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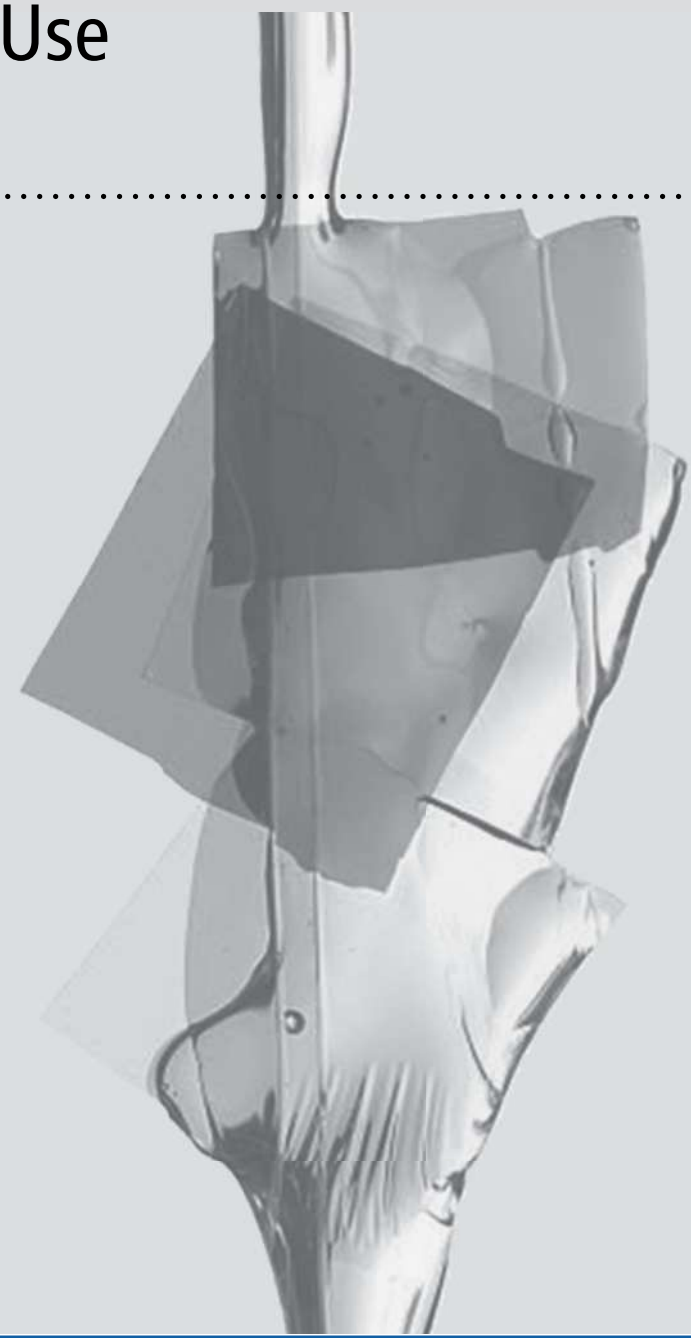
PART I

Identifying the Causes and Consequences of Disordered Substance Use



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1 The Biopsychosocial Perspective and Research Methods for Investigation of Substance Use Disorders

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LEARNING OBJECTIVES

1. Describe the incentives for and the hazards of using psychoactive drugs.
2. Describe how substance use disorders are identified in the DSM diagnostic system.
3. Describe the characteristics of and problems resulting from the addictive lifestyle.
4. Explain why it is difficult to identify the causes of substance use disorders (SUD).
5. Explain why simple observation is an unsatisfactory method of studying SUD.
6. List and describe each of the scientific methods of studying SUD.
7. Describe the biopsychosocial explanation of SUD.

Introductory Vignette: Losing a Good Team Member

Billy, a key player on the university basketball team, overdosed on heroin in late summer, before preseason practice and urine screens started. Prompt injection of Narcan saved his life, but he is off the team and suspended from the university. The team captain is trying to establish how this shocking event could have happened. He talks with two senior team members:

TEAM CAPTAIN: Billy's heroin overdose was a surprise – at least for me and the coach. The coach asked me if the team knew that Billy was using heroin – addicted, I guess – and if anybody knows why.

