Drugs, Behavior, and Modern Society

CHARLES F. LEVINTHAL Hofstra University

PEARSON

Boston Columbus Indianapolis New York San Francisco Upper Saddle River Amsterdam Cape Town Dubai London Madrid Milan Munich Paris Montréal Toronto Delhi Mexico City São Paulo Sydney Hong Kong Seoul Singapore Taipei Tokyo Editor in Chief: Ashley Dodge Acquisitions Editor: Susan Hartman Director of Marketing: Brandy Dawson Executive Marketing Manager: Kelly May Marketing Coordinator: Courtney Stewart Managing Editor: Denise Forlow Program Manager: Reena Dalal Senior Operations Supervisor: Mary Fischer Operations Specialist: Diane Peirano Art Director: Jayne Conte Cover Designer: Bruce Kenselaar Cover Image: efendy / Shutterstock Director of Digital Media: Brian Hyland Digital Media Editor: Rachel Comerford Digital Media Project Manager: Tina Gagliostro Full-Service Project Management and Composition: PreMediaGlobal/ Revathi Viswanathan Printer/Binder: Courier/Kendallville Cover Printer: Courier/Kendallville Text Font: Electra Lt Std-Regular, 10 pts

Credits and acknowledgments borrowed from other sources and reproduced, with permission, in this textbook appear on appropriate page within text (or on page 429).

Copyright © 2014, 2012, 2010, by Pearson Education, Inc. All rights reserved. Printed in the United States of America. This publication is protected by Copyright and permission should be obtained from the publisher prior to any prohibited reproduction, storage in a retrieval system, or transmission in any form or by any means, electronic, mechanical, photocopying, recording, or likewise. To obtain permission(s) to use material from this work, please submit a written request to Pearson Education, Inc., Permissions Department, One Lake Street, Upper Saddle River, New Jersey 07458 or you may fax your request to 201-236-3290.

Many of the designations by manufacturers and seller to distinguish their products are claimed as trademarks. Where those designations appear in this book, and the publisher was aware of a trademark claim, the designations have been printed in initial caps or all caps.

Library of Congress Cataloging-in-Publication Data

Levinthal, Charles F.
Drugs, behavior, and modern society / Charles F. Levinthal, Hofstra University. — Eighth edition.
pages cm
Includes index.
ISBN-13: 978-0-205-95933-4
I. Drugs. 2. Drug abuse. 3. Drugs—Physiological effect. 4. Psychotropic drugs. 5. Psychopharmacology. I. Title.
HV5801.L49 2014
362.29—dc23

2013013402

10 9 8 7 6 5 4 3 2 1



ISBN-10: 0-205-95933-4 ISBN-13: 978-0-205-95933-4 For my grandsons

Aaron Matthew Levinthal and Michael Samuel Levinthal

BRIEF CONTENTS

PART ONE	Drugs in Society/Drugs in Our Lives	1
----------	-------------------------------------	---

- CHAPTER 1 Drugs and Behavior Today 1
- CHAPTER 2 Drug-Taking Behavior: Personal and Social Issues 28
- CHAPTER 3 How Drugs Work in the Body and on the Mind 60

PART TWO Legally Restricted Drugs in Our Society 89

- CHAPTER 4 The Major Stimulants: Cocaine and Amphetamines 89
- CHAPTER 5 Opioids: Opium, Heroin, and Opioid Pain Medications 118
- CHAPTER 6 LSD and Other Hallucinogens 143
- CHAPTER 7 Marijuana 167

PART THREE Legal Drugs in Our Society 191

- CHAPTER 8 Alcohol: Social Beverage/Social Drug 191
- CHAPTER 9 Chronic Alcohol Abuse and Alcoholism 220
- CHAPTER 10 Nicotine and Tobacco Use 248
- CHAPTER 11 Caffeine 275

PART FOUR Enhancers and Depressants 293

- CHAPTER 12 Performance-Enhancing Drugs and Drug Testing in Sports 293
- CHAPTER 13 Depressants and Inhalants 315

PART FIVE Medicinal Drugs 339

- CHAPTER 14 Prescription Drugs, Over-the-Counter Drugs, and Dietary Supplements 339
- CHAPTER 15 Drugs for Treating Schizophrenia and Mood Disorders 362
- PART SIX Prevention and Treatment 379
- CHAPTER 16 Substance-Abuse Prevention 379
- CHAPTER 17 Substance-Abuse Treatment: Strategies for Change 407

CONTENTS

Preface xvi

PART ONE Drugs in Society/ Drugs in Our Lives 1

CHAPTER 1

Drugs and Behavior Today 1

By the Numbers ... 2 Social Messages About Drug Use 3 Two Ways of Looking at Drugs and Behavior 4 A Matter of Definition: What Is a Drug? 5

HEALTH LINE: Defining Drugs: Olive Oil, Curry Powder, and a Little Grapefruit? 6 Instrumental Drug Use/Recreational Drug Use 6 Drug Misuse or Drug Abuse? 7

DRUGS . . . IN FOCUS: Drug Abuse and the College Student: An Assessment Tool 8
 Drugs in Early Times 9
 Drugs and Behavior in the Twentieth Century 10
 Drugs and Behavior from 1945 to 1960 12
 Drugs and Behavior after 1960 12
 QUICK CONCEPT CHECK 1.1: Understanding the History of Drugs and Behavior 13

- Present-Day Attitudes toward Drugs 14
 Patterns of Drug Use in the United States 14

 Illicit Drug Use among High School Seniors 15
 Illicit Drug Use among Eighth Graders and Tenth Graders 16
 Illicit Drug Use among College Students 16
 Alcohol Use among High School and College Students 16
 Tobacco Use among High School and College Students 17
 Drug Use and Drug Perceptions 17
 Illicit Drug Use among Adults Aged Twenty-Six and Older 18

 Making the Decision to Use Drugs 19
 QUICK CONCEPT CHECK 1.2:
 - Understanding Present-Day Drug Use in the United States 19

Specific Risk Factors 19 Specific Protective Factors 21 Present-day Concerns 21 Club Drugs 21 Nonmedical Use of Prescription Pain Relievers 21

