

Substance Use Disorders

A Biopsychosocial Perspective

This textbook surveys the current knowledge on substance use disorders (SUD), summarizing scientific evidence from numerous fields. It uses a biopsychosocial framework to integrate the many factors that contribute to addictions, from genetic predispositions, neurological responses caused by drugs, co-occurring psychiatric disorders, personality traits, and developmental conditions to cultural influences. Real-life vignettes and first-person accounts build understanding of the lived experience of addiction. The currently accepted practices for diagnosis and treatment are presented, including the role of 12-step programs and other mutual-assistance groups. The text also investigates the research methods that form the foundation of evidence-based knowledge. The main body text is augmented by study guideposts, such as learning objectives, review exercises, highlighted key terms, and chapter summaries, which enable more efficient comprehension and retention of the book's material.

Perry M. Duncan is Emeritus Professor in the Department of Psychology at Old Dominion University, USA. There, he has taught courses in behavioral neuroscience, psychopharmacology, and substance use disorders to undergraduate and graduate students for forty years.

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A Biopsychosocial Perspective

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To Nancy, my life partner and colleague, with
much love

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Preface

Substance use disorders (SUD) are a serious problem for public health and safety and one of the most prevalent psychiatric disorders. Opioid overdose ended the lives of 47,600 individuals in the United States in 2017. However, 88,000 died from alcohol-related causes, and the leading preventable cause of death was tobacco use – which contributed to 480,000 fatalities, including 41,000 from passive exposure to “secondhand smoke.” Opioid overdose causes death within minutes or hours, but the delayed effects of chronic alcohol and tobacco use result in many more fatalities. With the exception of tobacco and illicit opioids, only a minority of those who use addictive substances develop a use disorder (an SUD), but many individuals who are not addicted experience adverse consequences from drug use.

A large amount of information exists about the origins, the course of development, and outcomes of drug abuse and addiction – based on years of extensive scientific investigation, clinical reports, and first-person accounts of problematic drug use. In my years of teaching courses on psychopharmacology and SUD, I found that many students appreciate receiving evidence-based knowledge about drug effects, the misuse of drugs, and addiction, especially when so much information of doubtful validity is prevalent in the popular culture.

This book presents a summary of current knowledge about substance use disorders that will be useful for anyone interested in learning about this important subject. The information will be especially valuable to students intending to pursue a career in scientific investigation or treatment of SUD.

Education about addiction – especially concerning the risk factors for, origins of, and consequences of the disorder – is often neglected in the training of counselors, social workers, clinical psychologists, and even medical doctors (including psychiatrists). Therefore, information provided in this book can be of use to individuals currently providing these services. Although only two chapters deal directly with clinical topics (diagnosis, treatment), information in all chapters will also be helpful to health care professionals. Most people with SUD never enter treatment for their harmful drug use but often seek assistance from medical or mental health professionals for related issues, such as anxiety or other problems. Knowledge of SUD will also be of value to many other individuals who will come into contact – perhaps at a personal level – with these widespread disorders.

SUDs arise from combinations of several sources: genetic and neurological factors, early-life and later experiences, psychiatric syndromes, and cultural influences – all interacting with the pharmacological actions of psychoactive drugs.

xxiv **Preface**

Because of the multiple causes, the behavioral disorders of substance abuse and addiction are best described as *biopsychosocial* in nature.

A disease theory of SUD is widely accepted and is supported primarily by the biological (genetic and neurological) aspects of addiction. Although there are definite limitations to the generality of a disease-based theory of SUD, this explanation of the self-destructive behavior has value for the treatment and recovery of afflicted individuals.

In this book, I describe how a cognitive behavioral explanation – although often rejected by proponents of conventional disease theory – is actually compatible with most parts of disease theory when SUDs are seen as biopsychosocial in nature. Cognitive processes, including learning and conditioning, are of special importance for the less severe, but more prevalent, forms of the disorder. I also explain how 12-step tactics for maintaining recovery (a major part of the many Minnesota-Model addiction treatment programs) share some features with cognitive behavioral treatment procedures – although the similarity is rarely acknowledged.

Three important topics of research on addictive disorders that sometimes receive little attention in discussions of SUD are given extensive coverage here: tobacco use and nicotine addiction; the role of craving in addiction and relapse; and the significant influence of co-occurring psychiatric disorders that so often accompany addiction. I summarize much of the large body of research-based information related to these aspects of SUD.

Harmful and compulsive use of alcohol and other addictive drugs has plagued humanity for many centuries, and scientific investigations of the problem began in the twentieth century. I include a very brief account of recent history of the use and misuse of each addictive substance. Some lessons have been learned – although several seem to have been forgotten. I also describe some important recent SUD-related discoveries, especially from the areas of genetics, brain function, and the biological basis of drug effects and addiction. The current state of knowledge is better appreciated with some understanding of the gradual process of scientific advancement.

Each chapter starts with a fictional vignette, previewing and illustrating some basic features of SUD discussed in that chapter.

Acknowledgments

My wife, Dr. Nancy Duncan, greatly contributed to all stages of creation of this book. She helped clarify my thinking and writing on many aspects of substance use disorders and identified points that I had omitted or not adequately explained. Having another professor of biological psychology as an in-house editor and a major contributor was a definite advantage. Thank you, Nancy, for years of commitment to this long-term project!

I also benefited from discussions with students in my classes on psychopharmacology and substance use disorders, especially those in the Professional Psychology Consortium Program of Old Dominion University, Eastern Virginia Medical School, and William and Mary University. These graduate students in a clinical doctoral program read and commented on early versions of several chapters. Other students at Old Dominion University, including some in recovery from SUD, also shared their relevant experience, which informed my writing of this book.

I appreciate the support, guidance, and patience of several editors and other personnel at Cambridge University Press.

Organization of the Book

Chapter 1 introduces the biopsychosocial concept of substance use disorders and describes research methods used to investigate substance use disorders (SUD).

Chapter 2 describes the diagnosis of SUD, including use of diagnostic criteria listed in the *Diagnostic and Statistical Manual of Mental Disorders* published by the American Psychiatric Association.

Chapter 3 presents the disease theory of addiction, including the benefits and limitations of this explanation of the disorder.

Chapters 4 and 5 present basic information from neuroscience relevant to SUD. Chapter 4 summarizes psychopharmacological principles of how psychoactive drugs affect brain function. Chapter 5 describes current theories of how drug-produced changes in brain function contribute to addiction.

Chapters 6, 7, and 8 present findings about the causes of and risk factors related to SUD. These origins of the disorder include abnormal brain function, genetic factors, psychiatric and developmental factors, and processes, such as reinforcement, learning, and inhibition, that control behavior in general and also give rise to compulsive drug use. Chapters 5 through 8 identify the essential components of a biopsychosocial explanation of SUD.

Chapter 9 describes the harmful effects of alcohol, a drug with widespread use in many cultures. Although alcohol has moderate addictive potential, its heavy use damages and shortens the lives of many who are not addicted.

Chapters 10 through 15 describe SUD for specific drugs of abuse, including risk factors, the course of the disorder, and adverse consequences.

Chapter 16 describes how many individuals suffering from SUD stop compulsive and destructive drug use, either with or without the assistance of health care professionals.