Stephen A. **Maisto**
Mark **Galizio**
Gerard J. **Connors**

Drug Use & Abuse

SEVENTH EDITION

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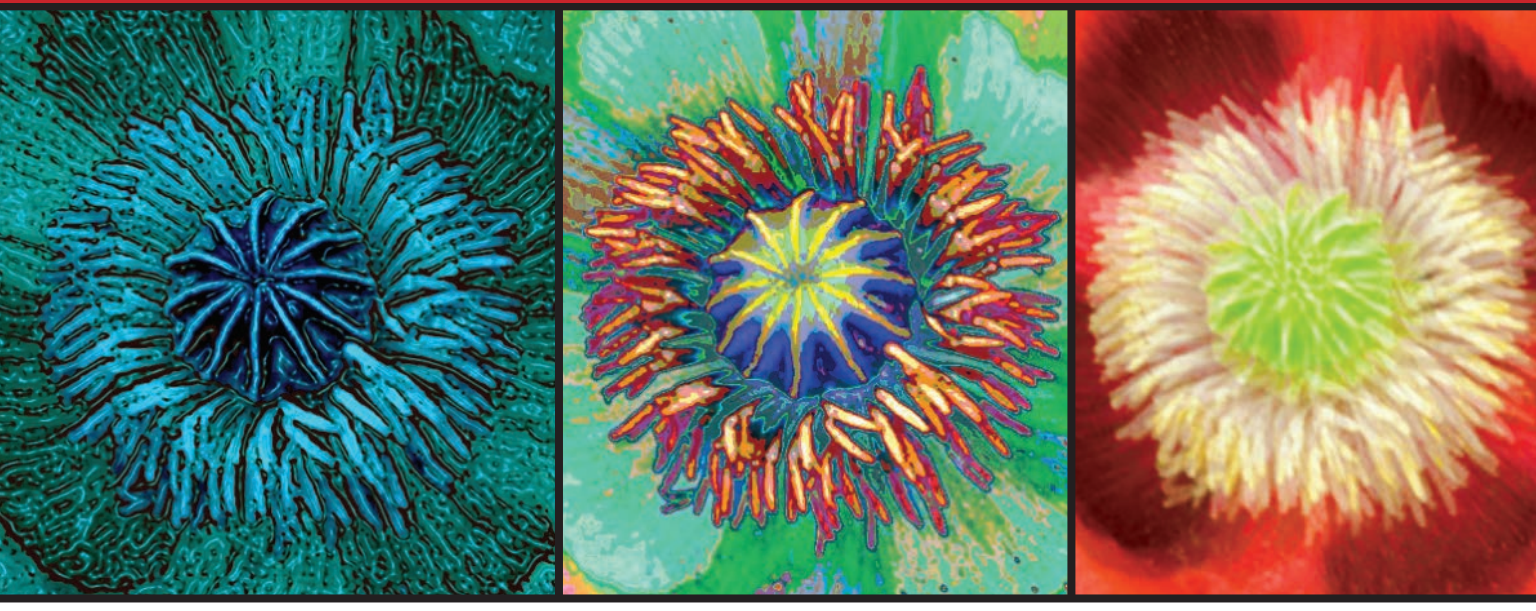

Drug Use and Abuse

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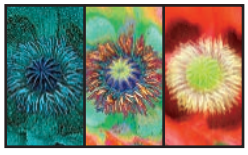

To Don Atito
S. A. M.

To Audrienne, Kate, and Annie
M. G.

To Lana
G. J. C.

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Stephen A. Maisto received a PhD in experimental psychology from the University of Wisconsin—Milwaukee and completed a postdoctoral respecialization in clinical psychology from George Peabody College of Vanderbilt University. He is a professor of psychology at Syracuse University. He has been engaged in research, teaching, clinical practice, and clinical training in the assessment and treatment of the substance use disorders for over 30 years. Dr. Maisto has published over 225 articles, 30 book chapters, and several books on substance use and the substance use disorders. His current research is supported by the National Institute on Alcohol Abuse and Alcoholism and the Department of Veterans Affairs. Dr. Maisto is a member of the American Psychological Association (Fellow, Divisions of Clinical Psychology and Addictive Behaviors), Association for Psychological Science, Research Society on Alcoholism, and the Association for Behavioral and Cognitive Therapies. Dr. Maisto was appointed editor for *Psychology of Addictive Behaviors*, a journal published by the American Psychological Association, for the term January 1, 2008 to December 31, 2013.

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BRIEF CONTENTS

PREFACE xi

CHAPTER 1 **Drug Use and Abuse** 1

CHAPTER 2 **Drug Use: Yesterday and Today** 23

CHAPTER 3 **Drugs and the Nervous System** 45

CHAPTER 4 **Pharmacology** 67

CHAPTER 5 **Psychopharmacology and New Drug Development** 93

CHAPTER 6 **Cocaine, Amphetamines, and Related Stimulants** 118

CHAPTER 7 **Nicotine** 144

CHAPTER 8 **Caffeine** 173

CHAPTER 9 **Alcohol** 193

CHAPTER 10 **Opiates** 237

CHAPTER 11 **Marijuana** 258

CHAPTER 12 **Hallucinogens** 288

CHAPTER 13 **Psychotherapeutic Medications** 315

CHAPTER 14 **Other Prescription and Over-the-Counter Drugs** 354

CHAPTER 15 **Treatment of Substance Use Disorders** 375

CHAPTER 16 **Prevention of Substance Abuse** 417

GLOSSARY 441

REFERENCES 448

INDEX 484

CONTENTS

PREFACE xi

CHAPTER 1
Drug Use and Abuse 1

Pharmacology and Drugs 3
- Drug Classification 4
- The Drug Experience 5

Alcohol and Drug Use in the United States 6
- National Household Survey 7
- Summary of Survey Data 10
- Multiple Drug Use 10
- International Comparisons of Drug Use 11
- Negative Consequences of Alcohol and Drug Use 12

Defining Harmful Drug Use 13
- Use of the DSM 13
- Drug Tolerance, Withdrawal, and Drug-Taking Behavior 17

Overview of the Text 18

Evaluating Websites 19

Summary 20

CHAPTER 2
Drug Use: Yesterday and Today 23

Historical Overview 24
- Drug Use in the United States 26
- Medical Science and Drug Use 30