 DRUGS . . . IN FOCUS: Facts about Club Drugs 22
 Nonmedical Use of Prescription Stimulant Medications 23
 Nonmedical Use of Over-the-Counter Cough-and-Cold Medications 23
 Why Drugs? 23

 PORTRAIT: From Oxy to Heroin— The Life and Death of Erik 24
 Summary 24 / Key Terms 25 / Endnotes 26

CHAPTER 2

Drug-Taking Behavior: Personal and Social Issues 28

By the Numbers ... 29 Drug Toxicity 30

 DRUGS . . . IN FOCUS: Acute Toxicity in the News: Drug-Related Deaths 32

QUICK CONCEPT CHECK 2.1: Understanding Dose-Response Curves 33

The DAWN Reports 33 Emergencies Related to Illicit Drugs 34 Drug-Related Deaths 34 Judging Drug Toxicity from Drug-Related Deaths 35 Demographics and Trends 35 From Acute Toxicity to Chronic Toxicity 36 Behavioral Tolerance and Drug Overdose 37

 QUICK CONCEPT CHECK 2.2: Understanding Behavioral Tolerance through Conditioning 38
 Physical and Psychological Dependence 39 Physical Dependence 39
 Diagnosing Drug-Related Problems: The Health

Professional's Perspective 41

Special Circumstances in Drug Abuse43Drug Abuse in Pregnancy43Drug Abuse and HIV Infection43

HEALTH LINE: Effects of Psychoactive Drugs on Pregnant Women and Newborns 44

Drugs, Violence, and Crime 45 Pharmacological Violence 45 Economically Compulsive Violence 46 Systemic Violence 47

- Governmental Policy, Regulation, and Laws 48 Efforts to Regulate Drugs, 1900–1970 48 Rethinking the Approach toward Drug Regulation, 1970–Present 49
- Drug Law Enforcement and Global Politics 50

PORTRAIT: Pablo Escobar – Formerly Known as the Colombian King of Cocaine
 51

 HEALTH LINE: Harm Reduction as a National Drug-Abuse Policy 53
 Summary 54 / Key Terms 55 / Endnotes 55

POINT/COUNTERPOINT I: Should We Legalize Drugs in General? 58

CHAPTER 3

How Drugs Work in the Body and on the Mind 60

By the Numbers ... 61 How Drugs Enter the Body 61 Oral Administration 61 Injection 62 Inhalation 63 Absorption through the Skin or Membranes 63

How Drugs Exit the Body 64

DRUGS . . . IN FOCUS: Ways to Take Drugs: Routes of Administration 65

Factors Determining the Behavioral Impact of Drugs 66 Timing 66 Drug Interactions 67 Cross-Tolerance and Cross-Dependence 67

QUICK CONCEPT CHECK 3.1: Understanding Drug Interactions 67

HEALTH ALERT: Adverse Effects of Drug– Drug and Food–Drug Combinations 68 Individual Differences 69 Introducing the Nervous System 69 The Peripheral Nervous System 70 Sympathetic and Parasympathetic Responses 70 The Central Nervous System 71 Understanding the Brain 72 The Hindbrain 73 The Midbrain 73

The Forebrain 73

QUICK CONCEPT CHECK 3.2:

Understanding Drugs and Brain Functioning 74

Understanding the Neurochemistry of Psychoactive Drugs 74 Introducing Neurons 74

Neuronal Communication 75

Drug Influences on Neuronal Communication 76 The Major Neurotransmitters in Brief: The Big Seven 76

Physiological Aspects of Drug-Taking Behavior 78 The Blood–Brain Barrier 78

 DRUGS . . . IN FOCUS: Endorphins, Endocannabinoids, and the "Runner's High" 79 Biochemical Processes Underlying Drug Tolerance 80

- QUICK CONCEPT CHECK 3.3: Understanding Cross-Tolerance and Cross-Dependence 80
 Physiological Factors in Psychological Dependence 81
- HEALTH LINE: Drug Craving and the Insula of the Brain 82
 Psychological Factors in Drug-Taking Behavior 82

Expectation Effects 83

 PORTRAIT: Nora D. Volkow—A Scientist-General in the War on Drugs 84 Drug Research Procedures 85
 Summary 85 / Key Terms 86 / Endnotes 86

PART TWO Legally Restricted Drugs in Our Society 89

CHAPTER 4

The Major Stimulants: Cocaine and Amphetamines 89

By the Numbers . . . 90 The History of Cocaine 90 Cocaine in Nineteenth-Century Life 91 HEALTH ALERT:Cocaine after Alcohol:The Risk of Cocaethylene Toxicity91Freud and Cocaine92

DRUGS . . . IN FOCUS: What Happened to the Coca in Coca-Cola? 93

QUICK CONCEPT CHECK 4.1:

Understanding the History of Cocaine 94 Acute Effects of Cocaine 94 Chronic Effects of Cocaine 95

HEALTH ALERT: The Physical Signs of Possible Cocaine Abuse 95 Medical Uses of Cocaine 96 How Cocaine Works in the Brain 96

Present-Day Cocaine Abuse 96 From Coca to Cocaine 97 From Cocaine to Crack 97

 DRUGS . . . IN FOCUS: Crack Babies Revisited: What Are the Effects? 99
 Patterns of Cocaine Abuse 100
 Treatment Programs for Cocaine Abuse 100

DRUGS . . . IN FOCUS: Paco: A Cheap Form of Cocaine Floods Argentine Slums and Beyond 100

 PORTRAIT: Robert Downey Jr. and Others – Cleaning Up after Cocaine 101
 Amphetamines 103 The Different Forms of Amphetamines 103 The History of Amphetamines 104 How Amphetamines Work in the Brain 104
 Acute Effects of Amphetamines 104 Chronic Effects of Amphetamines 105

Methamphetamine Abuse 105

Present-Day Patterns of Methamphetamine Abuse 105

 DRUGS . . . IN FOCUS: Methamphetamine and the Heartland of America 107 Methamphetamine-Abuse Treatment 107

QUICK CONCEPT CHECK 4.2: Understanding Patterns of Cocaine and Methamphetamine Abuse 108 Medical Uses for Amphetamines and Similar

