CHAPTER 10

Substance Use Disorders in Adolescents

Erica

Erica was a 16-year-old girl who was referred to our clinic by the juvenile court after she was arrested for driving a car while intoxicated. Two weeks earlier, Erica had attended a party at her friend's house. She consumed approximately six or seven alcoholic beverages and drove home. A police officer noticed Erica driving erratically, pulled her over, and determined that her blood alcohol content was .09. Erica was arrested. Her father made her spend the night in jail “to teach her a lesson.”

Erica resented having to meet with her substance abuse counselor, Randy Moore. She explained, “I don’t know why I’m here. I’m not an addict, I don’t use hard drugs, and I didn’t do anything that a million other kids my age haven’t done.” Nevertheless, the judge ordered Erica to participate in a substance abuse evaluation, 12 sessions of counseling, and community service.

Erica began drinking alcohol, at parties and on weekends with friends, when she was 14 years old. She said that she hated beer but liked sweet drinks. “I mostly drink to relax and have fun with my friends,” Erica said. “They call me ‘Captain Cook’ because that’s the kind of champagne I like to drink. Drinking helps me unwind and have a good time.” Erica admitted to also using marijuana at parties and other social gatherings, but denied using other drugs.

“What’s your relationship with your mom and dad like?” asked Randy. Erica replied, “Not really, although I have been hung over a few times this year.” Randy asked, “What about school?” Erica responded, “I guess my grades are lower now than when I started high school. But I think that’s because I hang around with different kids than I used to. I don’t think it’s the drinking.”

“What’s your relationship with your mom and dad like?” asked Randy. Erica replied, “It’s fine. My mom’s a doctor and my dad’s an investment banker, so they’re pretty busy. As long as I bring home good grades and stay out of trouble, they leave me alone. Now they’re on my case because of the arrest.”

After the initial session, Erica stated, “I know I have to be here, and I’m really sorry for what I did, but I obviously don’t have a drinking problem. Besides, I’m sure you have people worse off than me who really need your help.” Randy responded, “Let’s schedule an appointment for next week and talk some more.”
What Are Substance Use Disorders?

People are diagnosed with substance use disorders when they show a problematic pattern of alcohol or other drug use that interferes with their daily functioning or causes significant psychological distress. *DSM-IV-TR* uses the term “substance” to refer to drugs and medications that can be misused. It identifies 11 classes of substances including nicotine, alcohol, marijuana, cocaine, opioids (e.g., heroin), and hallucinogens. Most research on substance use disorders in adolescents has been directed at alcohol and marijuana use problems. Consequently, in this chapter, we will focus our attention on alcohol and marijuana use in adolescents as a model for understanding and treating substance use disorders more generally.

*DSM-IV-TR* distinguishes between two substance use disorders: Substance Abuse and Substance Dependence. Both disorders are characterized by repeated, problematic use of alcohol or other drugs; however, Substance Abuse indicates less severe impairment than Substance Dependence.

Substance Abuse

According to *DSM-IV-TR*, Substance Abuse is “a maladaptive pattern of substance use manifested by recurrent and significant adverse consequences related to the repeated use of substances” (p. 198). To be diagnosed with Substance Abuse, the adolescent’s alcohol or other drug use must have adversely affected her social, academic, or occupational functioning repeatedly during a 12-month period (see Table 10.1).

*DSM-IV-TR* identifies four possible negative consequences of Substance Abuse. First, the adolescent might repeatedly fail to fulfill major role obligations at home, school, or work. For example, a high school student might repeatedly miss class because she oversleeps after drinking too much the previous evening. Second, the adolescent might repeatedly use substances in situations that are particularly

<table>
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<tr>
<th>Table 10.1</th>
<th>Diagnostic Criteria for Substance Abuse</th>
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<tbody>
<tr>
<td>A. A maladaptive pattern of substance use leading to clinically significant impairment or distress, as manifested by one (or more) of the following, occurring within a 12-month period:</td>
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<tr>
<td>1. Recurrent substance use resulting in a failure to fulfill major role obligations at home, school, or work (e.g., repeated absences or poor performance related to substance use; substance-related absences, suspensions, or expulsions from school)</td>
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<td>2. Recurrent substance use in situations in which it is physically hazardous (e.g., driving an automobile when impaired by substance use)</td>
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<td>3. Recurrent substance-related legal problems (e.g., arrests for substance-related disorderly conduct)</td>
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<td>4. Continued substance use despite having persistent or recurrent social or interpersonal problems caused or exacerbated by the effects of the substance (e.g., arguments with family members about consequences of intoxication, physical fights)</td>
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<td>B. The symptoms have never met the criteria for Substance Dependence for this class of substance.</td>
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Source: Reprinted with permission from the *DSM-IV-TR*. 
hazardous. For example, a 16-year-old might frequently drive while intoxicated after parties. Third, the adolescent might experience recurrent substance-related legal problems. For example, an adolescent might be arrested twice for disorderly conduct and criminal mischief after acting out while intoxicated. Fourth, the adolescent might continue to use substances despite recurrent social problems associated with substance use. For example, a junior high school student might continue to drink excessively at parties even though his drinking has led to arguments with his parents and a loss of his old friends.

