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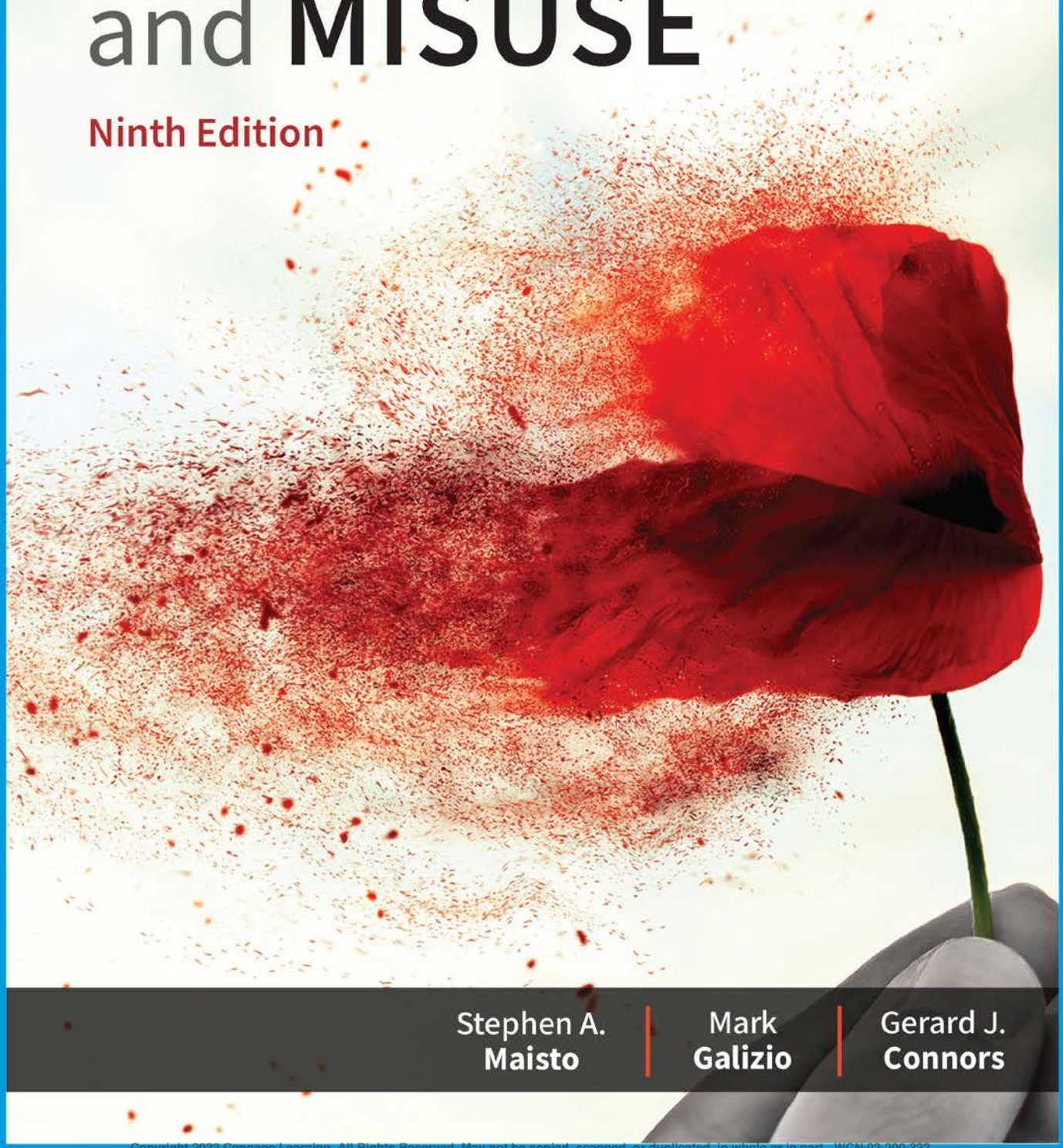
# DRUG USE and MISUSE

Ninth Edition



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

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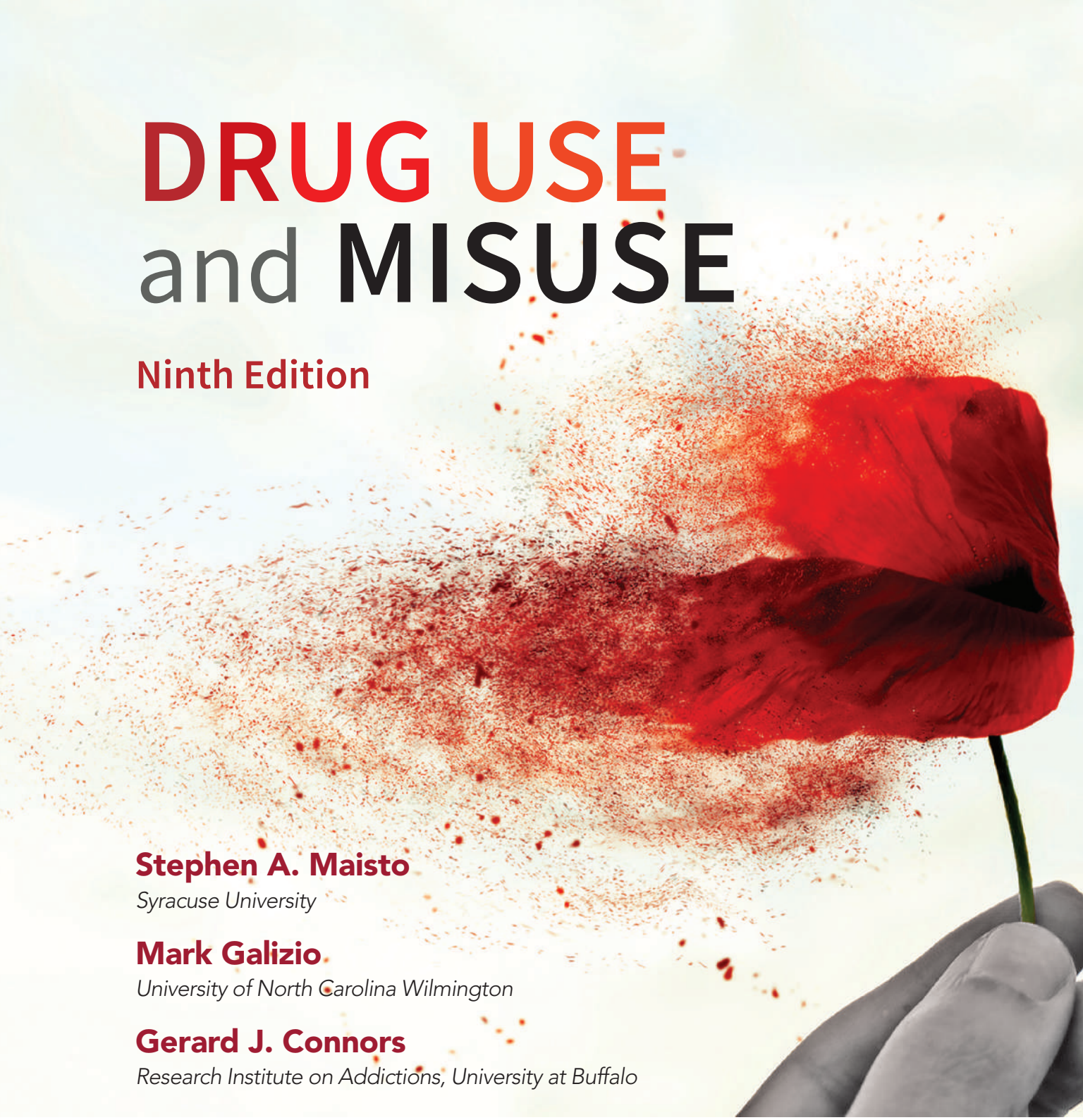


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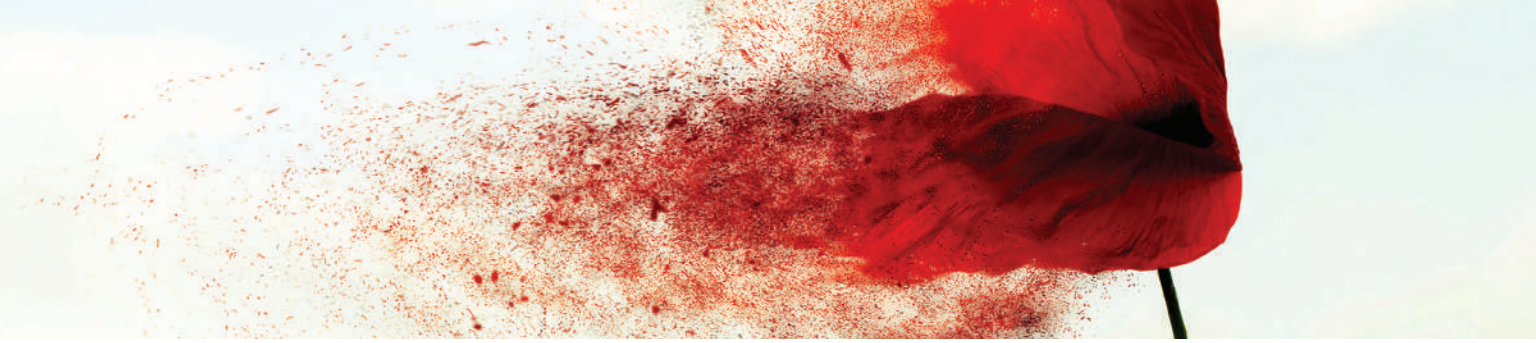

To Joseph A. Maisto
S. A. M.

To Kate and Annie
M. G.

To Elyse and Guy
G. J. C.

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# BRIEF CONTENTS

# CONTENTS









# 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 ninth edition, which retains many features of previous editions but also reflects changes that have occurred in this very dynamic area of study since the eighth edition was published in 2019.

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 seventh edition was published in 2015, synthetic designer drugs like "Spice" and "bath salts" had recently emerged as international phenomena. These designer drugs are sold on the Internet, often legally. The ninth 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 opiate drugs (Chapter 10), 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 eighth edition. Each chapter of the ninth 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. Chapter 2, "Drug Use: Yesterday and Today," includes new information on the voter and legislative approvals in multiple states to regulate, tax, and control marijuana use and distribution; updates on the continuing movement to legalize the use of marijuana for medical reasons; and new coverage on the synthetic opioid fentanyl being used alone or mixed with heroin.

Chapter 3, "Drugs and the Nervous System," adds detail on how drugs affect neurotransmission processes.

Chapter 6, "Cocaine, Amphetamines, and Related Stimulants," adds information on the changing trends in cocaine and methamphetamine use, as well as new information about synthetic cathinones (bath salts).

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. The latter includes how the concept of precision medicine is influencing the pharmacological treatment of tobacco cigarette smoking. Chapter 7 also features updated material on the harm-reduction approach to cigarette smoking, including expanded 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. Also included are new insights on the metabolism of caffeine, including the genetics of caffeine consumption. The chapter also features coverage of caffeine withdrawal as a clinical phenomenon. 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," provides extensive new coverage of the dramatic increase in use of heroin, prescription opiates, and synthetic opiates. Two new sections are included on the events that led to the opiate epidemic and the current status and impact of the epidemic. The increase in opiate overdose deaths is chronicled, and a new box on treating overdose with naloxone is added.

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 newer methods of consumption (such as vaping and dabbing).

Chapter 12 covers the exciting new research on psychological effects of hallucinogens, especially psilocybin and MDMA (methylenedioxymethamphetamine). New sections expand coverage of the therapeutic uses of hallucinogens like psilocybin for anxiety and depression, MDMA for posttraumatic stress disorder, and ketamine for depression. A new box discusses the potential and challenges for medical use of hallucinogens.

Chapter 13, "Psychotherapeutic Medications," includes the most recent data on the nature and extent of mental illness in the United States. It also includes the latest information on newly prescribed psychotherapeutic medications, with discussion of their benefits and side effects. Chapter 13 also provides coverage of 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," adds coverage of the controversial plant compound "kratom," which has become popular in recent years.