Stimulant Drugs 108

 HEALTH LINE: "Bath Salts" as a New Form of Stimulant Abuse 109
 Stimulant Medications for ADHD 109
 Other Medical Applications 110 Stimulant Medication and Cognitive Enhancement 111 Summary 111 / Key Terms 112 / Endnotes 112

POINT/COUNTERPOINT II: Should Cognitive Performance-Enhancing Drugs Be Used by Healthy People? 116

CHAPTER 5

Opioids: Opium, Heroin, and Opioid Pain Medications 118

By the Numbers ... 119 Opium in History 119 The Opium War 121 Opium in Britain and the United States 122 Morphine and the Advent of Heroin 123 Opioids in American Society 124 Opioid Use and Heroin Abuse after 1914 124 Heroin Abuse in the 1960s and 1970s 125 Heroin and Other Opioids since the 1980s 126

QUICK CONCEPT CHECK 5.1:

Understanding the History of Opium and Opioids 127 Effects on the Mind and the Body 127 How Opioids Work in the Brain 128 Patterns of Heroin Abuse 129 Tolerance and Withdrawal Symptoms 130 The Lethality of Heroin Abuse 130

QUICK CONCEPT CHECK 5.2:

Understanding the Effects of Administering and Withdrawing Heroin 131

Heroin Abuse and Society 132 Treatment for Heroin Abuse 132 Heroin Detoxification 132 Methadone Maintenance 133 Alternative Maintenance Programs 134 Behavioral and Social-Community Programs 134 Medical Uses of Opioid Drugs 134

HEALTH ALERT:Sustained-ReleaseBuprenorphine:A New Era in Heroin-AbuseTreatment135Beneficial Effects135Prescription Pain Medication Misuse and Abuse137OxyContin Abuse137Responses to OxyContin Abuse137

PORTRAIT: David Laffer—Pharmacy Robber and Killer of Four 138

Abuse of Other Opioids Pain Medications 138 Prevalence of Nonmedical Use of Opioid Pain Medications 138

Summary 139 / Key Terms 140 / Endnotes 140

CHAPTER 6

LSD and Other Hallucinogens 143

By the Numbers ... 144 A Matter of Definition 144 Classifying Hallucinogens 145 Lysergic Acid Diethylamide (LSD) 146

DRUGS . . . IN FOCUS: Strange Days in Salem: Witchcraft or Hallucinogens? 147 The Beginning of the Psychedelic Era 147

 PORTRAIT: Timothy Leary—Nutty Professor or Psychedelic Visionary? 149 Acute Effects of LSD 149 Effects of LSD on the Brain 150 Patterns of LSD Use 151
 Facts and Fiction about LSD 151

Will LSD Produce Substance Dependence? 151
Will LSD Produce a Panic Attack or Psychotic Behavior? 151
Will LSD Increase Your Creativity? 152
Will LSD Damage Your Chromosomes? 152

HEALTH ALERT:Emergency Guidelinesfor a Bad Trip on LSD152Will LSD Have Residual (Flashback) Effects?153Will LSD Increase Criminal or Violent Behavior?153Psilocybin and Other Hallucinogens Related to

Serotonin 154 Lysergic Acid Amide (LAA) 154

 HEALTH LINE: Bufotenine and the Bufo Toad 155
 Dimethyltryptamine (DMT) 155
 Harmine 156
 Hallucinogens Related to Norepinephrine 156
 Mescaline 156
 DOM 156

DRUGS . . . IN FOCUS: Present-Day Peyotism and the Native American Church 157 MDMA (Ecstasy) 157

HEALTH ALERT:MDMA Toxicity: TheOther Side of Ecstasy158

Hallucinogens Related to Acetylcholine 159 Amanita muscaria 159 The Hexing Drugs and Witchcraft 159 Miscellaneous Hallucinogens 160

Phencyclidine (PCP) 161 Acute Effects of PCP 161

QUICK CONCEPT CHECK 6.1: Understanding the Diversity of Hallucinogens 161 Patterns of PCP Abuse 162 Ketamine 162

QUICK CONCEPT CHECK 6.2: Understanding PCP 163 Salvia divinorum 163

Summary 163 / Key Terms 165 / Endnotes 165

CHAPTER 7

Marijuana 167

By the Numbers ... 168 A Matter of Terminology 168 The History of Marijuana and Hashish 170 Hashish in the Nineteenth Century 170 Marijuana and Hashish in the Twentieth Century 170 The Anti-Marijuana Crusade 171 Challenging Old Ideas about Marijuana 172 Acute Effects of Marijuana 172 Acute Physiological Effects 173 Acute Psychological and Behavioral Effects 173

QUICK CONCEPT CHECK 7.1: Understanding the Effects of Marijuana 174

 DRUGS . . . IN FOCUS: The Neurochemical "Yin and Yang" of Cannabis 175
 Effects of Marijuana on the Brain 175
 Chronic Effects of Marijuana 176
 Tolerance 176
 Withdrawal and Dependence 176
 Cardiovascular Effects 177
 Respiratory Effects and the Risk of Cancer 177
 Effects on the Immune System 178
 Effects on Sexual Functioning and Reproduction 178
 Long-Term Cognitive Effects and the Amotivational Syndrome 178 The Gateway Hypothesis179The Sequencing Question179The Association Question180The Causation Question180

 QUICK CONCEPT CHECK 7.2: Understanding the Adverse Effects of Chronic Marijuana Abuse 181
 Patterns of Marijuana Smoking 181
 Causes for Concern 182

HEALTH ALERT: A Synthetic Marijuana called Spice 182 Medical Marijuana 183 Muscle Spasticity and Chronic Pain 183

 PORTRAIT: Marcy Dolin—Marijuana Self-Medicator 183
 Nausea and Weight Loss 184
 The Medical Marijuana Controversy 184

The Issues of Decriminalization and Legalization 185 Summary 186 / Key Terms 187 / Endnotes 187