Substance Abuse is only diagnosed when adolescents repeatedly use alcohol and other drugs in a manner that causes significant distress or impairment. The term “abuse” is not synonymous with the term “use.” Many younger adolescents and most older adolescents occasionally use substances, especially nicotine and alcohol. Some youngsters use these substances repeatedly. However, repeated use does not constitute “abuse” until it leads to distress or impairment.

Substance Dependence

Substance Dependence is considered a more serious problem than Substance Abuse. Adolescents with Substance Dependence display a cluster of “cognitive, behavioral, and physiological symptoms” indicating that they use alcohol or other drugs despite multiple, significantly adverse effects (DSM-IV-TR, p. 192). Adolescents who show Substance Dependence display a number of serious impairments similar to those of adolescents with Substance Abuse. In addition, adolescents with Substance Dependence have a general loss of control over their substance use. The hallmarks of Substance Dependence are tolerance and withdrawal.

Table 10.2 Diagnostic Criteria for Substance Dependence

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<tr>
<th>A. A maladaptive pattern of substance use leading to clinically significant impairment or distress, as manifested by three (or more) of the following, occurring within a 12-month period:</th>
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<tr>
<td>1. Tolerance, as defined by either of the following:</td>
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<td>a. A need for markedly increased amounts of the substance to achieve intoxication or desired effect</td>
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<td>b. Markedly diminished effect with continued use of the same amount of the substance</td>
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<td>2. Withdrawal, as manifested by either of the following:</td>
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<td>a. Characteristic withdrawal syndrome for the substance</td>
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<td>b. The same (or a closely related) substance is taken to avoid withdrawal symptoms</td>
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<td>3. The substance is often taken in larger amounts or over a longer period than was intended</td>
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<td>4. There is a persistent desire or unsuccessful efforts to cut down or control substance use</td>
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<td>5. A great deal of time is spent in activities necessary to obtain the substance, use the substance, or recover from its effects</td>
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<tr>
<td>6. Important social, occupational, or recreational activities are given up or reduced because of the substance use</td>
</tr>
<tr>
<td>7. The substance use 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</td>
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Source: Reprinted with permission from the DSM-IV-TR.
Tolerance occurs when individuals need to take the substance more frequently or at higher doses to achieve the same subjective effects. Typically, the positive effects of most substances are strongest after their first use. With each subsequent administration, people need to take more of the substance to produce the same benefits. Physiologically, the body compensates for the recurrent presence of the drug by decreasing its response to the substance. The rate of tolerance depends on the substance. Some substances, such as cocaine and heroin, result in rapid tolerance. Other substances, such as marijuana, produce tolerance more slowly. The rate at which tolerance occurs partially determines the likelihood of dependence.

Withdrawal refers to the negative physiological and psychological symptoms caused by decreased use of the substance. Withdrawal symptoms most often occur when a person suddenly discontinues use. The symptoms of withdrawal depend on the nature of the substance; different drugs have different withdrawal symptoms. However, withdrawal symptoms are usually the opposite of the effects of ingesting the substance. For example, smoking marijuana produces relaxation and a state of emotional well-being in most people. After long-term marijuana use, discontinuation of the drug can cause the opposite effects: anxiety, agitation, and irritability.

To be diagnosed with Substance Dependence, the adolescent must show three or more dependence symptoms during a 12-month period. These symptoms include tolerance, withdrawal, and several other indicators of problematic use. Because the diagnosis of Substance Dependence indicates more problematic use of alcohol and/or other drugs than the diagnosis of Substance Abuse, an adolescent who meets diagnostic criteria for Substance Dependence is not assigned the additional diagnosis of Substance Abuse.

Problems Diagnosing Substance Use Disorders in Adolescents

Some researchers have claimed that the DSM-IV-TR substance use disorders do not apply well to adolescents (Chung, Martin, Armstrong, & Labouvie, 2002; Deas, Roberts, & Grindlinger, 2005; Martin, Chung, Kirisci, & Langenbucher, 2006). One criticism is that the DSM-IV-TR criteria are developmentally insensitive. The symptoms most commonly seen among adolescents who misuse alcohol and other drugs are absent from the DSM-IV-TR criteria. For example, two of the most frequently occurring signs of Alcohol Abuse and Dependence among adolescents are academic problems and truancy. However, neither problem is included in the current diagnostic criteria. Consequently, some researchers have developed more developmentally appropriate criteria for adolescent substance use problems. These criteria include (1) breaking curfew, (2) lying to parents, (3) showing a reduction in grades, and (4) engaging in truancy (E. F. Wagner & Austin, 2006).