Chapter 15, "Treatment of Substance Use Disorders," includes a new Contemporary Issue Box on the use of telehealth (the use of technology, such as electronic medical records, smartphones, and web-based applications to support the delivery of health care, health-related education, and other health-related services and functions) in efforts to help patients sustain changes that they make in treatment, added discussion of the effectiveness of mutual help support groups such as Alcoholics Anonymous, and updated information on the integration of the Affordable Care Act in our discussion of economics and the stepped-care approach to substance use disorders treatment.

Chapter 16, "Prevention of Substance Abuse," covers the latest trends in prevention interventions, including temperament-based programs that focus on traits, such as sensation seeking and anxiety sensitivity, uniquely associated with risk for subsequent development of a drug-related problem. Updates on the broad array of negative consequences associated with problematic use of alcohol among college students, including deaths, assault, sexual abuse, and academic problems, are provided.

Accompanying the ninth edition are both new and expanded supplements that will help instructors with class preparation and help students by providing opportunities for review, including an Instructor's Manual, Test Bank, Instructor PowerPoints, an online companion website, and MindTap. The Instructor's Manual provides chapter outlines, learning objectives, key terms, glossary terms and definitions, and useful web links. The Instructor's Manual follows the text chapter by chapter with organized material to aid in planning an effective, engaging course. To aid instructors in integrating technology into their classroom, the manual also includes a MindTap Integration Chart and Educator's Guide, designed to highlight important activities and content found in MindTap.

The Test Bank is available in Cognero electronic format, an online system which allows instructors to author, edit, and manage Test Bank content from multiple Cengage solutions. Instructors may also easily create multiple test versions in an instant and deliver tests from a chosen learning management system (LMS), the classroom, or anywhere else Internet access is available. The Test Bank features multiple-choice, true/false, and essay questions. Questions are tagged to Bloom's Taxonomy and to the associated text content.

Instructor PowerPoint presentations accompany each chapter. These slides address all major topics covered within the text in an easy-to-use and condensed format. Slides may be used to guide classroom presentations or conversations, as a classroom handout for student preparation, or as an additional student resource for chapter review. Instructors may customize the slides to best suit their course.

A student companion website offers text-specific review and enrichment materials, including tutorial quizzes, flash cards, and an online glossary. An instructor companion website features the Instructor's Manual, PowerPoint lectures, and Test Bank materials.

The ninth edition also includes MindTap. MindTap®, a digital teaching and learning solution, helps students be more successful and confident in the course—and in their work with clients. MindTap guides students through the course by combining the complete textbook with interactive multimedia, activities, assessments, and learning tools. Readings and activities engage students in learning core concepts, practicing needed skills, reflecting on their attitudes and opinions, and applying what they learn. Instructors can rearrange and add content to personalize their MindTap

course and easily track students' progress with real-time analytics. And MindTap integrates seamlessly with any learning management system.

## Acknowledgments

This text could not have been completed without the help of a number of people. We want to thank the many talented folks at both Cengage Learning and Lumina Datamatics, Inc., who provided guidance through content development, permissions, and production. This book would not be possible without all of you.

We also want to thank other special people who helped us in completing the ninth edition. Stephen Maisto would like to thank his wife, Mary Jean Byrne-Maisto, for her love and support in finishing this edition. He also would like to thank his outstanding graduate student, Dezarie Moskal, for all of her help in preparing this edition. Mark Galizio thanks his wife, Kate Bruce, and daughter, Annie. Their love and support make it all worthwhile. Mark also thanks the many students at the University of North Carolina Wilmington who provide continuing challenges and inspiration. Gerard Connors thanks his wife, Lana Michaels Connors, for her constant support and love throughout the preparation of the ninth edition. Finally, all three authors would like to thank Mark R. Duerr for his tireless assistance and patience in preparing the chapters for this edition.

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

## LEARNING OBJECTIVES

After studying this chapter, you will be able to…

- **1-1** Differentiate among the definitions of *drug*
- **1-2** Explain the major ways of classifying drugs
- **1-3** Describe the pharmacological and nonpharmacological factors that influence the drug experience
- **1-4** Explain current patterns of alcohol and drug use in the United States
- **1-5** Describe negative consequences associated with alcohol and drug use
- **1-6** Describe advantages and disadvantages of using the *DSM*-5 definitions for substance use disorder, addiction, psychological dependence, and craving
- **1-7** Differentiate between tolerance and withdrawal
- **1-8** Explain the criteria used to evaluate websites

CHAPTER

# 1

# Drug Use and Misuse



## 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 harmful drug use.

___ 2. A drug's street name sometimes describes the actual effects 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. From 2008 to 2018, the use of alcohol, cocaine, and heroin increased in the United States.

___ 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. Estimated economic costs associated with alcohol and drug use include illness, death, medical expenses, and crime.

___ 9. The chemical action 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 substance 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 societies in 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*.

As you'll soon see, we introduce many key terms in this chapter. These terms will be used throughout the text, so it is important for you to begin learning and differentiating among them.

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)

[1]Sometimes in this text 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.

# 1.1 Pharmacology and Drugs

## LEARNING OBJECTIVES

1-1 Differentiate among the definitions of *drug*

1-2 Explain the major ways of classifying drugs

1-3 Describe the pharmacological and nonpharmacological factors that influence the drug experience

**pharmacology**
The scientific study of drugs concerned with how drugs act on biological systems and how the body responds to the drug.

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

**psychology**
The scientific study of behavior and mental processes.

**drug**
Broadly defined as any substance with the potential to treat or cure disease, or enhance physical or mental welfare; any chemical agent that alters the biochemical physiological processes of tissues or organisms; psychoactive drugs, for which there is nonmedical use in addition to any medical use.

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 how drugs act on biological systems and how the body responds to the drug. Pharmacology is a separate discipline in the health sciences; it is considered a part of biology, and 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.

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, as it has varied usage. According to the World Health Organization, the term can mean:

1. "any substance with the potential to prevent or cure disease or enhance physical or mental welfare" (in medicine);
2. "any chemical agent that alters the biochemical physiological processes of tissues or organisms" (in pharmacology);
3. psychoactive drugs, or more specifically illicit drugs, "of which there is non-medical use in addition to any medical use" (in common usage).

These fundamental definitions bring us to the questions: What is drug *use* (and *misuse*), and what is drug *abuse* (or harmful drug use as it may be known as the field begins to use less stigmatizing language)? 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." The term *drug misuse*, while sometimes used interchangeably with drug abuse, is also used to refer to the use of a drug for reasons other than what it was prescribed for.

**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, the word *abuse* is used frequently, and 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.

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 those who misuse morphine most commonly take it 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, amobarbital, and secobarbital) 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.
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

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

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

or depressants such as methaqualone (Quaalude) are called "downers." As these examples show, street names sometimes reflect actual drug effects (Brands et al., 1998, pp. 11–13).

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 mood, 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 person who uses drugs.* 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.

## REVIEW

1. Describe the different ways that drugs are defined, and give an example of a substance that would be included under each definition.
2. Create a table listing the six major ways that drugs can be classified. Then give an example for each classification type.
3. Explain how pharmacological and nonpharmacological factors influence the drug experience.

# 1.2 Alcohol and Drug Use in the United States

### LEARNING OBJECTIVES

**1-4** Explain current patterns of alcohol and drug use in the United States

To get an understanding of the rates of alcohol and drug use in the United States, the federal government conducts regular national surveys, interviewing individuals age 12 or older throughout the country. The administrants of the survey generally ensure that those interviewed are representative of the U.S. population as a whole—taking into account variables such as gender, age, race, region of the country, and rural versus urban living environments. These data provide the best estimates concerning alcohol and drug use for all individuals in the population over age 12. In the United States, this is currently approximately 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

> *"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)

Dmitriy Shironosov/Alamy stock photo

Thomas Baker/Alamy stock photo

People use drugs in a variety of situations.

**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 U.S. citizens, popular opinion in the country 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 misuse 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 people who use intravenous drugs 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?

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.

## National Survey on Drug Use and Health

To provide you with an overview of alcohol and drug use, we used a national survey that is conducted annually by the Substance Abuse and Mental Health Services Administration, an agency in the U.S. Department of Health and Human Services. The National Survey on Drug Use and Health (NSDUH) includes households in all 50 states and the District of Columbia (but not U.S. territories such as Puerto Rico or Guam). In this section we refer to findings from the 2018 survey (Substance Abuse and Mental Health Services Administration, 2019).

This survey included individuals 12 years of age or older. Interviews were completed with 67,791 individuals, including 16,852 interviews with adolescents aged 12 to 17 and 50,939 interviews with adults over age 18. As it was a household survey, individuals with no fixed address (e.g., military personnel on active duty, residents of

jails or nursing homes) 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 2018 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 reference drug 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. Figure 1.1 presents data on reported substance use within the past month. Several findings stand out. First, alcohol leads the use list, followed by tobacco in a distant second place. Marijuana heads the list of illicit drug use (drug use not in accordance with legal restrictions). Note that, although it now is legal in several U.S. states to use marijuana, in the 2018 NSDUH marijuana was defined as an illicit drug. Looking into these data a bit more closely, we see that an estimated 60.2% of the population aged 12 or older engaged in substance use during the past month. About two in five people aged 12 or older did not use substances in the past month.

Table 1.1 compares the types of substances used among individuals aged 12 or older who reported the use of drugs during the past month, comparing 2008 and 2018.

**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.

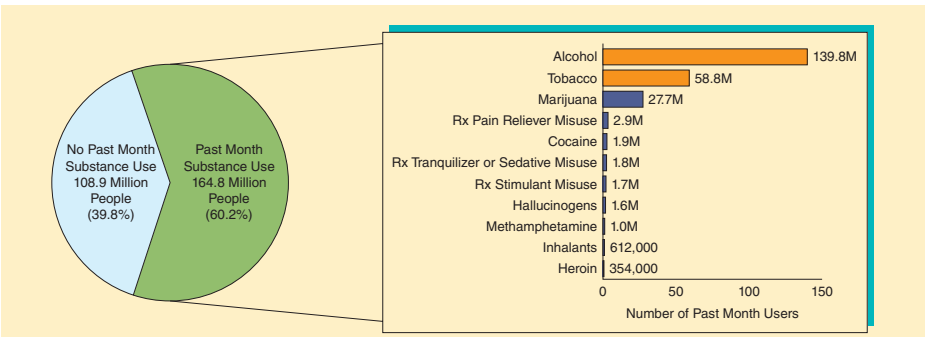


**FIGURE 1.1**
Past month substance use among people aged 12 or older: 2018

RX = prescription

**Note:** The estimated numbers of current users of different substances are not mutually exclusive because people could have used more than one type of substance in the past month.

**TABLE 1.1 Substances Used Among Individuals Aged 12 or Older Who Reported the Use of Drugs for the Past Month, 2008 and 2018**

| Drug | 2008 | 2018 |
|---|---|---|
| Alcohol | 51.2 | 51.1 |
| Tobacco | 28.4 | 21.5 |
| Marijuana | 6.1 | 10.1 |
| Cocaine | 0.7 | 0.7 |
| Heroin | 0.1 | 0.1 |
| Opioids | nc | 1.1 |

**nc** = not comparable due to methodological changes.

**Source:** Substance Abuse and Mental Health Services Administration. (2019). *Key substance use and mental health indicators in the United States: Results from the 2018 National Survey on Drug Use and Health* (HHS Publication No. PEP19-5068, NSDUH Series H-54). Rockville, MD: Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration. Retrieved from https://www.samhsa.gov/data/

**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?

The use of alcohol, cocaine, and heroin remained relatively stable over this 10-year period. The use of tobacco products declined. Unfortunately, due to methodological changes in the survey, we are unable to compare the use of opioids from 2008 to 2018. However, given the current opioid crisis in the United States, we might expect these numbers to have increased. We will discuss this issue more in Chapter 10. The reported use of marijuana increased from 2008 to 2018. Given that many states have legalized the use of marijuana recreationally and medically, this is not unexpected.

## Multiple Drug Use

**polydrug use**
A person's regular use of more than one drug.

Individuals may use more than one drug, such as both alcohol and marijuana. This is known as multiple drug use (or **polydrug use**) and is extremely important because of the effects drug combinations have on the body. We explore those effects in detail in Chapter 4. For now, it is important for you to know that polydrug use is a critical health and social problem.