Development of Drug Laws 31
- The San Francisco Ordinance 32
- Pure Food and Drug Act 32
- Harrison Narcotics Tax Act 32
- Alcohol Prohibition 33
- Post-Prohibition Legislation 35

Current Drug Laws 36

Summary 41

CHAPTER 3
Drugs and the Nervous System 45

The Neuron 46

Neural Transmission 47

Drugs and Neural Transmission 50

Major Neurotransmitter Systems 52
- Acetylcholine 52
- Monoamines 54
- Endorphins 56
- Amino Acid Neurotransmitters 56
- Other Transmitters 56

The Nervous System 56

The Brain 58
- The Hindbrain 58
- The Midbrain 59
- The Forebrain 59
- Imaging the Human Brain 62

Summary 64

CHAPTER 4
Pharmacology 67

Pharmacokinetics 69
- Drug Dose 69
- Routes of Administration 70
- Drug Absorption 74
- Drug Distribution 77
- Drug Elimination 77

Summary 81

Pharmacodynamics 82
- The Dose-Effect Curve 82
- Effective and Lethal Doses 86
- Drug Interactions 87

Summary 90

CHAPTER 5

Psychopharmacology and New Drug Development 93

Characteristics of Users 94
- Biological Characteristics 94
- Psychological Characteristics 95

Social and Environmental Factors 98

Tolerance 99
- Types of Tolerance 99
- Explanations of Tolerance 100

Behavioral Pharmacology 103
- Reinforcement and Punishment 104
- Operant Principles and Drug Dependence 105
- Drug Discrimination 106
- Conflict Paradigm 107

Animal Models and Human Drug Use 107

Human Behavioral Pharmacology 108
- Ethical Issues 108
- Placebo Controls 108

New Drug Development 110
- Clinical Trials and FDA Approval 111
- Distribution and Marketing 112
- Generic Drugs 113

Summary 115

CHAPTER 6

Cocaine, Amphetamines, and Related Stimulants 118

The Coca Leaf 119

Early Use of Cocaine 121

The Amphetamines 123

Cocaine Epidemic II 124

The Return of Meth 129

Bath Salts 131

Pharmacokinetics of Stimulants 132

Mechanism of Stimulant Action 132

Acute Effects at Low and Moderate Doses 134
- Physiological Effects 134
- Behavioral Effects 134

Acute Effects at High Doses 136

Effects of Chronic Use 137
- Tolerance 137
- Dependence 138

Stimulant Drugs and ADHD 138

Summary 142

CHAPTER 7

Nicotine 144

History of Tobacco Use 146
- The West Discovers Tobacco 146
- Tobacco as Panacea 147
- From Panacea to Panned 147

Prevalence of Tobacco Use 148
- Smoking in the United States 148
- Initiation of Smoking 150
- Smokeless Tobacco Use 151

Pharmacology of Nicotine 151
- Sites of Action 151
- Pharmacokinetics 152
- Distribution 153
- Metabolism and Excretion 153

Tolerance and Dependence 154
- Tolerance 154
- Physical Dependence 154

Acute Effects of Nicotine 155
- Nicotine's Dependence Liability 156

Effects of Chronic Tobacco Use 157
- Tar, Nicotine, and Carbon Monoxide 159
- Diseases Linked to Cigarette Smoking 160
- Other Tobacco Products and Health 161
- Passive Smoking 161

Treatment of Cigarette Smoking 163
- The Necessity of Formal Treatment 164
- Treatment Effectiveness 165
- Conclusions about the Treatment of Cigarette Smoking 167

Summary 170

CHAPTER 8

Caffeine 173

Sources of Caffeine 174

History of Caffeine Use 176

Prevalence of Caffeine Consumption 177

Pharmacology of Caffeine 180
Sites of Action 180
Pharmacokinetics 180

Tolerance and Dependence 181
Caffeine Withdrawal 181
Tolerance 181

Acute Effects of Caffeine 182
Behavioral and Psychological Effects 182
Interactions among Caffeine, Nicotine, and Alcohol 183
Acute Toxic Effects of Caffeine 185

Chronic Effects of Caffeine Use 187

Therapeutic Uses of Caffeine 189

Conclusions 190

Summary 190

CHAPTER 9
Alcohol 193

Alcoholic Beverages 194
Fermentation and Distillation 194
Expressing the Alcohol Content of a Beverage 196

History of Alcohol Use 197

Consumption of Alcohol and Heavy Drinking in the United States 199
Per Capita Consumption 199
Consumption of Alcohol and Heavy Drinking among College Students 202

Pharmacology of Alcohol 204
Sites of Action 204
Pharmacokinetics of Alcohol 204

Tolerance and Dependence 209
Tolerance 209
Physical Dependence 210

Therapeutic Uses 211

Acute Effects of Alcohol 211
Physiological Effects 212
Sensorimotor Effects 214
Alcohol and Driving Ability 215
Psychological Effects 217
Alcohol and Behavior 217

Effects of Chronic Heavy Drinking 222
Alcohol and Brain Functioning 224
Alcohol and the Liver 225
Alcohol and Reproductive Functioning 226
Fetal Alcohol Syndrome 227
Moderate Drinking and Health 228

The Development of Alcohol Use Disorder 230
Traditional Approaches to Etiology 230
"Biopsychosocial" Approaches to Etiology 232

Summary 233

CHAPTER 10
Opiates 237

History of the Opiates 238
Early History 239
Opiate Use in the 19th Century 239
Opiate Use in the 20th Century and Today 241
Prescription Opiate Abuse 246

Pharmacokinetics 247
Absorption 247
Distribution, Metabolism, and Excretion 248

Mechanisms of Opiate Action 248
Discovery of Endorphins 248
What Do Endorphins Do? 249

Medical Use of Opiate Drugs 249

Acute Psychological and Physiological Effects of Opiates 252

Chronic Effects of Opiates 254
Tolerance 254
Withdrawal and Dependence 255

Summary 256

CHAPTER 11
Marijuana 258

Historical Overview 260
Cannabis in the New World 261
Committee Reports on Marijuana 264

Epidemiology 265

Methods of Use 269

Active Ingredients 269
Potency of Cannabis 269

Pharmacokinetics 270
Absorption 270
Distribution, Metabolism, and Excretion 270

Mechanisms of Action 271
Research Findings 271
Tolerance and Dependence 272

Medical and Psychotherapeutic Uses 273
History of Therapeutic Use 273
Nausea and Vomiting 274
Cachexia 276
Glaucoma 276
Other Uses 276