A second criticism is that the DSM-IV-TR conceptualization of Alcohol Dependence does not differentiate adolescents with and without alcohol use problems. A hallmark of Alcohol Dependence is tolerance for alcohol. However, most adolescent drinkers show tolerance whether they use alcohol occasionally or daily. Another feature of Alcohol Dependence is withdrawal symptoms after the person stops regular use. However, most adolescents (even the heaviest drinkers) do not
show symptoms of alcohol withdrawal, probably because adolescents usually have shorter histories of alcohol use than adults.

A third criticism is that adolescents often show different patterns of alcohol and other drug use than adults (E. F. Wagner & Austin, 2006). Adolescent substance use differs from adult substance use in several ways:

- Adolescent substance use, especially alcohol use, is more episodic than alcohol use by adults. Most adolescents tend to drink in binges, especially at parties. They usually do not drink every day.
- Adolescents often use a greater number of substances simultaneously than do adults. Indeed, it is more common for adolescents to misuse alcohol and marijuana together than to misuse either substance alone. In contrast, most adults who show substance use problems have a single substance of choice.
- Adolescents with substance use disorders are more likely to show comorbid behavior problems than are adults with substance use disorders. Furthermore, adolescents are more likely to show disruptive and antisocial behaviors, whereas adults are more likely to develop mood and anxiety disorders associated with their substance use.

Finally, adolescents are more likely than adults to “outgrow” their substance use problems. Because of the great number of physiological and psychosocial changes occurring during adolescence, many adolescents show a gradual reduction in substance use by the time they reach early adulthood. For example, many older adolescents use alcohol fairly regularly, especially during their late teens and early twenties. However, most young adults dramatically reduce their alcohol consumption after they assume more adult-like responsibilities (e.g., gain full-time employment, have children). Although all serious substance use problems merit treatment regardless of the person’s age, adolescents usually show a different course of substance use than do adults.

### Alcohol and Marijuana Use, Abuse, and Dependence

#### Alcohol

Alcohol is the drug most widely used by adolescents. Alcohol is often overlooked as a possible drug of abuse because of its widespread availability in the United States. Alcohol is legal in nearly all parts of the country, and it is heavily advertised on television and in magazines. Furthermore, many adolescents and parents regard alcohol consumption as part of adolescent culture. After all, most adolescents drink alcohol at least occasionally at some point during their high school years. For these reasons, adolescents and adults tend to minimize the risks associated with alcohol use (Johnston et al., 2005).

*Psychological Effects of Alcohol*

Alcohol is technically a sedative. It falls into the same class of drugs as benzodiazepines, barbiturates, and most sleeping pills. The effects of alcohol depend on the
amount consumed. Experts usually describe its effects as biphasic. Mild to moderate alcohol use produces one set of (largely desirable) effects: increased arousal, sociability, euphoria, and reduced anxiety. Extended alcohol consumption produces a different cluster of (largely aversive) effects: sedation, cognitive and motor impairments, heart and respiratory problems, and other health risks (Perham, Moore, Shepherd, & Cusens, 2007).

Moderate alcohol consumption usually produces pleasurable effects. Consequently, many adolescents will continue to drink in order to maintain or enhance these subjective feelings of well-being. Unfortunately, excessive alcohol consumption produces less-than-desirable effects in most people. Excessive alcohol use can result in binge drinking, that is, consuming five or more alcoholic beverages in a single episode. Binge drinking can cause fatigue, dizziness, nausea, and blackout. Bingeing may also produce severe impairment in judgment and problem solving. Physiologically, binge drinking is associated with disturbances in balance and coordination, slurred speech, restlessness and irritability, and problems with heart rate and respiration. In rare cases, excessive alcohol consumption can cause coma and death.

**Physiological Effects of Alcohol**

Alcohol is rapidly absorbed by the gastrointestinal tract and quickly diffuses throughout the bloodstream. It is metabolized primarily by the liver. The enzymes alcohol dehydrogenase and acetaldehyde dehydrogenase are chiefly responsible for its metabolism. The exact mechanisms by which alcohol affects mood, cognition, and behavior are unknown. However, alcohol seems to affect the functioning of at least five major neurotransmitters: norepinephrine, glutamate, dopamine, opioids, and GABA (γ-aminobutyric acid; Kosten, George, & Kleber, 2005; Meyer & Quenzer, 2005; Nace, 2005).

First, low doses of alcohol stimulate the norepinephrine system, causing increased feelings of arousal and behavioral excitation. Alcohol seems to target a brain region known as the reticular formation, located near the base of the brain. The reticular formation is responsible for alerting us to important information in the environment and initiating attention and arousal. Increased norepinephrine activity in this brain area is probably responsible for the increase in alertness, sociability, and talkativeness shown by most people after one or two alcoholic beverages.