Using multiple substances on one occasion is not uncommon. For example, according to the 2018 NSDUH data, 6.4% of people who used alcohol in the past month also used marijuana on an occasion within 2 hours of their alcohol use.

**CONTEMPORARY ISSUE BOX 1.3**

## Nonmedical Use of Prescribed Drugs

The United States has seen an alarming increase in the nonmedical use of prescribed drugs. Painkillers such as OxyContin that became available relatively recently have been identified as a major source of the increased misuse rates, but many other drugs meant to be used as medical treatments to alleviate physical or psychological suffering are abused too. Another example especially prevalent on college campuses is the nonmedical use of prescription stimulant medications.

Two factors that may contribute to the increased misuse of medications are "doctor shopping" to get multiple prescriptions to treat a single physical or psychological ailment and the advertisement of prescription drugs over the Internet. Sales of drugs over the Internet are difficult for officials to track.

The misuse of prescription drugs is associated with the same kinds of physical, psychological, and social problems that come with the harmful use of any other drug. Therefore, it is important to find ways to prevent or reduce such misuse. One way is for the federal government to provide resources to the individual states to develop computerized drug-prescription monitoring systems (which monitor who writes the prescriptions and who gets them). Such systems may help to address the doctor-shopping problem. Can you think of other solutions to the misuse of prescription drugs?

This pattern of use was most prevalent among 12- to 17-year-olds and 18- to 25-year-olds compared to older age respondents. The respondents who reported "binge" drinking (five or more drinks at the same time or within a few hours of each other) in the past month were considerably more likely to report concurrent alcohol–illicit drug use than were the respondents who did not binge drink (drank alcohol but did not meet the criterion for "binge" drinking [32% vs. 20%]).

*"I think I did every drug known to mankind, smoked crack, boozed, dropped acid, you name it."*

Kid Rock

In its extreme, multiple drug use can include taking drugs with different or opposite physical effects in sequence on the same occasion. In such cases, the motive for use seems to be change, positive or otherwise, from one drug experience to another. An instance of extreme polydrug use, excerpted from Goldman (1971) and cited in Mendelson and Mello (1985, pp. 200–201), illustrates how people may use one type of drug after another, without apparent rhyme or reason. The example involves the famous comedian Lenny Bruce, who died in 1966, at age 40, and an associate of his:

> The night before, they ended a very successful three-week run in Chicago by traveling to the Cloisters (in New York City) and visiting the home of a show-biz druggist—a house so closely associated with drugs that show people call it the "shooting gallery." Terry smoked a couple of joints, dropped two blue tabs of mescaline, and skin-popped some Dilaudid; at the airport bar he also downed two double Scotches. Lenny did his usual number: 12, 1/16-**grain** Dilaudid pills counted out of a big brown bottle, dissolved in a 1-cubic centimeter (cc) ampoule of Methedrine, and heated in a blackened old spoon. The resulting soup was drawn into a disposable needle and then whammed into mainline (intravenously) until you feel like you're living inside an igloo. Lenny also was into mescaline that evening: Not just Terry's two little old-maidish tabs, but a whole fistful, chewed up in his mouth and then washed down with a chocolate Yoo-Hoo.

**grain**
As a measure, a unit of weight equal to 0.0648 gram.

## International Comparisons of Drug Use

The national surveys on drug use that the United States conducts provide extremely useful information. It would be valuable if similar data were available annually from other countries so that comparisons would be possible. Unfortunately, population surveys of both alcohol and other drug use that different countries, including the United States,

typically have done have not been designed with consideration of how other countries have designed their surveys, so comparisons of findings across countries can be difficult. Fortunately, the WHO initiated the "Global Burden of Disease" project in 1990, which was designed to gather health-related information from individual countries worldwide that would help to estimate the status of health-related concerns and problems and related risk factors for disease. Such data help nations to formulate evidence-based public health programs and policies. To place this WHO initiative in some context, global burden of disease refers to mortality and disability from major diseases, injuries, and risk factors.

One such risk factor is alcohol and other drug use. A paper by Degenhardt et al. (2008) is a report of lifetime alcohol and other drug use in each of 17 countries. These countries had agreed to participate in the "World Mental Health Survey" study, which was part of the ongoing Global Burden of Disease initiative. Each of these countries agreed to conduct population surveys of (among other health-related information) lifetime alcohol and other drug use. The data were collected by personal interviews conducted from 2002 to 2003, and the interviews followed a standardized format across the participating countries. The geographic span covered is impressive, as seen by some of the participating countries: Belgium, China, Columbia, France, Germany, Italy, Japan, Lebanon, Mexico, the Netherlands, New Zealand, Nigeria, South Africa, Spain, Ukraine, and the United States. Across the 17 countries there were 54,069 respondents to questions about lifetime alcohol and other drug use.

The results show interesting similarities and differences across the countries. For example, the large majority (typically, mid-80% to mid-90% range, except for Italy at 73%) of respondents in the Americas, Europe, Japan, and New Zealand reported alcohol use, compared to much smaller percentages in the Middle East, Africa, and China (generally, 40% to 60% range). In addition, the United States and New Zealand showed the highest percentage of cannabis use at about 42%, but cannabis use was below 5% in Asian countries. The United States stood out by far with lifetime use of cocaine at 16%, whereas all other countries were below 5%.

## DRUGS AND CULTURE BOX 1.4

### The National Survey on Drug Use and Health and Subgroup Differences

You know from our discussion that the National Survey on Drug Use and Health data give us a great description of drug use among people living in the United States. At the same time, a general description of findings from national surveys does not tell us as much as it seems to. We must take into account the differences in use patterns according to characteristics—such as age, gender, and race—of the person and the person's environment—such as area of residence and local laws and policies regarding alcohol and drug use.

Demographic group differences in drug use reflect differences in complex historical or current factors common to certain groups of people or regions. Therefore, drug use differences could reflect biological, psychological, or social/environmental factors that distinguish one group from other groups or from the population as a whole. These factors are so complex that certain groups have been designated "special populations." This label emphasizes that, to understand a particular group's drug use, we need to understand their unique history and current circumstances. Groups that today are considered special populations by experts who study drug use include women (because traditionally women have received far less attention from alcohol and other drug researchers than have men), Native Americans, African Americans, Hispanics, the homeless, and LGBTQ+ people.

The drug chapters in this text incorporate cultural and regional differences with features such as a historical account of the drug or drug class in question, and with attention to special cultural differences in use of the drug.

Given the importance of subgroup differences within a total survey sample, how might you adjust the sampling in a national survey to get a more accurate look at a subgroup that is of particular interest to you?

Several demographic variable correlates of use were similar to what we saw in the 2018 NSDUH survey. For example, across all countries, a higher proportion of males used all drugs compared to females. In addition, younger adults were more likely to have used all drugs compared to older adults.

Although the data on lifetime use of alcohol and other drugs provided by Degenhardt et al. (2008) are limited, they do provide a systematic look at how different countries compare. Cross-national data can be a valuable vehicle to understanding how cultural, legal, psychological, and biological factors affect alcohol and other drug use. We hope the material we present in the rest of this book begins to help you to do that as well.

*"No animal ever invented anything as bad as drunkenness or as good as drink."*

Lord Chesterton

## Negative Consequences of Alcohol and Drug Use

Describing alcohol and drug use returns us to the question of the consequences of such use. People may experience both positive and negative consequences from their use of drugs. Definitions of drug use are concerned with the negative effects. One way to look at the negative consequences of alcohol and drug use for society is to conduct "cost-of-illness" studies. The purpose of these studies is to quantify in dollars what society "pays" for its members incurring specific illnesses. It is important to add that focusing on economic factors does not mean that no psychological costs are associated with illness. However, psychological consequences are not easily quantified and thus are much more difficult to analyze.

Two major "illness" distinctions that have been studied in detail are alcohol misuse and other drug use. In such research, "drug abuse" concerns the use of illegal drugs and the nonprescription use of drugs typically used for therapeutic purposes. Nicotine use has not been included. (This is not to understate the costs of nicotine use to U.S. society. The costs are substantial and are reviewed in Chapter 7.)

The U.S. National Institute on Drug Abuse website (drugabuse.gov, accessed November 18, 2020) provided estimated economic costs of alcohol misuse and other drug use to U.S. society. The estimated cost of alcohol misuse was about $249 billion, and the estimated cost of tobacco and illicit drugs was $493 billion. The total: $742 billion.

The costs come from a wide range of sources, although the costs are not distributed in the same proportions for alcohol and drug use. The sources include illness, death, medical expenses, and crime. As you might expect, crime-related costs are especially significant for drug abuse.

Cost-of-illness studies give us a reasonable, well-rounded estimate of what society pays for its members' involvement with alcohol and other drugs. The multibillion-dollar cost estimates are staggering but ironically understate the impact. Some of the consequences of alcohol and drug use become clear when we think about what events make up the cost computations. For example, lifetimes of individuals will not be lived fully because the individuals were born with fetal alcohol syndrome (see Chapter 9). Hospital emergency room resources are used for overdoses of cocaine, heroin, and MDMA (see Chapters 6, 10, and 12, respectively). Then there is the suffering of a family who lost one of its young members as the result of a crime committed to obtain drugs. Maybe you have experienced what it is like to lose a friend or family member in one of the thousands of fatal alcohol-related traffic accidents that occur every year in the United States. It is important to step away from the statistics to look at these and other realities that make up the true costs of alcohol and drugs to society.

*"Unlike others, he (a heroin addict) could not find a vocation, a career, a meaningful, sustained activity around which he could wrap his life. Instead he relied on the addiction to provide a vocation around which he could build a reasonably full life and establish an identity."*

Psychologist Isidor Chein (quoted in Krogh, 1991, p. 133)

## REVIEW

1. Describe the process by which the federal government acquires data on alcohol and drug use.
2. Compare the concepts tolerance and withdrawal.

# 1.3 Defining Harmful Drug Use

**LEARNING OBJECTIVES**

**1-5** Describe negative consequences associated with alcohol and drug use

**1-6** Describe advantages and disadvantages of using the *DSM*-5 definitions for substance use disorder, addiction, psychological dependence, and craving

**1-7** Differentiate between tolerance and withdrawal

Discussing cost-of-illness research brings our focus back to harmful drug use, or use that is associated with detrimental consequences to the person using drugs or to others. Indeed, to reflect on harmful use, cost-of-illness studies have used terms like *alcohol abuse* and *drug abuse*. Yet, in the beginning of this chapter, we mentioned the widely different meanings of these terms. This is a problem, because it hampers communication about drug use. The lack of standard definitions also tends to slow the advance of knowledge. If there is disagreement about what it is we are trying to gain knowledge about, you can see why scientific advances might be impeded. As you read this text, keep in mind that the terminology to describe use and those affected has changed. While the term *drug abuse* is still used by some and found on older documents and publications, know that the field is beginning to use alternative terms that are less stigmatizing.

## Use of the *DSM*

In the United States and other countries, providers of care for physical and mental illness have handled problems of definition by developing systems of definitions of illnesses, or *diagnostic systems*. A diagnosis typically is based on a cluster of symptoms that is given a name (the diagnosis). The advantage is that, say, if two physicians are communicating about pneumonia in a patient and they are following the same diagnostic system, then each knows exactly what the referent of the other is when the term *pneumonia* is used. That is, a specific cluster of symptoms is being referred to. It also is possible to create diagnostic systems of mental illnesses. In the United States, the primary organization responsible for doing that has been the American Psychiatric Association (APA). Since the early 1950s, the APA has published formal diagnostic systems of different mental illnesses or disorders in its *Diagnostic and Statistical Manual of Mental Disorders* (*DSM*). The most recent version (systems are revised because of ongoing research that provides new information about different disorders) appeared in May 2013 and is called *DSM*-5. The *DSM*-5 has a section called "substance-related" (alcohol- or other drug-related) disorders, which includes definitions of "substance use disorders."


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Jan Sochor/Alamy stock photo

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The sometimes tragic consequences of drug use have drawn national attention and response.

Table 1.2 lists the criteria for defining substance use disorder according to *DSM*-5 (American Psychiatric Association, 2013). These criteria are applied consistently regardless of the drug being used.