PART THREE Legal Drugs in Our Society 191

CHAPTER 8

Alcohol: Social Beverage/Social Drug 191

By the Numbers ... 192 What Makes an Alcoholic Beverage? 192 Alcohol Use through History 194 Alcohol in Nineteenth-Century America 194 The Rise of the Temperance Movement 195 The Road to National Prohibition 196 The Beginning and Ending of a "Noble Experiment" 196 Present-Day Alcohol Regulation by Taxation 196 Patterns of Alcohol Consumption Today 197 Overall Patterns of Alcohol Consumption 197

 HEALTH LINE: Multiple Ways of Getting a Standard Drink 198

DRUGS . . . IN FOCUS: Visualizing the Pattern of Alcohol Consumption in the United States 199 Problematic Alcohol Consumption among College

Students 200

Alcohol Consumption among Adolescents 200

QUICK CONCEPT CHECK 8.1: Understanding Alcoholic Beverages 201 The Pharmacology of Alcohol 201 The Breakdown and Elimination of Alcohol 201 Measuring Alcohol in the Blood 202 HEALTH LINE: Gender, Race, and Medication: Factors in Alcohol Metabolism 203 Effects of Alcohol on the Brain 204 Acute Physiological Effects 204 Toxic Reactions 205 Heat Loss and the Saint Bernard Myth 205 HEALTH ALERT: Emergency Signs and Procedures in Acute Alcohol Intoxication 205 Diuretic Effects 206 Effects on Sleep 206 Effects on Pregnancy 206 Interactions with Other Drugs 206 Hangovers 206 Acute Behavioral Effects 207 Blackouts 208 Driving Skills 208 Preventing Alcohol-Related Traffic Fatalities among Young People 209 **PORTRAIT:** Candace Lightner-Founder of MADD 209 Alcohol, Violence, and Aggression 210 DRUGS . . . IN FOCUS: Alcohol, Security, and Spectator Sports 211

 DRUGS . . . IN FOCUS: Caffeine, Alcohol, and the Dangers of Caffeinated Alcoholic Drinks 212 Sex and Sexual Desire 212
 Alcohol and Health Benefits 212

QUICK CONCEPT CHECK 8.2: Understanding the Data from Balanced Placebo Designs 213

HEALTH ALERT: Guidelines for Responsible Drinking 214 Strategies for Responsible Drinking 215

Summary 215 / Key Terms 216 / Endnotes 216

CHAPTER 9

Chronic Alcohol Abuse and Alcoholism 220

Alcoholism: Stereotypes, Definitions, and Life Problems 221 By the Numbers ... 221 Problems Associated with a Preoccupation with Drinking 221 Emotional Problems 223 Vocational, Social, and Family Problems 223 Physical Problems 223

HEALTH LINE: A Self-Administered Short Michigan Alcoholism Screening Test (SMAST) 224 Hiding the Problems: Denial and Enabling 224

 QUICK CONCEPT CHECK 9.1: Understanding the Psychology of Alcoholism 225
 Alcohol Abuse and Alcohol Dependence: The Health

Professional's Perspective 225 Physiological Effects of Chronic Alcohol Use 226 Tolerance and Withdrawal 226 Liver Disease 226 Cardiovascular Problems 227 Cancer 227 Dementia and Wernicke-Korsakoff Syndrome 228 Fetal Alcohol Syndrome (FAS) 228

HEALTH LINE: Alcoholism Screening Instruments in Professional Use 230

Patterns of Chronic Alcohol Abuse230Gender Differences in Chronic Alcohol Use231Alcohol Abuse among the Elderly231The Family Dynamics of Alcoholism: A SystemsApproachApproach232Children of an Alcoholic Parent or Parents232The Genetics of Alcoholism233The Concept of Alcoholism as a Disease234Approaches to Treatment for Alcoholism235

Biologically Based Treatments 235

 PORTRAIT: Bill W. and Dr. Bob—Founders of Alcoholics Anonymous 237 Alcoholics Anonymous 237

HEALTH LINE: Is Controlled Drinking
 Possible for Alcoholics? 238

DRUGS . . . IN FOCUS: The Non-Disease Model of Alcoholism and Other Patterns of Substance Abuse 239

QUICK CONCEPT CHECK 9.2: Understanding Alcoholics Anonymous 240 SMART Recovery 240 Chronic Alcohol Abuse and Alcoholism in the Workplace 240 Summary 241 / Key Terms 242 / Endnotes 242

POINT/COUNTERPOINT III: Should Alcoholism Be Viewed as a Disease? 246

CHAPTER 10

Nicotine and Tobacco Use 248

By the Numbers ... 249 Tobacco Use through History 249 Politics, Economics, and Tobacco 250 Snuffing and Chewing 250 Cigars and Cigarettes 250 Tobacco in the Twentieth Century 251 Health Concerns and Smoking Behavior 252

HEALTH LINE: African Americans, Smoking, and Mentholated Cigarettes 252

The Tobacco Industry Today 253 The Tobacco Settlement of 1998 254 The Tobacco Control Act of 2009 254 Tobacco Regulation and Global Economics 254 What's in Tobacco? 254 Carbon Monoxide 255 Tar 255 Nicotine 256 The Dependence Potential of Nicotine 256 The Titration Hypothesis of Nicotine Dependence 256 Tolerance and Withdrawal 257

- Health Consequences of Tobacco Use 257
- HEALTH LINE:Visualizing 400,000to 440,000 Annual Tobacco-Related Deaths257Cardiovascular Disease257Respiratory Diseases258Lung Cancer259Other Cancers259Special Health Concerns for Women260The Hazards of Environmental Smoke260

HEALTH ALERT: Signs of Trouble from Smokeless Tobacco 261

Patterns of Smoking Behavior and Use of Smokeless Tobacco 261

QUICK CONCEPT CHECK 10.1: Understanding the Effects of Tobacco Smoking 262 The Youngest Smokers 262 Attitudes toward Smoking among Young People 262 Smokeless Tobacco 263 Cigars 264 Tobacco Use around the World 264

PORTRAIT: Sigmund Freud—Nicotine Dependence, Cigars, and Cancer 265

Quitting Smoking: The Good News and the Bad265The Good News: Undoing the Damage266The Bad News: How Hard It Is to Quit266