At the same time, alcohol affects glutamate functioning. Glutamate is a major excitatory neurotransmitter in the central nervous system. Alcohol acts to inhibit the neurotransmission of glutamate, thereby slowing neuronal activity. Specifically, alcohol interferes with certain glutamate receptor sites, especially the NMDA (N-methyl-D-aspartate) receptor. Consumption of one or two alcoholic beverages can begin to decrease glutamate activity, producing feelings of relaxation and stress reduction. Reduced glutamate activity might partially explain the negatively reinforcing properties of alcohol; alcohol can alleviate anxiety. Glutamate is also partially responsible for associative learning and memory. Excessive alcohol use, therefore, can lead to memory problems including difficulty forming new memories and periods of memory loss (i.e., “blackouts”).
Moderate alcohol consumption affects dopamine activity. Researchers have identified a neural pathway that they believe is responsible for the pleasurable effects of most addictive drugs, including alcohol. This “reward pathway” extends from the ventral tegmental area (VTA) of the midbrain to the nucleus accumbens, amygdala, and hippocampus, located in the limbic system. This neural pathway responds primarily to dopamine, a neurotransmitter responsible for feelings of pleasure, positive affect (i.e., energy, sociability), and increased motor activity. Because this dopamine-rich pathway extends from the midbrain (VTA) to the limbic system, it is called the dopaminergic mesolimbic pathway.

How does the dopaminergic mesolimbic pathway operate? Alcohol stimulates dopaminergic neurons in the VTA. The VTA, in turn, increases dopamine levels in a nearby brain area, the nucleus accumbens, producing subjective feelings of euphoria, pleasure, and emotional well-being. These pleasant effects constitute the first phase of the "biphasic" response to alcohol, and they are the primary reason most people, especially adolescents, drink. Furthermore, these pleasurable feelings also positively reinforce alcohol use, making the person consume more of the drug. Alcohol also increases neuronal activity in the amygdala and hippocampus, brain areas responsible for processing emotions and forming new memories. The increased activity of these brain regions may account for the highly emotional memories associated with alcohol consumption and the “cravings” for alcohol experienced by chronic drinkers.

Alcohol produces other pleasurable effects through its activity on the body’s production of natural opioids. Researchers have discovered opioid receptors throughout the brain. These receptors are primarily responsible for subjective feelings of satisfaction and alleviation of pain. Typically, the body makes natural opioids (i.e., endorphin, enkephalin) to cope with stressful or painful situations. These opioids are produced by the pituitary gland and released into the bloodstream to circulate throughout the body. Alcohol consumption increases the release of endogenous opioids, producing these pleasurable effects.

Finally, moderate alcohol consumption affects GABA, a major inhibitory neurotransmitter. GABA binds to receptor sites throughout the central nervous system, causing cells to rapidly take in negatively charged chloride ions. This increase in negatively charged particles makes cells less likely to fire. Alcohol enhances the effects of GABA, producing a rapid influx of chloride into cells and a general decrease in neuronal activity. This decrease in neuronal activity is partially responsible for many of the sedating effects of alcohol: relaxation, cognitive sluggishness, and slowed reaction time.

Most adolescents who use alcohol experience tolerance; that is, they report needing more alcohol to achieve previous levels of euphoria (Chung et al., 2002). Researchers distinguish between two types of tolerance (Meyer & Quenzer, 2005). First, adolescents can experience acute tolerance during a single drinking episode. Specifically, people experience the greatest effects of alcohol after only a few drinks, with diminishing effects after each successive drink. Many adolescents often try to “chase the high” by continuing their alcohol use after reaching this period of diminishing returns. Unfortunately, continued use results in increased sedation rather than increased pleasure.
Second, chronic alcohol use is associated with pharmacodynamic tolerance (Koob & LeMoal, 2006). Over sustained periods of time, the sensitivity of the neuroreceptors that respond to alcohol gradually decreases. For example, long-term alcohol use is associated with decreased sensitivity of GABA and dopamine receptors. Individuals who drink frequently may not exhibit the same sedating effects of alcohol due to this decrease in sensitivity to GABA. Frequent drinkers may also require more alcohol to achieve a state of euphoria due to decreased dopamine activity. Decreased receptor sensitivity is believed to be a homeostatic mechanism, that is, a way for the body to compensate for the individual’s history of excessive alcohol use.

Because of this decrease in sensitivity, abrupt discontinuation of alcohol can produce withdrawal symptoms in chronic users. Without alcohol, the body’s sensitivity to GABA and dopamine is diminished. Consequently, chronic drinkers who stop using alcohol may experience negative effects due to the relative underactivity of these neurotransmitters. Decreased GABA sensitivity can produce feelings of anxiety, excitability, irritability, restlessness, and excessive motor activity. Some adults experience delirium tremens, a cluster of symptoms that include tremors, seizures, confusion, and visual and tactile hallucinations. Decreased dopamine activity can cause low energy, fatigue, and depression.