Physiological Effects 277
Acute Effects 277
Longer-Term Effects 277

Psychological Effects 279
Behavioral Effects 280
Cognitive Effects 281
Emotional Effects 282
Social and Environmental Effects 283

Summary 284

CHAPTER 12
Hallucinogens 288

Overview 289

Serotonergic Hallucinogens: LSD and Related Compounds 290
Early History 291
Recent History 293
Mechanisms of Action of LSD-Like Drugs 297
Pharmacokinetics of LSD-Like Drugs 297
Psychotherapeutic Uses 298
Effects of Serotonergic Hallucinogens 299
Adverse Effects of Serotonergic Hallucinogens 300

Methylated Amphetamines 302
Overview 302
History and Epidemiology 304
Effects of Methylated Amphetamines 305
Toxicity 307
Residual Effects of MDMA 307

Anticholinergic Hallucinogens 309

Dissociative Anesthetic Hallucinogens 310
History 310
Pharmacokinetics 310
Effects of PCP and Ketamine 311

Salvinorin A (Salvia) 312

Summary 312

CHAPTER 13
Psychotherapeutic Medications 315

Historical Overview 317
The Pre-Chlorpromazine Era 317
The Age of Chlorpromazine 318

Epidemiology 319

Classes of Drugs and Their Actions 321
Antipsychotics 321
Antidepressants 326
Antianxiety Agents 333
Nonbenzodiazepine Treatment 345
Mood-Stabilizing Drugs 347

Psychotherapeutic Drugs and Pregnancy 349

Summary 349

CHAPTER 14
Other Prescription and Over-the-Counter Drugs 354

Overview 355

Prescription Drugs 355
Birth Control Drugs 355
Anabolic Steroids 358

Over-the-Counter Drugs 362
FDA Classification 363
Analgesics 363
Cold and Allergy Medications 365
Over-the-Counter Stimulants and Sedatives 365

Herbal Products, Hormones, and Dietary Supplements 366
Areca (Betel) 367
DHEA 367
Ephedra/Ma Huang 367
Ginkgo Biloba 367
Kava 368
Melatonin 368
S-Adenosyl-Methionine 369
St. John's Wort 369
Valerian 369
Gamma Hydroxybutyrate 369

Inhalants 370

Summary 372

CHAPTER 15
Treatment of Substance Use Disorders 375

Motivation to Change 377

Change without Formal Treatment 378

Self-Help Groups 379
Alcoholics Anonymous 380
Other Self-Help Groups 382

Models of Substance Use Disorders 384
Five Model Categories 384
Biopsychosocial Model 386

Professional Treatment: Assessment and Goals 386
Abstinence or Moderation? 387
Harm Reduction 388

Alcohol Treatment Settings and Services 388
Types of Settings and Services 388
Pharmacological Treatment 391
Effectiveness of Alcohol Treatment 392
Nonpharmacological Professional Treatment 393
Self-Help Treatment 394
Effectiveness of Pharmacological Treatments 396

Other Drug Treatment Settings and Services 398
Treatment of Nonopiate Drug Abusers 398
Pharmacotherapy of Other Drug Problems 399
Effectiveness of Drug Treatment 401
Nonpharmacological Professional Treatment 401
Self-Help Treatment 402
Pharmacological Treatments 403
Promising Treatment Techniques 404

Special Topics in Alcohol and Drug Treatment 405
Treatment of Polysubstance Abusers 405
Treatment of Dual-Diagnosis Patients 406
Relapse 407

Models of Causes and Treatment Methods 409

Economic Factors in Alcohol and Drug Treatment 410

The Stepped Care Approach 411

Summary 413

CHAPTER 16
Prevention of Substance Abuse 417

Defining Prevention 419

Models of Prevention 420
Sociocultural Model 420
Distribution of Consumption Model 422
Proscriptive Model 423

Principles of Drug Abuse Prevention 424

Current Topics in Prevention 427
Education and Mass Media Efforts 428
Affect-Oriented Programs 431
Alternative Behaviors and Resistance-Skills Training 431
Worksite Programs 433
Programs for College Students 434

Closing Comments on Prevention 437

Summary 438

GLOSSARY 441

REFERENCES 448

INDEX 484

PREFACE

We began writing the first edition of this text in the late 1980s. At that time, drug use and related problems were of major interest and concern in the United States and in other countries. Awareness, interest, and concern about drug use have not abated since that time, nor has the need for a general undergraduate text to educate college students on the biological, psychological, and social factors that influence drug use and its effects. Therefore, we have completed this seventh edition, which retains many features of previous editions but also reflects changes that have occurred in this very dynamic area of study since the sixth edition was published in 2011.

As in all of the text's previous editions, the central theme of this edition is that a drug's effects are determined not only by its chemical structure and interaction in the body but also by drug users' biological and psychological characteristics and the setting in which they use the drug. This central theme is reflected in the inclusion of chapters on pharmacology and psychopharmacology, and is continued throughout the presentation of individual drugs or drug classes and in the discussion of prevention and treatment. The text examines the complexity of human drug consumption on biological, psychological, and social levels. Although the text is scholarly, it is understandable to students with little background in the biological, behavioral, or social sciences.

The text also retains a number of pedagogical features designed to increase students' interest and learning. **Diagnostic pretests** at the beginning of each chapter challenge students to test their knowledge of drugs while drawing their attention to important concepts or facts that follow in the chapter. Pretest answers and explanations at the end of each chapter provide an important review of the main concepts. The **margin glossary** helps students identify and define important terms within the text. **Margin quotes** help bring abstract concepts to life through personal accounts, comments, and quips about drug use and its ramifications. **Drugs and Culture boxes** explore variations in drug use and its consequences. They highlight the importance of differences in drug use that are associated with factors such as a person's sex, race, and ethnic background. Finally, **Contemporary Issue boxes** discuss current controversies involving drugs or drug use, as well as events related to such controversies.