 HEALTH LINE: How to Succeed in Quitting Smoking—By Really Trying 268 Nicotine Gums, Patches, Sprays, and Inhalers 268 The Role of Physicians in Smoking Cessation 268 A Final Word 269
 Summary 270 / Key Terms 271 / Endnotes 271

CHAPTER 11

Caffeine 275

Coffee 276 By the Numbers . . . 276 Coffee in Britain and North America 276 Major Sources of Coffee 277 The Caffeine Content in Coffee 277

DRUGS . . . IN FOCUS: Why There Are No (Live) Flies in Your Coffee 278

Tea278Tea in Britain and North America278The Chemical Content in Tea279

Chocolate 279

How Chocolate Is Made 280 The Chocolate Industry Today 280 The Xanthine Content in Chocolate 280

 HEALTH LINE: Chocolate, Flavanols, and Cardiovascular Health 281
 Soft Drinks 281
 Caffeine from OTC Drugs and Other Products 281

PORTRAIT: Milton S. Hershey and the Town Built on Chocolate 282

Caffeine as a Drug 282

QUICK CONCEPT CHECK 11.1: Understanding Caffeine Levels in Foods and Beverages 283

Effects of Caffeine on the Body 283 Effects of Caffeine on Behavior 283 Potential Health Benefits 284 Potential Health Risks 285 Cardiovascular Effects 285 Osteoporosis and Bone Fractures 285

HEALTH LINE: Coffee, Genes, and Heart

Attacks286Breast Disease286Effects during Pregnancy and Breastfeeding286Panic Attacks286Dependence, Acute Toxicity, and MedicalApplications287Tolerance287Withdrawal287Craving287Acute Toxicity of Caffeine287Prescription Drugs Based on Xanthines288Caffeineand Young People: A Special Concern288

DRUGS . . . IN FOCUS: Energy Shots 289 Summary 289 / Key Terms 290 / Endnotes 290

PART FOUR Enhancers and Depressants 293

CHAPTER 12

Performance-Enhancing Drugs and Drug Testing in Sports 293

Drug-Taking Behavior in Sports 294 By the Numbers . . . 294 What Are Anabolic Steroids? 294 Anabolic Steroids at the Modern Olympic Games 295

 PORTRAIT: Lance Armstrong: From Honor to Dishonor 297
 Anabolic Steroids in Professional and Collegiate Sports 297

Performance-Enhancing Drug Abuse and Baseball 297

DRUGS . . . IN FOCUS: Suspension Penalties for Performance-Enhancing Drug Use in Sports 298

The Hazards of Anabolic Steroids299Effects on Hormonal Systems299Effects on Other Systems of the Body300Psychological Problems300Special Problems for Adolescents301

QUICK CONCEPT CHECK 12.1: Understanding the Effects of Anabolic Steroids 301

Patterns of Anabolic Steroid Abuse 301

The Potential for Steroid Dependence302Counterfeit Steroids and the Placebo Effect303

HEALTH ALERT: The Symptoms of Steroid Abuse 304

Nonsteroid Hormones and Performance-Enhancing Supplements 304 Human Growth Hormone 304

Dietary Supplements as Performance-Enhancing Aids 305

- Nonmedical Use of Stimulant Medication in Baseball 306
- Current Drug-Testing Procedures and Policies 306 The Forensics of Drug Testing 306

 DRUGS . . . IN FOCUS: Pharmaceutical Companies and Anti-Doping Authorities: A New Alliance 307 Sensitivity and Specificity 308

Masking Drugs and Chemical Manipulations 308 Pinpointing the Time of Drug Use 309

QUICK CONCEPT CHECK 12.2: Understanding Drug Testing 310

The Social Context of Performance-Enhancing Drugs 310 Summary 311 / Key Terms 312 / Endnotes 312

CHAPTER 13

Depressants and Inhalants 315

By the Numbers ... 316 Barbiturates 316 Categories of Barbiturates 317 Acute Effects of Barbiturates 317

 DRUGS . . . IN FOCUS: Is There Any Truth in "Truth Serum"? 318 Chronic Effects of Barbiturates 319 Current Medical Uses of Barbiturates 319 Patterns of Barbiturate Abuse 319
 Nonbarbiturate Sedative-Hypnotics 320
 The Development of Antianxiety Drugs 320
 Benzodiazepines 321 Medical Uses of Benzodiazepines 321 Acute Effects of Benzodiazepines 322 Chronic Effects of Benzodiazepines 322 How Benzodiazepines Work in the Brain 323 Patterns of Benzodiazepine Misuse and Abuse 323 Nonbenzodiazepine Depressants 324

HEALTH ALERT: The Dangers of Rohypnol as a Date-Rape Drug 324 Zolpidem and Eszopiclone 325 Buspirone 325 Beta Blockers 325 Antidepressants 325

QUICK CONCEPT CHECK 13.1: Understanding the Abuse Potential in Drugs 326 A Special Alert: The Risks of GHB 326 Acute Effects 326

Protective Strategies for Women 326

- **PORTRAIT:** Patricia White, GHB, and the "Perfect" Crime 326
- Inhalants through History 327 Nitrous Oxide 328 Ether 329
- Glue, Solvent, and Aerosol Inhalation 329 The Abuse Potential of Inhalants 329 Acute Effects of Glues, Solvents, and Aerosols 330 The Dangers of Inhalant Abuse 330

HEALTH ALERT: The Signs of Possible Inhalant Abuse 330

Patterns of Inhalant Abuse 331

 DRUGS . . . IN FOCUS: Resistol and Resistoleros in Latin America 332 The Dependence Potential of Chronic Inhalant Abuse 333
 Responses of Society to Inhalant Abuse 333

QUICK CONCEPT CHECK 13.2: Understanding the History of Inhalants 334 Summary 334 / Key Terms 335 / Endnotes 336

Part Five Medicinal Drugs 339

CHAPTER 14

Prescription Drugs, Over-the-Counter Drugs, and Dietary Supplements 339

By the Numbers ... 340 The History of Prescription Drug Regulations 341 Procedures for Approving Prescription Drugs 342 Phases of Clinical Testing for Prescription Drugs 342 Patents and Generic Forms of Prescription Drugs 344 Speeding Up the FDA Approval Process344Procedures for Approving OTC Drugs345

