destigmatization of the use and sale of cannabis. The most recent high school survey released a preliminary media statement that revealed a remarkable, newsworthy, and almost astounding development that expresses this tendency: More seniors smoked marijuana during the month prior to the survey (22.9%) than had smoked tobacco cigarettes (9.7%). In 1991, 40.6 percent of seniors saw "great risk" in using marijuana; in 2017, only 14.1 percent did. The fact is, commented the reporter who covered the story for *The New York Times,* we are living in an era in which marijuana is "quietly condoned" or "tacitly approved," even though a majority may not use it regularly (Hoffman, 2017).

The second of these stories is gloomier, nastier, indeed, catastrophic, and that is the huge rise in overdose deaths as a result of taking one or more of the opiates. Between 1999 and 2016, fatal drug overdoses in the United States nearly quadrupled, from about 16,800 to about 64,000, and more than two-thirds of these deaths were induced by prescription opioids, heroin, and fentanyl. This is an astonishing development and completely unprecedented in the history of American drug taking. It forces us to take a closer look at the use of the opiates and try to understand what is causing such ruinous increases in fatalities.

Alfred Knopf published the first edition of this book—more essay than textbook, which I dashed off in about six weeks—over four decades ago, at a time when reliable and valid drug-related evidence was difficult to come by. Today, researchers and writers have vastly more data, more than they can handle—it is an embarrassment of riches—and the difficulty today is in sorting it all out. Naturally, I would like to express my gratitude to the parties who work for and administer the many agencies, organizations, and institutes whose job it is to record and tally the many manifestations and consequences of the consumption of psychoactive substances. Over the years, through this volume's multiple editions, I have expressed my thanks to the many parties who have helped me put this book together by supplying information and material, as well as by sharing their views on drug-related issues and matters, its use, effects, and impact on the society, or agreeing to write a narrative about their drug involvement or allowing me to interview them and publish their accounts.

At the very least, I owe a debt of gratitude to a multitude and diversity of people who helped me to

complete this edition, as well as those who helped me write the earlier editions. I have looked through the acknowledgments in past editions, and the list of the people who have assisted me, and to whom I am grateful, is daunting. Unfortunately, some of them are no longer with us, but my gratitude remains. All of them, taken together, include Patricia Adler, Paul Attewell, Stephan Barr, Nachman Ben-Yehuda, Gina Bisagni, Nancy Blaine, Zhanine Brooks, Jennifer Brown, Elof Axel Carlson, Paul Chalfant, Stephen Chappell, James Colliver, Stephanie Compos, Elizabeth Crane, Julie David, Dale Deutsch, Lisa Castelluzzo Dolan, Nancy Duckworth, Diane Eidelman, Kathryn Ann Farr, Laura Franz, Tricia Fuentes, John Fuller, John Galliher, Avram Goldstein, Lester Grinspoon, JoAnn Grundbaum, Maris Hearn, Clare Imholtz, James Inciardi, Eric Jensen, Bruce Johnson, Robert Keel, Paula Holtzman Kleinman, Jerome Koch, Marvin Krohn, Laura LaPiana, Henry Lesieur, Alfred Lindesmith, William McAuliffe, Arthur McBay, Charles McCaghy, David McCandlish, Jacqueline McFadden, Iona Man-Cheong, Patti Meyer, James Miller, Judith Droitcour Miller, Ethan Nadelmann, Diane Reznikov, Marsha Rosenbaum, Terry Rosenberg, Alphonse Sallett, Mark Segal, Nathan Sevin, Linda Silber, Maura Strausberg, John Talbott, Al Woodward, and Joanna Yoon. In addition, I owe a debt of gratitude to Alexia Cooper, Howard Snyder, and Joseph Mulako-Wangota for supplying me with the material that I adapted for the table on drug arrests. I'd also like to thank my former students, especially those who have taken the courses I've taught that dealt with drug use and from whom I have learned so much over the years. Likewise, I'd like to express my appreciation to all the researchers who have studied drug use and written about its complexities, contradictions, and mysteries. I'd also like to thank the readers of all the versions of this book, who have reminded me of my obligations as a writer, a communicator, and a teacher, to make its prose clear and its discussions comprehensive. My thanks to Francesca King, at McGraw-Hill, and Tara Slagle, who shepherded this edition through to completion and publication. And what husband does not thank his wife? I owe a debt of gratitude to Barbara Weinstein, who held my body, soul, and spirit together while I revised and rewrote this book.

NEW TO THIS EDITION

I have reorganized this edition somewhat. I've rewritten Chapter 1 as a stand-alone introduction to the subject, which consolidates the previous Chapters 3 and 4; the current Chapter 4 is the previous Chapter 7, and I've deleted the former Chapters 6 and 9; for the most part, I retain the chapters that follow. All the description and analysis in this volume that depend on ongoing data collection have been updated. There are two exceptions to my statement about the abundance of data that's available to the researcher and author of drug phenomena. The termination of two important government statistics-gathering programs, ADAM II (the Arrestee Drug Abuse Monitoring system), and DAWN (the Drug Abuse Warning Network)—both of which were defunded in 2011 in a misguided and ignorant cost-cutting frenzy—represent a heavy body blow to the community made up of observers and analysts who make use of these data, as well as to the parties who are assisted in other multiple ways by such surveillance and tabulation efforts. How else can we know whether and where intensified drug programs are needed? We can only take hope in the recommendation of the report of the President's Commission, led by prior New Jersey governor Chris Christie, issued in its publication *On Combating Drug Addiction and the Opioid Crisis,* published in 2017, to reinstitute ADAM and DAWN. If we do not resurrect these surveillance and data collection programs, we blindfold ourselves, and then grope around in the dark for essential information that is half-hidden yet, if fully revealed, can perform a service to the lives of all of us. In the sense that these data are useful, this book is poorer for the needless, mean-spirited, and foolish budget-slashing gesture that the cancellation of these programs represents. Unfortunately, the present presidential administration seems to be in no mood for such a restoration. But before that happens, my thanks to the people at SAMHSA who explained to me how the agency puts together the scattered data that pre-2011 DAWN would have assembled.

I would like to think of this volume, this edition, as both a big-picture portrayal of drug consumption as well as an up-close and empathetic portrait of all the principal actors in this more than century-long drama of a particular method of altering the human consciousness. What happens when a major sector of a society engages in a systematic transformation of how they think, feel, and even conduct themselves? What are the lives of these actors like? How does their transformation impact on the lives of others, on the collective as a whole? What do these mind-voyagers gain by this transformation? What do they lose? What about the rest of us? Is the whole enterprise institutionalized and routinized—or do any surprises remain? What can we learn from these undertakings? What can we *do* about them? And do we *want to*? Perhaps this book represents something in the way of an effort—as much for me as anyone else—at enlightenment, at understanding the human condition. I'm not aiming for wisdom but I would like to achieve some illumination.

Facts matter, and in an era when liars manage to grab the loudest megaphone, I feel no shame in reminding my readers that this truism, this cliché, is worth reiterating. Yes, I know, facts are *interpreted*, but before the interpretation comes the validation, and the sad reality of this story is that, in some higher circles, no one seems to care. But I do, and I hope that readers will regard this book as a testament to my insistence that what we don't know, or what we think we know but actually don't, can hurt us. I've gathered as much valid information as I can cram within these two covers, but perhaps I've told a few interesting stories along the way as well.

Erich Goode—

Greenwich Village, New York City

Students—study more efficiently, retain more and achieve better outcomes. Instructors—focus on what you love—teaching.

SUCCESSFUL SEMESTERS INCLUDE CONNECT

FOR INSTRUCTORS

You're in the driver's seat.

Want to build your own course? No problem. Prefer to use our turnkey, prebuilt course? Easy. Want to make changes throughout the semester? Sure. And you'll save time with Connect's auto-grading too.

65%

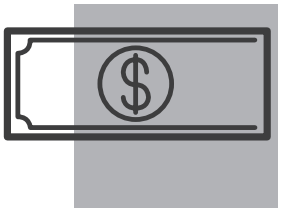
Less Time Grading

They'll thank you for it.

Adaptive study resources like SmartBook® help your students be better prepared in less time. You can transform your class time from dull definitions to dynamic debates. Hear from your peers about the benefits of Connect at **www.mheducation.com/highered/connect**

Make it simple, make it affordable.

Connect makes it easy with seamless integration using any of the major Learning Management Systems—Blackboard®, Canvas, and D2L, among others—to let you organize your course in one convenient location. Give your students access to digital materials at a discount with our inclusive access program. Ask your McGraw-Hill representative for more information.



Solutions for your challenges.

A product isn't a solution. Real solutions are affordable, reliable, and come with training and ongoing support when you need it and how you want it. Our Customer Experience Group can also help you troubleshoot tech problems—although Connect's 99% uptime means you might not need to call them. See for yourself at **status.mheducation.com**

For Students

©Shutterstock/wavebreakmedia

Effective, efficient studying.

Connect helps you be more productive with your study time and get better grades using tools like SmartBook, which highlights key concepts and creates a personalized study plan. Connect sets you up for success, so you walk into class with confidence and walk out with better grades.

"I really liked this app—it made it easy to study when you don't have your textbook in front of you."

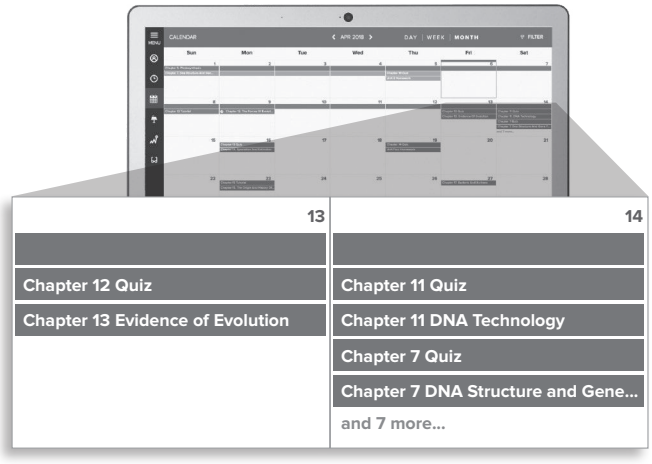
- Jordan Cunningham,
Eastern Washington University

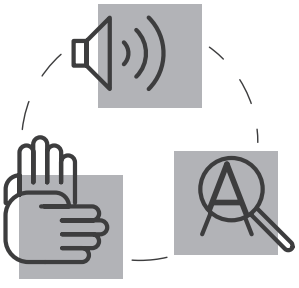
Study anytime, anywhere.

Download the free ReadAnywhere app and access your online eBook when it's convenient, even if you're offline. And since the app automatically syncs with your eBook in Connect, all of your notes are available every time you open it. Find out more at **www.mheducation.com/readanywhere**

No surprises.

The Connect Calendar and Reports tools keep you on track with the work you need to get done and your assignment scores. Life gets busy; Connect tools help you keep learning through it all.





Learning for everyone.

McGraw-Hill works directly with Accessibility Services Departments and faculty to meet the learning needs of all students. Please contact your Accessibility Services office and ask them to email accessibility@mheducation.com, or visit **www.mheducation.com/about/accessibility.html** for more information.

This page intentionally left blank

CHAPTER 1

AN INTRODUCTION TO DRUG USE

What Is a Drug? *4*
- *Medical Utility 5*
- *Illegality 6*
- *Psychoactivity 7*
- *Defining Drugs: A Summary 8*

Drug Action Versus Drug Effect *9*

A Few Basic Pharmacological Concepts *11*
- *The Acute-Chronic Distinction 11*
- *The ED/LD Ratio 11*
- *Drug Tolerance 12*

Factors that Influence Drug Action *13*
- *Route of Administration 13*
- *Dose 15*
- *Potency and Purity 15*
- *Drug Mixing 16*

Drug Dependence *17*
- *The Classic Addiction Model 17*
- *The Dependence-Reinforcement Model 18*
- *Continuance or Loyalty Rates 20*

Drug Use and Drug Abuse *24*

A Classification of Drugs and Their Effects *24*
- *Stimulants 26*
- *Sedative-Hypnotics 26*
- *Opiates 27*
- *Hallucinogens 28*
- *Marijuana 29*
- *Ecstasy 30*
- *Disassociative Anesthetics: PCP and Ketamine 30*

Summary *31*

Account: Interview with John, an Advertising Executive *34*

Questions *38*

©Everett Historical/Shutterstock

Dave is 40 years old, and he's never smoked marijuana before. At a party, a friend offers him a joint, which he decides to accept. He takes a deep drag on the joint, and after very slowly letting out the smoke, as he's seen others do, he casts his eyes toward the ceiling and says softly, "Nice place to visit." George, an 18-year-old, doesn't go to bars to have a good time—he drinks to get drunk. It's binge drinking every time, and, as he tells his friends, he likes the feeling of getting smashed. Before going to an Orpheus concert, Chuck, a college student, snorts two fat lines of ketamine. "Pain shot across my brow, bringing tears to my eyes, and forcing me to wrinkle my nose," Chuck explains. Walking to a

friend's apartment, Mark picks up a young woman, Sally, who seems interested in taking some of the cocaine he says he had stashed with his friend. She squats on the floor of the friend's apartment, pulls a syringe kit out of her jacket, takes out a tiny spoon, taps half the coke out of the envelope Mike gave her into the spoon, liquefies the coke, draws the liquid into a syringe, and injects it into her bare right arm. When she collapses on the floor, Mike immediately calls EMS. "The girl spent a month in the hospital in a coma," he tells me.

Drugs are chemicals that influence the workings of the mind—in other words, they are substances that are *psychoactive*. Obvious as it might seem, users take drugs to get high. Puffing on a marijuana joint, snorting a line of cocaine intranasally, chewing a wad of peyote cactus, swallowing a glass of wine, or injecting a solution of heroin intravenously enables us to attain a psychic state that many of us experience as gratifying, enjoyable, exhilarating, intoxicating, and mind bending. But psychoactivity is a coat of many colors; the mind can be bent in different directions, some of them pleasing to most of us, while many have psychic effects that we find unsettling, disturbing, even unpleasant—and that's the story driving this volume. Taking drugs is a cultural universal, and, in our society, it is extremely widespread; getting high is as primordial as humankind itself. The incitement of drug taking includes the pleasurable experiences most users feel most of the time when ingesting psychoactive substances—but it also includes the disagreeable or harmful ones as well.

Our paleolithic ancestors foraged for food. Nature is abundant in plants that harbor chemicals that, when ingested, have *effects*; they influence the way the brain works. And when brain chemistry is altered, we think, feel, and do many things that are significantly and substantially different from our everyday habitual thoughts, feelings, and behavior. Some of these effects have been toxic—they sickened and even killed us; prehistoric humans learned to avoid such substances. Other substances put us in a psychic state we experienced as pleasurable; they made us more sensuous, contemplative, or capable of appreciating dimensions of reality that stretched beyond the ordinary ways of thinking and feeling. Many ancient peoples came to use such substances for spiritual purposes. Putting a precise date on the very earliest human ingestion of psychoactive plants is conjecture, of course, because all the physical traces of this remarkable event has long ago vanished. But paleontologists and archaeologists have discovered evidence of psychoactive drug use in materials that are, at the very least, thousands of years old.