New in This Edition

As mentioned earlier, drugs and drug use are popular and dynamic areas of study. For example, when the sixth edition was published in 2011, synthetic designer drugs like "Spice" and "bath salts" had not yet emerged as international phenomena. These designer drugs are sold on the Internet, often legally. The seventh edition chronicles the impact of this drug trade, with a focus on the legal changes in the United States designed to address the problem (Synthetic Drug Abuse Prevention Act of 2012, Chapter 2) and reviews of the major drugs involved: synthetic cathinones or bath salts (Chapter 6), synthetic cannabinoids or Spice (Chapter 11), and phenethylamine hallucinogens (2C-B, Chapter 12).

Numerous other changes have occurred in the field since publication of the sixth edition. Each chapter of the seventh edition has been updated to represent findings from the latest research, as well as to reflect social and legal changes related to drugs.

Among the many revisions, we present the latest survey data available at this writing on patterns of drug use in the United States and in other countries worldwide. We also align the seventh edition where relevant with the recently published fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5).

Chapter 2, "Drug Use: Yesterday and Today," includes new information on the voter approvals—in Colorado and Washington—to regulate, tax, and control marijuana in a manner similar to that applied to alcohol, updates on the continuing movement to legalize the use of marijuana for medical reasons, updated material on drug legislation, including the 2010 Fair Sentencing Act and the 2012 Synthetic Drug Abuse Prevention Act, and new coverage on "bath salts" and synthetic marijuana.

Chapter 3, "Drugs and the Nervous System," adds detail on neurotransmission processes, receptors, and receptor subtypes.

Chapter 6, "Cocaine, Amphetamines, and Related Stimulants," adds new sections on the crack sentencing law controversy and on regulations on methamphetamine and the effects of such regulation on the production and availability of methamphetamine. Chapter 6 also contains a new Drugs and Culture box on the current use of coca in Latin America, as well as updates on the epidemiology of cocaine and methamphetamine use.

Chapter 7, "Nicotine," has updated National Survey on Drug Use and Health (NSDUH) data on the epidemiology of nicotine use in the United States, along with an expanded and updated section on the treatment of nicotine addiction. Chapter 7 also features updated material on the harm-reduction approach to cigarette smoking, including discussion of products billed as "safer" alternatives to traditional cigarettes, such as the electronic cigarette and smokeless tobacco products.

Chapter 8, "Caffeine," includes the latest data on caffeine effects, including a variety of apparent health benefits of coffee, and updates on caffeine consumption among children. The latest information on the combined use of alcohol and caffeine is also provided.

Chapter 9, "Alcohol," has new epidemiological data on alcohol consumption in the United States and around the world, as well as the health "benefits" of moderate alcohol consumption. Chapter 9 also contains updated data on the effects of a pregnant woman's moderate alcohol use on the health of the fetus that she is carrying.

Chapter 10, "Opiates," includes an updated discussion of prescription opiate drug abuse.

The chapter on marijuana (Chapter 11) includes the latest epidemiological data on marijuana use around the world, including use among youth. Chapter 11 also contains the latest information on the therapeutic uses of marijuana, on the relationship between cannabis use and various mental health outcomes, and on the increased risk of a motor vehicle crash when under the influence of cannabis. The chapter also includes a new Contemporary Issue box on synthetic marijuana, best recognized under the names of Spice and K2, among others.

Chapter 12, on the hallucinogens, includes new information on therapeutic uses of hallucinogen drugs, including MDMA for post-traumatic stress disorder and ketamine for depression, as well as coverage of DMT.

Chapter 13, "Psychotherapeutic Medications," includes the latest information on newly prescribed psychotherapeutic medications, with discussion of their benefits and side effects. Chapter 13 also includes a newly developed section on the use of psychotherapeutic medications during pregnancy, which often has been a difficult and challenging issue for pregnant women and their physicians alike.

Chapter 14, "Other Prescription and Over-the-Counter Drugs," has dropped coverage of the compound salvia that is now covered in Chapter 12. In addition, Chapter 14 covers the new continuous birth control pill and includes an update on the health risks associated with acetaminophen.

Chapter 15, "Treatment of Substance Use Disorders," includes new information on the use of technology (e.g., computer-delivered, mobile device-delivered) interventions, integration of the Affordable Care Act in our discussion of economics and the stepped-care approach to substance use disorders treatment, as well as discussion of 12-step facilitation treatment.

Chapter 16, "Prevention of Substance Abuse," covers the latest trends in prevention interventions, including programs geared toward college students. Updates on the broad array of negative consequences associated with problematic use of alcohol among college students, including deaths, injuries, sexual abuse, and academic problems, are provided.

Accompanying the seventh edition are both new and expanded supplements that will help instructors with class preparation and help students by providing opportunities for review. In the Instructor's Manual with Test Bank, we provide chapter outlines, learning objectives, InfoTrac® College Edition, key terms, glossary terms and definitions, useful web links, and test items in three formats (multiple-choice, true/false, and essay).

The test bank is also available in Cognero electronic format, which allows instructors to author, edit, and manage test bank content from multiple Cengage Learning solutions. The new companion website offers text-specific, interactive review and enrichment materials for students, including tutorial quizzes, flash cards, and useful web links. Electronic transparencies found on the instructor companion website provide figures and tables from the seventh edition uploaded into Microsoft PowerPoint that instructors can use as is or modify to create their own presentations. Each new copy of the seventh edition comes with a pass code to the InfoTrac College Edition full-text periodical database. With this database, students will have access to thousands of journal articles from a wide variety of publications.

Acknowledgments

This text could not have been completed without the help of a number of people. Foremost among these individuals are Jon-David Hague, product director; Amelia Blevins, product assistant; Joshua Taylor, outsource development coordinator; Charlene Carpentier, content project manager; and Vernon Boes, senior art director. Thanks also go to the production team, including Heather McElwain, copy editor; Alekha Jena, proofreader; Shan Young, indexer; and Teresa Christie, production editor at MPS Limited. Thank you as well to the composition team at MPS Limited, led by Rakesh Pandey.