Marijuana

Marijuana is the most commonly used illegal drug. Marijuana contains dozens of compounds known to affect brain chemistry. These compounds fall into a certain class called cannabinoids. The most powerful cannabinoid is delta-9-tetrahydrocannabinol (THC; O’Brien et al., 2005).

Psychological Effects of Marijuana

When someone smokes a marijuana cigarette, approximately half of the THC enters the lungs and is rapidly absorbed. Within seconds of the first puff, THC enters the brain and affects mood, cognition, and behavior.

Moderate doses of marijuana usually produce mild intoxication. Within seconds of use, people often feel lightheaded and dizzy. Some people report tingling sensations in their limbs. After a few minutes, most people experience feelings of euphoria, disinhibition, and increased energy and sociability. Continued use (10–30 minutes) produces reductions in anxiety, a general sense of relaxation, and a state of emotional well-being or contentment. Cognitive and motor processes are usually slowed. For example, marijuana users may show slowed movements, speech, or problem-solving ability. Slowed cognitive and motor responses can interfere with people’s abilities to perform complex mental activities (e.g., complete homework) and motor activities (e.g., drive a car). Effects typically last a few hours. Larger doses of marijuana can cause paradoxical effects: increased anxiety and agitation, perceptual distortions or visual hallucinations, and paranoia.
Physiological Effects of Marijuana

THC is detected by cannabinoid receptors located throughout the brain. The largest concentrations of these receptors are in the basal ganglia, cerebellum, hippocampus, and cortex. When THC is detected by these receptors, it causes a reduction in the cell’s metabolic activity and the activity of neurotransmitters. The specific effects of THC depend on where it is detected. For example, THC detected by the basal ganglia affects movement and coordination, whereas THC detected by receptors in the cortex affects thinking, judgment, and problem solving.

THC is known to affect a wide range of neurotransmitters, including norepinephrine, dopamine, glutamate, GABA, and serotonin. The multiple brain areas and neurotransmitters affected by THC likely account for the diverse effects of the substance on people's behavior.

Experts disagree about the long-term physiological risks of repeated marijuana use (O’Brien et al., 2005). People who frequently use marijuana often show impairments in attention, memory, and problem-solving ability relative to individuals who do not use the drug. Some researchers, but not all, have found that these cognitive impairments persist for weeks or months after discontinuing marijuana use (Pope & Yurgelun-Todd, 2004). Many chronic users show decreased motivation and goal-directed behavior, a phenomenon called amotivational syndrome (Meyer & Quenzer, 2005). However, experts are unsure whether this lack of motivation is caused by the physiological effects of the drug or by environmental factors associated with drug use. For example, people who frequently use marijuana may drop out of mainstream culture and adopt an unconventional lifestyle characterized by low achievement motivation.

Perhaps the most serious effect of chronic marijuana use is health impairment. Smoking marijuana is associated with the same health risks as smoking cigarettes: respiratory problems, circulatory problems, and cancer. Marijuana can also suppress immune functioning. Finally, the effects of marijuana can impair people’s sensory and motor functioning, increasing their likelihood of injury.

Most people show acute tolerance to marijuana. During the course of a single marijuana episode, most people need to use more of the drug to achieve the initial state of intoxication. Animal studies demonstrate pharmacodynamic tolerance to marijuana. Long-term use causes reductions in the number and sensitivity of cannabinoid receptors in animals. There is less evidence for pharmacodynamic tolerance in humans; however, many people who frequently use marijuana report needing more of the drug after months or years of use.

Frequent marijuana use can cause dependence. Individuals who are dependent on marijuana report cravings for the drug and show a characteristic pattern of withdrawal symptoms associated with abstinence. Frequent users who are denied the drug can experience sleep and appetite disturbance, anxiety, agitation, restlessness, and general irritability. Sometimes, marijuana withdrawal is also associated with physical symptoms such as sweating, chills, and nausea. Chronic marijuana users show more severe withdrawal symptoms including intense cravings for the drug, depression, anger, bizarre dreams, and headaches. Withdrawal symptoms typically last only a few days.
Associated Psychiatric Disorders

Approximately 50% of adolescents in the community with Substance Abuse or Dependence show at least one other mental disorder. Among adolescents referred to treatment, comorbidity ranges from 50% to 90% (Rowe, Liddle, Greenbaum, & Henderson, 2004).

Adolescents who have both a substance use problem and a psychiatric diagnosis show greater impairment than adolescents with either substance use or psychiatric problems alone. Specifically, adolescents with dual diagnoses show more school-related difficulties, greater family conflict, more emotional distress, and more legal problems than adolescents with either substance use disorders or psychiatric disturbances alone (Grella, Hser, Joshi, & Rounds-Bryant, 2001). Adolescents with dual diagnoses also show poorer prognoses. They are more likely to have substance use problems during adulthood, experience long-term psychiatric illness, and develop personality disorders.