Elisa Guerra-Doce (2015), a Spanish archaeologist, conducts research on the use of psychoactive substances in prehistoric Eurasia; she has examined fossilized cactus and mescal beans, alcohol residue in shards of pottery, poppy seed capsules, fragments of coca (a leaf containing cocaine) in mummy hair and human dental remains, and nicotine, even opium, in pipes. Some of these remains date back 8,000 or more years, some only hundreds, but the most ancient of them tell the same story: Humans began *intentionally* self-inducing an intoxicated state longer ago than we first devised writing, as long ago as when we built our first cities. Most paleontologists date the dawn of alcohol consumption at the Paleolithic Era, 12,000 years ago. Ernest L. Abel likewise dates the first consumption of cannabis at 10,000 BCE (1980). Iain Gately places the earliest human puff on a tobacco pipe at roughly 6,000 years ago (2001). The message of the drug-related artifacts that homo sapiens left behind seems clear: There's *something* in the human central nervous system that motivates us to *seek* altered states of consciousness.

Not all of us seek this state, but all of us have the neurological wiring to do so. Of course, we can attain transformations of our everyday consciousness in lots of different ways. Prayer and meditation introduce us to the spiritual dimension; fasting or abstaining from eating food causes light-headedness; spinning around induces dizziness. Multiple common experiences—sex, daydreaming, listening to music, and sleep—give rise to mental states that cause us to transcend our routine, run-of-the-mill perceptual dimension. Some experts have argued that seeking such states is hard wired into us; it is a drive much like an instinct (Weil, 1973, 2004). Whether or not we agree with this claim, our DNA undeniably enables us to alter our sense of awareness, our perceptions, our very consciousness. That capacity is in our genes, laid down by our neurological wiring, and, as a consequence, *some* members of *nearly all* societies seek one or another psychoactive state—that is, getting high. It is, to emphasize the point, very close to a cultural and societal universal. Moreover, taking drugs is a *dependable* method of attaining this out-of-the-ordinary psychoactive state. And drug taking may also be among the most *transformative* of such methods; that is, among many ways of seeking such states, altering our consciences by taking a chemical substance reliably induces the most immediate, untutored, and dramatic changes in the way we think and feel in our ordinary, everyday lives.

To us, as students of drug use, what makes drugs interesting and distinctive is this very capacity to influence mood, emotion, and intellectual processes. This is the case because it is the *psychoactivity* of certain chemical substances that gives them their popular appeal and that impels substantial numbers of members of society to experiment with and use them. And it is precisely this appeal that initiates the chain of events that leads to their scrutiny by physicians, pharmacologists, neurologists, psychiatrists, psychologists, epidemiologists, and social scientists. But their "side effects"—those toxic consequences of ingesting the wrong drug, by the wrong person, or too much of the drug, or under the wrong circumstances—are what bring these specialists into the picture.

Drugs accrete a tradition, a *lore*: People take drugs and tell their friends about their experiences: "Try it, you'll like it, it's fun." or "Avoid it, it'll make you sick." People who take a drug *typically* experience positive psychic effects, enjoy the experience, and tell others about what they felt. Other drugs have more complicated effects; they are unsettling and disturbing. At substantial doses, they will run you over like an onrushing truck. Drug-naïve individuals—persons who have never ingested a given psychoactive substance—hear descriptions of a drug's effects from friends and acquaintances who have used it. Most of these descriptions are inspired by a drug's pharmacological action: how its chemical structure interacts with the central nervous system. It is the psychic effects that users enjoy that prompts their initial use. Drug *effects* are absolutely central to drug use.

But the same effect that one person will enjoy, another will find unpleasant, and even the same person will experience a specific effect as enjoyable at one time and in one setting, yet as disagreeable at another time and place. Lots of drugs, lots of effects, and lots and lots of considerations. In the material world, we rarely get something for nothing, and psychoactivity is always accompanied by a host of other effects as well. At a certain dose, taken over a sufficiently extended time, psychoactive drugs produce significant side effects. And some chemical substances are capable of producing a powerful dependence in users. Others exhibit extreme toxicity—when using them, the person who takes them may experience a drug "overdose," for instance, in the form of temporarily losing consciousness, possibly even death. Still others produce medical damage; they kill body tissue

by harming the lungs, the liver, the brain, and/or the hormonal system. Negative side effects of psychoactive substances are crucial to the researcher because they suggest one reason, among others, why societies attempt to control access to and the use of particular drugs—that is, legislators attempt to prevent people from taking a drug because medical and popular opinion recognizes that it harms people who take it. The fact that marijuana possession and sale are being decriminalized and re-legalized suggests that the drug's effects may not be as harmful as the authorities once claimed.

Psychoactive drugs are interesting for a variety of reasons, including their potential impact on human behavior and society's attempt to control them. The psychoactive appeal of drugs leads to their potential for widespread use, which, in turn, leads to the possibility of widespread harm or problematic behavior, which further results in some form of social control, that is, legal restrictions on their distribution and use. Hence, societies raise the question, Is this drug harmful to users? When the answer seems to be in the affirmative, the next question becomes, "How can we limit and control the use of this drug?"

Another reason why we have to understand the psychopharmacology of drugs—the study of the impact of drugs on the mind—is that the action of some drugs conduces users to engage in certain actions. (*Conduce* means to "lead or contribute" to something.) For instance, to the sociologist and the criminologist, one extremely interesting effect of certain drugs is that they make violent or criminal actions more likely. If taking a drug lowers our inhibitions, certain behaviors that would normally be unthinkable to users become acceptable under the influence. Alcohol, a drug that is strongly intertwined with violent and criminal behavior, plays precisely such a disinhibiting role. And if a drug is physically addicting or dependency-producing, *and it is illegal—and hence, relatively expensive*—it may not be possible to pay for a steady supply without resorting to a life of crime. To the sociologist, whether and to what extent drugs influence the enactment of unacceptable and/or criminal behavior is interesting and worth investigating.

By itself, the pharmacology of drugs does not *cause* the drug laws to materialize out of thin air. Nor is pharmacology or side effects the only factors in drug-related behavior. What people do under the influence, again, is partly a consequence of a society's cultural and legal structure—the social and legal norms spelling out and sanctioning appropriate and inappropriate behavior. Still, what a drug does to the neurochemistry of the human brain—and hence, the body—is relevant to the social scientist's interests: human behavior and, along with other factors, legal controls. Thus, we need to begin by discussing drugs as psychopharmacological substances.

WHAT IS A DRUG?

Ask a dozen people for their definition of the word *drug*. I've done it, and some of the answers I get are far too broad to be useful ("a chemical"), while others are too narrow—not to mention wrong ("an addicting substance"). In addition, some of these answers dwell exclusively on the effects of substances ("drugs get you high"), while others focus on their social or legal status ("drugs are against the law"). The question, "What is a drug?" cannot be answered strictly objectively (from a substance's pharmacological properties alone) or strictly subjectively (the way a substance is seen, thought of, reacted to, and defined in a society). Each of these types of properties is necessary to define "drugness"—that is, what a drug *is*.

Drugs is a concept that is defined both *materially*, with respect to drugs' essential or physically real properties, and *socially*, a construct that is both in our minds—in the way we picture or represent the world—and in institutions we have built to deal with certain substances. Drugs can be defined by what they *are* and *do*—in a real-world biochemical and pharmacological sense—as well as what they are *thought* to do, including how the law defines them and the way they are depicted in the media, how they are socially constructed and conceptualized. The first definition delineates the "objective," or *essentialist*, reality of drugs, while the second definition delineates the "subjective," or *constructionist*, reality of drugs. Every phenomenon that has ever existed—including drugs—can be looked at through the lens of these two definitions or perspectives.

Definitions may be more—or less—useful according to a specific setting or context. For drugs, three relevant drug contexts come to mind: medical utility, illegality, and, as we saw, psychoactivity. The "medical utility" definition regards a drug as a substance used by physicians to treat the body or mind; the "illegality" definition regards as a drug any substance whose possession and sale are against the law; and the "psychoactivity" definition regards a drug as a substance that influences the workings of the brain or mind, that has an impact on cognitive and emotional processes. If we use one definition, certain implications unfold that may—or may not—be fruitful in a different setting. But if we use another definition, different implications appear that could be useful or counterproductive, again, depending on what we wish to achieve. Even though both are tools, we don't use a hammer to saw wood or a saw to hammer a nail. Definitions, like tools, are useful only according to their context—what we want to use them for.

Medical Utility

A drug can be defined as a *substance that is used to treat or heal the body or mind*. According to this definition, physicians administer drugs to persons who are sick, disordered, or abnormal to return them to a state of normalcy or "ordinariness," to *remove* that which is pathological, abnormal, unnatural—the disease or medical condition—or "out of the ordinary." Can we define a drug by the criterion of medical utility? For instance, given that heroin is not approved for medical use in the United States, does our medical definition exclude heroin? Does it mean that heroin is *not* a drug? Well, if we were to follow that definition alone, yes, it does dictate that, in the United States, we may not regard heroin as a drug. And is penicillin a drug? Yes, if we were to adopt a strictly medical criterion as defining what a drug is, *of course* penicillin is a drug; it is used to treat bacterial infection. But is penicillin used illegally on the street? No, because it does not produce a "high" or intoxication. In the context of illicit use, penicillin is *not* a drug.

The medical definition contains both an objective (or essentialist) and a subjective (or constructionist) element. For a drug to be used medically, we assume that it *does* something to the body—it acts as a healing agent. This is its objective reality. But in addition, a drug has to be *recognized* as therapeutically useful by physicians, and physicians in a given society may not adopt it as medicine even if it works as a therapeutic agent. Controversy may exist with respect to whether some drugs are medically useful. For instance, as of this writing, marijuana is recognized and legitimated as medicine in 29 states and the District of Columbia, but not in the other 21 states, and it is not so recognized by the federal government. Heroin maintenance programs are legal in much

of Western Europe—Switzerland, the Netherlands, Denmark, and Germany—but not in the United States. Same substance, objectively speaking; different legal and social construction. This is the subjective reality—the "socially constructed" side of the medical definition, or how drugs are defined and how the medical profession regards or *defines* substances.

This means that the same substance can be defined *as* a drug and *not* as a drug—depending on the context or the setting. Within the context of medical therapy, the definition of a drug as medicine is useful. *Outside* that context, it is less useful. However, it's also true, as we'll see, that a medical definition may *determine* a substance's legal status; if it is *not* recognized as medicine by the government, this often induces members of a society to criminalize its possession and sale. Because most of the drug use we'll be looking at in this book is recreational—users engage in it for the purpose of getting high, for the effects themselves—the medical definition of drugs is not as useful to us in our quest to understand the causes, consequences, and implications of drug use.

Illegality

How a drug is defined is also determined by a substance's *legal* status—whether the possession and sale of a given substance are legal or illegal. According to this definition, the law and law enforcement define what a drug is. If the possession and sale of a substance are against the law and likely to generate criminal punishment, then that substance, according to the dimension of illegality, is a drug. The legal status of drugs is a *socially constructed* definition: When a drug law is enacted, a category of illegal substances is created. Societies vary with respect to their drug laws. The same substance may be legal in one jurisdiction and illegal in another. Same substance, different status with respect to "drugness." In addition, drug laws change over time; substances move from being legal to illegal, and vice versa. Presumably, the possession and sale of certain drugs result from their physical or material properties: They are *considered* harmful and, thus, are prohibited by law. Though the legal definition of what drugs are is a social construct, it is hypothetically based on their physical (or essentialist) properties.

But here, as in the medical world, controversy is the rule. For instance, some marijuana users proclaim, "Marijuana's not a drug—it's a gentle, natural herb! How can you outlaw nature?" But, as we have discussed, the possession of marijuana (or cannabis) is *legal* in some states, decriminalized for small-quantity possession in others, legal only *as medicine* in still others, *both* decriminalized *and* approved as medicine in other states, and completely illegal in still others. The social and legal construction of cannabis is topsy-turvy both with respect to historical time and jurisdiction or geography, and it continues to evolve. "It's a matter of definition" seems to be the watchword of marijuana. And to top it all off, the possession and sale of cannabis remains strictly illegal with respect to *federal* law.

In contrast, according to the definition based on a substance's legal status, alcohol is not a drug, because its sale is authorized and controlled by the state, and nearly anyone above the age of 21 may possess it. (Its sale to someone under 21 years old is, of course, by the law's very definition, illegal.) Hence, if someone who uses a definition based on a substance's criminal status refers to the drug problem, alcohol is *not* part of the drug problem, because its possession and sale are not illegal to adults. The definition based on illegality uses a kind of double standard when it comes to psychoactivity: Certain substances that influence the mind are included, while others are excluded. To the federal government, the

"drug problem" includes *only* the recreational use and abuse of illicit substances—not alcohol—or the unauthorized (and therefore illegal) use of prescription pills.

A definition of a drug based on criminality is woefully inadequate if we wish to examine the full range of the use of psychoactive substances—why they are used and with what consequences. Why is this so? Because the "illegality" definition, based on a drug's legal status, excludes alcohol, a psychoactive substance with an extremely *strong* connection with both the use of illicit drugs and behaviors that illicit drugs cause or are correlated with. Alcohol consumption can never be neatly separated from the use of illegal drugs, because the same people who engage in the latter activity also engage in the former. It is not enough to say, well, yes, but they also drink milk, because consumers of alcohol are *much more* likely to use and abuse illegal drugs than persons who do not use alcohol. Alcohol tends to be used in addition to, not instead of, illegal drugs. *And* people who commit crimes are *much more* likely to drink than people who do not engage in criminal behavior, but these two categories don't consume milk at substantially different rates.

The criminalization of certain substances is a central topic when thinking about the issue of drug use. The fact that a given substance is illegal—regardless of its effects—determines the sorts of lives users and sellers lead. A consumer of alcohol may be using a psychoactive substance, but that fact alone does not make him or her a potential target of law enforcement. The same cannot be said for the consumers of illicit substances.

Psychoactivity

Pharmacology is the study of the effect of drugs on biological organisms; the scientists who study the effects of drugs are called "pharmacologists," and psychopharmacology is the study of the effect of drugs specifically on the brain, that is, on the mind. As we saw, a third way of defining a drug is *any substance that is psychoactive and has a significant effect on the mind*. To the psychopharmacologist, psychoactivity is the most crucial and important property of a chemical substance. A psychoactive substance is one that affects the workings of the central nervous system (the brain and the spinal column) and thus influences thinking, mood, feeling, sensation, perception, emotion, and, as a consequence, behavior as well. The psychopharmacological definition—what a drug does to the brain, and therefore the mind—is a definition that is based *entirely* on the materially real or essential properties of substances. According to this definition, some substances (such as LSD) are drugs because they influence mood, emotion, and cognitive processes. In contrast, other substances (such as penicillin) are not drugs because they are not psychoactive. By the definition of psychoactivity, which opens the door to *recreational* use, a drug serves exactly the opposite purpose as that focused on in the medical definition. Medically, drugs are used to return the body or mind to a state of normalcy, ordinariness, or *stasis*. In contrast, from the perspective of psychoactivity, drugs are used to take the mind *out of* a state of normalcy, or ordinariness, into a state that the ancient Greeks referred to as *extasis*—ecstasy. This condition may be very mild (such as puffing on a cigarette or sipping a cup of coffee) or very powerful (swallowing a tab of LSD or smoking crack cocaine). But in principle, the functions of medical and recreational drugs, as implied by their respective definitions, are very different—very nearly the opposite of one another.