FIRST TEAM MEMBER: I realize now that I missed some things about Billy, but at the time I didn't suspect anything like using drugs. We used to be real close, but he didn't talk much anymore – seemed sort of down and mostly stayed away from all of us. Sometimes, though, he did have what you might call mood swings. I think he was worried about keeping his grades up this year, even with all the help we get for our classes. He was drinking hard too, sometimes getting into fights for no good reason. He managed to keep that stuff hidden from most of us. I knew more than the others, but sometimes he lied even to me. I couldn't understand why he did that.

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SECOND TEAM MEMBER: I know he had a rough time when he was a kid. His dad drank a lot, and his mother pretty much abandoned him and his brother. He got into running with a low-life crowd, until he started playing basketball in high school. I thought he had come out of a bad situation pretty well. Then this summer he went back to his hometown in the mountains. I know there's a lot of oxycodone, heroin, and fentanyl on the streets there. I'm pretty sure his brother is a heroin addict.

TEAM CAPTAIN: I didn't know most of these things about Billy. I did notice that his playing wasn't as good in the last couple of games last year. And – I knew the doc gave him some pain pills after he got hurt, but I thought he had recovered okay. Several of us – including me – took oxycodone for a few days after an injury. As far as I know, none of us had trouble stopping taking it when we were ready to play again. Billy had a lot of potential, but it looks like there were some things that messed up his head, and then he made some really bad moves about using smack. I sure wish we could have seen how much trouble he was in and could have helped him.

Use and Misuse of Psychoactive Drugs

Psychoactive drug use presents a major worldwide threat to public health and safety (Degenhart and Hall 2012, World Health Organization 2008). Drug use is not always harmful, but for many individuals, use disorders of psychoactive drugs disrupt normal life activities and cause or contribute to health or living problems.

Two prominent addiction researchers, William Miller and Kathleen Carroll, acknowledge the breadth and complexity of drug use, including its origins and adverse consequences:

> It became obvious that the behavior of drug use is not isolated, but is intimately intertwined with a range of common, long-standing human issues and societal problems.... In some ways, the central issues of this field represent a microcosm of classic human dilemmas: why we persist in patterns of behavior that clearly lead to devastating consequences. (Miller and Carroll 2006, p. 12)

Some with difficulties related to drug use seek assistance from general medical practitioners or mental health providers. However, because **harmful consequences** of drug use are commonly entangled with other life problems, there is often an inability or refusal to recognize a major source of the medical problem or life difficulty. As a highly visible example, the singer Amy Winehouse experienced a combination of emotional and behavioral problems – including extreme abuse of drugs – before she succumbed to a fatal alcohol overdose at age twenty-seven. The

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drug-related problems of entertainers and other celebrities are often widely publicized. However, for most people, the tragic consequences of drug use are known only to close friends or relatives. In 2017, more than 70,000 Americans died as a result of unintentional drug overdose (Scholl et al. 2019).

Because alcohol, nicotine, cocaine, opioids, and other psychoactive drugs provide desirable effects, their use is widespread and frequent in many nations and cultures. In the United States, the National Survey on Drug Use and Health (NSDUH) for the year 2017 indicated that 51.7 percent of people age twelve or older drank alcohol, 22.4 percent used a tobacco product, and 11.2 percent used an illicit drug within the month before the survey (Substance Abuse and Mental Health Services Administration 2018). The prevalence of use varies with the age of the respondents, with young adults (ages eighteen to twenty-five) reporting the highest use rates. Illicit drug use includes cannabis and other drugs as well as nonmedical use of stimulants and opioid pain relievers.

Incentives for Use of Psychoactive Drugs

Psychoactive drugs – which alter subjective experience and behavior – have been used for various purposes since ancient times. Drug effects seen as beneficial and desirable include those that (1) are utilitarian, (2) are medical (distress relieving), (3) produce altered states of consciousness, or (4) are simply pleasurable. Utilitarian effects include increased concentration and vigilance or facilitation of relaxation and sleep, as produced by caffeine and alcohol. The use of opioid drugs for relief of pain and the accompanying emotional distress are perhaps the clearest example of the medical use of psychoactive drugs. Utilitarian, medical, and pleasurable effects of drugs are the most frequent incentives for regular drug use, which in some individuals can lead to heavy **compulsive use** and dangerous consequences. These motivations for drug use are discussed in the subsequent drug-specific chapters.