Criteria 1 through 9 focus on what traditionally has been called "compulsive drug use," or drug **addiction**. In essence, the individual's life centers on drug use and its procurement to the point of reduced attention to or outright neglect of other aspects of life. Similarly, drug use persists despite the risk of incurring serious consequences by doing so. Individuals with addictions also have an inability to stop or to reduce drug use for any length of time, if that is the intention. This phenomenon has been called "loss of control." The last two criteria introduce two terms: *tolerance* and *withdrawal*. We have more to say about them later in this chapter and in other chapters in this text. At least two of the 11 criteria listed in Table 1.2 must be met for the diagnosis of substance use disorder.

**addiction**
In reference to drugs, overwhelming involvement with using a drug, getting an adequate supply of it, and having a strong tendency to resume use of it after stopping for a period.

Although *DSM*-5 no longer includes substance dependence as a separate substance use disorder, the term *drug dependence* still is, and likely will continue to be, widely used. In this regard, we would like to define a term that you probably have heard or read because it is so commonly used: **psychological dependence**.

**psychological dependence**
The emotional state of craving a drug either for its positive effect or to avoid negative effects associated with its abuse.

Like many terms used in communicating about drugs and their use, *psychological dependence* has had different meanings. So the Rinaldi et al. (1988) consensus

## CONTEMPORARY ISSUE BOX 1.5

### Drugs, Criminal Activity, and Aggression

We have noted how costs associated with criminal behavior are especially significant for harmful drug use. The association of alcohol, drugs, and crime is one we happen to see and hear about continually in the popular media.

The problem of drugs, alcohol, and crime is an old, much-studied one. It should be clear that we are dealing with associations, or correlations, and not causes. For example, the pharmacological effects of cocaine are not known to *cause* a person to commit murder. Yet the high positive correlation between drugs and crime remains a fact: As drug use in a community increases, the occurrence of certain kinds of crimes tends to increase as well, depending on the drug.

Much of the earlier and still more recent research on drugs and crime has concerned heroin. Most crimes committed by people with a heroin addiction are either violations of the drug laws or ways to get money to buy more heroin. Therefore, the most commonly committed crimes are burglary, larceny, assault, and other street crimes. These crimes are indeed serious and sometimes result in injury or death to the victims. The direct intent of the crime is not to harm the victim, however, but to get money. This same motive probably applies to much of the violence related to cocaine, and to conflicts over money among cocaine dealers and their customers.

The use of some drugs has no relationship to criminal activity, and there may even be a negative association between use of the drug and crime. Use of hallucinogens, for example, is not associated with crime, and marijuana seems to fall in the same category. The evidence is mixed for barbiturates and tranquilizers: Some studies show no relationship, but others suggest that the relationship between use and crime is the same for barbiturates and alcohol.

Alcohol intoxication has a high correlation with criminal activity. Because alcohol is legal and very available, little violence is connected with violating drug laws or stealing to obtain alcohol. Most of the crimes associated with alcohol intoxication are assaultive, which means that they are committed with the intent to harm the victim. Alcohol is correlated with other types of crime as well, such as aggravated assault, homicides, property offenses, sexual offenses, and check fraud.

Therefore, one point is clear: Some types of drug use are associated with criminal activity. But what is the explanation? Pharmacology figures complexly in the answer but seems to be only one of many factors. Others include the person's expectations about the drug's effects, the setting where the drug is being used, and the person's personality characteristics.

The drug–crime problem is a good example of how a society and its individual members are affected by drug use. It also illustrates that drug use and its effects on people are influenced by many factors working together.

**craving**
A term that has been variously defined in reference to drug use; typically a strong or intense desire to use a drug.

definition is useful again. In the Rinaldi study, psychological dependence was defined as "the emotional state of **craving** a drug either for its positive effect or to avoid negative effects associated with its abuse" (p. 557). Interestingly, note that "craving" (for a substance) is one of the 11 criteria for a diagnosis of substance use disorder according to *DSM*-5.

We would like to say a few more words about the *DSM*-5 definitions before concluding our discussion of them. The *DSM*-5 criteria, which are based on the most current knowledge about substance use disorders that comes from research and clinical practice, ease problems in communication because they are clearly written, descriptive criteria. This does not mean that the criteria are perfect; indeed, the expectation is that the criteria will continue to evolve as new knowledge accrues. In this regard, having a generally accepted definition of a phenomenon makes it far more likely that we will acquire new knowledge about substance use and will eventually have a good understanding of it. Another point you may have noticed is that

**TABLE 1.2 *DSM*-5 Diagnostic Criteria for Current Substance Use Disorder**

Substance use disorder is a problematic pattern of substance use leading to clinically significant impairment or distress, as manifested by at least two of the following, occurring within a 12-month period:

1. The substance is often taken in larger amounts or over a longer period than was intended;
2. Users have a persistent desire or unsuccessful efforts to cut down or control use of the substance;
3. A great deal of time is spent in activities necessary to obtain the substance (e.g., visiting multiple doctors or driving long distances), to use the substance (e.g., chain-smoking), or to recover from its effects;
4. Users have cravings, or strong desires, to use the substance;
5. Recurrent use of the substance results in a failure to fulfill major role obligations at work, school, or home;
6. Use of the substance is continued despite having persistent or recurrent social or interpersonal problems caused, or exacerbated, by the substance;
7. Use of the substance is recurrent so that important social, occupational, or recreational activities are given up or reduced;
8. Use of the substance is recurrent in situations in which it is physically hazardous;
9. Use of the substance is continued despite knowledge of having a persistent or recurrent physical or psychological problem that is likely to have been caused or exacerbated by the substance; and
10. Tolerance has developed, as defined by either of the following:
    (a) Need for markedly increased amounts of the substance to achieve intoxication or desired effect, or
    (b) Markedly diminished effect with continued use of the same amount of the substance.
11. Withdrawal is experienced, as manifested by either of the following:
    (a) The characteristic withdrawal syndrome for the substance, or
    (b) The same (or closely related) substance is taken to relieve or avoid withdrawal symptoms.

Specify current severity: Mild, presence of two to three symptoms; Moderate, presence of four to five symptoms; Severe, presence of six or more symptoms.

**Source:** From the *Diagnostic and Statistical Manual of Mental Disorders*, Fifth Edition. Copyright 2013. American Psychiatric Association.

the *DSM*-5 provides no definition of drug use. In *DSM*-5 terms, *drug use* would be any consumption of alcohol or other drugs and related events that do not meet the criteria for "use disorder."

Although we may never get away entirely from the influence of societal values on definitions of substance use disorders, the creators of *DSM*-5 have considerably advanced our ability to communicate about harmful drug use. Because of this, *DSM*-5 is ubiquitous in alcohol and other drug treatment and research settings in the United States. Accordingly, we follow the *DSM*-5 definitions where relevant in the remaining chapters of this text.

## Drug Tolerance, Withdrawal, and Drug-Taking Behavior

**tolerance**
Generally, increased amounts of a drug needed to achieve intoxication, or a diminished drug effect with continued use of the same amount of a drug.

The *DSM*-5 criteria for substance use disorder include the term drug **tolerance**, which was defined in parts (a) and (b) of criterion 10 in Table 1.2. Another new

**withdrawal**
A definable illness that occurs with a cessation or decrease in use of a drug.

**syndrome**
In medicine, a number of symptoms that occur together and characterize a specific illness or disease.

term is **withdrawal** symptoms. Withdrawal is a definable illness that occurs with a cessation or decrease in drug use after the body has adjusted to the presence of a drug to such a degree that it cannot function without the drug. Not all drugs are associated with an identifiable withdrawal **syndrome** (also called *abstinence syndrome*). For any drug associated with withdrawal symptoms, the severity of those symptoms may change with the characteristics of the individuals and their history of use of that drug. Furthermore, psychological symptoms, such as anxiety, depression, and craving for drugs, are often part of withdrawal syndromes. These psychological symptoms strongly influence whether the individual can stop using drugs for any length of time.

We draw your attention to drug tolerance and withdrawal in this introductory chapter because they are central topics in psychopharmacology. Tolerance and withdrawal are addressed as part of any evaluation or study of a drug. As a result, we discuss these concepts in far more detail in later chapters. It is critical to mention now, however, that tolerance and withdrawal affect drug-use patterns. For example, if tolerance to a drug develops, the individual must consume increasing amounts of it to achieve a desired drug effect. Such a trend in use may affect how much time the person devotes each day to acquiring the drug and to using it. Furthermore, with greater quantities and frequencies of drug use, the person becomes more susceptible to experiencing various negative physical, social, or legal consequences.

Drug withdrawal also makes a person more likely to continue or resume the use of a drug after a period of abstaining. Many studies have shown that relief from withdrawal is a powerful motivator of drug use. In this regard, drug withdrawal may begin when the level of drug in the blood drops. If the person takes more of the drug at this point, the withdrawal symptoms are relieved. Here the motivating force is the "turning off" of unpleasant withdrawal symptoms, which works to perpetuate a powerful cycle of drug use–drug withdrawal–drug use. Withdrawal is also associated with a higher likelihood of resuming drug use following a period of abstinence because of learned reactions to cues in the environment. We describe how this might happen in Chapter 5.

We want to emphasize here that the influences of tolerance and withdrawal are at the heart of psychopharmacology—the incentives or motivators that drive human (and other animal) drug use. Chapter 5, on the principles and methods of psychopharmacology, addresses this topic in detail.

You may have observed from this discussion of drug tolerance, withdrawal, and drug-taking behavior that they may be instrumental in the development of what we defined earlier as drug addiction. Another factor that may be critical to the development of addictive drug-use patterns is "sensitization" (Robinson & Berridge, 2003). The sensitization hypothesis is that one result of repeated use of a drug in interaction with environmental factors is changes in the brain neural pathways (Chapter 3) that may heighten (sensitize) the reward value of that drug. This means that the drug's effects become more appealing to an individual, and therefore procurement of the drug may assume increasing control over the individual's behavior. Critically, the brain changes resulting from repeated drug use may be permanent, which is one reason why drug addiction may be such an intractable problem for many people, as we show later in this text.

This discussion shows that using a drug for a long time alters the patterns of use for that drug. Long-term use also relates to the *DSM*-5 criteria. Tolerance, withdrawal, and sensitization may result not only in changes in drug use and preoccupation but also in the likelihood that the person's life and the lives of those around that person are affected by the drug in a snowballing effect, with one consequence building on another. The outcome can reflect some of the criteria included in the *DSM*-5 definition of substance use disorder.

Astrid Stawiarz/Stringer/Getty Images Entertainment/Getty Images

David McNew/POOL New/REUTERS/Alamy stock photo

Many celebrities are frank about their struggles with alcohol and the problems it creates for their careers.

Of course, discussion of the effects of tolerance and dependence on motivations for drug use addresses only a small minority of the different reasons that people use drugs, which takes us back to the 10 systems that influence or are influenced by drug use that we discussed at the beginning of this chapter. In this regard, people give numerous reasons for "why" they use different drugs, and different drugs may be most strongly associated with different reasons. At the same time, multiple drugs may be used for the same reasons. The same drug also may be used for different reasons in different times and places. This suggests that reasons for use are not limited to a drug's pharmacological effects but relate to a variety of other variables as well. For example, Boys et al. (2001) conducted an interview study of 364 men and women aged 16 to 22 in the United Kingdom who had used two or more substances in the last 90 days. The study showed that use of substances such as alcohol, marijuana, cocaine, ecstasy, and LSD was associated with multiple "purposes" or functions, which referred to what the participants expected to gain by using the drugs. Each substance was associated with eight to nine different functions (such as feeling better when depressed, getting intoxicated, enhancing sex, helping to relax, helping to sleep, and enhancing another activity, such as listening to music), and there was considerable overlap in the functions cited for each drug, despite the drugs' considerable differences in pharmacology. The upshot of findings such as these is that they highlight the complexity in motivations for drug use among humans, and we will spend considerable space elaborating upon this basic point in subsequent chapters of this text. The complexity of human alcohol and drug use is also represented in the models of the causes of the substance use disorders that are summarized in Chapter 15.

*"If drinking is interfering with your work, you're probably a heavy drinker. If your work is interfering with your drinking, you're probably an alcoholic."*

Anonymous

*"No one is immune from addiction; it afflicts people of all ages, races, classes, and professions."*

Patrick J. Kennedy

*"In the 1960s, people took acid to make the world weird. Now the world is weird, and people take Prozac to make it normal."*

Author unknown

## REVIEW

1. Identify three criteria the *DSM*-5 uses to diagnose substance use disorder.
2. Explain how the concepts of addiction, drug dependence, psychological dependence, tolerance, and withdrawal are included in the *DSM*-5 criteria for current substance use disorder.