Different types of drugs have different sorts of effects, and we'll be looking at some of these effects in later chapters. But whenever a substance influences how the brain works,

pharmacologists refer to it as psychoactive. In addition, to any social scientist, including the criminologist, psychoactive drugs are interesting because they influence human behavior, including drug-taking behavior. Why do people take drugs? Because drugs make users feel good. Why are they illegal? Because all drug taking entails a measure of risk; the good judgment of users may be impaired, they may like the effects too much and become drug dependent and do all sorts of terrible and illegal things to obtain the substance, and they may take so much that medical consequences ensue—even death. As a consequence of their effects, societies all over the world have decided that the possession and sale of certain substances should be illegal. This will be a central theme that runs throughout this book.

According to the psychoactivity definition, any substance, regardless of its legal or medical status, that significantly and pharmacologically alters the workings of the brain, is a drug. Any substance that does not is not a drug.

All substances that are taken recreationally are psychoactive. This is the reason *why* they are taken—so that the user can get high, *because* of their effect on his or her mind. Users seek the effects that constitute the psychoactivity of certain chemical substances. For most users, the effects of particular drugs are felt as pleasurable, and it is this pleasure state that they wish to achieve when taking the drug. Drug researchers refer to drugs that are taken primarily for their effects—for the purpose of getting "high"—as *recreational drugs*. But with all drugs, pleasure is a "package deal," and some of the contents of the package may be undesirable to all concerned, user and nonuser alike.

To repeat: Is alcohol a drug? According to the definition of "psychoactivity," *of course* alcohol is a drug! Alcohol is psychoactive. It has effects on the brain; it influences mood, emotion, feeling, and cognitive processes. In addition, it influences human behavior. Coordination diminishes under the influence; human speech is impaired at low to moderate doses of alcohol; inhibitions are lowered, and behavior that is unlikely to be attempted under most circumstances is all too often seized upon with great enthusiasm. Yes, most emphatically, pharmacologically, alcohol *is* a drug! Pharmacologically speaking, alcohol is a drug *in exactly the same way* as illicit substances such as cocaine and marijuana are. *Objectively*, it is no different from the controlled substances that can get the possessor and seller arrested.

Defining Drugs: A Summary

For the purposes of the discussion in this book, two definitions, based on entirely different criteria, define what drugs are: psychoactivity and illegality. The first is based entirely on an essentialist or (presumably) materially real property, while the second is partly a socially constructed property and partly a consequence of the effects of certain substances. To the sociologist and criminologist interested in real-life or "street" behavior, a third definition of what a drug is, the *medical* definition, is far less useful. The fact that penicillin is used as a medicine is not interesting or relevant to the work of the criminologist or the sociologist studying recreational drug use. Some substances are defined as drugs according to one of our two relevant definitions (psychoactivity and illegality) but not the other; many substances are drugs according to both of these criteria. And a few medications, such as morphine, are drugs according to *all three* of our definitions; they are psychoactive; they are illegal if used for recreational purposes; and they are used by physicians as medications, for instance, to treat pain.

DRUG ACTION VERSUS DRUG EFFECT

To understand what drugs do to the brain and the body, it is necessary to distinguish between a drug *action* and a drug *effect*.

A drug action is specific and takes place at the molecular level. Drugs are chemicals that interact with the body's neurochemical system; the outcome of this interaction is what is a drug's "action." As we'll see, drugs act in certain ways on receptor sites located at nerve endings. These actions are measurable and take place, with some variation, in laboratory animals as well as humans. Indeed, they even take place in tissue that has been removed from an organism's body.

Drug effects are nonspecific and more highly variable, and result from more than a given dose of a particular drug. For instance, by its very nature, alcohol *always* binds to a receptor site, located in the cerebellum, that controls coordination (a drug action), and as a result, the consumption of a sufficient quantity of alcohol *usually* produces ataxia or discoordination in users (a drug effect). A drug action is a molecular product of chemistry, while a drug effect is a nonspecific product of chemistry interacting with the organism, plus personal characteristics and social environment. An action that takes place in the body—as predictable as mixing two chemicals in the lab—often, although not always, results in human responses or behavior that we refer to as a drug effect.

Drugs have one or more actions because their chemistry interacts in specific ways with the biochemistry of the nervous system. The nerve cells, called neurons, send electrical impulses or signals from one part of the body to another. When neurons send signals, they release chemicals that are conducted from one site or locus to another. These chemicals, called neurotransmitters, act as chemical messengers. Neurotransmitters, when accompanying drugs that are conveyed to the brain, influence such absolutely crucial functions such as emotion, mood, pleasure, sexuality, appetite, anger, waking and sleeping, and depression. The body has many neurotransmitters. In effect, neurotransmitters may be regarded as endogenous drugs—chemical substances, produced internally by the body, that influence the workings of the brain and powerfully influence behavior.

At the end of each neuron are receptors; between the receptor of one neuron and the receptor of the one next to it is a microscopic space called a synapse. Neurotransmitters are released into this space and travel toward the receptor of the next neuron. The receptors of specific neurons are able to detect and react toward only certain neurotransmitters; the neurotransmitters "fit into" a specific receptor in a distinctive and unique fashion, similar to the way a particular key fits into a lock. Some keys (certain drugs) will not "fit"—and hence, not act upon—certain locks (receptor sites of specific areas of the nervous system), but will pass by the site without exerting an effect. When neurons recognize or fit into specific neurotransmitters, they translate their signals into a certain neurological action. They bind or attach to a receptor, causing a current or signal to flow from one neuron to another, across the synapse between them. Once binding is achieved, the signal goes to a certain location in the brain and from there, to an organ, in effect, telling it what to do (for instance, to speed up or slow down). All organic functions in the body—including those that regulate emotion, coordination, and cognition—are controlled by this system of electrical impulses that are activated by these chemical reactions in the nervous system.

When introduced into the body, drugs *mimic* or *block* the neurotransmitters used to communicate with one another (Goldstein, 2001, p. 20). Drugs, including those that are taken for the purpose of getting high, "hijack," or take over, certain functions of neurotransmitters. Psychoactive drugs overpower the usual communication processes that involve vital functions—such as hunger, pleasure, fatigue, anger, and sexual arousal—by sending their own chemicals to the appropriate sites or blocking them by fitting their chemicals into receptor sites and short-circuiting certain chemical reactions. In this way, under the influence of one or more psychoactive drugs, our usual capacity, for example, to feel pleasure, is stimulated many times over; when we would normally feel hungry or tired, that sensation is blocked; in situations when our neurological pathways would usually communicate no (or at least modulated) irritation, a flood of anger overtakes us.

The sites in the brain that control certain organs are rich in receptors into which specific drugs "fit," as I said, much like a key in a lock. These same sites may lack receptors for other drugs. When a drug passes through the brain, a given drug (the "key") will be attracted to and will bind to a specific site in the brain (the "lock"), which controls a certain function or organ. Hence, the drug will act on that organ. Another drug, which lacks the chemical configuration to fit into the lock, will not bind to that site and will pass it by, not acting on the organ that the site controls.

For example, heroin enters the body, breaks down into morphine, and flows toward and then acts on receptors in the brain that control breathing and heartbeat rate. Because morphine has an affinity for and fits into those sites, the drug hijacks the usual neurotransmitters that control and affect these functions. As a consequence, a sufficiently large dose of heroin can shut down breathing and heartbeat and cause death by overdose.

In contrast, the chemical keys of tetrahydrocannabinol (THC), the major psychoactive chemical in marijuana, do not fit into and hence do not bind with—and consequently do not act on—the receptor sites in the brain that control breathing and heartbeat rate. Because of its chemistry, therefore, marijuana does not powerfully act on breathing or heartbeat rate the way that heroin does, so it is virtually impossible for anyone to die of a marijuana overdose. In contrast, two areas of the brain, the hippocampus and the cerebral cortex—which control thinking and short-term memory—are rich in receptors to which THC provides the chemical key. When THC approaches these sites, it is attracted to them, binds to them, and acts on them. Therefore, sufficient doses of marijuana can diminish the user's short-term memory and disorganize his or her cognitive processes. In addition, there is a dense binding of THC to the cerebellum and basal ganglia, which control movement and coordination.

The relationship between a specific drug and a given receptor site is not absolute. Just as a poorly made key may open a lock with a certain amount of jiggling, a drug that fits poorly into a receptor site may produce an action, though more weakly than a better-fitting drug does. Drugs with the best fit in a given receptor will be more potent and will produce a greater effect than those with a less-than-perfect fit. Methamphetamine, a stimulant, is more potent than amphetamine, to which it is closely related. Thus, it elicits a greater response in the relevant organs. But the affinity of a receptor for chemicals with a specific configuration is a matter of degree. Some receptors have a high affinity or "specificity" for a certain drug molecule; for others it has a lower affinity, and for still others, none at all.

A FEW BASIC PHARMACOLOGICAL CONCEPTS

In this section, we'll look at four basic, crucial pharmacological concepts everyone should understand to have a good idea of how drugs work. The acute-chronic distinction, the ED/LD ratio, drug tolerance, and drug fate.

The Acute-Chronic Distinction

"Acute" effects are the short-term effects of a drug, those that take place within the period of its administration and during the immediate aftermath of a single episode of use. Motor discoordination is an acute effect of downing four mixed drinks, each containing an ounce of an alcoholic beverage. Getting high after smoking crack or snorting four lines of cocaine, likewise, would be acute effects of administering these substances. So is dying of an overdose after an intravenous (IV) injection of a massive dose of heroin. These are effects that occur *during* or *immediately after* taking one or more drugs; they are "acute" effects.

In contrast, "chronic" effects are *long-term* effects, those that occur after the continued use of one or more drugs. Developing cirrhosis of the liver after 30 years of compulsive drinking, lung cancer after decades of two-pack-a-day cigarette smoking, or brain damage after a period of methamphetamine dependence are all chronic effects from which users can suffer. Some chronic effects are a direct consequence of the long-term action of the drug itself. Heavy, frequent use of alcohol damages the liver as well as most other organs of the body; the heavy, frequent use of nicotine damages the lungs as well as most other organs of the body. These are *direct* effects of the *chronic* use of certain drugs.

Then there are the *indirect effects* of taking the drug. These effects are caused not by the action of the drug itself but by the circumstances of use—for instance, using contaminated needles or leading an unhealthful lifestyle. By itself, heroin does not cause AIDS, but using shared needles that are contaminated by HIV, a common practice among addicts, does cause AIDS. Distinguishing between direct effects and indirect consequences of drug taking is crucial because it has extremely important policy implications, as we'll see in Chapters 12 and 13.

The ED/LD Ratio

ED stands for "effective dose." Also known as "active dose," this refers to the dose of a given drug that is required to produce a given effect. More specifically, because all organisms vary in their receptivity to the effects of drugs, ED is represented with respect to the *percentage* of a given population (including humans, as well as animals such as mice, rats, and beagles) among which the dose in question produces the specific effect. ED50 indicates that the drug in question produces a given effect for 50 percent of a designated population; ED100 refers to the same effect for 100 percent of the population.

For instance, if we stipulate the ED50 for morphine in humans for a reduction in pain among a population of postoperative patients, we are spelling out the dose of morphine that is required to achieve a pain-killing effect for half the patients tested. We can do this for any drug, any specific effect, any percentage, in any population. Obviously, for different effects or functions, the ED will differ. For instance, alcohol will slow down reaction time in humans at lower doses (at a lower ED50) than the dose at which it produces motor discoordination or ataxia. And obviously, larger organisms require larger doses to produce a given effect—humans versus mice, for instance. Doses are often expressed per kilogram of body weight.

LD stands for "lethal dose," the quantity of a given drug that is required to kill a stipulated population. LD also refers to a drug's toxicity—how much of the substance can kill a particular organism. More specifically, the ED/LD ratio measures its toxicity—its danger to life and limb. The ED/LD ratio—the *size* of the difference or the gap between ED and LD—is its *safety margin* or *therapeutic margin*.

The larger the ratio between a dose that has a given effect and a dose that is lethal, the safer the drug; the smaller the ratio, the more dangerous it is. For a drug to be considered safe, its ED/LD ratio should be *much* higher than 1:1. The closer a drug's ED/LD is to 1:1, the more dangerous it is. If a drug were to have an ED/LD ratio of exactly 1:1, this would mean that to achieve a given effect (for instance, getting high), everyone that ingested it would end up dead—an extremely *dangerous* drug indeed! But if this ratio is on the order of 1:1 million, it is an extremely *safe* drug. Most drugs are somewhere in-between 1:1 (the most dangerous conceivable drug) and 1:1 million (an extremely safe and nearly totally nontoxic drug).

Realistically, a drug that has a safety or therapeutic margin of 1:10 or so is an extremely unsafe drug. If the quantity that can kill a user is only 10 times greater than the quantity that causes the desired effect, a very substantial number of users who take it will end up dead. On the other hand, a drug with an ED/LD ratio or safety margin on the order of 1:1,000 is extremely safe; that is, it will be very difficult for a user to die of an overdose of this drug.

Drugs vary enormously with respect to their safety or therapeutic margin. Heroin is a remarkably unsafe drug; the dose that causes death in a substantial proportion of users is only 10–15 times higher than the dose at which a substantial proportion of humans achieve a given effect—and obviously here, getting high is the effect in which we are interested. Because illicit heroin is highly variable in purity and potency, it is not terribly difficult to die of a heroin overdose. As we'll see, considering the relatively small number of heroin users, heroin makes a remarkably substantial contribution to the nation's overdose statistics.

One reason for this is the affinity of the receptor sites in the brain that control breathing and heartbeat rate for the chemical structure of morphine, which is the substance heroin breaks down into after entering the body. In contrast, as we have seen, marijuana has a remarkably high safety margin. It is extremely difficult, if not virtually impossible, to die of an overdose of marijuana because its ED/LD ratio is so enormous. As Arthur McBay, a research toxicologist, professor of pharmacy at the University of North Carolina at Chapel Hill, and former chief medical examiner of the state of North Carolina, told me, he once testified in a court case before the Supreme Court of Nevada that "a person would have to consume 1,500 pounds of marijuana in 15 minutes to get a lethal dose." Of course, drugs have effects other than their capacity to kill in an acute episode of use. No one dies of a nicotine overdose (although if the quantity of nicotine in one cigar were injected intravenously, it would be lethal), but the *chronic* effects of tobacco are often devastating.