Are FDA-Approved Drugs Safe? 346

 QUICK CONCEPT CHECK 14.1: Understanding the FDA Approval Process 346 The Issue of Speed versus Caution 346 Patterns of Prescription Drug Misuse 347 Unintentional Drug Misuse through Prescription Errors 347

HEALTH LINE: The Potential for Death by Prescription Error 348

 HEALTH LINE: Doctor Shopping for Prescription Drugs 349
 Patterns of Prescription Drug Abuse 349

Major OTC Analgesic Drugs 349

Aspirin 350 Acetaminophen 351 Ibuprofen 351 Naproxen 352 OTC Analgesic Drugs and Attempted Suicide 352

QUICK CONCEPT CHECK 14.2:

Understanding OTC Analgesic Drugs 352 Other Major Classes of OTC Drugs 352 Sleep Aids 352 Cough-and-Cold Remedies 353 The Pharmaceutical Industry Today 353

 PORTRAIT: Ryan Haight and the Ryan Haight Act of 2008 354
 Dietary Supplements 355

DRUGS . . . IN FOCUS: What We Know about Nine Herbal Supplements 356

Summary 357 / Key Terms 358 / Endnotes 358

POINT/COUNTERPOINT IV: Should Prescription Drugs Be Advertised to the General Public? 360

CHAPTER 15

Drugs for Treating Schizophrenia and Mood Disorders 362

The Biomedical Model 363 By the Numbers ... 363 Antipsychotic Drugs and Schizophrenia 364 The Symptoms of Schizophrenia 364 The Early Days of Antipsychotic Drug Treatment 364 HEALTH LINE: Mercury Poisoning: On Being Mad As a Hatter 365 Antipsychotic Drug Treatment 365 First-Generation Antipsychotic Drugs 365 Second-Generation Antipsychotic Drugs 366 Third-Generation Antipsychotic Drugs 367 Effects of Antipsychotic Drugs on the Brain 367
 Drugs Used to Treat Depression 368

PORTRAIT: The Melancholy President— Abraham Lincoln, Depression, and Those "Little Blue Pills" 369 First-Generation Antidepressant Drugs 369 Second-Generation Antidepressant Drugs 370 Third-Generation Antidepressant Drugs 370 HEALTH ALERT: SSRI Antidepressants

 and Elevated Risk of Suicide among Children and Adolescents 371
 Effects of Antidepressant Drugs on the Brain 371
 The Effectiveness of Specific Antidepressant Drugs 372
 Drugs for Other Types of Mental Disorders 372
 Mania and Bipolar Disorder 372
 QUICK CONCEPT CHECK 15.1:

Understanding the Biochemistry of Mental Illness 373 Autism 373 Off-Label Usage of Psychotropic Medications 374 Psychiatric Drugs, Social Policy, and Deinstitutionalization 374

 DRUGS . . . IN FOCUS: Psychiatric Drugs and the Civil Liberties Debate 375
 Summary 375 / Key Terms 376 / Endnotes 376

PART SIX Prevention and Treatment 379

CHAPTER 16

Substance-Abuse Prevention 379

By the Numbers . . . 380 Levels of Intervention in Substance-Abuse Prevention 380

 QUICK CONCEPT CHECK 16.1: Understanding Levels of Intervention in Substance-Abuse Prevention Programs 381

 Strategies for Substance-Abuse Prevention
 381

 Resilience and Primary Prevention Efforts
 382

Measuring Success in a Substance-Abuse Prevention Program 382 A Matter of Public Health 382

HEALTH LINE: The Public Health Model and the Analogy of Infectious Disease Control 383

PORTRAIT: Dr. A. Thomas McLellan Goes to Washington (Briefly) 384

Lessons from the Past: Prevention Approaches That Have Failed 384 Reducing the Availability of Drugs 384 Punitive Measures 385 Scare Tactics and Negative Education 385 Objective Information Approaches 386 Magic Bullets and Promotional Campaigns 386 Self-Esteem Enhancement and Affective Education 386

 Hope and Promise: Components of Effective School-Based

 Prevention Programs
 387

 Peer-Refusal Skills
 387

 Anxiety and Stress Reduction
 387

Social Skills and Personal Decision Making 387 An Example of an Effective School-Based Prevention Program 387

HEALTH LINE: Peer-Refusal Skills: Ten Ways to Make It Easier to Say No 388 Drug Abuse Resistance Education (D.A.R.E.) 389

QUICK CONCEPT CHECK 16.2: Understanding Primary Prevention and

Education 389

Community-Based Prevention Programs 390 Components of an Effective Community-Based Program 390

Alternative-Behavior Programming 391

The Influence of Media 391

An Example of an Effective Community-Based Prevention Program 391

Family Systems in Primary and Secondary Prevention 392

Special Role Models in Substance-Abuse Prevention 392

DRUGS . . . IN FOCUS: Substance Use and Abuse among Young Mothers 393

Parental Communication in Substance-Abuse Prevention 393

The Triple Threat: Stress, Boredom, and Spending Money 394

Multicultural Issues in Primary and Secondary Prevention 394

Prevention Approaches in Latino Communities 394

Prevention Approaches in African American Communities 395

Substance-Abuse Prevention in the Workplace 395

The Economic Costs of Substance Abuse in the Workplace 396

Drug Testing in the Workplace 396

The Impact of Drug-Free Workplace Policies 397

Yes, You: Substance-Abuse Prevention and the College Student 397 Changing the Culture of Alcohol and Other Drug Use in College 398

Substance-Abuse Prevention on College Campuses 398

HEALTH LINE: Alcohol 101 on College Campuses 399

Substance-Abuse Prevention Information 399 Summary 400 / Key Terms 401 / Endnotes 401

POINT/COUNTERPOINT V: Should We Continue to D.A.R.E. or Should We Give it up? 405