Adolescents with both substance use and mental health problems may be less responsive to treatment than adolescents with substance use or mental disorders alone. Adolescents with dual diagnoses are more likely to drop out of treatment or relapse within one year of treatment completion (Rowe et al., 2004; Wise, Cuffe, & Fischer, 2001).

Behavior Problems

ADHD is the most frequently occurring psychiatric disorder shown by adolescents with Substance Abuse (Dennis et al., 2002, 2004). Approximately 15%–30% of adolescents with ADHD eventually develop a substance use disorder. Conversely, most (50%–75%) adolescents with substance use disorders have ADHD. Adolescents with ADHD and substance use problems show more severe symptoms of both disorders and greater impairment in overall functioning. Their substance use tends to be longer and more resistant to treatment than that of individuals without ADHD. After treatment for substance use problems, youths with ADHD are more than twice as likely to relapse compared to adolescents without ADHD (Latimer, Ernst, Hennessey, Stinchfield, & Winters, 2004).

The relationship between ADHD and Substance Abuse is unclear (J. J. Wilson & Levin, 2005). At least three hypotheses have been offered to explain their high comorbidity. First, ADHD and substance use problems can have a common genetic or biological cause. For example, adolescents with both disorders display problems with executive functioning and behavioral inhibition that could stem from their genetic makeup. Second, both ADHD and substance use problems are correlated with other disruptive behavior disorders. For example, children with ADHD show increased likelihood of developing ODD and CD later in their development. ODD and CD, in turn, are associated with adolescent substance use problems. It is possible that ADHD, ODD/CD, and substance use problems are part of a spectrum of externalizing behavior that unfolds across development. Third, symptoms of ADHD could increase the probability of substance use problems. For example, individuals
with ADHD often show problems with decision making, social problem solving, and peer relations. These problems can cause peer rejection, social isolation, and depression. Rejected children with ADHD might use substances to gain acceptance from peers or to cope with feelings of loneliness.

Approximately 35%–40% of adolescents with substance abuse also meet diagnostic criteria for CD (Henggeler, Pickrel, Brondino, & Crouch, 1996; Kaminer, Burleson, & Goldberger, 2002). Furthermore, nearly 90% of youths with substance use disorders show at least some problems with oppositional, defiant, or disruptive behavior (Waldron, Slesnick, Brody, Charles, & Thomas, 2001). Among adolescents with CD, alcohol and other drug abuse is usually part of a much larger problem with impulsive, disruptive, and destructive behavior.

**Depression and Anxiety**

Approximately 25%–50% of adolescents with substance use problems are depressed. Longitudinal data indicate that most adolescents do not use alcohol and other drugs primarily to cope with depression. Instead, mood disorders often develop after the onset of adolescents’ substance use problems. Comorbid depression and substance use problems can sometimes be explained by shared genetic and psychosocial risk factors, as well (Goodwin, Fergusson, & Horwood, 2004).

Adolescents with substance use problems show greater likelihood of suicidal thoughts, suicide attempts, and suicide completion than their counterparts without substance use disorders (Kaminer & Bukstein, 2005). Mood problems, especially depression, associated with substance use partially account for the relationship between substance use and suicidal ideation. However, at least one study showed that the likelihood of suicide attempts remained elevated even after controlling for co-occurring depression (Wu, Hoven, Liu, Cohen, Fuller, & Shaffer, 2005). It is possible that alcohol and other drugs increase the likelihood of adolescent suicide by producing feelings of dysphoria, by lowering adolescents’ inhibitions against self-harm, and by increasing impulsive and risky decision making.

Approximately 10%–40% of adolescents with substance use problems show comorbid anxiety (Kaminer & Bukstein, 2005; Waldron et al., 2001). The relationship between substance use and anxiety is complex. Some anxiety disorders usually precede the development of adolescents’ substance use problems. For example, some adolescents use alcohol and other drugs to cope with social anxiety or unwanted memories of traumatic experiences. Alternatively, other anxiety disorders usually develop after the onset of substance use problems. For example, chronic use of alcohol can produce a gradual increase in worry and generalized anxiety.

**Psychotic Disorders**

Three large community based studies have demonstrated an association between adolescent marijuana use and the development of psychotic symptoms later in life (Crome & Bloor, 2005). Adolescents who regularly used marijuana were more likely to report psychotic symptoms (e.g., hallucinations, delusions) or develop
Schizophrenia in late adolescence or early adulthood compared to adolescents who did not use marijuana. The association between marijuana use and psychotic symptoms could not be explained by adolescents' levels of psychological distress. Therefore, it is unlikely that adolescents who eventually showed psychotic symptoms used marijuana to treat early symptoms of psychosis. Instead, the data suggest that repeated marijuana use may increase the likelihood of psychotic symptoms, especially among those adolescents who have a genetic predisposition toward Schizophrenia.