Drug Tolerance

Tolerance means that the repeated administration of a drug produces diminishing effects. Over time, the body requires a larger dose to achieve the same effect.

Pharmacological tolerance refers to the fact that the neurons become increasingly insensitive to a given drug, and so that drug becomes decreasingly effective. For instance,

as a general rule, drug users must increase the dose of their drug of choice to get high. The flip side of this is the fact that as habituation rises along with tolerance, the lethal quantity of a given drug rises as well. It requires much more of a given drug to kill a habituated or long-term user than it does a neophyte or inexperienced user.

Cross-tolerance refers to the fact that the same principle of diminishing effects that takes place for a given drug also applies to another drug within the same type. For example, tolerance to LSD will also produce tolerance to psilocybin, a related psychedelic substance. Similarly, tolerance to heroin will also produce tolerance to morphine, another narcotic.

Behavioral tolerance reflects how an experienced user learns to compensate for the effects of a given drug, and, hence, a given dose of the drug has a decreasing impact on his or her behavior. For instance, experienced drinkers claim that they can drive as well under the influence as normally. This is false, but what *is* true is that they can drive better under the influence than an inexperienced drinker can. Over time, as a result of trial and error, they have inadvertently trained themselves to "handle" or compensate for the effects of alcohol in such a way that these effects are not nearly as discoordinating as they are to the novice drinker. Still, at a certain level of intoxication, alcohol is discoordinating to *all* drinkers.

FACTORS THAT INFLUENCE DRUG ACTION

To exert a mind-altering or psychoactive effect, drugs must enter and act on the central nervous system (CNS)—the brain and the spinal column. As I have said, most substances we call drugs are not psychoactive, and even psychoactive drugs exert many actions in addition to psychoactivity. To exert an action on the brain, a drug must enter the bloodstream and cross the blood-brain barrier. The body's entire volume of blood circulates roughly once a minute. Hence, when a drug enters the body, it circulates rapidly and evenly. At least four major factors influence the action of drugs: route of administration, dose, potency and purity, and drug mixing.

Route of Administration

Drugs may be ingested in a variety of ways. Pharmacologists refer to a method of taking a drug as a route of administration. Some routes of administration introduce drugs into the body in an extremely rapid and efficient manner. Injecting directly into the vein a liquid solution into which a drug has been mixed is called IV administration. Obviously, only a drug that actually dissolves in water can be injected in this way. IV administration is one of the most effective means of administering drugs. Injection of a drug under the skin—subcutaneously—or directly into a muscle—intramuscularly—is a much slower and more inefficient route of administration than injection into a vein. Oral administration, such as drinking a liquid (like alcohol) or swallowing a pill, is a much slower and more inefficient method of ingestion. This is because if taken orally, a drug must pass through the stomach and be absorbed from there or even further down, through the small intestine, all of which takes a long time. Drugs can also be administered via a dermal patch, through a rectal or vaginal suppository, or placed directly on mucous membranes such as the eye, the gums, or under the tongue or elsewhere inside the mouth.

Smoking is the most rapid and efficient route of administering a psychoactive drug. A substance will produce the quickest, strongest reaction when smoked. This is the case because the air sacs of the lungs are densely surrounded by capillaries; as a result, drugs move rapidly from the lungs into the bloodstream and from there they "swamp" the brain.

The difference between IV administration and smoking is that when a drug that is injected into a vein enters the heart, the blood that carries it to the heart is diluted with blood that does not contain the drug. In contrast, blood that travels from the lungs through the capillaries to the brain is completely undiluted and enters the brain at full strength (Goldstein, 2001, p. 19). Hence, if heroin or crack cocaine is injected intravenously, the high, felt as a "rush" or "flash," will take hold in 12–14 seconds. If these drugs are smoked, the rush will take place in 6–8 seconds.

The route of administration is a crucial factor because a focus on it, and it alone, may confuse observers into thinking that drugs taken in different ways are actually different drugs. For instance, federal law mandates much harsher criminal penalties for crack cocaine than for powder cocaine possession: A 5-year prison sentence was once mandated for the possession of 5 grams of crack and 500 grams of powder cocaine. (In 2010, Obama signed the Fair Sentencing Law into effect, which recalibrated the weight to reflect a more moderate 18:1 ratio.) The justification for a discrepancy is that crack is a more dangerous and addicting drug than powder cocaine. In fact, crack and powder cocaine are very nearly the same drug, taken via different routes of administration. Crack is more dangerous and addicting; it has different "effects" from powder cocaine specifically because it is taken in a more efficient, effective, and reinforcing fashion. Because powder cocaine combusts at a higher temperature than crack, it is more difficult to smoke, but smoking it would produce a similar effect as crack cocaine. As a result of the way it is used, practically speaking, crack cocaine *is* more reinforcing and, hence, more dependency-producing than powder cocaine (which is snorted). Consequently, the legal distinction is not *totally* absurd.

To summarize, crack both *is* and *is not* a different drug from powder cocaine. It is different in that, when taken via the usual route of administration, it is extremely pleasurable and, therefore, very likely to result in abuse and dependence. But it is *not* different in the sense that the active ingredient in crack and power cocaine are chemically identical, and both break down into the same chemical in the body. The world of drugs is not a simple either-or, black-or-white phenomenon.

The route of administration influences the effects a drug has. The same drug will have different effects according to the manner in which it is taken. In addition, because of their physical form, some drugs cannot be taken by certain methods.

For example, marijuana is not soluble in water and so cannot be injected intravenously into the bloodstream. In some societies, marijuana is brewed in tea; its effects are much milder, more muted, and less intense than if it is smoked. In the United States, it is mainly smoked. The fact that a small proportion of marijuana users become dependent on it indicates that the drug has an extremely low *potential* for dependence, because the method by which most users take it is highly reinforcing. As for alcohol, because it is only used orally, its effects tend to be considerably less powerful and less instantaneous than if it were taken in more reinforcing ways. As a result, most people who drink do not become dependent on alcohol. The leaves of the coca plant contain roughly 1 percent cocaine, but the effects of chewing coca leaves are very different from the effects of snorting powder cocaine, which, in turn, are very different from those of smoking crack. Some

gases (amyl nitrite, for instance) are too volatile and unstable to be taken in any manner other than by inhalation. Cocaine and heroin are smoked, administered intravenously, and sniffed or snorted intranasally. Each means of taking these drugs will produce a different set of effects–although they are recognizably "cocaine" or "heroin" effects.

Dose

A discussion of drug effects is meaningless without considering the factor of dose. At minuscule dosage levels, a normally potent drug would exert no discernible effects. And massive doses of a normally weak or safe drug will have overwhelming, even fatal, effects. Heroin, a drug that can shut down the body's heartbeat and breathing mechanisms, can be extremely safe if taken in a dose as minuscule as several micrograms, which will exert no recognizable effect at all. Aspirin, a safe drug taken by millions of people every day with no harmful effects whatsoever, can cause death if taken in a sufficiently large dose. As we know, it is almost impossible to die of a marijuana overdose, yet if several kilograms of the drug were forcibly shoved down someone's throat, the dose could conceivably be fatal. In sum, the issue of dose is inevitably intertwined with drug effects.

The issue of the customary dose at which a drug is taken by users is crucial here. Drug effects are most meaningful at the dosage levels users customarily take. And doses on the street are more meaningful than doses in the laboratory. For each drug, traditions that dictate the appropriate dose for users to take have evolved and vary from one society to another. In addition, the availability of drugs influences what doses users take. During a period of abundance, when an illicit drug is not only readily available but inexpensive as well, users will take it at higher doses; during a "drought," when the drug is expensive and difficult to obtain, users will tend to take lower doses. It is possible that when a drug is studied in the laboratory, the doses administered are not realistic in that the drug may not be used at that dosage level in real life.

Drugs generally exhibit what pharmacologists refer to as a dose-response curve. Each drug exhibits a characteristic dose-response curve *for each effect*. As a general rule, the higher the dose, the greater or more extreme the effect. For all drugs, there are doses at which a given effect does not occur at all. Plotted on a graph, the lower end (at low doses) of the dose-response curve will be almost flat, rising very slowly. As the dose increases and the drug's effects begin to kick in, there will be a kind of "takeoff" point, where the dose-response curve rises very rapidly. Then, for most drugs and for most effects, at even higher doses, the dose-response curve will flatten out again, after which a higher dosage does not produce more extreme effects. With alcohol, for instance, the range of doses between one drop and roughly half an ounce will produce no discernible effect in most adults. This is the nearly flat part of the dose-response curve. Then, for most adults, after half an ounce, the effects of the drug start to kick in, and the imbiber begins to feel intoxicated. Most effects begin to flatten out at a certain point, although with alcohol, death by overdose occurs at extremely high doses. To know a drug's effect, it is absolutely necessary to consider the dosage taken.

Potency and Purity

Potency is defined as the quantity of a drug it takes to produce a given action or effect; the lower the quantity that produces a given effect, the greater the potency of the drug. Drugs

vary in potency between and among themselves. LSD is vastly more potent than psilocybin, a related psychedelic. In addition, the same drug will be variable in potency from one batch to another. For instance, "ditch weed" marijuana, which grows by the side of the road, will usually have an extremely low level of potency, containing less than 1 percent THC, the drug's active ingredient. Other batches of marijuana that are cultivated to achieve maximum effect will contain 10 percent or more THC. Alcoholic beverages, likewise, are variable in potency: Beer is about 4–5 percent alcohol; table wines are roughly 13 percent; and distilled spirits such as gin, vodka, whisky, and tequila are 40–50 percent alcohol. (Technically speaking, the alcohol itself is not variable in potency, it is alcoholic *beverages* that vary with respect to the percent of alcohol they contain.) Hence, drinking the same quantity of each beverage will produce different effects because of the factor of potency.

Purity refers to the fact that batches containing the same drug will vary as to the percentage of the drug they contain. Two users, for example, may each ingest the same quantity of a substance sold on the street as heroin—two packets containing 100 milligrams of something that is sold as "heroin." But one packet may be only 10 percent pure, containing roughly 10 milligrams of actual heroin and 90 milligrams of adulterants, such as quinine, lactose, or milk sugar, which are not psychoactive. The second packet may also contain 100 milligrams of a substance that is referred to as heroin but have 50 milligrams of actual heroin and 50 milligrams of adulterants. The second user is getting five times as much heroin as the first, even though they both purchased packets of the same size. This is because some illicit drugs are "hit," "cut," or "stepped on" with cheap, nonactive fillers so that dealers can increase their profits. Heroin is much more potent today (the average potency is roughly 70% if from South America and 60% if from Mexico) than it was 30 years ago, when the average potency of street heroin was 3–5 percent. Purity is a major consideration when thinking about drug effects.

Drug Mixing

Drug mixing is also a crucial factor in considering the effects of drugs because it is extremely common in the world of use, and it plays a major role in the variability of what drugs do to the minds and bodies of users. Many users who take one drug also take one or more other drugs simultaneously. Roughly two-thirds of all persons who die of a drug overdose are found with more than one drug in their bodies. A street drug called a "speedball" contains cocaine and heroin, or methamphetamine and heroin. Alcohol is frequently imbibed at the same time as marijuana is smoked; people who take "downers" such as barbiturates, methaqualone, or tranquilizers often drink as well.

It is extremely important to consider drug mixing because drugs can *interact* in important ways when they are taken together. Some drugs have antagonistic effects with one another, meaning the effect of one drug nullifies or cancels out the effect of another. For instance, Antabuse not only blocks the effects of alcohol but makes the drinker violently ill when alcohol is ingested. For antagonistic drugs, one plus one equals zero.

Other drug combinations produce *additive* effects. For example, one aspirin plus one Tylenol will have the same effect as two aspirin, or two Tylenol, taken separately. Additive effects can be depicted by the formula one plus one equals two.

Some drugs have synergistic effects when taken in combination. *Synergy* refers to the multiplier effect, whereby the effects of one drug plus the effect of another equals more

than twice as much of either, taken alone. We can represent synergy by the formula one plus one equals four. For example, alcohol and barbiturates are synergistic with one another. If you were to ingest half a quart of vodka plus ten 10-milligram capsules of the barbiturate Seconal, you would be much more likely to die of a lethal overdose than if you ingested a full quart of vodka *or* twenty 10-milligram capsules of Seconal. This is because alcohol and barbiturates in combination interact with one another to produce a more powerful synergistic, or multiplier effect, than they would produce by themselves. Synergy is especially important because drugs are more likely to be mixed today than was true in the past, and synergy produces not only more powerful but also more dangerous effects, such as death by overdose.

DRUG DEPENDENCE

The Classic Addiction Model

Until the 1970s, the model of drug dependence that dominated the field of drug studies was the "classic" drug addiction model. In this model, an "addicting" drug is defined by the appearance of specific withdrawal symptoms. If an organism takes a sufficient quantity of a given drug over a sufficiently long period and then use is discontinued, withdrawal symptoms appear. These symptoms include chills, fever, gooseflesh, diarrhea, muscular twitching, spasms, nausea, vomiting, cramps, and bodily aches and pains, especially in the joints. These effects are pharmacological, not psychological; they can be reproduced in laboratory animals and in patients who do not even know they have been administered an addicting drug.

The classic addiction model recognizes the existence of cross-dependence. When the addict becomes physically dependent on a given drug and then stops taking it, painful withdrawal symptoms appear. These symptoms can be alleviated by the administration of a dose of the drug. But more than that, administration of any drug that is cross-dependent with the addicting drug, that is, any drug in that same *category* of drugs, will alleviate withdrawal. For example, withdrawal from heroin can be alleviated by the administration of morphine, because both are narcotics. Heroin and morphine are cross-dependent with one another. Taking a barbiturate drug can alleviate withdrawal from alcohol, because they are both sedatives. Cross-dependence only applies to drugs that produce a classic addiction.

Not all psychoactive drugs are addictive in the classic sense of the word. The narcotics, including heroin and morphine, are addicting, as are alcohol, the barbiturates, and the other depressants. However, no withdrawal symptoms even remotely like those spelled out by the classic model appear with the discontinuation of cocaine, marijuana, or LSD. What we see instead is more psychological discomfort than physical manifestations of genuine withdrawal symptoms. Because some observers have theorized that the avoidance of withdrawal symptoms explains the continued use of narcotic drugs (Lindesmith, 1968), the puzzle that once confronted researchers was why such a high proportion of users took *nonaddicting* drugs on a chronic, abusive basis. Behavioral dependence—engaging in continued, compulsive, chronic use to the point where that use becomes a threat to what one once valued, including life and limb—is not the same thing as physical dependence, or the pharmacological capacity of a drug to cause withdrawal symptoms. Drugs that do not

produce a physical dependency (that is, they are not "addictive") *often* produce a behavioral dependence. But cocaine (a nonaddicting drug) is more likely to produce behavioral dependence than alcohol (an addicting drug); contrarily, *most* drinkers are *not* alcoholics—but the same rule applies to cocaine: Most users do not become dependent. Physical addiction is only one of several pieces of the dependency puzzle.