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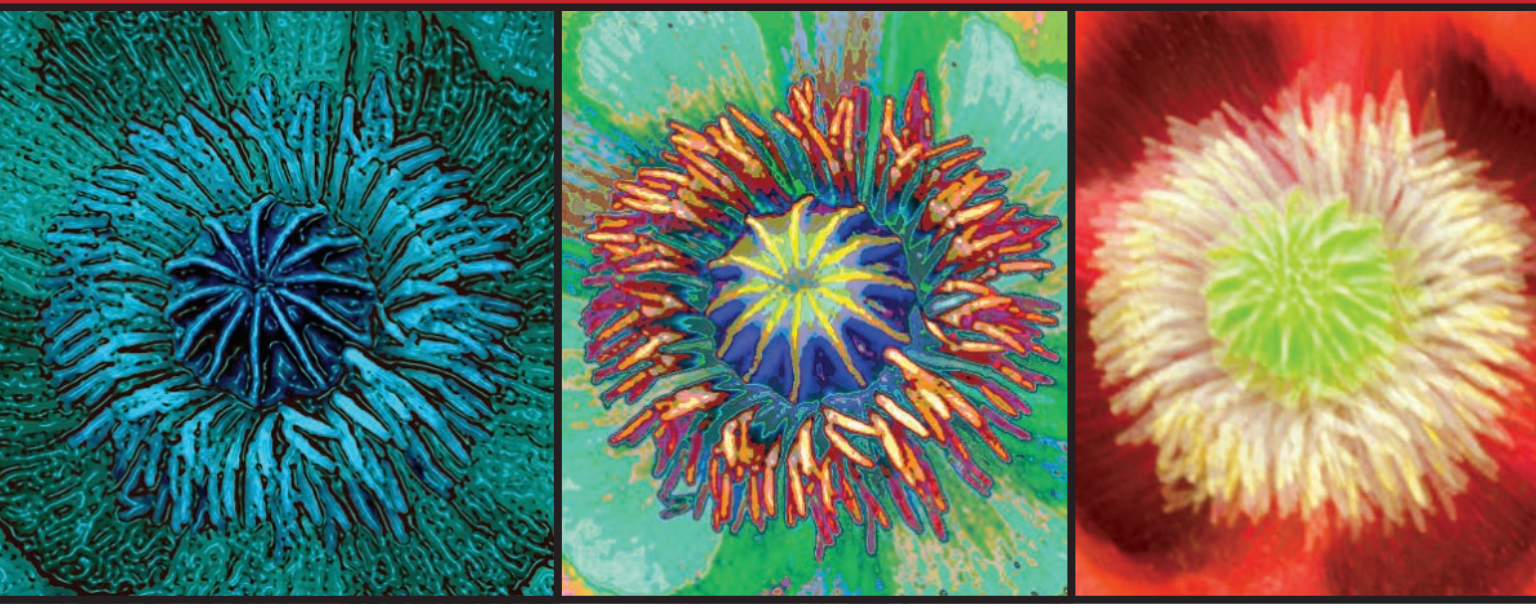
Mark Galizio
Gerard J. Connors

CHAPTER ONE



Drug Use and Abuse

Pharmacology and Drugs
- Drug Classification
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Alcohol and Drug Use in the United States
- National Household Survey
- Summary of Survey Data
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- International Comparisons of Drug Use
- Negative Consequences of Alcohol and Drug Use

Defining Harmful Drug Use
- Use of the DSM
- Drug Tolerance, Withdrawal, and Drug-Taking Behavior

Overview of the Text

Evaluating Websites

Summary

What Do You Think? True or False?

Answers are given at the end of the chapter.

___ 1. Because the effects of drugs are both predictable and obvious, it is relatively easy to define drug abuse.

___ 2. A drug's street name sometimes describes the actual effect of that drug.

___ 3. A person's reaction to a drug depends mostly on the biological action of the drug in the body.

___ 4. Because drug use is complicated, it is impossible to estimate patterns of drug use for the population of a whole country.

___ 5. Within the United States, similar patterns of alcohol and other drug use are found even among different subgroups of the population.

___ 6. The highest rates of alcohol and other drug use are found among 18- to 25-year-olds.

___ 7. A person's use of more than one drug at a time is of little concern because it happens so infrequently.

___ 8. The total economic cost of alcohol and drug abuse in the United States is about a billion dollars annually.

___ 9. The use of alcohol and other drugs causes violence and crime.

___10. Modern researchers rely on definitions of alcohol and other drug use that are free of social or cultural biases.

___11. A diagnosis of drug use disorder is made when a person has become either physically or psychologically dependent on a drug.

___12. Definitions of addiction emphasize overwhelming involvement with a drug.

___13. The continued use of any drug will eventually lead to tolerance of and physical dependence on that drug.

Athletic	Legal	Religious
Biological	Medical	Social/cultural
Economic	Political	
Educational	Psychological	

Q: How are these 10 systems alike?

A: They influence or are influenced by alcohol and other drug use.

This one-question quiz shows that drugs[1] may affect us in many ways, whether or not we use them. Although what we see and hear in the media often focuses on the negative consequences of drug use, drugs are popular all over the world because people perceive that they benefit from using drugs. For example, on an *individual* level, people say that drugs make them feel more relaxed, socialize more easily, feel sexier, escape boredom, and feel more confident and assertive. Drugs have also helped to ease a lot of suffering in humans and other animals when used for specific medical purposes. On a *group* or *community* level, drugs have been used for thousands of years as part of social and religious rituals. Drugs are used for such purposes less for the effects of the drug's chemistry than for social or cultural reasons. One society may condone the use of a drug—say, alcohol in the United States and European countries—whereas another society condemns it, such as the

[1]Sometimes in this book, we use the phrase *alcohol and drugs;* at other times, we use *drugs* as the inclusive term. Because alcohol is a drug, saying "alcohol and drugs" is redundant. However, we do so on occasion, when it seems useful, to distinguish alcohol from all other drugs.

Islamic countries of Iran and Saudi Arabia. This complex picture of human drug use suggests that many different factors influence drug use.

What influences drug use and how that use affects us make up the subject of drugs and human behavior and are what this text is about. Because our subject matter is so wide-ranging, this introductory chapter spans a variety of topics. We include formal definitions throughout the chapter, beginning with terms such as *pharmacology*, *drug*, and *drug abuse*.

Introducing a lot of terms in one chapter might be confusing at first, but there is no need to feel that you have to grasp all the terms immediately. Because the terms will be used repeatedly throughout the book, you will have time to learn them. By introducing the terms now, we give you the vocabulary to read later chapters more easily.

In this chapter, we also explain the drug-classification systems used in this book and then move to a discussion of who uses drugs. The final sections of the chapter cover ways to define harmful drug use. The chapter closes with a brief overview of the rest of the text.