**Epidemiology**

**Prevalence**

*Prevalence of Adolescent Substance Use*

To estimate prevalence, scientists at the University of Michigan Institute for Social Research have annually assessed adolescent substance use in a project called Monitoring the Future (MTF; Johnston, O'Malley, Bachman, & Schulenberg, 2006). These researchers collect data regarding adolescents' attitudes and overt behavior regarding substance use. In recent years, approximately 50,000 youths in eighth, tenth, and twelfth grades have completed anonymous surveys. Their data allow us to determine normative substance use throughout adolescence and see trends in adolescents' substance use over the past 30 years.

Recent data indicate that adolescent alcohol use is common (Johnston et al., 2006). By their senior year in high school, nearly 75% of adolescents have used alcohol at some point in their lives, approximately 65% have used alcohol in the past year, and almost 50% have used alcohol in the past 30 days. A sizable minority of younger adolescents also report alcohol use. Approximately 40% of students in eighth grade report trying alcohol at some point in their lives, while 15% report alcohol use in the previous month (see Figure 10.1).

Marijuana use is also fairly widespread, especially among older adolescents. Approximately 45% of high school seniors have tried marijuana; almost 18% have used it within the past month. Marijuana use is less common among younger adolescents. Only about 15% of eighth-grade students report having tried the drug.

Although many adolescents report having tried alcohol and marijuana, most adolescents do not try other illicit drugs. Only about 25% of high school seniors have tried another illicit substance in their lifetime. Excluding alcohol and marijuana, the most commonly used drugs among twelfth-grade students were prescription medications, including Vicodin (10%), other medicinal narcotics (9%), medicinal amphetamines (9%), barbiturates (7%), tranquilizers (7%), and OxyContin (6%). Less than 6% of high school seniors reported trying other so-called “street” drugs like hallucinogens, crack cocaine, heroin, and methamphetamines (Feinberg, 2006).

In general, substance use has decreased over the past decade (Kuehn, 2006). The greatest reductions in substance use have been for drugs like marijuana, LSD,
methamphetamine, and ecstasy. Although these drugs reached peak levels in the middle to late 1990s, their use has been decreasing ever since. In contrast, occasional alcohol use among adolescents has remained fairly steady over the years. Use of other drugs, especially prescription medications, seems to be on the rise among adolescents.

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Prevalence of Adolescent Substance Abuse and Dependence

What about substance use disorders? Studies assessing the prevalence of adolescent Substance Abuse and Dependence have yielded inconsistent findings. Results
vary depending on the sample of adolescents studied, the method of questioning, and the researcher’s definitions of “abuse” and “dependence.”

One method of defining “abuse” and “dependence” is to use *DSM-IV-TR* definitions to identify youths with substance abuse problems. When researchers use *DSM-IV-TR* diagnostic criteria, the prevalence of Substance Abuse among adolescents in the community ranges from 1% to 9%, while the prevalence of Substance Dependence among adolescents in the community ranges from 1% to 5%.

A second method of classifying substance use problems is to base classification on the frequency of use. For example, many researchers believe that daily use of alcohol or marijuana for one month or longer indicates a significant substance use disorder. Using this criterion, almost 3% of high school seniors abuse alcohol while almost 5% abuse marijuana (Johnston et al., 2006; see Figure 10.2).

Yet a third technique involves classifying alcohol abuse in terms of binge drinking. Binge drinking is often associated with increased intoxication, risk-taking behavior, and many of the harmful effects of alcohol use. Unfortunately, binge drinking is fairly common among adolescents. Approximately 25% of high school seniors admit to binge drinking in the past two weeks, while less than 10% of eighth-grade students admit to bingeing (see Figure 10.3). Interestingly, there is a

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**Figure 10.2**  Percentage of Youth Who Use Alcohol or Marijuana Daily

Source: From Johnston et al. (2006). Used with permission.

Note: Most people regard daily use of alcohol and marijuana by adolescents as problematic. Using this criterion, approximately 3%–5% of youth have substance use problems.
moderate, inverse relationship between binge drinking and perceived risk associated with bingeing. Adolescents who show the greatest rate of binge drinking are least likely to view their consumption as dangerous.

Gender Differences

Patterns of substance use differ slightly for boys and girls. Boys usually begin using cigarettes, alcohol, and marijuana at earlier ages than girls (Andrews, 2005). At any given age, the percentage of boys who have tried any of these substances is slightly higher than the percentage of girls (Johnston et al., 2005; see Figure 10.4). Boys are also more likely than girls to binge drink, to engage in dangerous activities as a result of their substance use, and to get into trouble at school because of alcohol or other drugs.

Gender differences in the rates of substance use disorders are less clear. Some research indicates that adolescent boys show greater prevalence of Substance Abuse and Dependence than girls. For example, approximately 30% of adolescent boys report binge drinking compared to only about 22% of adolescent girls. Other studies have not found gender differences in substance use disorders (Johnston et al., 2005).