Animal experiments with cocaine indicated that this supposedly nonaddicting drug—at least, with respect to the classic model—is taken as chronically and as abusively as heroin is taken by addicts. How could an addictive drug like heroin and a supposedly nonaddictive drug such as cocaine produce similar patterns of use and abuse? If addiction, the product of a pharmacologically induced craving, culminating in the avoidance of withdrawal symptoms at almost all cost, is the principal explanation for compulsive use, how is this possible? The fact is, the classic model of physical addiction as an explanation for continued, compulsive use is wrong.

These animal experiments have verified cocaine's capacity to generate compulsive patterns of abuse. Rats, mice, and monkeys that were rigged up to self-administer a drug by pressing a bar worked very hard to receive cocaine, pressing the bar thousands of times to receive a single dose. When the animals were withdrawn from the drug they had self-administered, they continued to press the bar without receiving the drug for a much longer period of time for cocaine than for heroin, which is an addicting drug. And when the animals were given the choice between cocaine and food, they self-administered cocaine in preference to food—even to the point of death by starvation (Johanson, 1984; Clouet, Asghar, and Brown, 1988).

Remarkably, most animals who take cocaine end up taking it uncontrollably, even to the point of killing themselves; animals who take heroin take it more reasonably and controllably, typically keeping themselves alive and healthy in the process. Animals that self-administer cocaine ad libitum—at will, as much or as little as they choose—exhibit an erratic pattern of use, with periods of bingeing alternating with periods of abstinence; do not maintain their pretest weight; cease grooming behavior; and maintain poor physical health. In contrast, when laboratory animals self-administer heroin ad libitum, they develop a stable pattern of use, maintain their pretest weight, continue grooming behavior, and, for the most part, remain in good health. In one experiment, after 30 days, 90 percent of the mice that self-administered cocaine ad libitum were dead (Bozarth and Wise, 1985). Most psychopharmacologists argue that cocaine is the most reinforcing—though not the most classically "addicting"—drug known to humanity.

But humans are not laboratory animals, and laboratory conditions are not the same as real life. Laboratory experiments do give us the broad outline of how drug effects can be understood; they establish the inherent pharmacological properties of drugs. Just how people take them may be a different matter; laboratory experiments, however, do give us an important clue to what a drug's potential is.

The Dependence-Reinforcement Model

What such experiments show is that the classic conception of addiction does *not* explain most continued use of drugs. An altogether different mechanism is at work here, and most contemporary researchers believe that positive reinforcement or the pleasure that organisms derive from taking a drug, is the driving force in generating continued,

compulsive, abusive drug use. A drug does not have to be addicting in the classic sense of the term—generating physical withdrawal symptoms—to produce a dependency in users, whether animal or human. Physical dependence has become so irrelevant to the way most specialists view continued, compulsive abuse that they now prefer the term *dependence* to *addiction*. Typically, little or no distinction is now made between the physical dependence that a drug like heroin produces and the psychic dependence that cocaine and amphetamine produce. Heroin generates a physical dependence or "addiction" (withdrawal symptoms appear when chronic use is discontinued) *and* a psychic dependence (highly reinforcing upon administration). The original meaning of addiction has been buried.

Use of a highly reinforcing drug alters the chemistry of the brain such that the neurons "remember" having been reinforced, having once been administered a jolt or rush of an intensely pleasurable stimulus. Events in the current milieu of former users may remind them of the sensations they experienced at one time, and such stimuli will produce actual physical sensations in their bodies. For instance, watching a smoker light up will result in the firing of neurons in a former smoker's central nervous system, which generate a craving for cigarettes. Former cocaine users watching a film in which actors snort a white power up their noses will experience sensations in the brain that cause their sinuses to tighten up and nostrils to dilate, and they will involuntarily begin sniffing—a biochemical reminder of their experiences in days gone by. Many former users of cigarettes, cocaine, and heroin report that these sensations never go away. The less reinforcing drugs are less likely to produce such reactions.

Not all or even most human users of even the most pleasurable or reinforcing of drugs will become dependent on them. *Most* users of cocaine do not become cocaine "addicts." Compulsive drug taking is caused as much by the characteristics of the user as the characteristics of the drug being used. But a drug's capacity to deliver a reinforcing jolt of pleasure is perhaps the most important factor in generating a dependence on it. The more reinforcing a drug is, the stronger the desire to repeat the experience, and the greater the sacrifices one will make to continue doing so. Because of this shift from the "classic" model, based on withdrawal symptoms, to the more contemporary "dependence" model, based on reinforcement, most researchers today have abandoned the term (or at least the original concept) *addiction*. Reinforcement helps explain continued, compulsive use—"behavioral dependence"—better than addiction does, but a literal physical addiction nonetheless *does* produce clear-cut withdrawal symptoms, though it does *not* explain all, or even most, continued, compulsive use.

Substances vary in their potential for causing dependence, with cocaine ranking at the top, methamphetamine and amphetamines next, heroin in a slightly lower category, and the other drugs trailing substantially behind these three. The potential for dependence is closely related to and is probably caused by how *reinforcing* each drug is, how intense the pleasure each delivers to the user. The more reinforcing the drug, the higher is its potential for dependence. Consequently, substances vary with respect to their *immediate sensual appeal* (Grinspoon and Bakalar, 1976, pp. 191–194). This is closely related to the capacity to generate pleasure. More precisely, it means the capacity to generate intense pleasure *without the intervention of learning or other cognitive processes*. Some drugs deliver a jolt of intense, orgasmlike pleasure, much like a flash of electricity to the brain.

In contrast, the pleasure that most other drugs deliver is more subtle—as much mental as physical—more cultivated, less immediate and intense. For the most part, one has to *learn* to enjoy marijuana; the same is true of alcohol, LSD, and nicotine. These are drugs that animals don't like to take initially and have to be taught to self-administer. The pleasure of many activities, much like alcohol, has to be cultivated, including reading classic books, appreciating fine art, and eating caviar. The pleasure these activities generate is great, even intense, but people must *learn* to appreciate them. Contrarily, cocaine requires no such learning process. When human subjects are experimentally administered cocaine and amphetamine without knowing what they are taking, they usually enjoy them the first time and want to take them again. This is what "immediate sensual appeal" means. Drugs with this quality are highly reinforcing and have a high dependence potential.

Humans vary with respect to their degree of susceptibility or vulnerability to becoming dependent on a chemical substance. The variation from one person to another is vastly greater than from one representative of the same animal species to another. There is an especially enormous variation from one person to another with respect to their initial experience with a given drug. The physician David Smith says, "Some people will take the drug—any drug—and not get addicted [or dependent]. Others will take it once and be inexorably drawn to it. The drug is the same; the people are different. . . . Interestingly," Smith adds, "the person who is addicted to cocaine responds very differently the very first time he [or she] uses it [from the person who uses it but does not become dependent]. Later, he'll [or she'll] use terms that are qualitatively different from those that others use to describe the experience of taking cocaine the first time: 'This is the greatest thing that's ever happened to me,' or words to that effect" (Gonzales, 1984, p. 114). The pharmacological properties of a given drug are not the *only* factor that explains its continued, compulsive ingestion, but they are a *major* reason for chemical dependence and must be kept in mind when discussing the abuse of psychoactive drugs.

Continuance or Loyalty Rates

The knowledge of how the mechanisms of dependence operate take on a nuanced aspect if we consider *typical* patterns of use more fully; I refer to the continuance or "loyalty" rate as it varies from one drug to another. Do experimenters or one-time users tend to "stick with" the substance they try? Or do more of them give up on the drug, stopping use altogether? What proportion of experimenters go on to regular use? Most drug surveys ask their respondents if they have ever used a particular drug during their lifetime, if they have used it within the past year, and within the past month. "Past month" users are defined as "current" users. Some of these surveys also ask about frequency of use. For instance, the yearly Monitoring the Future (MTF) survey of 8th-, 10th-, and 12th-grade students and college students asks how often the respondents have used specific substances (marijuana, alcohol, and cigarettes). Those who say they have used a substance 20 or more times in the past month are defined as "daily" users. In addition, there's the now-yearly drug use survey of the general population, the National Survey on Drug Use and Health.

Which drugs attract the greatest user "loyalty"? Which ones will experimental users most likely take up again and again? That is, which substances will they "stick with" after

trying them? The most obvious generalization we can make here is that *legal* drugs attract more loyalty or continuance rates than do *illegal* drugs. Almost two-thirds of lifetime users of alcohol (persons who have taken at least one drink during their lives) are still drinking; that is, they have taken an alcoholic drink within the past month (64%). For lifetime cigarette smokers, about one-third (33%) have smoked a tobacco cigarette in the past 30 days. The news about cigarettes, which has been old-hat for some time, is that use has declined drastically since the 1960s, to the point of near oblivion. For marijuana, the continuance or loyalty rate is 20 percent; one out of five lifetime users have toked up over the course of the past month. For no other illicit drug is the continuance rate above 5 percent; for cocaine, it's 4.8 percent, for meth, 4.6 percent, and for inhalants and Ecstasy, 3.4 percent. The two drugs with the lowest loyalty rates are LSD (1.4%) and PCP (0.3%). As discussed in Chapter 7, LSD is a drug of episodic use. In contrast, PCP is a drug that is gradually disappearing from the use/abuse landscape; once fairly common, young people are no longer taking up the PCP experience.

The lifetime-to-past-month ratio is far from an infallible measure of drug continuance. For one thing, it doesn't distinguish between drugs that are used once in a while or sporadically and those whose users have abandoned altogether. For another, past month use does not *necessarily* indicate current or regular use; a respondent may use a particular substance once or twice a year—or may have tried it once in his or her lifetime—and just happened to have done so in the 30 days prior to the survey.

There is a different and better way of indicating user loyalty that is probably a more valid measure of drug-use continuance. The 2017 *National Survey on Drug Use and Health: Detailed Tables* (*NSDUH*) also tabulated *how many days* the respondent used each drug: in the past year for all substances and in the past month for five drugs: cocaine, marijuana, cigarettes (which contain nicotine), alcohol, and methamphetamine. The results were surprising. For persons age 12 and older, the drug that was used *during the most days*, of *all* substances, legal and illicit, was marijuana. It was used for nearly a third of all days during the previous year for past-year users (121.9), and for nearly half of all days for past-month users (14.4). Only methamphetamine ranked near this pinnacle of regularity of use; past-year "tweakers" took their drug of choice 114.9 times during the prior year, and "past-monthers" took it 14.0 times during the past month. (Of course, meth is a much more harmful drug than marijuana, and regular use of meth will much more often lead to medical distress and sometimes even death.) Even alcohol was used on only 90 days during the past year by past-year drinkers, and for past-month drinkers, only on 8.3 days during the past 30 days. *Most* drinkers are episodic, though mostly loyal, in their use of alcohol. The chain-smoker is a stereotype of cultural lore; cigarette smoking is an all-or-nothing affair; many of us imagine that someone either never smokes *or* smokes a pack or two a day. It's not true. The respondents in the National Survey who smoked in the month prior to the survey said that they did so an average of 21.8 use-days. *Among the daily smokers*, 1 in 5 (20%) said that they smoked fewer than 6 cigarettes; less than 4 in 10 (38.8%) smoked less than half a pack a day; less than a third (30.9%) smoked about a pack a day; and only 1 in 10 (10.2%) smoked more than a pack; this works out to an average of less than 15 cigarettes per day. Is some self-delusion going on here? Possibly, but that factor, if operative, would invalidate practically all drug-use surveys. Even smokers use their drug of choice less than we'd expect. As we can see in Table 1-1, *age* influences frequency of use, but, again, not necessarily the way we'd expect. The youngest users (ages 12–17) are also the most moderate in their use,

TABLE 1-1 **Number of Days Used, Past Year (for Past-Year Users), and Past Month (for Past-Month Users), by Drug and Age, 2017**

	Age			
	12+	**12–17**	**18–25**	**26+**
Marijuana				
Past Year	124.1	78.0	131.6	126.1
Past Month	14.5	10.1	15.1	14.7
Cocaine				
Past Year	37.1	13.7	26.2	44.2
Past Month	5.0	2.4	3.6	5.7
Methamphetamine				
Past Year	116.1	60.0	83.1	128.1
Past Month	14.9	12.0	10.4	16.0
Cigarettes				
Past Month	21.7	10.5	17.3	22.7
Alcohol				
Past Year	91.3	26.7	75.1	96.5
Past Month	8.3	3.3	6.7	8.7

Source: NSDUH, 2018.

and the oldest (26 and older) use on the greatest number of days for cocaine, meth, cigarettes, and alcohol.

It might seem reasonable to use Monitoring the Future's (MTF) figures to look at loyalty rates for different drugs as well, and we shall, but with a caveat. Because of their youth, adolescents have done *everything* in their lives recently, and that includes drug use. Hence, the lifetime, past-year, and past-month use figures are more bunched together than is true for the population at large. With that in mind, let's examine the lifetime versus past month figures. We also have daily figures for marijuana, alcohol, and cigarette use. The most recently used substance among high school seniors is, of course, alcohol; 54 percent of MTF's respondents who had drunk alcohol at least once in their lives had done so in the past month—which is slightly less than *NSDUH*'s 64 percent figure. For marijuana, this figure was 50.6 percent, highest among the illicit drugs. About a third of MTF's seniors (37.1%) who had smoked did so in the past 30 days, a figure which is very close to that for the general population. As we might expect, for adolescents, MTF lifetime use figures are much closer to past-month use figures, but alcohol is the exception. As with *NSDUH*'s life-to-month ratios and percentages, the legal drugs rank high, as does marijuana, and the illicit drugs are much more likely to be abandoned, or, if that is too premature for 17-year-olds, to be used less regularly and more episodically than the legal (although not for them!) alcohol and tobacco and the "semi-legal" marijuana.