## 1.4 Overview of the Text

You now are ready for a brief overview of the rest of this text, which is divided into three main sections. The first section, which includes Chapters 1 through 5, gives you fundamental information on psychopharmacology and the history of laws and policy regarding drug use in the United States and other countries. You saw that this first chapter introduced you to important definitions of concepts and the epidemiology of drug use. Chapter 2 places human drug use in a historical context by giving you a better appreciation of today's use patterns and the social and political contexts in which they occur. Chapter 3 is a basic discussion of the nervous system and how drugs affect it. This knowledge is essential to understanding psychotropic drugs because, no matter what drug effect or experience you consider, some change in the nervous system is inevitable. Chapter 4 concerns pharmacology, as we review the methods scientists use to study drugs and their effects. Chapter 5 focuses on principles and methods of psychopharmacology, which is the central topic of this text. Chapters 4 and 5 will help you to understand how we have learned much of what we know about drugs.

Chapters 6 through 14 constitute the second section of the text and concern individual drugs and drug classes. Our drug topics include cocaine and the amphetamines, nicotine, caffeine, alcohol, opiates, marijuana, hallucinogens, psychiatric medications, and other prescription or **over-the-counter drugs**. These chapters follow a broad outline of historical overview and epidemiology; mechanisms of drug action; medical and psychotherapeutic uses; and physiological, psychological, and social or environmental effects. Your study of each of the drug chapters will give you a good understanding of that drug (or drug class) and its use.

**over-the-counter drugs**
Drugs that can be obtained legally without a medical prescription.

The last section of the text consists of two chapters on topics geared to the general public that are often discussed in media. Chapter 15 is a review of the treatment of substance use disorders, and Chapter 16 covers the prevention of substance use disorders before they occur. Prevention is a fitting topic on which to end this text because that is what all the research, politics, and discussion are about—reaching the goal of living in a society free of substance use disorders.

## 1.5 Evaluating Websites

### LEARNING OBJECTIVES

**1-8** Explain the criteria used to evaluate websites

We will close this chapter with a discussion of a topic that is relevant to your research on drugs and therefore central to this text: evaluating online sources. College students often view "doing research" as synonymous with "searching the web," and there are good reasons for that. An internet search will yield information on the topics we cover.

Online information is wide-ranging in scope and usually instantly accessed. Information on drugs is a good example. Search for the word *drugs* on Google, and you have access to over 1,000,000,000 (as of November 2020) potentially useful web pages! *Potential* is a key word here, because web pages are not monitored for accuracy or currency or even for whether they or links related to them still exist. Therefore, in seeking nonfictional information, the web user must determine whether the data under review meet standards that would stand up in the research community.

**TABLE 1.3 Five Criteria for Evaluating Web Pages**

1. Accuracy of web documents
   - Who wrote the page, and can you contact him or her?
   - What is the purpose of the document, and why was it produced?
   - Is the person qualified to write this document?
   - Make sure the author provides an e-mail or a contact address and/or phone number.
   - Know the distinction between author and web master.
2. Authority of web documents
   - What credentials are listed for the author(s)?
   - Who published the document, and is the publisher separate from the web master?
   - Check the domain of the document: What institution publishes this document?
   - Does the publisher list its qualifications?
3. Objectivity of web documents
   - What goals and objectives does this page meet?
   - How detailed is the information?
   - What opinions (if any) are expressed by the author?
   - Determine whether the page is a mask for advertising; if so, information might be biased.
   - View any web page as you would an infomercial on television. Ask why was this written, and for whom.
4. Currency of web documents
   - When was it produced?
   - When was it updated?
   - How up-to-date are the links (if any)?
   - How many dead links are on the page?
   - Are the links current or updated regularly?
   - Is the information on the page outdated?
5. Coverage of web documents
   - Are the links (if any) evaluated, and do they complement the document's theme?
   - Is the site all images or a balance of text and images?
   - Is the presented information cited correctly?
   - If special software is required to view the information, how much are you missing if you do not have the software?
   - Is it free, or is there a fee to obtain the information?
   - Is there an option for text only, or frames, or a suggested browser for better viewing?

**Source:** J. Kapoun. (1998). Teaching undergrads web evaluation: A guide for library instruction. *College and Research Library News, 59*, 522–523. Reprinted with permission from the American Library Association.

Fortunately, a number of educators have thought a lot about evaluating web pages. Kapoun (1998) provided a checklist of five criteria to help you to evaluate a web page: accuracy, authority, objectivity, currency, and coverage. They are summarized for you in Table 1.3. Even though this was published in 1998, this checklist remains highly relevant and applicable. We encourage you to learn these criteria until they are second nature to you, if you have not done so already. The effort will be valuable to you in this course and in any other context that requires you to have accurate and current information. A study done by the Stanford History of Education Group (2016) showed that over 7,000 students at multiple levels (middle school, high school, and college) in 12 U.S. states found it difficult to discriminate between fact and fiction in researching information on the web. As part of this study, undergraduate students at six different colleges or universities were included in the sample. The colleges ranged from those considered the elite in the United States to large state universities that accept the majority of students who apply for admission.

## REVIEW

1. Create a table describing the five criteria to help you evaluate websites.
2. Google "drug use" to locate a website describing drug use in the state in which you reside. Then apply the five criteria for evaluating web pages to this website to determine if this is a reliable and accurate source of information.

# Summary

- Psychopharmacology—the scientific study of the effects of drugs on behavior—is the subject of this chapter.
- Drugs may be classified in different ways; six of the major ones are reviewed in this chapter.
- The experience that humans have from taking drugs is influenced by three sets of factors: pharmacological factors, characteristics of the person who uses drugs, and the setting in which the drug is used.
- National survey data show that people in the United States use a variety of drugs. Alcohol, tobacco, and marijuana consistently have appeared as the most commonly tried and currently used psychoactive drugs.
- Some individuals use more than one drug regularly and may use different drugs together on the same occasion.
- The U.S. National Institute on Drug Abuse estimates that the annual cost of alcohol and illicit drug use to the United States is more than $742 billion.
- The formal definition of substance use disorders in the United States is given in the fifth edition of the American Psychiatric Association's *Diagnostic and Statistical Manual*.
- The *DSM*-5 definition includes drug tolerance and withdrawal, which may powerfully affect drug-use patterns.
- This book covers basic psychopharmacology concepts, details on major drugs and drug classes and those who use them, and discussions of prevention and treatment for a better understanding of drugs and human behavior.

# *Answers to "What Do You Think?"*

1. Because the effects of drugs are both predictable and obvious, it is relatively easy to define harmful drug use.
   **F** *Drugs have a variety of effects on people, and the way drugs are perceived may vary in different cultures and subcultures. As a result, it has proved difficult to create a definition of drug abuse that is generally agreeable.*
2. A drug's street name sometimes describes the actual effects of that drug.
   **T** *Street names, which come from drug subcultures and the street drug market, sometimes do reflect actual drug effects.*
3. A person's reaction to a drug depends mostly on the biological action of the drug in the body.
   **F** *Biology is important, but psychological and social or environmental factors must also be included to explain the effects of psychoactive drugs on humans.*
4. Because drug use is complicated, it is impossible to estimate patterns of drug use for the population of a whole country.
   **F** *Drug use is complicated, but sophisticated sampling methods and computers have made it possible to select large numbers of people and survey them to derive precise estimates of drug use in a given population.*
5. From 2008 to 2018, the use of alcohol, cocaine, and heroin increased in the United States.
   **F** *From 2008 to 2018, the use of alcohol, cocaine, and heroin use remained relatively unchanged in the United States. During this time, however, the use of marijuana increased.*
6. The highest rates of alcohol and other drug use are found among 18- to 25-year-olds.
   **T** *People in this age group, called "young adults," have the highest rates of alcohol and other drug use in the United States.*

7. A person's use of more than one drug at a time is of little concern because it happens so infrequently.
   **F** *Although multiple drug use is not as frequent as use of a single substance, it is hardly rare, especially among young people. It is of great concern because combining drugs sometimes has unpredictable effects that may be life-threatening.*
8. Estimated economic costs associated with alcohol and drug use include illness, death, medical expenses, and crime.
   **T** *When governments estimate the economic cost associated with alcohol and drug use, they include costs of illness, death, medical expenses, and crime.*
9. The chemical action of alcohol and other drugs causes violence and crime.
   **F** *The use of alcohol and other, but not all other, drugs is associated with violence and crime but does not directly cause such behavior.*
10. Modern researchers rely on definitions of alcohol and other drug use that are free of social or cultural biases.
    **F** *We are improving our ability to rid our definitions of biases, but due to the influence of social and cultural factors on alcohol and other drug use and the perception of such use, it is unlikely that we will ever arrive at bias-free definitions.*
11. A diagnosis of substance use disorder is made when a person has become either physically or psychologically dependent on a drug.
    **F** *Tolerance and physical dependence are two of 11 criteria in DSM-5 that must be considered in making a diagnosis of substance use disorder. In DSM-5, psychological dependence "is not among the criteria for a substance use disorder."*
12. Definitions of addiction emphasize overwhelming involvement with a drug.
    **T** *Addiction is identified when a person has overwhelming involvement with using a drug. The person's life centers on getting an adequate supply of the drug, which takes priority over most or all other parts of life, such as school, job, family, and friends.*
13. The continued use of any drug will eventually lead to tolerance of and physical dependence on that drug.
    **F** *The continued use of many, but not all, drugs may lead to tolerance of and physical dependence on that drug.*

## Key Terms

**addiction**
**craving**
**drug**
**drug abuse**
**drug dosage**
**drug effects**
**grain**
**over-the-counter drugs**
**pharmacology**
**placebo**
**polydrug use**
**prevalence**
**psychoactive**
**psychological dependence**
**psychological set**
**psychology**
**psychopharmacology**
**route of drug administration**
**syndrome**
**tolerance**
**withdrawal**

## Essays/Thought Questions

1. Even though marijuana is still defined by the National Survey on Drug Use and Health as an illicit drug, the percentage of individuals reporting the use of marijuana has increased over the last decade. Considering that drug use has both positive and negative consequences, what do you think of this trend? Should efforts be made to further legalize the recreational or medicinal use of marijuana? Why or why not?

2. Many factors influence the drug experience, including characteristics of the person who uses the drug such as their gender, age, and personality. Personality variables include one's knowledge, expectations, and thoughts about a drug. How do you think these factors influence an individual's drug experience? Can you create an example of how someone's knowledge and expectations of how they will experience alcohol can affect their experience of using alcohol?
3. What are some of the advantages and disadvantages of having a formal, standard way to define a construct like "substance use disorder," such as *DSM*-5 does? Should cultural differences in substance use and definitions of *abuse* (or harmful drug use) matter in defining substance use disorder? Why or why not? If you believe that cultural factors should be incorporated in definitions of substance use disorder, how would you do it?

## Suggested Readings

Kapoun, J. (1998). Teaching undergrads web evaluation: A guide for library instruction. *College and Research Library News, 59*, 522–523.

Weil, A., & Rosen, W. (2004). *From chocolate to morphine* (rev. ed.). Houghton Mifflin Co.

## Web Resources

Go to MindTap® for digital study tools and resources that complement this text and help you be more successful in your course and career. There's an interactive eBook, skill-building activities, quizzes to help you prepare for tests, apps, and more—all in one place. If your instructor *didn't* assign MindTap, you can find out more about it at Cengage.com.

## LEARNING OBJECTIVES

After studying this chapter, you will be able to…

**2-1** Describe the historical use of psychoactive drugs in African, Asian, European, and American cultures

**2-2** Explain how the development and use of drugs for medical and nonmedical purposes are intertwined

**2-3** Evaluate the history of drug laws in the United States in terms of their effect on rates of drug use

**2-4** Evaluate the effects of the Eighteenth Amendment to the Constitution, which prohibited the production, sale, transportation, and importation of alcohol

**2-5** Describe the Controlled Substances Act and the criteria by which a drug is scheduled

**2-6** Discuss the current drug laws in the United States and factors contributing to continued legislative action on possession and use

CHAPTER

# 2

# Drug Use Yesterday and Today



## What Do You Think? True or False?

Answers are given at the end of the chapter.