CHAPTER 17

Substance-Abuse Treatment: Strategies for Change 407

By the Numbers . . . 408

- Designing Effective Substance-Abuse Treatment Programs 409
- The Biopsychosocial Model for Substance-Abuse Treatment 409

Intervention through Incarceration and Other Punitive Measures 409 Substance-Abuse Treatment and Law Enforcement 410

 DRUGS . . . IN FOCUS: Penalties for Crack versus Penalties for Powder Cocaine: Correcting an Injustice 413 Prison-Alternative Treatment Programs 414 Drug Courts 414

PORTRAIT: Monsignor William O'Brien— Founder of Daytop Village 415

Prison-Based Treatment Programs 416

- Substance-Abuse Treatment in the Workplace 416
- The Personal Journey to Treatment and Recovery 417Rehabilitation and the Stages of Change 417Stages of Change and Other Problems in Life 418
- QUICK CONCEPT CHECK 17.1: Understanding the Stages of Change in Substance-Abuse Treatment 419

The Impact of Family Systems on Treatment and Recovery 419 Family Dynamics in Drug Abuse 419 Enabling Behaviors as Obstacles to Rehabilitation 420 Survival Roles and Coping Mechanisms 421 Resistance at the Beginning, Support along the Way 421 Finding the Right Substance-Abuse Treatment

Program 421 Judging the Quality of the Treatment Facility 422 Principles to Maximize the Chances of Successful Treatment 423
Needing versus Receiving Substance-Abuse Treatment 423
A Final Note: For Those Who Need Help ... 424
Summary 425 / Key Terms 426 / Endnotes 426

Credits 429 Index 431

PREFACE

In today's world, drugs and their use have the potential for good and for bad. As a society and as individuals, we can be the beneficiaries of drugs-or their victims. This perspective continues to be the message of Drugs, Behavior, and Modern Society, Eighth Edition. As has been the case since the first edition, this book introduces the basic facts and major issues concerning drug-taking behavior in a straightforward, comprehensive, and reader-friendly manner. A background in biology, sociology, psychology, or chemistry is not necessary. The only requirement is a sense of curiosity about the range of chemical substances that affect our minds and our bodies and an interest in the challenges these substances bring to our society and our daily lives. These challenges can be framed in terms of three fundamental themes.

- The role of drug-taking behavior throughout history— First of all, present-day issues concerning drug misuse and abuse are issues that society has confronted for a long time. Drugs and drug-taking behavior are consequences of a particularly human need to feel stronger, more alert, calmer, more distant and dissociated from our surroundings, or simply good. It is the misuse and abuse of chemical substances to achieve these ends that have resulted in major problems in the United States and around the world.
- The diversity in psychoactive drugs in our society— There is an enormous diversity among drugs that affect the mind and the body. We need to educate ourselves not only about illicit drugs such as cocaine, amphetamines, heroin, hallucinogens, and marijuana but also about legally available drugs such as alcohol, nicotine, and caffeine. Drugs, Behavior, and Modern Society has been designed as a comprehensive survey of all types of psychoactive drugs, addressing the issues of drug-taking behavior from a combination of psychological, biological, and sociological perspectives.
- The personal impact of drug-related issues in our lives— Finally, we need to recognize that, like it or not, the decision to use drugs is one of life's choices in contemporary society, regardless of our racial, ethnic, or religious background, how much money we have, where we live, how much education we have acquired, whether we are male or female, and whether we are young or old. The potential for misuse and abuse is a problem facing all of us.

New To This Edition

The Eighth Edition of *Drugs*, *Behavior*, *and Modern Society* is divided into six sections:

- Part One (Chapters 1-3): Drugs in Society/Drugs in Our Lives
- Part Two (Chapters 4–7): Legally Restricted Drugs in Our Society
- Part Three (Chapters 8–11): Legal Drugs in Our Society
- Part Four (Chapters 12 and 13): Enhancers and Depressants
- Part Five (Chapters 14 and 15): Medicinal Drugs
- Part Six (Chapters 16 and 17): Prevention and Treatment

As you will see, chapters about particular drugs have been grouped not in terms of their pharmacological or chemical characteristics but, rather, in terms of how readily accessible they are to the general public and today's societal attitudes toward their use. The last section of the book concerns itself with prevention and treatment. In addition, several special features throughout the book will enhance your experience as a reader and serve as learning aids.

This text is available in a variety of formats—digital and print. To learn more about our programs, pricing options, and customization, visit **www.pearsonhighered**.com.

By the Numbers . . .

At the beginning of each chapter, a feature called **By the Numbers**... provides an often surprising and provocative insight into current viewpoints and research. It is presented in a brief, quantitative format that draws you into the chapter and sets the stage for further exploration.

Quick Concept Checks

Sometimes, when the material gets complicated, it is good to have a quick way of finding out whether you understand the basic concepts being explained. Each chapter of this book includes, from time to time, a **Quick Concept Check**, where you can see in a minute or two where you stand. Some of the Checks are in a matching format; others involve interpreting a graph or diagram. In some cases, you will be asked to apply the principles you have learned to a real-world situation.

Portraits

Seventeen **Portrait** features, one in each chapter, take you into the lives of individuals who either have influenced our thinking about drugs in our society or have been affected by drug use or abuse. Some of these people are known to the public at large, but many are not. The subjects of these Portraits include a brutal drug trafficker (Pablo Escobar, Chapter 2), a movie star (Robert Downey Jr., Chapter 4), a convicted killer (David Laffer, Chapter 5), a cultural icon (Timothy Leary, Chapter 6), and a depressive U.S. President (Abraham Lincoln, Chapter 13). All the Portraits put a human face on discussions of drugs and behavior. They remind us that we are dealing with issues that affect real people in all walks of life, now and in the past.

Drugs . . . in Focus

There are many fascinating stories to tell about the role of drugs in our history and our present-day culture, along with important facts and serious issues surrounding drug use. A total of 26 **Drugs** . . . **in Focus** features are presented in the Eighth Edition. The topics of these features cover a wide range, from questions about the origins of the word *coca* in Coca-Cola (Chapter 4) and possible hallucinogenic witchcraft in seventeenth century Salem, Massachusetts, (Chapter 6), to future possibilities of gene doping in the Olympics (Chapter 12) and the present-day use of "truth serum" in terrorist interrogations (Chapter 13).