Loyalty or continuance rates demonstrate that the *typical* or most common user of *nearly every* substance is not the addict, not the daily, day-in-and-day-out compulsive abuser, but someone who uses along a spectrum from daily to occasional consumption. Cigarette use, which most of us expect to produce a pattern close to addiction, instead likewise displays a range of use; even the daily smoker does not typically inhale two packs a day. Alcohol even more so; even the past-month drinker, on average, downs potentially inebriating beverages on only 8 days of his or her consumption. On average, cocaine, that most pleasurable and reinforcing of drugs—that "Ace of Sunlight," to quote poet Michael McClure—results in about 35 days of use during the year prior to the survey for past-year users. The two drugs whose use patterns veer closest to compulsive, daily abuse are marijuana and methamphetamine—that is, among persons who have used during a recent year, close to every other day during a recent month. Only cigarettes generate use on *most* days (21.8) during the recent use month. And the number of cigarettes smoked by the typical daily smoker is, as I said, fewer than 15. Drug abuse may be compulsive, but the picture we get as a result of looking at the spectrum is less than complete compulsivity. Any spectrum entails a tail end of extremity, the domain where harm to oneself and others enters the picture with almost complete certainty. And keep in mind that even modest habits of illicit substances may be expensive and, hence, often entail exploitation of and crimes against the rest of us. And remember the methodological warning I issue throughout regarding surveys: Many persons whom researchers can't locate to interview lead disorganized, asocial lives, and these persons are more likely to use drugs compulsively that those in these samples. But it's likewise important to be aware that regular use of even illicit drugs, does not—*necessarily*—an addiction make. What is so remarkable about the continuance rate figures is that they are not patterned exclusively by the inherent capacity of certain substances to produce a chemical dependency. The drugs that produce the highest rates of actual use are not necessarily the classically addicting drugs, such as heroin and the opioids, nor even cocaine, which produces the most instant dependency in lab animals. Of drugs tallied (excepting cigarettes), past-year users of marijuana racked up the most use-days, and meth ranked second. Of all persons who smoked it once or more during their lives, one in four used marijuana in the past month; for the more dependency-producing substances—heroin (0.8%), the opioids (3.9%), meth (0.9%), and cocaine (2.5%)—the figures were much lower. Clearly, factors other than a substance's capacity to produce a chemical dependence—cost, availability, the hassle factor—influence day-to-day or continued use. Perhaps the most remarkable piece of information conveyed by Table 1-1 is the fact that marijuana is not only the most commonplace substance, the drug used on more days than any of the others, but that (with the single exception of monthly teen use) it seems to have been woven into the lives of all age groups in a more or less homogeneous fashion. Young adult and older adult past-year users smoke it at about the same rate, as do monthly users at all ages. The routine use of marijuana, manifested in this table, appears to speak more to the drug's domestication than any other recent datum I've encountered. As a sober reminder that this is not necessarily a positive development, consider only that much the same can be said about methamphetamine—a smaller and distinctly different slice of the American pie of drug consumption. Table 1-1 offers realistic insight into drug-use patterns that develop when a substance becomes available to a community of customers.

DRUG USE AND DRUG ABUSE

What makes drugs interesting to the researcher, the sociologist, the criminologist, the legislator and politician, the law enforcement officer, the journalist, and the general public is the fact that they are used and that their use has crucial consequences for the user and the society at large. The fact that use is the be-all and end-all of the drug equation raises the issue of the distinction between *use* and *abuse*. "Use" is the more generic or general category. Drug use is simply the act of ingesting a given substance or set of substances in any quantity with any frequency over any period of time; it covers the entire spectrum of consumption. "Abuse" is a specific subset or type of use. But how exactly should abuse be defined?

Some experts argue that abuse is any use of a nonmedical psychoactive substance outside a medical context (Ausubel, 1958, 1980)—that is, an illicit drug consumed for recreational purposes. Hence, according to this definition, smoking one marijuana joint a month, or a year, for the purpose of getting high would qualify as drug abuse. This definition adopts a legalistic or criminal criterion for what a drug is, thereby excluding alcohol. Thus, because alcohol is not a drug, drinking a quart of whiskey a day is not drug abuse. (It is the abuse of alcohol, true, but it is not *drug* abuse.) It is not clear what such a definition seeks to achieve, aside from confirming that the drug laws are fair and just by demarcating "bad" substances (drugs) from "good" substances (nondrugs, such as alcohol and tobacco). For the purposes of this book, such a definition confuses the issues we wish to make clear.

The problem is that *abuse* is a very inexact and loaded term. It cannot be pinned down with scientific exactitude—yet it *suggests* scientific exactitude; it is a matter of degree. Here, I'll use the word *abuse* as a purposely inexact term to refer to the level of use of a given drug at which harm is at least moderately likely.

Snorting two lines of powder cocaine once a month is statistically unlikely to cause harm of any kind to the user; smoking 2 grams of crack cocaine every day is almost certainly harmful. Drinking a glass of wine at dinner causes harm to practically no one; drinking a quart of vodka a day will harm almost anyone. Exactly where we should draw the line between ordinary use and abuse cannot be determined with any precision. However, higher levels of use are more likely to cause harm and are thus more likely to qualify as abuse than lower levels of use. The term *abuse* should be avoided except at levels of use that are, by their very nature, likely to be harmful and, hence, abusive. Of course, any activity at any level carries a certain measure of risk of physical and mental harm; this includes driving a car, flying on an airplane, taking a shower—and consuming psychoactive substances. But some activities carry a very high likelihood of significant harm, while for others, that likelihood is low. Here, we'll regard the term *abuse* as drug use that carries a *higher* rather than a *lower* likelihood of objectively determinable harm.

A CLASSIFICATION OF DRUGS AND THEIR EFFECTS

Our two paramount interests in this book are the relationship between the use of psychoactive substances and human behavior, especially crime and the criminalization of drug distribution. Does one follow the other, and if so, why? Many of the drugs that are

interesting to the psychiatrist—for instance, antidepressants or antipsychotics—are not of concern to criminologists. Here, we're mainly interested in *psychoactive*, *recreational* drugs—those that are taken for pleasure, for the purpose of getting high. Do certain kinds of drug-induced behaviors cause societies to define psychoactive substances as social problems and seek to shut down their distribution to substantially limit their use?

TABLE 1-2 A Classification of Psychoactive Drugs

Sedative-Hypnotics (General Depressants)

alcohol (ethyl alcohol or ethanol)

barbiturates: Nembutal, Tuinal, Amytal, Seconal, phenobarbital, pentobarbital

benzodiazepines: Librium, Valium, Xanax, Halcion, Ativan

miscellaneous sedatives: meprobamate (Miltown, Equanil), methaqualone (Quāālude, Mandrax, Sopor), GHB (gamma-hydroxybutyrate), Rohypnol

Antidepressants or Mood Elevators

Prozac, Elavil, Zoloft, Sinequan, Tofranil, Paxil

Antipsychotic Agents

phenothiazines: Thorazine, Stelazine, Mellaril, Haldol

Hallucinogens (Psychedelics)

LSD ("acid"), mescaline ("mesc"), psilocybin ("'shrooms")

Opiates (Narcotics)

opiates (opium and its derivatives): opium, morphine, heroin, codeine

opioids (synthetic narcotics): methadone, oxycodone (OxyContin), Darvon, Percodan, fentanyl, Dilaudid, Demerol, hydrocodone, buprenorphine

Stimulants

cocaine ("coke"), crack cocaine

amphetamine (Adderall, Benzedrine, Dexedrine, "speed")

methamphetamine (Methedrine, Desoxyn, "meth," "crank," "crystal," "ice")

methylphenidate (Ritalin)

caffeine

Disassociative Anesthetics

PCP (Sernyl, Sernylan, "angel dust")

ketamine ("K," "special K," "super K")

Nicotine

Drugs Not Easily Classifiable in a General Category

marijuana

Ecstasy (MDMA, "XTC," "E," "X")

Stimulants

The drugs that excite or stimulate the CNS are called stimulants. Stimulants produce arousal, alertness, an elevation in mood, even excitation. They also inhibit fatigue and lethargy and stimulate physical activity. For our purposes, cocaine and amphetamine (along with methamphetamine) are the most important stimulants.

Pharmacologist Avram Goldstein refers to the use of cocaine and the amphetamines as "the wild addictions" (1994, p. 155). The immediate subjective effects of these two stimulants are euphoria and a sense of self-confidence and well-being. As we just saw, administering cocaine and the amphetamines is extremely reinforcing; they possess what pharmacologists call "immediate sensuous appeal" (Grinspoon and Bakalar, 1976, pp. 191–194). Taking them generates the impulse to use regularly, regardless of the obstacles, pain, or cost. In popular or lay terms, they are pleasurable.

It should come as no surprise that these two drugs are widely used for recreational purposes, that is, for getting high. Most experimenters and even episodic users can overcome the impulse to become dependent on cocaine and amphetamines; they have other things to do with their lives than to devote all their time to self-indulgence. But the seductive pleasure principle is always present, always exerting an effect, and for a minority of experimenters—perhaps one in ten—it will escalate to more serious use and for many of them eventually to abuse.

Stimulants speed up signals passing through the CNS. They activate organs and functions of the body, heighten arousal, increase overall behavioral activity, and suppress fatigue. In low doses, stimulants can heighten the body's sensitivity to stimuli, increase concentration and focus, and improve mental and physical performance. At higher doses, however, many of these functions seem to go haywire. Behavior becomes unfocused, hypersensitivity translates into paranoia, and mental and intellectual performance becomes uncontrollable, ineffective, counterproductive, and compulsively repetitive.

Because the stimulants are highly pleasurable, their use can become compulsive and abusive which not infrequently causes medical complications, including death. Hence, as we would expect, societies everywhere have instituted legal controls on the distribution and use of the stimulants. These legal controls cause stimulants to become expensive, hence, profitable to sell, which means enormous criminal enterprises are based on the sale of cocaine and amphetamines. In addition, because both drugs activate bodily processes, we are led to ask what their role is in influencing or causing violent, problematic, "deviant," and criminal behavior. Cocaine and amphetamines interpenetrate with crime in important ways.

Sedative-Hypnotics

Sedative-hypnotics, or general depressants, have effects that are more or less the opposite from those of the stimulants. They inhibit and slow down signals passing through the CNS, affecting a wide range of bodily functions. At low to moderate doses, they induce relaxation and an inhibition of anxiety. At higher doses, they induce relaxation and reduce anxiety. At even higher doses, they produce (or potentiate) drowsiness and eventually sleep. Alcohol (known to pharmacologists as ethyl alcohol or *ethanol*) is a sedative, as are methaqualone (once sold commercially as Quāālude); barbiturates, such as Seconal, GHB (gamma-hydroxybutyrate), a once-semipopular "club drug"; and anti-anxiety agents

(mostly benzodiazepines), including Valium, Halcion, Xanax, clonazepam, Dalmane, Rohypnol, and lorazepam. At a sufficiently high dosage, all sedatives produce a high or intoxication, produce a physical addiction or dependency, and can cause death by overdose. PCP, once sold under the trade name of Sernyl as an animal anesthetic and tranquilizer, has complex and contradictory effects because it produces "disassociation" (a feeling of being detached from reality) and, sometimes, hallucinations. It is frequently (but, in my opinion, erroneously) classified as a hallucinogen. Ketamine ("special K") is closely related to PCP but with a somewhat weaker disassociative effect.

All sedatives, alcohol included, slow down, retard, or *obtund* many functions of the body, especially the CNS; organs become more sluggish, slower to respond to stimuli. If the dose is too high, the body's organs will shut down altogether and death will result. The sedatives also disorganize and impair the brain's ability to process and use information, and so they impair many perceptual, cognitive, and motor skills needed for coordination and decision making.

At a sufficiently high dose, all the sedatives produce mental clouding and motor discoordination. This is especially relevant for alcohol, the most widely used of the sedatives. According to the National Highway Safety Administration, in the United States in 2015, about 10,200 people died as a result of alcohol-related highway accidents (32% of all highway fatalities were alcohol related), a substantial decline since 1982, when 26,000 died in alcohol-related roadway accidents and 60% of all deaths on the road were alcohol related. This decline came about in spite of the fact that Americans drive twice as many miles as they did 3 decades ago. At low doses, users of the sedatives feel a mild euphoria, a diminution of anxiety, fear, and tension, a corresponding increase in self-confidence and, usually, what is called a "release of inhibitions." Fear of engaging in risky activities generally diminishes, an effect that can be observed in laboratory animals as well as humans. Ingestion of higher doses of a number of sedatives, including alcohol and the barbiturates, often results in paranoia, distrust, heightened anxiety, and belligerence—even hostility.

Of all drugs, worldwide, alcohol is by far the one that is most likely to be implicated in violent crimes. The empirical evidence linking alcohol to violent behavior is overwhelming. More individuals who commit violent offenses are under the influence of alcohol more than any other single drug. For this reason, any examination of drugs and crime cannot possibly omit the role of alcohol in potentiating, influencing, or facilitating criminal, especially violent, behavior.

The role of sedatives, especially alcohol, is crucial to any investigation of human behavior, including—and perhaps especially—drugs *and* crime. Possibly the effects of alcohol, GHB, barbiturates, PCP, and ketamine *conduce to* criminal behavior. Barbiturates are illegal for nonmedical use, and the other sedatives, apart from alcohol, are not legally available in the United States. Hence, the issue of the criminalization of drugs, or drugs *as* crime, is crucial for the sedatives as well.

Opiates

Opiates—once more commonly called narcotics—have a specific action in which psychopharmacologists are very interested: They act to depress or inhibit a particular function—the perception of pain. Opiates are the most efficient and effective of all painkillers and are essential in the practice of medicine. However, at a sufficiently high dosage, opiates

also produce mental clouding, a euphoric high, or intoxication. In addition, opiates have, as we have seen, a fairly narrow safety margin. They are physically addicting and can produce death by overdose. The opiates are the natural derivatives of opium: morphine, heroin, and codeine. The opioids are the entirely synthetic narcotics with effects very similar to the opiates: methadone, Demerol (meperidine), Dilaudid, OxyContin, and fentanyl. Many scholars and researchers use the terms *opiates* and *opioids* interchangeably. *Opiates* are ALL the psychoactive narcotic substances that are derived from opium. Yes, there are "semisynthetic" drugs, partly derived from opium. The *opioids* are the completely synthetic derivative of chemicals not found in nature. The are completely "artificial" (Gahlinger, 2004).

The painkilling property of opiates makes them of interest to the physician. But their narrow safety margin and their euphoria-inducing and addicting properties make them of interest to any social scientist. Their narrow safety margin tells us that they are dangerous drugs. Compared with other drugs, they are highly likely, on a dose-for-dose basis, to lead to death by overdose. At the same time, their euphoria-inducing property tells us that many users are likely to be motivated to take them, and their addicting quality also tells us that they are likely to be used on a compulsive basis. Societies are likely to control or criminalize such behavior ("drugs *as* crime") and, combined with their illegality, such behavior is likely, in turn, to produce or conduce to criminal acts ("drugs *and* crime"). This is why sociologists and criminologists are very interested in opiates.

Hallucinogens

Hallucinogens—also commonly called psychedelics—have effects on the CNS that are not easily classified in terms of stimulation or depression; they occupy their own territory. The hallucinogens include LSD, mescaline (a naturally occurring chemical found in the peyote cactus), psilocybin (the naturally occurring chemical found in the mushroom of the same name), and the extremely short-acting DMT (dimethyltryptamine). DMT seems to have had a cultural renaissance, partly because of the rediscovery that it occurs in nature [both in the plant ayahuasca (also known as yagé)—which some South American tribes use—and endogenously, in minute quantities, in animals, including humans], and partly because a 2010 film, *DMT: The Spirit Molecule*, gave the drug some cachet. Drug texts often mention other substances, such as MDMA (Ecstasy) and PCP, as hallucinogens (for instance, Hanson, Venturelli, and Fleckenstein, 2012; Hart and Ksir, 2015), but these drugs have none of the major subjective effects of LSD, psilocybin, and mescaline and, hence, are not true hallucinogens. The hallucinogens stimulate a range of psychic effects: eidetic imagery (vivid closed-eye visual imagery), synesthesia (the mixing or translation of one sense into another—for instance, "seeing" sound), subjective exaggeration, the "eureka" experience (the ordinary becoming the extraordinary), emotional lability (extreme mood shifts, from ecstatic to depressive), a sense of timelessness, sensory overload (a bombardment of the senses), and striking alterations of visual stimuli. We'll look at the subjective effects of LSD in Chapter 7.