Many individuals – especially adolescents and other young people – enjoy experiencing novel altered states of consciousness, an effect provided by psychoactive drugs as well as by some other experiences not related to drug use. The attraction to new and different states of thinking, feeling, and perceiving the world can encourage experimentation with drugs, which in some cases is followed by regular, excessive, and harmful drug use. Although such tentative use of drugs does present some risk of eventual drug use problems, most who sample the novel effects of psychoactive drugs do not progress into persistent and dangerous substance use.

Psychoactive drug effects are often experienced as pleasurable because they increase enjoyment of other human activities, such as recreation and play, consumption of food, appreciation of music and art, spiritual experiences, and especially social interaction (including intimacy and sex) (Figure 1.1). Pleasurable effects also often accompany other incentives for drug use. For example, opioid

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drugs might produce pleasure as well as relieving pain. A stimulant (amphetamine or caffeine) can promote a positive mood change as well as enabling sustained work performance.

Figure 1.1 Alcohol can enhance the pleasure of good times with friends. Photo: SolStock / E+ / Getty Images.

However, drugs can also produce pleasurable feelings different from or more profound than most other enjoyable human experiences. Such drug effects can be very intense with initial use – such as the "rush" produced by injection or inhalation of stimulant or opioid drugs (e.g., cocaine or heroin). This brief, intensely rewarding feeling is sometimes described as similar to sexual orgasm – but without the intimate human contact that can be a part of sexual activity. The vivid euphoria of injected or inhaled drugs can be especially alluring and dangerous, often gaining control of behavior and promoting compulsive drug use. Positive reinforcement produced by addictive drugs is discussed extensively in Chapters 4 and 7.

Hazards of Psychoactive Drug Use

As with many other useful and pleasurable activities ranging from consumption of food through contact athletic sports to driving automobiles, psychoactive drug use can result in harmful consequences. Hazards include personal losses leading to a greatly diminished life, biological toxicity, and premature death – due to fatal overdose or other causes related to drug use. Painful or dangerous consequences typically result from overindulgence (frequent or high-dose drug use) and use in

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inappropriate situations – such as consuming alcohol or cannabis prior to driving. Unfortunately, for many individuals, patterns of chronic dangerous high-dose use emerge and become quite resistant to change.

Substance Use Disorders

Persistent drug use that significantly damages or threatens a safe and healthy life is designated as a **substance use disorder (SUD)**, the causes and consequences of which are the subject of this book (Figure 1.2). Not all users of psychoactive drugs suffer harm from drug use, but the NSDUH indicated that in the United States, 5.3 percent of the adolescent and adult population (14.5 million individuals) had an alcohol use disorder in 2017, and 2.8 percent (7.5 million individuals) had a use disorder for illicit drugs or therapeutic psychoactive drugs. Alcohol use disorder was about twice as prevalent as disordered use of illicit drugs, although 2.3 million individuals had both types of substance use disorder. Many additional individuals experience drug-related problems that are less severe than a diagnosable SUD but make their lives more difficult. Table 1.1 presents NSDUH estimates of the extent of drug and drug-containing substance use and misuse and substance use disorders in the United States. Demographics of drug use and SUD are described in the

Figure 1.2 Heavy and persistent alcohol use can cause isolation and depression. Photo: Rafael Ben-Ari / Photodisc / Getty Images.

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subsequent drug-specific chapters. However, age and gender are the most predictive demographic variables for drug use and misuse, with prevalence consistently highest for men of ages eighteen to twenty-five.

Table 1.1 Use, misuse, and use disorders of addictive psychoactive drugs: Percentage of adult and adolescent population in the United States

Drug or substance	Current users[a]	SUD[b]
Licit substances		
Alcohol	51.7%	5.3%
Tobacco	22.4%[c]	12.1%
Illicit substances		
Cannabis[d]	9.6%	1.5%
Cocaine	0.8%	0.4%
Methamphetamine	0.3%	0.4%[e]
Heroin/fentanyl	0.2%	0.2%[e]
Misuse of therapeutic psychoactive drugs used in medical practice[f]		
Opioid Analgesics	1.2%	0.6%
Stimulants	0.7%	0.2%
Tranquilizers	0.7%	0.3%
Sedatives	0.1%	–

Note. Estimates are for percentage of US population of age twelve years or older as reported by the NSDUH (Substance Abuse and Mental Health Services Administration 2018).