"Food is good. Poison is bad. Drugs may be good or bad, and whether they are seen as good or bad depends on who is looking at them."

(Weil & Rosen, 1983, p. 10)

Pharmacology and Drugs

Humans have used drugs for several thousand years, but the scientific study of drugs is more recent. The scientific study of drugs is called **pharmacology**, which is concerned with all information about the effects of chemical substances (drugs) on living systems. Pharmacology is considered a part of biology and is allied with physiology and biochemistry (Blum, 1984). **Psychopharmacology** is an area within the field of pharmacology that focuses on the effects of drugs on behavior. Although *psychopharmacology* is a joining of the words ***psychology*** and *pharmacology,* it is now recognized that understanding how drugs affect human behavior requires knowledge about social and environmental factors as well. This book is about human psychopharmacology.

pharmacology
The scientific study of drugs concerned with all information about the effects of drugs on living systems.

psychopharmacology
The subarea of pharmacology that concerns the effects of drugs on behavior.

psychology
The scientific study of behavior.

Drugs are easy enough to talk about, or so it seems from the numbers and variety of people who do so. However, defining *drug* is not so simple. Although they have run into confusion along the way, experts have arrived at a workable definition. According to a World Health Organization (WHO) report published in 1981, **drug** is defined in the broadest sense as "any chemical entity or mixture of entities, other than those required for the maintenance of normal health (like food), the administration of which alters biological function and possibly structure" (p. 227). This definition remains useful today (United Nations Office on Drugs and Crime, 2003).

drug
Broadly defined as any chemical entity or mixture of entities not required for the maintenance of health but that alters biological function or structure when administered.

These fundamental definitions bring us to the questions: What is drug *use,* and what is drug *abuse*? We discuss these distinctions in more detail later in this chapter, but it is important for you to get an idea at the outset of what is called drug use and drug abuse. Abuse has been referred to in different ways when people write about drugs, and there is no generally accepted definition. In such circumstances, one way to define a term is by a consensus of experts. A study by Rinaldi et al. (1988) achieved such a consensus definition for a number of terms used in research and clinical work on alcohol and drugs. In the Rinaldi et al. study, the experts defined **drug abuse** as "any use of drugs that causes physical, psychological, legal, or social harm to the individual or to others affected by the drug user's behavior."

drug abuse
Any use of drugs that causes physical, psychological, legal, or social harm to the individual user or to others affected by the drug user's behavior.

As you can see, the definition of abuse centers on the consequences of drug users' behavior, both to themselves and to others in their social environment. Our opening question on the 10 systems and drug use comes into sharper relief with this definition of abuse. The definition also illustrates the difficulties in defining abuse. A major

problem is that the behavior that causes consequences in one community or culture may not cause them in another, or not to the same degree. Therefore, the goal to have a standard reference for drug abuse has proved elusive. Nevertheless, in writing and other forms of communication about alcohol and other drugs, the word *abuse* is used frequently, and thus efforts to arrive at a more generally applicable definition should continue. For now, however, our initial definition of abuse is sufficient for understanding what we say in the first part of this chapter. Toward the end of this chapter, we discuss a "diagnostic" definition of substance (alcohol or other drugs) abuse that the American Psychiatric Association has developed.

If *abuse* is drug use with negative consequences, then drug *use* may be viewed as the larger category, with drug abuse as a subset. Drug consumption that does not meet the criteria for drug abuse is referred to as drug use.

Drug Classification

As the WHO panel of experts understood, their definition of *drug* is very broad. To make the definition useful for research and practical purposes, it is necessary to order the substances that fit the definition of drug into smaller categories. Pharmacologists have done this with their many systems for classifying drugs. These classification systems have been based on the primary properties of drugs to communicate a drug's nature and the ways it can be used. Following are some of the major ways of classifying drugs:

1. By origin. An example is drugs that come from plants, such as the opiates, which are derived from the opium poppy. The "pure" (nonsynthetic) opiates include compounds such as morphine and codeine. Heroin, which is a semisynthetic compound, is often called an opiate drug. Because this classification distinguishes only the source of the drug, a given drug class may include many drugs that have different chemical actions.
2. By therapeutic use, or according to similarity in how a drug is used to treat or modify something in the body. For example, with this system, amphetamines are called appetite-suppressant drugs. Note that the reasons some drugs are used can be much different from their therapeutic effects. Amphetamines are often used nonmedically because of their stimulant effects. Similarly, morphine may be used medically as a powerful painkiller, but street users most commonly take morphine for its euphoric effects.
3. By site of drug action, which pertains to where in the body the drug is causing physical changes. For example, alcohol is often called a depressant drug because of its depressant action on the central nervous system (CNS). Conversely, because of its CNS stimulant properties, cocaine is often called a stimulant drug. The utility of this system is limited when a drug affects several different body sites. One example is the CNS stimulant cocaine, which also has local anesthetic (pain-reducing) effects. Furthermore, drugs that differ widely in chemical structure or mechanisms of action may affect the same body site.
4. By chemical structure. For example, the barbiturates (such as phenobarbital, Amytal, and Seconal) are synthetic compounds derived from the chemical structure of barbituric acid, the synthetic compound that forms the chemical base for barbiturate drugs.
5. By mechanism of action, which means how a drug produces its **drug effects**. This is a good system in principle, and ongoing research in pharmacology is directed at specifying the mechanisms of action of an increasing number of drugs.

drug effects
The action of a drug on the body. Drug effects are measured in different ways.

6. By street name, which comes from drug "subcultures" and the street drug market. For example, amphetamines are called "speed," and drugs like the barbiturates or depressants such as methaqualone (Quaalude) are called "downers." As these examples show, street names sometimes reflect actual drug effects. (Brands, Sproule, & Marshman, 1998, pp. 11–13)

"I don't do drugs. I am drugs."
Salvador Dali

The topics of this text's drug chapters (Chapters 6 through 14) were determined according to several different ways of classifying drugs. One of the ways to classify drugs, by their effects, applies to virtually all of the drugs covered in this text. We are most interested in **psychoactive** drugs—those that affect moods, thinking, and behavior. Some substances have been designated formally as psychoactive, such as alcohol, whereas others have not, such as aspirin. Psychoactive drugs are most important in this text because they are the ones that people are most likely to use, sometimes in ways that create serious problems for them. This text mainly concerns the nonmedical use of psychoactive drugs, but we also discuss medical uses.

psychoactive
Pertaining to effects on mood, thinking, and behavior.