Most of the harms attributed to hallucinogens in the 1960s—hallucinations, psychotic episodes, psychosis, suicidal behavior, violence, and genetic damage most prominent among them—turn out to have little or no factual foundation. Perhaps the most remarkable fact about the hallucinogens is that they are hardly ever abused. By that I mean they are used episodically, sporadically, and infrequently; very few users take them frequently, chronically, or compulsively. LSD's month-to-lifetime continuance rate is the lowest of all the well-known

drugs or drug types. Hardly any users take hallucinogens frequently or regularly. In the universe of at-least-one-time users, for all drugs, LSD is among the *least* likely to have been taken within the past 30 days. This is almost certainly because LSD and the hallucinogens are not reinforcing in the usual sense of the word. (If permitted to take them at will, laboratory animals do not repeat their use of LSD.) The enjoyment of taking hallucinogens is an extremely cultivated taste. In addition, aside from their illicit sale, the hallucinogens are very unlikely to be implicated in criminal behavior. On the other hand, LSD's impact on human emotion, cognition, and behavior is spectacular, so profound and disruptive to everyday life that it is rarely used on a compulsive basis. (The doses taken currently are much lower than they were in the sixties and seventies and, hence, are less disruptive than they were back then.) And the legal controls imposed on the distribution of LSD are interesting sociological and criminological topics in their own right.

Marijuana

What is referred to as "marijuana" is the dried buds and flowers (now, increasingly less commonly, the leaves) of the cannabis plant; its Latin name is *Cannabis sativa*. Hashish is the dried resin of the cannabis plant and is usually more potent than marijuana. The main psychoactive ingredient of marijuana is THC (trans-delta-9-tetrahydrocannabinol). Marijuana varies enormously in THC content, from less than 1 percent to more than 10 percent. Many specially tended, homegrown hydroponic plants (those that are grown in water rather than soil) contain buds that are well over 10 percent THC. Hashish, which is much less readily available in the United States than marijuana preparations, usually contains 10–15 percent THC.

At different times, observers have classified marijuana as a stimulant, a depressant, a psychedelic, and a hallucinogen—even a narcotic. Actually, it is none of these. Although marijuana does produce sedation in users, this is not regarded by most pharmacologists as its central effect. A few users have reported psychedelic-like effects, but this is rare. Today, marijuana is regarded as occupying its own unique category. Marijuana is not cross-tolerant with any of the hallucinogens, which means that it belongs in a category by itself.

In spite of the fact that marijuana is smoked—an extremely efficient and effective route of administration—the effects of marijuana are not powerfully reinforcing, nor does the drug have a high potential for producing a strong dependence. Some research on laboratory animals supposedly indicates that marijuana may be a "harder" drug than was previously thought, that withdrawal-like symptoms appear when the drug is discontinued (Swann, 1995; Tsou, Patrick, and Walker, 1995; Tanda, Pontieri, and DiChiara, 1997). However, the fact that the vast majority of human users take the drug in moderation, do not become dependent, and do not experience withdrawal symptoms when they stop probably suggests that these studies may not be sufficiently lifelike for researchers to draw any conclusions from them about the abuse or dependence potential of marijuana.

Marijuana, like alcohol, is used extremely frequently among people who violate the law. Studies show that arrested offenders are more likely to test positive for marijuana than any other illicit drug, with the partial exception (depending on the city and the sex of the arrestee) of cocaine. Unlike alcohol, however, it is not clear what marijuana's role is in the commission of crimes. Marijuana is much less likely to be associated with violent behavior than alcohol. And, because it does not produce the same kind of compulsive drug taking as heroin and crack cocaine, it is not as likely to be as closely implicated in

money-making crimes. But to the interested sociologist, the enormous distribution of marijuana, an illegal substance used currently—within the past month—by 24 million Americans, 9 percent of the population age 12 and older, is fascinating. And the marijuana industry—very likely, America's number one agricultural crop—make the drug a fit and worthy subject of inquiry for the inquisitive criminologist. In addition, the *criminalization*—and the *de*criminalization—of marijuana are as interesting to the sociologist and criminologist as for any other drug or drug type.

Ecstasy

Ecstasy—also called XTC, E, or MDMA—is often classified as a hallucinogen (Hanson, Venturelli, and Fleckenstein, 2012, chapter 12; Hart and Ksir, 2015, chapter 14). But as stated before, it causes none of the major effects of LSD and the other hallucinogens, such as spectacular alterations of visual stimuli, synesthesia, or eidetic imagery. As with marijuana, it seems reasonable to classify Ecstasy as belonging to its own category. Some observers argue that the fact that Ecstasy induces an extremely strong feeling of closeness with others suggests that it is an "empathogen"—an agent that induces empathy: a sense of trust, openness, peacefulness, and serenity, along with the sense that one is experiencing the world afresh. Like LSD, Ecstasy is rarely used on a compulsive basis. And the drug is not associated with criminal behavior. However, critics of the drug argue that, in animal experiments, continued use of Ecstasy produces a permanent depletion of serotonin, a crucial neurotransmitter that regulates emotion, mood, cognition, sex, and sleep. If this effect took place in humans, Ecstasy could be an extremely dangerous drug. Between the 1990s and 2000, the use of Ecstasy grew faster than any other major drug, but use since 2000 has declined significantly. In 1985, possession and sale of Ecstasy became illegal at the federal level.

Disassociative Anesthetics: PCP and Ketamine

Many pharmacologists classify PCP (and, by implication, its milder but related cousin, ketamine) as a hallucinogen because of its capacity to induce hallucinations. I believe this to be a mistake because these drugs are vastly more different than they are similar. The florid bursts of vivid color and the synesthesia that people who ingest LSD and the other hallucinogens see and experience are completely absent with PCP and ketamine. Moreover, PCP and ketamine principally cause a physical disassociation from one's surroundings and anesthesia, which are utterly foreign to the hallucinogens. Virtually no one who has taken both drugs would make this mistake. More properly, we should regard both PCP and ketamine as *disassociative anesthetics* because their principal effects on users are a feeling of numbness and a sense of alienation or being removed from one's surroundings.

For most users and for most episodes of use, the effects of PCP and ketamine are sensed as intoxicating, pleasurable, and euphoric, but ketamine's effects are general experienced more rapidly and less intensely. Other effects include a sense of unreality, timelessness, weightlessness, and disorientation. Perhaps of all drugs, according to both the American Psychiatric Association and the National Institute on Drug Abuse (NIDA), PCP is most likely to induce panic attacks or a psychosis-like or schizoid state that includes fear, paranoia, and delusions. Likewise, also perhaps more than for any other drug, erratic, unpredictable, seemingly bizarre behavior—such as jumping from heights or running into moving traffic—sometimes accompany the high.

Medical scientists developed PCP in the late 1950s as an injectable anesthetic—for which it was effective—but quickly discovered its multiple undesirable side effects. In the late 1960s, the drug, called "angel dust," had escaped from labs and medical settings and was used—in crystalline form, sprinkled on parsley, and smoked—on the street, recreationally. Even when its administration was restricted to animals, dealers and users stole batches to sell for recreational purposes; by the mid-1980s, PCP was banned even from veterinary medicine. Today, it is a Schedule II drug (a substance which the federal government considers as having a high abuse potential but some possible medical uses) and nearly all illicit PCP is manufactured illegally, in clandestine labs. Even polydrug users have discovered the harmful effects of PCP; according to Monitoring the Future, the annual prevalence figure for high school seniors dropped from 1979 to 2016 from 7 to 1 percent.

Summary

Drugs are both physical substances with measurable effects and symbols—socially and legally constructed entities that society thinks about, reacts to, and talks and writes about in certain ways. Pharmacologists study the molecular action of drugs on organisms, and psychopharmacologists study how a drug's chemistry interacts with the body's neurology, and hence its brain and spinal column—its mental processes. Many of these actions translate into the real-world "effects" we observe when people take drugs. Much of the most innovative and influential research on drug use is being conducted at the molecular and neurochemical levels. Drugs can be thought of, in conjunction with substances called neurotransmitters, as a "key" that unlocks a site in the brain (a "lock") that causes a chemical reaction to take place. Neurotransmitters—which are in effect endogenous drugs—regulate countless functions, from the molecular level through the brain to the relevant organs of the body. These functions include hunger, emotion, pleasure (sexual pleasure included), fatigue, and anger. Drugs mimic or block the usual chemical reactions caused by neurotransmitters and either prevent certain functions from taking place or exaggerate those that usually take place. Many of these chemical reactions produce behavior in which we, as sociologists and criminologists, are interested, with addiction or behavioral dependence foremost among them.

Understanding drug use requires a grasp of the acute-chronic distinction, the ED/LD ratio, drug tolerance, and drug fate or disposition. In addition, four factors that influence drug effects are crucial: dose, potency and purity, route of administration, and drug mixing.

Acute drug effects occur within the span of a single episode of use, under the influence—for instance, the marijuana smoker's high, the heroin addict's overdose, or the LSD user's dilated pupils. Chronic drug effects take place over an extended period of time—for instance, the cigarette smoker's cancer, the alcoholic's damaged liver, or the methamphetamine addict's damaged brain. The acute-chronic distinction is crucial to any student and researcher of drug use.

Before the 1970s, the dominant perspective toward or model of drug dependence was the classic "addiction" model. Certain drugs (such as the opiates, alcohol, and barbiturates), if consumed in moderate to heavy quantities over a period of time, produced what was known as an abstinence or withdrawal syndrome. And if their use was abruptly discontinued, the user would undergo a painful reaction, including nausea, vomiting, muscular

twitching, gooseflesh, chills, aches and pains, and the like. The avoidance of withdrawal was thought to be the primary motive of addicts for continued, compulsive use. But the results of laboratory experiments with animals demonstrated that cocaine, a drug that does not produce these classic withdrawal symptoms, generates a far more powerful pattern of continued, compulsive use than heroin, a drug that does produce classic withdrawal symptoms. Psychologists eventually realized that psychological reinforcement is a more adequate explanation for abusive, compulsive drug-use addiction. Some drugs (cocaine and methamphetamine) produce a strong, orgasmlike "rush" that generates in some users a behavioral pattern we call dependence. Not all (or even most) users develop such a pattern, so understanding why some do and some don't is a central mission of drug researchers.

Drugs may be looked at with respect to the dosage at which certain effects take place. The "effective dose" (ED) is the dosage at which a certain relevant effect occurs (among a specific percentage, usually 50 percent, of a designated population) which is of interest to a given researcher or observer. To the marijuana smoker, the relevant ED is the amount that causes a high or intoxication. To the physician, the relevant ED is the dose of morphine, Percodan, or Darvon that is necessary to alleviate pain in patients with a certain level or degree of pain.

In contrast, the "lethal dose" (LD) is the dosage that produces death in a percentage of a designated population. Most drug-related acute deaths occur as a result of shutting down or inhibiting signals from the brain commanding breathing and/or heartbeat. Some drugs have an affinity for specific sites in the brain that control these functions. Fifty percent of humans will die if they have four-tenth of one percent (0.4%), in volume, of alcohol in their bloodstream; 100 percent will die if their blood contains more than 0.8 percent alcohol, by volume. Hence, for alcohol, the LD50 is 0.4 percent blood-alcohol concentration and the LD100 is 0.8 percent.

Drugs differ with respect to the ratio or gap between ED and LD. For some drugs (barbiturates and heroin are excellent candidates here), it takes only 10 times as much to kill an organism (LD) as it does to produce a given effect, such as intoxication or sedation (ED). For these drugs, the ED/LD ratio is 1 to 10, narrow enough to cause a very substantial number of deaths by overdose. For other drugs, such as marijuana, the ED/LD is enormous, almost incalculable. Hence, hardly anyone dies of an "overdose" of marijuana. (But marijuana, through its principle psychoactive ingredient THC, does influence other functions of the body, such as coordination and cognition.) Hence, our twin concepts, ED and LD, as well as their relationship *for specific drugs*, is central to any social scientist's understanding of how and why drugs are used, as well as with what consequences.

Drug tolerance is a crucial pharmacological concept because, over time, with most drugs, to achieve the same effect, a user needs to take an increasing dose. Addicts take a quantity of heroin that would kill a nonuser; their bodies have become habituated to the drug. *Behavioral tolerance* refers to the fact users are able to comport themselves under the influence in such a way that minimizes the negative effects of the drug. Some drinkers say they can drive as well under the influence as normally. This is not true, but they *are* able to drive better than an inexperienced drinker who is under the influence.

Drugs break down in different ways; some course through and exit the body fairly quickly, while others are more slowly metabolized by and eliminated from the body. Heroin is a rapidly metabolized drug and evidences no buildup over time, while marijuana is slowly metabolized and tends to store over time in fatty tissue. The *fate* of drugs is an important feature of recreationally used substances and may have crucial consequences.

Aside from the chemical features and actions of drugs themselves, of the many thousands of factors that influence drug effects, four stand out as crucial for us, as students of the intersection between drugs and human behavior.

Route of administration is central to any understanding of drug use and drug effects. How drugs are taken influences what they do. "How" refers to techniques of use—for our purposes, mainly smoking, injecting, sniffing (snorting), and swallowing. The same drug may be taken in different ways and have very different effects. (Not different "actions," but different effects.) In the Andean region of South America, indigenous residents chew coca leaves (containing 1% cocaine); such a route of administration produces effects vastly milder than smoking crack, also a cocaine product. Both routes entail "taking" cocaine, but they produce such different effects that it is difficult to think of both as entailing the use of the same drug. Both smoking and IV administration of drugs are very swift, efficient, and effective routes through which to take psychoactive substances. Snorting and oral administration are vastly less efficient and produce slower and less intense "highs."

Dose is central to the enterprise of understanding drug use. While pharmacologists study drug effects in a laboratory setting, social scientists look at the impact of drug use in naturalistic settings. What's more important here is the dose characteristically taken, not the potential effect of a drug in an artificial context. In all societies, norms and rules regulate the use of drugs and the amount that is regarded as acceptable to use. Most consumers of alcohol do not become high or intoxicated when they drink because they usually consume modest amounts, but if their dose were to increase drastically, they would become not only intoxicated but seriously debilitated as well. To know the effects of drugs in real-life situations, it is necessary to know the customarily taken doses.