___ 1. The first recorded use of cannabis was in the early 1800s.

___ 2. Grape wine was the first alcoholic beverage to be used.

___ 3. The Opium Wars between China and Great Britain in the mid-1800s occurred in large part because Britain was unwilling to curtail its trade of opium into China.

___ 4. Khat, a mild stimulant consumed by chewing, is used by Sufi men for religious purposes.

___ 5. Many of the drugs that are now illegal in the United States were widely used to treat a broad spectrum of maladies in the 1800s and early 1900s.

___ 6. The first notable drug law in the United States—the 1875 San Francisco ordinance—banned the smoking of opium.

___ 7. The Pure Food and Drug Act of 1906 had little impact on individuals who were dependent on drugs.

___ 8. The Harrison Narcotics Tax Act of 1914 sharply curtailed the prevalence of heroin use in the United States.

___ 9. The Eighteenth Amendment, which prohibited the production, sale, transportation, and importing of alcohol, failed because it did not have a substantial effect on drinking in the United States.

___10. Several states in the United States have decriminalized marijuana possession and use.

___11. The most successful aspect of the war on drugs has been the interception of drugs.

___12. Hair testing is a reliable method of testing for drug use.

Humans have used drugs for thousands of years, for religious purposes, recreational use, altering states of consciousness, and obtaining relief from pain or distress. In this chapter, we have three objectives. The first is to provide a historical overview of drug use, from prehistory to current times. More detailed histories of specific psychoactive substances appear in their respective chapters. This general overview is useful as a picture of the evolution of drug use and as a background for considering the patterns of today's drug use described in Chapter 1. You will notice in some cases that history has repeated itself, and we hope understanding such patterns will help us learn from past experiences. A second goal of this chapter is to discuss some parallels between developments in medicine and the nonmedical use of drugs. The third goal is to review the restrictions that have been placed on drug use and summarize current drug laws.

# 2.1 Historical Overview

## LEARNING OBJECTIVES

**2-1** Describe the historical use of psychoactive drugs in African, Asian, European, and American cultures

Indications of psychoactive substance use date back to the beginnings of recorded history and revolve around the use of alcohol and plants with psychoactive properties. Throughout history, cultures have been characterized by their diversity and similarity in patterns of drug use. Investigations by archaeologists suggest that beer and huckleberry wine were used as early as 6400 B.C. (Mellaart, 1967). Alcohol probably was discovered following accidental **fermentation**. Also, various plants were used for the physical and psychological changes they produced, usually in religious or medicinal contexts. As an example, what probably was the **opium poppy** was used in Asia Minor about 5000 B.C. as a "joy plant" (Blum, 1984; O'Brien & Cohen, 1984). The use of ***Cannabis sativa*** (brewed as a tea) dates to around 2700 B.C. in China. Emperor Shen Nung recommended it to his citizens for the treatment of gout and absentmindedness, among a host of other ailments. People in the Stone Age are thought to have been familiar with opium, **hashish**, and cocaine, and to have used these drugs to produce altered states of consciousness (typically in a religious context) or to prepare themselves for battle (Government Printing Office [GPO], 1972). In the horn of Africa, khat chewing has a long history. Its leaves were viewed as sacred by ancient Egyptians, and Sufi religious men chewed on khat while meditating on the Koran. Archaeological studies in Central and South America indicate coca use dates to as early as 1000 B.C. Under Incan rule, coca was used for several purposes, including ritual, social, and physiological uses.

Throughout history, contact between distant cultures has often been forced by trade agreements or by wars or other hostilities. For example, the Crusades and the expeditions of Marco Polo exposed Europeans to the drugs, particularly opium and hashish, that were popular in Asian cultures. Other contacts were opened later through the travels of European explorers (particularly from England, France, Portugal, and Spain) to the Americas. The predominant psychoactive substances brought to Europe from the Americas were cocaine (from South America), various hallucinogens (from Central America), and tobacco (from North America). According to O'Brien and Cohen (1984), the exchange was not one-sided. The trees that

**fermentation**
A combustive process in which yeasts interact with the sugars in plants such as grapes, grains, and fruits to produce an enzyme that converts the sugar into alcohol.

**opium poppy**
A plant cultivated for centuries, primarily in Eurasia, for opium—a narcotic that acts as a central nervous system depressant.

***Cannabis sativa***
The Indian hemp plant popularly known as marijuana; its resin, flowering tops, leaves, and stem contain the plant's psychoactive substances.

**hashish**
A drug produced from the resin that covers the flowers of the cannabis hemp plant. The resin generally contains a greater concentration of the drug's psychoactive properties.

produced the caffeine-containing coffee bean were native to Ethiopia. The coffee beverage derived from this bean was brought to Europe in the 1600s, and European seagoers were responsible for the eventual spread of coffee bean cultivation to the current world-leading supplier of coffee, South America. In addition, Europe introduced distilled alcoholic beverages to the Americas and cannabis to Chile in 1545 (O'Brien & Cohen, 1984).

There were relatively few restrictions on drug availability or drug use prior to the beginning of the 20th century (an exception is Islamic law's edicts on alcohol consumption). Occasional efforts were made to decrease or eliminate certain substances, but these efforts tended to be short-lived or ineffective. For example, initial introductions of tobacco, coffee, and tea to Europe all met some resistance. Rodrigo de Jerez, a colleague of Columbus and the first European thought to smoke tobacco, was jailed in Spain because the authorities felt the devil had overtaken him (Whitaker, 1987). Also, at different times, efforts were made to ban the use of coffee and tea.

Cases are also known in which governments acted not to make drugs unavailable but rather to keep the drug trade open and flourishing. The best example was armed conflicts between China and Great Britain in the mid-19th century. These conflicts, because they dealt with British traders bringing opium into China, are now known as the Opium Wars. By the mid-1800s, millions of Chinese men had become dependent on opium. In fact, China appears to have had the highest national use of opium at that time. Most of the opium used in China was cultivated in India and brought to China by British traders. Chinese officials passed a variety of laws to control or eliminate opium imports, but none (including **prohibition**) had the desired effect of reducing opium use or the prevalence of dependence. Furthermore, the British were unwilling to curtail the trade of opium into China, in part for financial reasons and in part because they did not witness such a degree of dependence among those who used opium in England (where opium was widely used in medicine). Relations reached a crisis in 1839, when the Chinese government destroyed large shipments of opium being brought into China by British and American traders. Thus began the First Opium War between China and England. The British won the conflict and, as part of the 1842 Treaty of Nanking, received rights to the port of Hong Kong (rights that ended in 1997) as well as reimbursement for the shippers who lost their opium cargo. The opium trade continued until 1856, when the Second Opium War commenced. The war ended in 1858, and the Treaty of Tientsin mandated that China would continue to import opium but could impose heavy taxes. Not until the beginning of the 20th century was this trade reduced and eventually terminated, dovetailing with a growing international recognition of **narcotic** drug use.

**prohibition**
The legislative forbidding of the sale of a substance, as in the alcohol prohibition era in the United States, 1920–1933.

**narcotic**
A central nervous system depressant that contains sedative and pain-relieving compounds.

In the 20th century, few differences existed between Europe and North America in the types of drugs being used. What is of interest is that a large number of new or "rediscovered" drugs were first popularized in the United States and later became popular in other countries, making the United States something of a trendsetter in drug use.

## Drug Use in the United States

Native Americans used **peyote** and tobacco during spiritual experiences and for shamanic use. Before European colonization, fermented beverages were rather low in alcohol content and are believed to have been mainly used in ceremonial and religious practices. When Europeans arrived they introduced indigenous peoples to distilled spirits.

One of the most interesting times in this country in terms of drug use was the 19th century. Into the mid-1800s, few restrictions were placed on drugs. Drugs such as opium, **morphine**, marijuana, heroin (at the end of the century), and cocaine were

**peyote (pā -'ō -tē)**
A cactus plant, the top of which (a "button") is dried and ingested for its hallucinogenic properties.

**morphine**
A derivative of opium best known as a potent pain-relieving medication.

easy to obtain without prescription, often at grocery stores or through mail order. Opium, for example, was sold legally and at low prices; some opium poppies were grown in the United States (opium cultivation was not outlawed nationally until 1942). Morphine was commonly used, especially during and after the Civil War, and opium, morphine, and cocaine could be obtained in a variety of **patent medicines** readily available in stores. Examples were Godfrey's Cordial, Swaim's Panacea, Ayer's Sarsaparilla, and Mrs. Wilson's Soothing Syrup. Opium was frequently taken in liquid form in mixtures such as laudanum (which contained 1 grain of opium to 25 drops of alcohol), and one of its common uses was in calming and quieting crying babies!

**patent medicines**
Products that were sold, most often in the 19th century, as medicines that would cure a host of illnesses and diseases.

Most narcotic use throughout this period was legal—whether through over-the-counter "tonics" or prescription. Physicians recommended these substances widely and referred to opium and morphine as "God's own medicine," or "G.O.M." (Morgan, 1981). Indeed these were effective calming agents. Opium was recommended for a nearly endless list of ailments. A short list includes dysentery, pain, swelling, delirium tremens (associated with withdrawal from alcohol), headache, and mental illness in certain cases. Morphine, the active agent in the opium poppy, was isolated in 1806. It was named after Morpheus, the god of sleep and dreams, and was used widely during and after the Civil War, its administration greatly facilitated by the introduction of the hypodermic needle in the late 1840s. In fact, the widespread use of morphine during the Civil War is generally considered responsible for large numbers of soldiers developing the "soldier's disease"—morphine dependence. The smoking of opium was introduced in the United States by Chinese laborers and was a widespread practice in the mid-1800s, especially on the West Coast. However, increased recognition by medical experts and others of the physically and mentally dependent nature of opium poppy products—opium, morphine, and heroin—triggered efforts to control their use and availability. We discuss some of these efforts later in this chapter.

Marijuana is another substance with a long history of use. In the 1800s, physicians used a liquid extract of the *Cannabis sativa* plant as a general all-purpose medication (Nahas, 1973). Its nonmedical use was much wider in the 1920s, probably in part a reaction to alcohol prohibition (Brecher, 1972). The use of marijuana was fairly constant in the 1930s through the 1950s but was generally limited to urban areas and to the rural areas in which marijuana was grown and harvested. In the 1960s, its popularity soared, and that popularity has remained strong. Coinciding with this popularity have been efforts to decriminalize or legitimize marijuana sale and use. Organizations active in this effort include the National Organization for the Reform of Marijuana Laws, or NORML, and the Drug Policy Alliance. Some advocacy groups have focused their efforts on legalizing marijuana for medical uses. Via Proposition 215 in 1996, California was the first state to legalize medical marijuana. Laws surrounding the use of marijuana are

Contraband Collection/Alamy stock photo

Several million Chinese men and women became physically and mentally dependent on opium by the mid-1800s. This photograph depicts a Chinese man smoking opium in a raised bed in a Peking (now Beijing) den around 1905. Beside him is a woman attendant in traditional clothing and hairstyle.


Pictorial Press Ltd/Alamy stock photo

Patent medicines, such as Hamlin's Wizard Oil, were widely marketed in the 1800s as cures for a variety of ailments and illnesses.

changing rapidly. By 2020, 14 states and the District of Columbia had decriminalized marijuana and legalized recreational and medicinal use. Thirty other states allowed for the use of medical marijuana, but varied as to whether its use had been decriminalized. However, possession and use of marijuana remained fully illegal in six states: Alabama, Idaho, Kansas, South Carolina, Tennessee, and Wyoming.

A drug whose popularity has fluctuated among those who use drugs in the United States is cocaine. Cocaine was widely used in various "tonics" and patent medicines in the late 1800s and early 1900s, despite concerns over negative effects associated with its extended use; not until 1914 was cocaine brought under strict legal controls and penalties. Its use was apparently limited in the United States until the 1960s. In the late 1960s and up to now, it has been in much wider use. In the 1970s cocaine was seen as a fashionable drug and used by celebrities and businesspeople. By the 1980s different forms of the drug were used, such as crack cocaine (a free-based form of cocaine made by cooking cocaine powder, water, and baking soda until it forms a solid), making the drug more accessible and affordable. As a result, the use of cocaine steadily increased. Recent increases in use have been attributed to increases in availability.