[a] Current use indicates use during the month of the survey. [b]SUD prevalence indicates occurrence of the disorder during the twelve months prior to the survey. [c]Seventy-eight percent of current tobacco users smoke cigarettes. [d]Cannabis use is prohibited by federal law, although medical and recreational use is not prohibited by the statutes of several states. [e]Some individuals with SUD for methamphetamine or heroin did not use the drug in the month of the survey. Use prevalence for all drugs during previous year was higher than current use level. [f]Current use entries for therapeutic drugs indicate misuse prevalence (use not prescribed by a medical professional). Pharmaceutical stimulants include d-amphetamine (Adderall) and methylphenidate (Ritalin). Tranquilizers include benzodiazepines (Valium and similar drugs). Opioid analgesics include hydrocodone (Vicodin), oxycodone (OxyContin), and similar drugs. Survey results did not include SUD prevalence for sedative drugs (barbiturates or similar drugs).

Identification and Diagnoses

The American Psychiatric Association publishes the *Diagnostic and Statistical Manual of Mental Disorders* (referred to as the DSM), a widely accepted system for identifying substance use disorders (SUD). Since its origin in 1952, the DSM has been revised five times, with the latest revision (DSM-5) published in 2013. The large amount of clinical information collected prior to 2013 and reported in

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scientific journals used DSM-IV or earlier terminology. In both versions of the DSM, the presence of **diagnostic criteria** – damaging consequences of drug use, and difficulty of controlling that use – determine the diagnosis of SUD.

Mild cases of SUD involve various harmful consequences of drug use – such as relationship problems, reckless driving or accidents, and poor work or academic performance – that often resemble antisocial behavior or other problems not directly related to intoxication. As a result, these less intense levels of the disorder may be difficult to identify as a psychiatric syndrome. In the DSM-IV, such less severe cases were designated as **substance abuse**.

At moderate and severe levels of SUD (designated as **substance dependence** in the DSM-IV), damaging consequences worsen and are more frequent and persistent, but despite these harmful outcomes, drug use continues and becomes compulsive. The priorities of afflicted individuals often narrow to obtaining and using the drug, with neglect of other interests and obligations. An emotional relationship with the drug makes stopping or even reducing its use very difficult or seemingly impossible without outside intervention.

Although the terminology and specific diagnostic criteria for SUD listed in DSM-5 are somewhat different from those of the DSM-IV, the behavior and symptoms of substance use disorders are essentially the same as in earlier years. The number of DSM-5 diagnostic criteria seen in an individual indicates whether the SUD is mild, moderate, or severe.

The terms *abuse* and *dependence* are no longer official designations of SUD in the DSM-5. Severe cases of the disorder are unofficially but widely referred to as addiction. DSM-5 designation of SUD is further discussed in Chapter 2, and treatment and recovery are discussed in Chapter 16.

Physiological or Psychological?

A question often arises regarding whether an addiction is "physiological" or merely "psychological" – implying that there are two distinct disorders, which is an invalid assumption. This supposed difference in addictions typically refers to the presence or nature of a withdrawal syndrome – which for opioid drugs includes overt symptoms of vomiting and diarrhea and for alcohol can produce life-threatening seizures. A "merely psychological" addiction is often incorrectly seen as less serious – similar to a bad habit and perhaps not even qualifying as an actual psychiatric disorder. However, an overt withdrawal syndrome is not a critical feature of addiction and is neither necessary nor sufficient for diagnosis of a severe SUD. As discussed in Chapter 2, compulsive (addictive) drug use can occur without an overt withdrawal syndrome. Furthermore, with medical use of opioid drugs, withdrawal symptoms are common – often in the absence of addictive behavior.

The **process addictions** – compulsive behaviors that do not involve drug use but are extremely difficult to control – provide further evidence that an overt

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