Potency and purity are central to drug taking and its impact. In the 1980s, heroin was available, illegally, on the street at a purity of roughly 3 to 5 percent heroin. This means that most of what addicts were taking was inert, nonactive fillers. Today, heroin is available on the street at a purity of 40 to 50 percent. This means that users are taking nearly 10 times more heroin per packet than they did 2 or 3 decades ago. Different batches of marijuana will contain varying percentages of THC, the drug's psychoactive ingredient, from less than 1 percent THC for wild marijuana growing in roadside ditches to more than 10 percent THC for hydroponic cannabis. Batches of greater potency will produce more extreme effects, or the same effects at lower doses.

Lastly, drug mixing influences drug effects. Increasingly, different drugs are used together, with many users enjoying the effects of two or more drugs simultaneously. For instance, a "speedball," a concoction taken on the street, is a mixture of heroin and cocaine or methamphetamine. Most drug episodes that result in trips to the hospital and, even more seriously, death by overdose, were a consequence of taking two or more drugs at the same time. Hence, the pharmacological interaction of the drugs users actually take is crucial. The effects of some drugs, when taken together, are additive. With other drugs, taken together, the effect is synergistic—they multiply one another, their effect, together, is greater than twice as much as each single drug, taken alone. Alcohol and barbiturates taken together is the classic example here.

In the past, researchers placed a great value in the power of certain drugs to produce a chemical dependency in influencing continued use. Classic addiction, complete with full-blown withdrawal symptoms, is characteristic of cessation from high-dose, long-term use of very few drugs, notably, the opiates and most sedative-hypnotics. As a result of this

limitation, to explain the continued, compulsive use of harmful, non-narcotic drugs, researchers devised the dependence-reinforcement model, which does not require invoking a chemical dependence. Even animals in experiments become dependent on certain substances (such as cocaine) that do not produce a physical withdrawal as such. The causal mechanism that may help explain such use is the *immediate sensual appeal* that some drugs, again, such as cocaine, generate upon administration; this appeal—a jolt of orgasmlike intensity—causes some users to be strongly motivated to continue use in spite of the harm it causes. But among humans, many factors influence why users take one substance or another on a continued basis. Cigarettes aside—not a drug per se, but a vegetal substance that contains nicotine, which is addictive—the continuance rates of classically addicting drugs (such as heroin and the opioids, as well as alcohol) is lower than marijuana, a clearly nonaddicting drug. Perhaps cost, availability, and the hassle of living day to day with an addiction help explain continued use more than the biochemical properties of drugs. Drugs vary with respect to their continuance or "loyalty" rates, but this variance is not understandable solely from their biochemical properties.

Drugs are classified in different ways. For our purposes, psychoactive effects fall into the following categories: (1) sedative-hypnotics, or general depressants, which have a generalized inhibiting effect on all or most organs and functions of the body; (2) opiates, which dull the mind's perception of pain; (3) stimulants, or substances that speed up signals passing through the central nervous system; and (4) hallucinogens, or psychedelics, which generate profound alterations in the perception of sensory stimuli. Sedative-hypnotics include alcohol, GHB, barbiturates, methaqualone, and the tranquilizers, including Rohypnol and Valium. The "disassociative anesthetics" PCP and ketamine ("special K"), have sedative-like properties. Opiates include opium and its derivatives—morphine, heroin, and codeine—as well as the many synthetic potent analgesics, such as methadone, oxycodone, Darvon, Dilaudid, Percodan, and fentanyl. The stimulants are made up mainly of powder cocaine and crack cocaine, amphetamines, and methamphetamine, a chemical relative of amphetamine. Marijuana and Ecstasy do not seem to easily fall into any broader class of drugs and, hence, occupy separate and independent categories.

ACCOUNT: Interview with John, an Advertising Executive

John is married, in his early 70s, has several grown children, is a successful advertising executive, lives in New York, and travels extensively in the service of his job.

EG: You mentioned that you currently consume one or more controlled substances. Why don't you tell me a bit about this use—what are the substances, how long have you been using, what your patterns of use are, what are some of your typical or atypical experiences, what your use of psychoactive substances does for you, how you obtain the drugs you've used, with whom do you do use them.

John: I've tried speed, acid, mushrooms, cocaine, marijuana, and a variety of prescription medications. As a

recreational experience, pain medication hasn't been all that pleasurable, so I haven't done that in quite a while. I smoked hash in Europe—I lived there for five years, in London. Of course, hash is a lot like marijuana—it's the same drug. However, the drugs I've used *frequently* over a period of years comes down to only two—marijuana and cocaine. I really got started late. The first time I even *saw* marijuana was the day before I graduated from college. This was in '64. I was shocked—the whole thing seemed so decadent. But I started smoking marijuana years later, in '67. I was already 25 at the time. But all through college and up until the early sixties, I consumed a lot of alcohol. I found that the consumption of both alcohol and marijuana cut down on my use of alcohol. If I had to take one or the other, I'd take marijuana. In '67, I worked in broadcasting—a lot of creative people worked in broadcasting, a lot of whom used drugs recreationally; I was drawn to taking part in it myself as well. I was also in marketing, and a lot of the people I worked with used marijuana. There's a strong connection between the use of cocaine and sex. The sexual revolution of the sixties extended into the seventies, but up until the late seventies, the use of cocaine was fairly confined. Then in the eighties, cocaine seemed to be all over the place. Drug use was not that unusual in the eighties at suburban parties. In those industries, in that age group—in their thirties and forties—for those who could afford it, there was a lot of use. Where I purchased marijuana and cocaine, these kids who worked in the mail room had it, and we purchased it from them. When I worked in the office, a lot of clients would also use. Bartenders would do a lot of dealing. You knew that a particular dealer was going to show up at a particular bar. A lot of dealers would sell in grams. A gram of cocaine was tucked into a book of matches. For a long time, a gram of cocaine cost $100. In New York, we made a connection with a couple of Colombians, who sold us coke. When they were near you, they would call you, and you'd go downstairs and they'd sell it to you in the car. I don't ever remember buying marijuana from Colombians. It was aging hippies who sold it to you. To this day, I know an aging hippie who sells grass. You could meet him or he'd come to your place. He also deals a bit in cocaine, but just for a few people. I have not used cocaine in about 10 years. I had a heart issue. I knew that it would be idiotic for me to continue using cocaine with that condition. I used to do a lot of traveling to major cities. I found it exceptionally easy to find drugs when I traveled. I'd call the guy in the advertising agency who sells commercial time for the network—he'd get it. In my case, I had sales staffs, but I was the one doing the traveling. A majority of the people in my business were doing drugs. One of my salesmen would get me in touch with a bartender. Or I would travel with cocaine. I would only travel with cocaine if I was going to travel with a woman. I wouldn't travel with marijuana—it smells. The sexual revolution escalated the use of drugs. If a woman used drugs, that would increase the drug use of the guy she was with. Women absolutely go crazy over cocaine and sex—although for me, it hampers performance.

EG: It obstructs blood flow. You mentioned Amyl Nitrite. It does the opposite—it increases blood flow. What was that like?

John: Yeah. Yeah. It was great. Women love it. For that matter, men like it, too. When you snap it at the point of orgasm, it intensifies the orgasm. I figure anything

that feels that good has got to be dangerous. It was big in the gay community, I don't know how popular it was in the straight community. I took it maybe 50 times over the decade of the seventies. I know I didn't take it in the sixties, and I moved to New York in 1978, and I didn't take it here—so in a period of eight to ten years, that's how often I took it. I've used marijuana a lot, though. I saw the price of marijuana go from $20 an ounce to $300. The *quality* has gone up at least ten times. In the old days, the quality marijuana was called "Acapulco Gold." [Chuckles.] It was pretty strong. I personally somewhat like the psychedelics. Not acid—that's too much of a commitment. I don't want to be up for 24 hours. I'm talking about mushrooms. But they are very, very rare. I read Steve Jobs' book. He says that you should take a trip from time to time. But you have to be really careful. You get paranoid on acid. I've never regretted doing that though. I particularly remember the seventies and eighties before [Mayor] Bloomberg. I was still a little on the wild side. I'd ask the cabdrivers if I could smoke. Two out of three said OK. One even asked me to leave him one [joint]. At a lot of parties, people would be smoking and the people who didn't smoke didn't mind if you did, and if they did mind, you could step outside. A lot of us grew up with parents who were restricted and repressed. So, when the sixties rolled around, we were rebelling against our parents. And let me say, marijuana was a lot easier on the body than alcohol. I moved from Washington, which was a fairly conservative town, to LA, which was much more relaxed and permissive, and then to San Francisco. Drugs were simply part of the social scene. I got into the international side of the business [I worked in] during the eighties and nineties, and in the nineties, I moved to London. An unbelievable amount of drugs were done in London and Paris. Especially London. There were periods when I'd smoke probably 250 days a year. After a while, the effect of the drug would just stop. I'd have to clean out my system. I never talked with anyone about this before, perhaps because I was too ashamed to admit it. I also felt that to some degree I was getting dependent on marijuana. People say that marijuana makes them more creative. I've tried to write on marijuana—it was gibberish.

EG: In the last year, how often would you say you've smoked marijuana?

John: In the last year, I would say 40 times. With marijuana, I used to smoke a lot on my own. That would be OK. But as of late, I would have to be in a social setting. But in the past eight years or so, at my age, you don't exactly just go over to people's places and smoke marijuana. Environments change. One of the most interesting things that happened to me, once, years ago, I was talking to a cop. We were talking about how someone gets marijuana. I asked him, what about the guys in Washington Square Park? He said, don't buy from those guys, there are cameras all over the Park. If you want grass, I can give you the phone number of a guy you can buy it from. I don't think that would happen today. The thing about my life was that I drank quite a bit from early on. The effects of grass are so much better than alcohol. It's such a stupid thing that we don't legalize marijuana. I read an article about this Mexican drug lord who is responsible for 7,000 deaths. All of this would end with legalization. We are paying for the deaths of the people who develop cirrhosis of

the liver and the people who die of lung cancer from smoking.

EG: I think that, today, most of the opposition to legalization comes from people who say that it would encourage automobile accidents—more people are going to drive while they're under the influence of marijuana.

John: I've smoked marijuana quite a few times and then I got in the car and drove. I never felt I was impaired.

EG: So, would you say that, over time, your use of marijuana has tapered off?

John: Yeah. Though I would say that's been only in the last few years. Two years. One of the things I think about is how lucky I've been. The ins and outs of airports. The times when I've overindulged. The possible danger from drug dealers. Actually, I've never hung around with drug dealers who might have been dangerous. I've had a circle of friends, and only one of us would buy it and we'd split it up. I've always felt uncomfortable carrying illegal drugs outside my home. I'd carry cocaine, but I've never felt that a dog could smell that. I had a close call once. I was traveling with my girlfriend. She had a silver cigarette case in her purse, we were in an airport, and the metal detector went off, and the guard, who was a woman, opened up the case, and there were six marijuana cigarettes inside. She closed it up and said, "Have a nice weekend." Another time, in the London airport, a beagle approached my bag, and at that very moment, his handler got a phone call, and he left the vicinity. [Long pause.] In the seventies and eighties, in broadcasting, drug use was *rampant*. Advertising. Marketing. Same thing. There are fewer people, now, that I know, that use drugs. I don't know anyone my age—I'm 71—who uses cocaine. Since the age of 60, I haven't known anyone who used cocaine. Even with marijuana, I've known fewer people who use it than I did before. Also, I'm concerned about preserving my health. It doesn't seem to be worth the risk. On 14th Street, between Fifth and Sixth Avenues, there is a smoke shop. He sells a lot of smoking paraphernalia. They sell devices for smoking marijuana. There are dozens of stores like that, twenty maybe, right around here. Bongs. Glass pipes. I don't know if they sell marijuana under the table, but their primary business is selling devices for smoking grass. For many years, I smoked out of a tiny water pipe—the top was a bowl, and you put a screen on top of the bowl, and you smoked the grass off the screen. After a week, when I cleaned out the pipe, it was really disgusting—all the tar and shit. Last year, I went to a wedding in Vermont, and I smelled marijuana smoke coming out of a room, and I went in and asked, "Why don't you invite me in?" The kids there got the biggest kick out of me being interested. They think of me as being a thousand years old. It's interesting—none of my kids used drugs.

EG: What about your wife?

John: Out of maybe 5,000 times I smoked grass, my wife, in 30 years of marriage, smoked grass maybe 20 times. In my group, smoking marijuana was particularly skewed towards men. But cocaine, I would say that it ramped up the sexual appetite of women and lowered any barriers and inhibitions against having sex. It shot a lot of dopamine into their systems. If you ended up with a woman using cocaine, chances are, you would be having sex with her. They really came onto you. One of the things I wanted to say about cocaine was that in the eighties and nineties, it was adulterated with a lot of

shit. It was cut with speed. Dealers also put a lot of baby laxative in it. It was often crap—a very unsatisfying experience. Often, I'd wake up with a bloody nose. With pure cocaine, you could go to sleep at night. Years ago, with the crap they mixed it with, you'd stay up all night and then maybe you'd have to go to work in the morning. When I used cocaine, I made friends in high places and we'd end up doing some radical things. Sometimes we'd go into the wrong sections of Harlem and Washington Heights—the Dominican sections of Manhattan, at night, when we shouldn't have. I was very nervous going up there. It was the dumbest thing I've done in my life. But I knew this guy once, I had his phone number, he had mine, and he called me when he was in the neighborhood, so I didn't go into unsafe neighborhoods much. Sometimes I'd buy what was called an "Eight Ball" from him, which was three and a half grams. That generally ran $250. If you knew Colombians, it would cost you $150. In Miami, the cocaine is cheaper and purer. By the time it gets up here, everybody's dumped a lot of crap into it. Years ago, I had this very conservative lawyer in London and he'd come over here, and his drug dealer was actually a nurse. He'd take pharmaceuticals to get high. You can't believe how conservative this guy was—but it was all a show, I felt. I was out there with a lot of people who used drugs, but I didn't have much exposure to people who used much beyond coke and marijuana. There was only one person I knew who used heroin. I never, ever, *ever* had any desire to use heroin. Opium was weird. I rolled it up in a cigarette with tobacco. It was great for about 15 minutes, but then I proceeded to fall asleep. It was also very constipating. I think that I was psychologically addicted to marijuana but not physically. I see a really great psychologist. It's really great talking to someone you have total confidence in and you can talk to about these things. I feel that talking to the psychologist has enabled me to cut down on using the marijuana. I feel that smoking grass has cut into my work. But still, my doctor, who is a conservative Jewish guy, he's 78, said that he cannot say with confidence that it is bad for you. I would say, however, that the continual use of it has cut into my productivity.

QUESTIONS

Does it seem incongruous that John is both a drug user—some observers would say a drug abuser—as well as a successful, affluent executive? What do you think his peers would say and do if they discovered his recreational, mind-transforming activities? Would they take him as seriously as they do now? Would they continue to hire him? What does this seeming incongruity say about the theories experts use to explain drug use? Or the assumptions many observers have about the negative impact of drug use on success, even the ability to lead the sort of life that a man such as John leads? Does this account change the way you think about drug use, especially about the intersection of drug use and everyday life?