Other psychoactive substances have had their distinct periods of popularity during this century. **Amphetamines**, for example, were widely used to treat depression in the 1930s. In addition, they were given to soldiers during World War II in the belief that the drug would enhance alertness (O'Brien & Cohen, 1984). Obtaining amphetamines through medical outlets such as physician prescriptions was not particularly difficult. As concern arose about the dangers inherent in the continued use of these drugs, restrictions on their availability became much tighter. At this juncture, the stage was set for a much greater production and distribution of amphetamines through illicit channels. Later, in the 1960s and 1970s, amphetamines went through another period of heavy use when they were overprescribed for weight control. Amphetamines also became widely available on the street during this time. The misuse of amphetamines remains a significant problem today, particularly when these drugs are taken intravenously.

**amphetamines**
Central nervous system stimulants that act like naturally occurring adrenaline.

The 1950s were the era for two central substances. Use of the minor tranquilizers became popular, and that trend continues today. As we discuss in Chapter 13, minor tranquilizers are among the most commonly prescribed psychiatric drugs in the United States. The 1950s are also associated with the contemporary appearance of **solvent** inhaling. The first report of such misuse was in 1951, by Clinger and Johnson, who described the intentional inhalation of gasoline by two boys. Solvent misuse tended to be more common with other substances, however, such as model cements, lighter fluids, lacquer thinner, cleaning solvents, and more recently the propellant gases of aerosol products (Hofmann, 1975; MacLean et al., 2012). The problem was marked in the early 1960s, with solvent inhaling causing deaths and leading hobby glue producers to remove the two most toxic solvents—benzene and carbon tetrachloride—from their products (Blum, 1984). A more recent example has been the sniffing of correction fluids that contain the solvent trichloroethane. Manufacturers of correction fluid have replaced trichloroethane with other solvents or added unpleasant substances to the fluid, such as mustard oil. Solvent inhalant misuse (such as the current "huffing" of propane and spray paint fumes) is still a serious problem, especially among teenagers. Indeed, there have been recent reports of teenagers using aerosol products and then diving into a swimming pool because they had heard that the underwater

**solvent**
A substance, usually a liquid or gas, that contains one or more intoxicating components; examples are glue, gasoline, and nonstick–frying pan sprays.

pressure would increase the rush. Instead, doing so has sometimes resulted in "sudden sniffing death syndrome," whereby the individuals have a heart attack and drown.

A historical view of psychoactive substance use might show the 1960s as the era of lysergic acid diethylamide-25, commonly known as LSD. The drug had been used in various tests during the 1950s (e.g., as an adjunct to psychotherapy) but did not reach the height of its popularity until the mid-1960s, when Dr. Timothy Leary, a Harvard psychologist, began to expound on what he found to be its mind-altering advantages. LSD was banned in 1967, and its use waned considerably until a recent resurgence in its popularity, particularly in the context of the "rave" culture. Recent studies have investigated the use of LSD in palliative care and in the treatment of several disorders, including anxiety, depression, posttraumatic stress, cluster headaches, and substance use disorders (Dakwar, 2016). Most of the studies have demonstrated positive short-term changes in patients. LSD may emerge as an effective therapeutic agent in psychiatry, but additional research is needed. A more recent psychedelic substance to appear on the scene is methylenedioxymethamphetamine, better known as MDMA or "Ecstasy." MDMA is one of a cluster of drugs collectively referred to as "club drugs" (others include methamphetamine, GHB, LSD, and ketamine; they are discussed in greater detail in Contemporary Issue Box 2.1).

Angela Hampton Picture Library/Alamy stock photo

Solvent sniffing remains a serious problem, particularly among teenagers.

> *"The universal, immediate reaction is that the amphetamine high is like nothing else. You fix up a shot. You dissolve it in water. You draw it up into the dropper. You put a belt or a tie around your arm. In the meantime, you're very excited, your heart's beating fast. 'Cause you know you're going to get happy in a couple minutes. Then you give yourself a shot."*
>
> A person dependent on amphetamine (Goode, 1972)

Heroin is another drug with a long history of use in the United States. Heroin was first synthesized in the late 1890s, and it has been available for use since the early 1900s. The extent of use traditionally has been greater among two populations: lower and higher socioeconomic groups (O'Brien & Cohen, 1984). During the Vietnam War, the high incidence of heroin use among U.S. soldiers in Vietnam was a significant concern, but soldiers who used the drug overseas did not tend to continue its use following their return to the States. In recent years, heroin has been showing a renewed popularity. The same factors that contributed to the spread of crack—low price and easy availability—appear to be behind this increase in heroin use. However, there are some new wrinkles and concerns. First, the level of purity of the currently available heroin is higher than in the past. In the 1980s, the purity of heroin sold on the street was less than 10%; it is now estimated at more than 60% and can be as high as 80%. Second, fewer individuals are injecting the drug. Instead, they have been snorting or smoking it, or mixing heroin and crack and smoking the combination. Third, heroin was a drug historically used by adults. However, early use and experimentation with heroin by U.S. teenagers have been an ongoing concern. Among those using heroin for the first time, approximately 25% are under the age of 18.

This overview provides only a sample of the major drugs that have been used over the years for their psychoactive properties. It is important to recognize that patterns of drug use and misuse are not static. The drugs more frequently used next year might include a drug used in the past that develops a renewed popularity or a newly synthesized substance, such as one of the so-called designer drugs. Two examples serve to highlight this. The first is the recent attention focused on **"bath salts"** and **synthetic marijuana**. The second example, quite profoundly, is the recent increased use of fentanyl, a synthetic opioid being used alone or mixed with heroin. An anesthetic used in surgery settings, fentanyl can be 50 to 100 times more potent than

**bath salts**
A psychoactive "designer drug" that is synthesized from various amphetamine-like chemicals and can be inhaled, swallowed, smoked, or injected.

**synthetic marijuana**
A psychoactive "designer drug" comprised of natural plants that are sprayed with synthetic chemicals that mimic the effects of cannabis when consumed.

## CONTEMPORARY ISSUE BOX 2.1

# The Rise of "Club Drugs"

The popularity of a group of substances collectively referred to as "club drugs" has more or less been sustained over the past 2 decades. This term was originally used to describe drugs used by young adults at all-night dance parties such as "raves" and "trances" and at dance clubs and bars. However, club drug use more generally is inextricably linked to a variety of nonrave social contexts and as well to patterns of polysubstance use (Parks & Kennedy, 2004). They now have usage beyond those more specific contexts. All indications are that club drugs can cause serious health problems and even death in some cases. Some of these drugs are stimulants, some are depressants, and some are hallucinogens. When used in combination with alcohol, these drugs can be even more dangerous. Because some club drugs are colorless, tasteless, and odorless, individuals who want to intoxicate or sedate others (often to commit sexual assaults) can unobtrusively add them to beverages. Following is some information on the leading club drugs. More details on these substances are provided in later chapters of this text:

*Methylenedioxymethamphetamine (MDMA)* (street names: Ecstasy, Molly, XTC, X, Adam, clarity, lover's speed). MDMA is chemically similar to the stimulant methamphetamine and the hallucinogen mescaline. MDMA can produce both stimulant and psychedelic effects and can be extremely dangerous when taken in large doses.

*Gamma hydroxybutyrate (GHB)* (street names: grievous bodily harm, G, liquid Ecstasy, Georgia homeboy, bedtime scoop). GHB can be produced in clear liquid, white powder, tablet, and capsule forms, and it is often used in combination with alcohol, making it even more dangerous. GHB has been increasingly involved in poisonings, overdoses, rapes, and fatalities. GHB is often manufactured in homes with recipes and ingredients found and purchased on the Internet. It is usually misused either for its intoxicating, sedative, or euphoriant properties or for its growth hormone–releasing effects, which can build muscle. When taken in smaller doses, GHB can relieve anxiety and produce relaxation; however, as the dose increases, the sedative effects may result in sleep and eventual coma or death.

*Ketamine* (street names: special K, K, vitamin K, cat valiums, jet). Ketamine is an injectable anesthetic that has been approved for both human and animal use in medical settings since 1970. Ketamine is produced in liquid form or as a white powder that is often snorted or smoked with marijuana or tobacco products. Taken in larger doses, ketamine can cause delirium, amnesia, impaired motor function, high blood pressure, depression, and potentially fatal respiratory problems. Low-dose intoxication from ketamine results in impaired attention, learning ability, and memory.

*Rohypnol* (street names: roofies, rophies, roche, forget-me pill). Rohypnol (flunitrazepam) belongs to the class of drugs known as benzodiazepines. It is not approved for prescription use in the United States, although it is approved in Europe and is used in more than 60 countries as a treatment for insomnia, as a sedative, and as a presurgery anesthetic. Rohypnol is tasteless and odorless, and it dissolves easily in carbonated beverages. The drug can cause profound "anterograde amnesia"; that is, individuals may not remember events they experienced while under the effects of the drug.

*Methamphetamine* (street names: speed, ice, chalk, meth, crystal, crank, fire, glass). Methamphetamine is a toxic, addictive stimulant that affects many areas of the central nervous system. The drug is often made in clandestine laboratories from relatively inexpensive over-the-counter ingredients. Available in many forms, methamphetamine can be smoked, snorted, injected, or orally ingested. Its use is associated with serious health consequences including memory loss, aggression, violence, psychotic behavior, and potential cardiac and neurological damage. Those who use methamphetamine typically display agitation, excited speech, decreased appetite, and increased physical activity levels.

*Lysergic acid diethylamide (LSD)* (street names: acid, boomers, purple haze, yellow sunshines). LSD is a hallucinogen; it induces abnormalities in sensory perceptions. The effects of LSD are unpredictable, depending on the amount taken, on the surroundings in which the drug is used, and on the individual's personality, mood, and expectations. Two long-term disorders sometimes associated with LSD are persistent psychosis and hallucinogen persisting perception disorder (which used to be called "flashbacks").

Source: Adapted from *community Alert Bulletin on Club Drugs* (National Institute on Drug Abuse [NIDA], 2004, updated 2017).

**CONTEMPORARY ISSUE BOX 2.2**

## Recreational Designer Drugs: "Bath Salts" and Synthetic Cannabinoids

Although synthetic drugs are not a new phenomenon, the recent appearance of two such synthetic designer drugs—"bath salts" and synthetic marijuana—has elicited widespread concern and subsequent legislative action.

"Bath salts" in the present context are not the bath salts you are more familiar with, those fragranced salts added to bath water. Instead, the drug "bath salts" is synthesized from various amphetamine-like chemicals. The formulation varies, and it can be snorted, swallowed, smoked, or injected. These drugs are nicknamed "bath salts" because they tend to be white or off-white crystals, similar to the more traditional understanding of bath salts. Frequently, "bath salts" contain the compounds MDPV (3, 4-methylenedioxy-pyrovalerone) and/or mephedrone, known as synthetic cathinones. As the popularity of "bath salts" spread, more and more cases of emergency room visits by those who used "bath salts" were recorded, with individuals typically presenting with extreme agitation, violent behaviors, and psychotic symptoms. In response, a number of states passed laws banning "bath salts," which were typically being sold for $25 to $50 per 50 milligram packets at convenience stores and head shops as plant food or cleaning/hygienic products. The "bath salts" were packaged under names like Aura, Ivory Wave, Blue Silk, Loco-Motion, Vanilla Sky, and Ocean Burst.

Synthetic cannabinoids are synthesized from various man-made chemicals and sprayed onto an appropriate plant and smoked like regular cannabis. They are best known by the brand names Spice and K2. The use of synthetic cannabinoids can lead to serious side effects that are different from marijuana use, including rapid heart rate, vomiting, agitation, and confusion.