Health Line

Helpful information regarding the effectiveness and safety aspects of particular drugs, specific aspects of drug-taking behavior, and new medical applications can be found in 22 **Health Line** features throughout the book. Health Line topics include understanding the neurological basis for drug craving (Chapter 3), the controversy over the use of stimulant medications as "smart pills" (Chapter 4), concerns over a new synthetic marijuana called Spice (Chapter 7), the risks of smoking mentholated cigarettes among African Americans (Chapter 10), "doctor-shopping" and prescription pain medications (Chapter 14), and alcohol prevention programs like Alcohol 101 on college campuses (Chapter 16), to name a few.

Health Alert

Information of a more urgent nature is provided in 14 **Health Alert** features. You will find important facts that you can use to recognize the signs of drug misuse or abuse and ways in which you can respond to emergency drug-taking situations, as well as useful Internet links where you can go for assistance. Health Alert topics in the Eighth Edition include strategies to avoid adverse effects of drug-drug and food-drug combinations (Chapter 3), the risks of cocaine combined with alcohol (Chapter 4), emergency guidelines for adverse reactions to LSD (Chapter 6) or alcohol (Chapter 8), and the dangers of Rohypnol as a date-rape drug (Chapter 13).

Point/Counterpoint Debates

Drug issues are seldom black or white, right or wrong. Some of the most hotly debated questions of our day concern the use, misuse, and abuse of drugs. These issues deserve a good deal of critical thought. This is why at specific locations in this book, I have taken five important controversies concerning drugs, collected the key viewpoints pro and con, and created a Point/ Counterpoint debate based on a simulated conversation that two hypothetical people might have on that question. The Point/Counterpoint features appear at the end of the chapter that deal specifically with the controversy addressed in the debate. I invite you to read these debates carefully and try to arrive at your own position, as an exercise in critical thinking. Along with considering the critical thinking questions for further discussion that follow each Point/Counterpoint feature, you may wish to continue the debate in your class.

Supplements

Pearson Education is pleased to offer the following supplements to qualified adopters.

Instructor's Manual and Test Bank (0-205-04839-0)

This Instructor's Manual and Test Bank provides instructors with support material, classroom enrichment information, and wealth of assessment questions. Corresponding to the chapters in the text, each of the manual's 17 chapters contains discussion questions, lecture outlines, video suggestions, and a test bank, which includes an extensive set of multiple choice, true/false and essay questions.

MyTest Test Bank (0-205-04837-4)

This test bank is available in computerized format, which allows instructors to easily create and print quizzes and exams. Questions and tests can be authored online, allowing instructors ultimate flexibility and the ability to efficiently manage assessments anytime, anywhere. Instructors can easily access existing questions, edit, create, and store using simple drag and drop Word-like controls. For more information, go to www.PearsonMyTest.com.

PowerPoint Presentation (0-205-04836-6)

The PowerPoint Presentation is an exciting interactive tool for use in the classroom. Each chapter pairs key concepts with images from the textbook to reinforce student learning.

MyPsychLab (www.mypsychlab.com)

This online study resource offers a wealth of animations and practice tests, plus additional study and research tools. With this edition, there are now new assessments, web and video/media links, and flash cards. www.pearsonhighered.com

An Invitation to Readers

I welcome your reactions to *Drugs, Behavior, and Modern Society*, Eighth Edition. Please send any comments or questions to the following address: Dr. Charles F. Levinthal, Department of Psychology, 135 Hofstra University, Hempstead, NY 11549. You can also communicate by fax at 516 463-6052 or at the following email address: charles.f.levinthal@hofstra.edu. I look forward to hearing from you.

Acknowledgments

In the course of writing the Eighth Edition, I have received much encouragement, assistance, and expert advice from a number of people. I have benefited from their generous sharing of materials, knowledge, and insights. I am particularly indebted to Dr. Elizabeth Crane, Substance Abuse and Mental Health Services Administration, U.S. Department of Health and Human Services; Charles F. Miller, Office of Policy and Interagency Affairs, National Drug Intelligence Center, U.S. Department of Justice; Dr. Patrick M. O'Malley, Institute for Social Research, The University of Michigan, Ann Arbor; and Lawrence Payne, Office of Public Affairs, Drug Enforcement Administration, U.S. Department of Justice.

I am fortunate to have worked with a superb team at Pearson. I am especially indebted to my editor, Susan Hartman, my program manager, Reena Dalal, and my senior project manager, Revathi Viswanathan. Their professionalism and talents contributed so much to the production quality of this book and are greatly appreciated. A number of manuscript reviewers made invaluable suggestions as I worked on the Eighth Edition. I thank all of them for their help: Marge Murray-Davis, Minnesota State University; Philip Langlais, Old Dominion University; Robin Joynes, Kent State University; Chris Jones-Cage, College of the Desert; Susan Fellows, California State University, Dominguez Hills; Toni Watt, Texas State University; Larry Ashley, University of Nevada; Frank White, University of North Dakota; Jennifer Graham, Penn State University; Christopher Goode, Georgia State University; Andy Harcrow, The University of Alabama; Robert Carr, University of South Dakota; John Gampher, University of Alabama at Birmingham; Bengie Cravey, Darton State College; Lee Ancona, University of North Texas; Sidney Auerbach, Rutgers University; Christopher Correia, Auburn University; Perry Fuchs, UT Arlington; Edith Ellis, College of Charleston; Neil Rowland, University of Florida; William Cabin, Richard Stockton College.

On a more personal note, there are others who have given me their support over the years and to whom my appreciation goes beyond words. As always, I thank my mother-in-law, Selma Kuby, for her encouragement and love.

Above all, my family has been a continuing source of strength. I will always be grateful to my sons David and Brian, and to my daughters-in-law Sarah and Karen, for their love and understanding. I am especially grateful to my wife, Beth, for her abiding love, support, and complete faith in my abilities. The Eighth Edition is dedicated to my grandsons, Aaron Matthew Levinthal and Michael Samuel Levinthal.

Charles F. Levinthal