The Drug Experience

As we said earlier, people like many of the experiences they have when they take drugs. This raises an important question: What causes the "drug experience"? The drug's chemical action is part of the answer, but how much? Not too long ago, the chemical actions of drugs were viewed as the primary reason people experienced certain changes when they took different drugs. However, research from different disciplines, such as pharmacology, psychology, and sociology, has shown that the drug experience is a product of more factors than just the drug's pharmacological action.

Generally, we can look at three sets of factors, one pharmacological and two nonpharmacological. The first set includes *pharmacological factors,* and three of them stand out. First are the chemical properties and action on the body of the drug used. Another is **drug dosage** (or dose), which is the measure of how much of the drug is consumed. The third pharmacological factor is the **route of drug administration**, or the way the drug enters the body. This is important because the route affects how much of a dosage reaches its site(s) of action and how quickly it gets there. Chapter 4 discusses in detail major routes of drug administration and their effects on the drug experience.

drug dosage
Measure of the quantity of drug consumed.

route of drug administration
The way that drugs enter the body.

The second set of factors is nonpharmacological and consists of the *characteristics of the drug user*. Included are such factors as the person's genetic makeup (biologically inherited differences among people govern their bodies' reaction to the ingestion of different drugs), gender, age, drug tolerance, and personality. An important part of personality is the person's **psychological set** about a drug, which refers to knowledge, attitudes, expectations, and thoughts about a drug. For example, sometimes the strong belief that a drug will produce a certain effect will be enough to produce the effect, even though the person has ingested a chemically inactive substance (**placebo**).

psychological set
An individual's knowledge, attitudes, expectations, and other thoughts about an object or event, such as a drug.

placebo
In pharmacology, a chemically inactive substance.

The third and last set of factors, also a nonpharmacological one, is the *setting in which a drug is used*. The factors in this group span a wide range and include laws pertaining to drug use in the community where the drug is taken, the immediate physical environment where the drug is used, and whether other people are present at the time of drug use.

Together, these three sets of factors influence what people experience when they take a drug. You may have guessed that the path to a drug experience is not always easy to chart. However, many people are trying to do just that—to understand how drugs affect people. The accumulated knowledge from these efforts is the foundation of this book.

Alcohol and Drug Use in the United States

> *"I could have easily gotten stoned [before coming to this interview]; it wouldn't have bothered me. It depends on the situation. I wouldn't like to smoke [marijuana] in the middle of the day if I have things to do. Or I wouldn't smoke in the middle of a class. Things like that."*
>
> Research participant (Zinberg, 1984, p. 140)

The way the popular media tell it, it may seem as if virtually everyone has positive experiences using drugs because everyone seems to be using them. However, scientists learned long ago that our impressions or feelings about a subject often are inaccurate, and to find out what is really going on, it is best to study the subject systematically. This means using the scientific method, which is the major way we have learned as much as we do know about drugs. One of the best ways to answer questions about the uses of alcohol and drugs in a community or larger region is to do a survey study. When we want to learn about a whole country, we do what is called a national survey study.

In the United States, national survey studies of alcohol and drug use have involved interviewing a sample of individuals (in this case, age 12 or older) across the country. Such studies generally ensure that those interviewed are as similar as possible to the U.S. population as a whole—regarding, for example, factors such as gender, age, race, region of the country, and rural versus urban living environments. The national survey data give us the best estimate we have of what the findings would be if we studied every person in the population age 12 and older. In the United States, that means about 255 million people.

The U.S. federal government goes to great trouble and expense to support these national surveys of drug use, because the knowledge gained from them is extremely valuable in making legal, tax, educational, and health policy decisions. More narrowly, we are interested in the information from national surveys for this text because many people do not know the typical patterns of drug use among Americans. For example, the popular media expose us primarily to extreme cases of use and problems associated with it. The national survey data on alcohol and drug use give us a more balanced reference for understanding any one person's or group's use. In the same way, our brief review of national survey data in this chapter will help you understand drug use patterns and related problems that we write about in later chapters of this book.

Matt Smith/Comstock/Jupiter Images

Corbis

People use drugs in a variety of situations and experience different reactions to them.

CONTEMPORARY ISSUE BOX 1.1

U.S. Society and Drug Use

Learning about alcohol and drug use in the United States is important. One reason is the sheer number of people in the United States who use alcohol or other drugs. Another reason is the negative consequences associated with alcohol and drug use, which are discussed later in more detail. A third reason is the amount of controversy that drugs, especially illicit drugs, create. Despite the prevalence of drug use among its citizens, United States popular opinion has been to eradicate illicit drug use, at times ranking such use among the nation's top problems. Indeed, a 2007 survey conducted by the University of Michigan involved collection of data on adults' perceptions of the main problems threatening children's and adolescents' well-being, and "drug abuse" was number 2 in the top 10. (Interestingly, smoking tobacco and alcohol abuse were numbers 1 and 4, respectively.) Think of some of the major headline events that have occurred and the controversies they have generated in the last few years. Some of them touch upon the basic constitutional rights of Americans:

- The right of the federal government and other public and private employers to conduct urine screens (tests for drug taking) of employees as a way to control drug abuse in the workplace
- The question of whether intravenous drug users should be supplied with clean syringes free of charge as a way of preventing the spread of human immunodeficiency virus (HIV) infection
- The continuing debate on whether marijuana should be available as a prescription drug, and more recently, whether it should be legally available to adults for recreational purposes
- Some proposed legal penalties related to selling or using drugs—the requirement of life sentences for drug dealers who are convicted twice of selling drugs to teenagers and the imposition of the death penalty for dealers when a murder occurs during a drug deal

Many Americans use alcohol or other drugs. However, the country's attitudes toward such use, especially regarding illicit drugs, are far from permissive. Society's proposed and actual solutions to drug use in the United States have far-reaching legal, social, and financial implications. Which stand out to you?

National Household Survey

To provide you with an overview of current alcohol and drug use, we used a national survey that is conducted annually by the Office of Applied Studies within the Substance Abuse and Mental Health Services Administration (SAMHSA). The National Survey on Drug Use and Health (NSDUH) includes households in all 50 U.S. states and the District of Columbia. In this section, we refer to findings from the 2011 survey (SAMHSA, 2012).