The use of these recreational designer drugs has led to a surge in visits to emergency rooms. Many states have banned these drugs. Along with the actions taken by individual states, the federal Drug Enforcement Agency in 2011 added several of the ingredients most commonly used in "bath salts" and synthetic marijuana to the controlled substances schedule. In 2012, the Synthetic Drug Abuse Prevention Act was passed to ban these ingredients at the federal level. In addition to adding these latest ingredients to the controlled substances schedule, the new law closed a loophole that was associated with the 1986 Controlled Substances Analogue Enforcement Act. In this regard, "bath salts" and synthetic marijuana came in packages labelled as "not for human consumption," which helped them avoid the provisions of the Analogue Enforcement Act, under which any substance substantially similar to a banned drug was deemed illegal if intended for human consumption.

morphine. In many communities, fentanyl fatalities are exceeding those associated with heroin. More broadly, the rapid rise in heroin and fentanyl use, and the associated negative consequences and deaths, have been widely cited as a national epidemic. The only thing that can be said with confidence is that drug use will continue and that some drug misuse will be associated with any given psychoactive substance.

## Medical Science and Drug Use

Before leaving our historical perspective section, we should note the interesting long-term parallel between the development and use of psychoactive substances in medicinal forms (discussed in more detail in Chapter 5) and the nonmedicinal use or misuse of these drugs. Many of the drugs described in this text were used for medicinal purposes at one time or another. Medical science only gradually became the well-respected institution that we know today. Even in the 20th century, folk cures, potions, and so-called patent medicines were freely available and widely used.

Perhaps the best examples of this are the opiates opium and morphine that, throughout most of the 1800s, were used to treat a variety of complaints, including rheumatism, pain, fever, delirium tremens, and colds. The opiates were also used as an anesthetic for some surgeries and for setting broken bones. As we noted earlier, physicians used and prescribed the opiates despite a lack of understanding of how they acted in the body. All that was known was that opium and morphine seemed to

> *"LSD did unlock something for me, and pot definitely did something for the old ears. Suddenly I could hear more subtle things."*
>
> Musician and former Beatle George Harrison (*Musician*, May 1992)

help alleviate pain and symptoms that simply were not understood (Morgan, 1981). Unfortunately, such widespread use contributed to a considerable number of people becoming physically dependent on these substances. Not until the 1870s did a clearer picture of the physically and mentally dependent properties of these drugs emerge.

Numerous other examples can be cited. Chloroform and ether were developed as anesthetics, but each also went through a period in the 1850s when its nonmedical use was quite fashionable. At one time, cocaine was used to treat complaints such as depressed mood and pain. In fact, one of its uses was as a treatment for opiate dependence. In the latter half of the 19th century, physicians recognized an array of uses for cannabis, including treatment of insomnia and nervousness, although its prescribed use was not nearly as extensive as with the opiates. The 20th century witnessed the development of the synthetic stimulant amphetamines, some of which initially were available without prescription.

*"It's not good for the body; it's not good for the mind. It's the real immature adolescent in everybody that finds romance in that."*

Branford Marsalis on using drugs to enhance creativity (*Musician*, May 1992)

We could provide additional examples, but the important point is that medicinal uses of psychoactive substances (whether folk medicine or more contemporary medicine), medical science, and nonmedical drug use and misuse will always be closely intertwined. In the past, folk or cultural use of a substance often became incorporated into the practice of medicine. More common today is the incorporation of a substance developed for the practice of medicine into the array of drugs that can be used in nonmedicinal ways. The reverse can still occur, however, as shown by the attention being given to the medical uses of marijuana. In any event, keeping the medical and nonmedical uses of drugs separate is impossible.

### REVIEW

1. Describe the historical use of opium poppy, *Cannabis sativa*, hashish, coca, and khat throughout the cultures of the world.
2. Create a timeline indicating the main events in the history of drug use in the United States, from the 18th Century to the current day.

## 2.2 Development of Drug Laws

### LEARNING OBJECTIVES

**2-2** Explain how the development and use of drugs for medical and nonmedical purposes are intertwined

**2-3** Evaluate the history of drug laws in the United States in terms of their effect on rates of drug use

**2-4** Evaluate the effects of the Eighteenth Amendment to the Constitution, which prohibited the production, sale, transportation, and importation of alcohol

**2-5** Describe the Controlled Substances Act and the criteria by which a drug is scheduled

Legislation is the main way society establishes formal guidelines for drug use. Furthermore, such legislation essentially reflects a society's beliefs about drugs. Laws generally establish restrictions or prohibit the manufacture, importation, sale, or possession of the substance under evaluation. Actual drug use in the United States, and

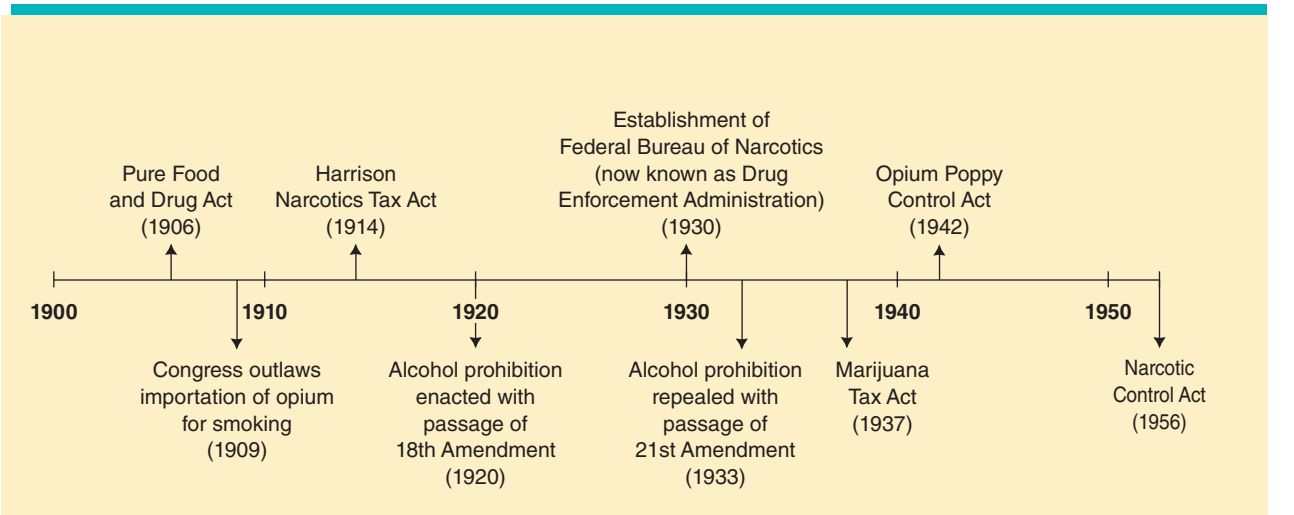


**FIGURE 2.1**
Major U.S. drug legislation

in other countries, is not a crime under federal law, nor is it a crime to have a drug or alcohol problem.

Drug laws for the most part have had limited effectiveness in reducing overall illicit drug availability and use (Australian Drug Law Reform Foundation, 1996; Jung, 2001; Nadelmann, 1989). In fact, the more restrictive the laws, the less effective they have tended to be in the long run (Brecher, 1972, 1986). The only time these laws seem to be more effective is when drug use or misuse is particularly unpopular (Brecher, 1986; Hofmann, 1975). However, the duration of these periods and the time between them are variable. Nevertheless, legislation remains society's central means for addressing its concerns about drugs.

Describing the history of drug laws in the United States will provide an example of one society's response to drug use and misuse. Interestingly, the implementation of drug laws in the United States did not really begin until the turn of the 20th century. This made the United States one of the last industrialized nations to formally implement drug legislation. Various efforts were mounted to regulate opiates in the second half of the 19th century, but these were largely half-hearted and ineffective. That is not to say that sanctions on drug use did not exist, but rather there were no legal penalties to speak of. At different times and in different locations, varying degrees of social sanctions existed, such as the ostracism of citizens who displayed certain forms of drunkenness in Colonial times.

## The San Francisco Ordinance

The only notable law regarding drug use in the 19th century that had any effect was a city ordinance passed in San Francisco in 1875. Chinese men had entered this country throughout the mid-1800s, to meet demands for labor in the rapidly expanding West. Most of these immigrants worked on the building of the railways. When this construction was finished, many of the laborers made their way back to San Francisco, where they frequented "opium dens"—places where people could smoke opium. Although this drug use had little negative effect on the San Francisco community per se, some thought the practice was sinister. Rumors began to circulate that the opium den houses were evil and that unsuspecting members of the community—young women were used frequently as examples—were at risk for unknowingly heading down dangerous paths toward disrepute

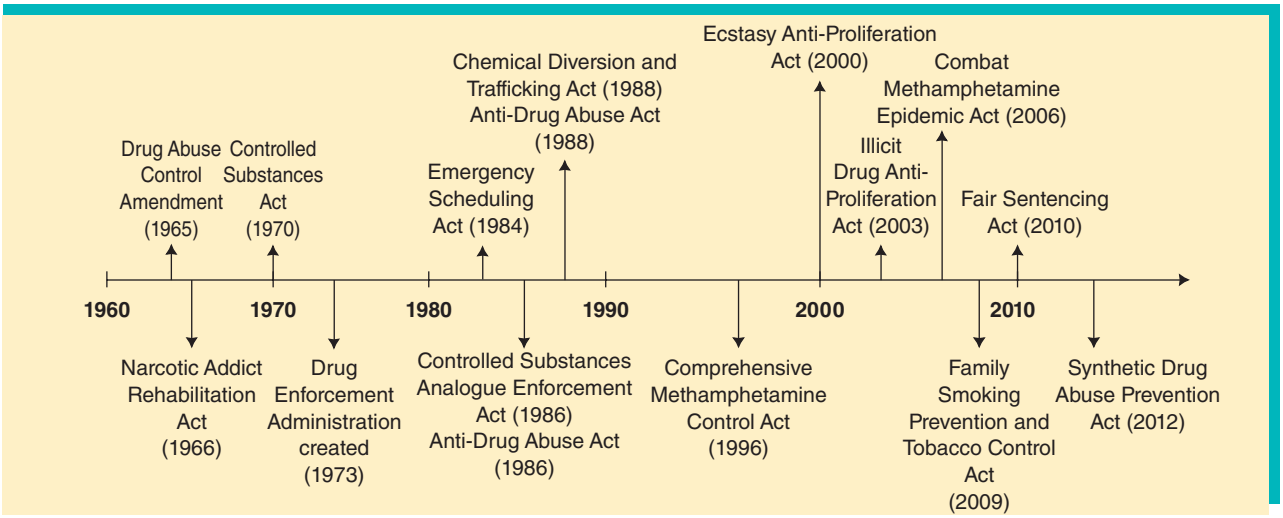


**FIGURE 2.1**
(*Continued*)

and substance use dependence. This concern led to the 1875 ordinance. Only opium dens were banned, however, not the smoking of opium. Conviction for operating or frequenting an opium den carried a fine of $50 to $500 and/or a jail sentence of 10 days to 6 months. The actual impact of the ordinance was not great; the larger and more obvious opium dens closed, and the number of smaller dens increased. The effect was greater in the sense of setting the stage for drug regulation in other parts of the country, as a number of other cities and states passed similar ordinances in later years. Not until 1909 did Congress pass a law banning the importation of opium for smoking.

## Pure Food and Drug Act

The first federal legislation of note was the Pure Food and Drug Act passed in 1906 (see Figure 2.1). This act, which was designed to control opiate dependence, legislated that producers of medicines must indicate on the packaging the amount of drug contained in their products. The law focused particularly on the opiates opium, morphine, and heroin, but also mandated the accurate labeling of products that contain alcohol, marijuana, and cocaine. The overall effect of the act was mixed: It did not ban opiates in patent medicines and thus had little impact on those who were dependent upon opium at the time, but the legislation may have served to decrease the number of people who become newly dependent, given the subsequent political and educational efforts to describe the dependence potential of patent medicines containing opiates (Brecher, 1972).

## Harrison Narcotics Tax Act

Another major piece of federal legislation, the Harrison Narcotics Tax Act, was passed in 1914. Curiously, this law was passed not in response to domestic demand but rather as a consequence of the United States signing the Hague Convention of 1912, an international agreement that directed signing nations to regulate opium traffic within their respective countries (Brecher, 1986). The Harrison Narcotics Tax Act strictly regulated, but did not prohibit, the legal supply of certain drugs, particularly the opiates. The law stated that marketing and prescribing these drugs required licensing. The physician was directed to prescribe narcotics only "in the course of his professional practice." This phrase is certainly general and open to interpretation, and controversy