This survey included individuals 12 years of age or older. Personal and self-administered interviews were completed with 69,500 respondents. As it was a household survey, people such as military personnel in military installations, individuals in long-term hospitals, and prisoners were excluded from the sample. As a result, the data cannot be viewed as completely representative of everyone in the 50 states. Nevertheless, the NSDUH provides the best single description of frequency and quantity of drug use among a broad age range of people in U.S. society.

In the 2011 NSDUH, a variety of data about drug use in the United States were collected. We first discuss data on the overall **prevalence** of use in the last year and the last month respectively for different drugs, including alcohol and tobacco cigarettes. In this case, "use" means the person used the drug in question at least once during the time in question; "past month" and "past year" are from the time the respondents give information about their drug use. We also offer counterpart prevalence data from the 2010 survey to allow for comparison with the 2011 data. Table 1.1 presents this first

prevalence
The general occurrence of an event, usually expressed in terms of percentage of some population. Another common statistic in survey studies is *incidence,* or the number of first-time occurrences of an event during some time period.

TABLE 1.1 Percentages of Individuals Aged 12 and Older Who Reported Use of Drugs for the Past Year and Past Month, 2010 and 2011

	Past Year		Past Month	
Drug	**2010**	**2011**	**2010**	**2011**
Marijuana	11.6	11.5	6.9	7.0
Cocaine	1.8	1.5	0.6	0.5
Inhalants	0.8	0.8	0.3	0.2
Hallucinogens	1.8	1.6	0.5	0.4
Heroin	0.2	0.2	0.1	0.1
Nonmedical use of any psychotherapeutic	6.3	5.7	2.8	2.7
Alcohol	66.4	66.2	51.8	51.8
Cigarettes	27.0	26.1	23.0	22.1

Note: Psychotherapeutic drugs include any prescription-type stimulant, sedative, tranquilizer, or analgesic. They do not include over-the-counter drugs. "Use" means used at least one time.

Source: SAMHSA (2012).

set of percentages. Several findings stand out in Table 1.1. First, alcohol leads the use list, followed by cigarettes in a distant second place. Marijuana heads the list of illicit drug use (drug use not in accord with legal restrictions). These relationships hold up for use both in the past year and in the past month.

Table 1.1 gives you an overall picture of drug use, but as we noted before, drug use differs with characteristics of people. Tables 1.2 and 1.3 give you an initial look at some of the characteristics that are highly associated with drug use differences. Table 1.2 centers on age differences in drug use in the past year and month, as reported in the 2011 national survey. As you can see in Table 1.2, individuals in the age range 18 to 25 have the most prevalent substance use. Over three of every four of these respondents said they used alcohol in the last year, and over one of every three of them reported at least one occasion of illicit drug use in the past year. In Table 1.3, we provide 2011 substance use data for the past month according to ethnic or racial group and gender. The most striking findings in Table 1.3 are the gender differences. Men were almost one and three-quarters times as likely as women to report any illicit drug use in

TABLE 1.2 Percentages of Individuals in Different Age Groups Who Reported Use of Drugs for the Past Year and Past Month, 2011

	Past Year			Past Month		
Drug	**12–17**	**18–25**	**≥26**	**12–17**	**18–25**	**≥26**
Any illicit drug	19.0	35.2	10.8	10.1	21.4	6.3
Alcohol	27.8	77.0	69.1	13.3	60.7	55.1
Cigarettes	13.2	42.3	24.9	7.8	33.5	21.9

Note: Any illicit drug use includes the nonmedical use of marijuana, cocaine, inhalants, hallucinogens, heroin, or psychotherapeutic drugs at least one time.

Source: SAMHSA (2012).

TABLE 1.3 Percentages of Individuals Aged 12 and Older of Different Ethnic and Gender Groups Who Reported Any Illicit Drug or Alcohol Use in the Past Month, 2011

	Any Illicit Drug	Alcohol
Ethnic/Racial Group		
White	8.7	56.8
Black	10.0	42.1
Hispanic	8.4	42.5
Gender		
Male	11.1	56.8
Female	6.5	47.1

Note: Any illicit drug use includes the nonmedical use of marijuana, cocaine, inhalants, hallucinogens, heroin, or psychotherapeutic drugs at least one time.

Source: SAMHSA (2012).

the past month, and about 20% more likely than women to report any alcohol use. For ethnic or racial differences, Whites showed the highest rate of alcohol use in the last month, followed by Hispanics and Blacks, who did not differ by much. For use of any illicit drug in the last month, Blacks showed the highest prevalence, followed by Whites and Hispanics.

CONTEMPORARY ISSUE BOX 1.2

Survey Data on Drug Use: Are They Accurate?

There are compelling reasons for conducting national survey studies of drug use and its consequences. Such information can help a society formulate effective legal and social policies on the use of specific drugs. National survey data also may help to identify groups within a population that are at the greatest risk for experiencing health or other problems related to drug use, which could help in creating more effective prevention programs.

These and other benefits of national survey data on drug use are significant, but a big question is whether the information that is obtained reflects a society's *actual* drug use. That is, are the data accurate?

There are several reasons for asking this question. For example, even the largest surveys rarely collect data from every person in a target population, so it is possible that the sample of people chosen to participate in the survey is biased in some way. This means that the sample might not reflect the population's characteristics on sex, race, religion, or education of the respondent, all of which could be associated with the main behavior of interest (here, drug use). In addition, because many of the drugs asked about are illegal for nonmedical use, or for any use at all, people may be reluctant to admit to a researcher that they have used a particular drug or have used it in particular amounts or frequency. Furthermore, as surveys typically ask about past behavior, memory limits may interfere with the collection of accurate information, regardless of the respondent's intention to tell the truth.

These and other problems are real and must be addressed if national survey data on drug use are to have the utility that they are intended to have. Fortunately, the challenge to collect accurate survey information has been an active research area over the years, and methods of representative sampling and data collection to assure confidentiality or anonymity of responses have led to better survey design and procedures. These advances have resulted in data that meet high standards of reliability and accuracy. This is not to say that national survey data provide a literal picture of drug use in a population, but that the picture is getting clearer and more detailed as survey research methods continue to improve.

If you were designing a survey to study some behavior, such as drug use, in a given population, what potential sources of bias in the data would you consider? How would you handle them?