The presentation of substance use problems is different for adolescent boys and girls (Andrews, 2005; Hsieh & Hollister, 2004). Boys with substance use problems
are more likely than girls to show comorbid disruptive behavior. Boys with substance use disorders show high rates of impulsivity, aggression, and antisocial behaviors. They are also more likely than girls to experience legal problems associated with their substance use. For boys, Substance Abuse usually reflects a more general problem with conduct and antisocial behavior.

Girls with substance use problems often report greater emotional disturbance than boys. These girls often show comorbid problems with depression, anxiety, and physical complaints. Girls with substance use problems are also more likely than boys to have histories of family problems and sexual abuse.

**Ethnicity**

Substance use differs by ethnicity (Wagner & Austin, 2006). Native American youth show the highest rates of substance use, abuse, and dependence overall, followed by white and Hispanic adolescents. Native American and white adolescents also begin using alcohol and other drugs at earlier ages and may show greater comorbid psychiatric problems than most other ethnic minorities living in the United States (Abbott, 2007).
African American and Asian American adolescents show the lowest rates of substance use, abuse, and dependence. The low prevalence of substance use problems among African American adolescents is remarkable because African American adolescents are disproportionately exposed to risk factors associated with substance use disorders, such as low SES (Gil, Vega, & Turner, 2002). It is possible that certain aspects of African American culture somehow protect these youths from developing substance use problems. For example, involvement in extended family kinships or church activities may buffer African American youths against the potentially harmful effects of socioeconomic hardship.

Hispanic American adolescents usually show prevalence rates somewhere between those of white and African American adolescents (see Figure 10.5). However, Hispanic American adolescents show the greatest use of certain “hard” drugs such as cocaine and crack. Furthermore, Hispanic American adolescents born in the United States show greater rates of drug abuse and dependence than Hispanic American adolescents born in other countries (Vega, Gil, & Wagner, 1998). Among foreign-born adolescents, acculturation and ethnic identity seem to influence their likelihood of using alcohol and other drugs.

![Figure 10.5 Ethnic Differences in Adolescent Substance Use](image)

Source: From Johnston et al. (2006). Used with permission.

Note: White adolescents show the highest rates of problematic drinking and marijuana use, while African American adolescents show the lowest prevalence. Hispanic adolescents tend to show slightly higher use of so-called “hard” drugs like crack.
Adolescents tend to use substances in an orderly, predictable fashion (Kandel, Yamaguchi, & Chen, 1992). Among adolescents who use alcohol and other drugs, a typical pattern of use begins in late childhood with cigarettes. Then, sometime during adolescence, youth may begin to use alcohol and try marijuana. Some individuals subsequently try other illicit drugs such as stimulants (e.g., cocaine) or opioids (e.g., heroin). This progression from “soft” to “hard” drugs has led some people to suggest that marijuana is a “gateway drug” that introduces youths to other illicit substances.

Evidence supporting the gateway hypothesis is limited. On the one hand, longitudinal data indicate that the vast majority of adolescents who abuse stimulants (e.g., cocaine) and opioids (e.g., heroin) have also used cigarettes, alcohol, and marijuana. On the other hand, most adolescents who use cigarettes, alcohol, and marijuana do not use other illicit substances. We might conclude, therefore, that the abuse of “hard” drugs is almost always dependent on the use of cigarettes, alcohol, and marijuana; however, use of these “softer” drugs does not imply an escalation to other illicit substances (Tucker, Ellickson, Orlando, Martino, & Klein, 2005).

Why do most youths stop at alcohol and marijuana while some youths progress to using cocaine, heroin, and other illicit substances? Recent longitudinal studies have shed some light on this question (Stice, Kirz, & Borbely, 2002; Wagner & Austin, 2006). At least three factors seem to predict escalation in substance use. First, adolescents with histories of impulsive and disruptive behavior are more likely to escalate their use of alcohol and other drugs and develop Substance Abuse. Their substance use may be part of a larger problem with disruptive and antisocial activity. Second, adolescents whose parents model excessive substance use in the home are at increased risk of developing substance use problems. Parents who drink or use other drugs to excess may provide adolescents with access to these substances and model their use. Third, and most important, friends’ use of alcohol and other drugs strongly predicts the adolescents’ likelihood of escalated substance use. Peers introduce adolescents to illicit substances, then model and reinforce their use (Kessler, Berglund, Dernier, Jin, & Walters, 2005; O’Brien et al., 2005).

Adolescents who develop Substance Abuse are at risk for a host of deleterious outcomes. First, substances carry direct risks to adolescents’ health. For example, excessive use of alcohol can cause transient illness; impairment in cognitive functioning; and, in rare cases, coma and death. Substance use can also place adolescents in hazardous situations. For example, adolescents who binge drink may drive while intoxicated, practice risky sexual behavior, or engage in aggressive or antisocial activity. Substance use also carries psychosocial risks. Adolescents with substance use problems show increased conflict and decreased communication with parents, greater likelihood of school-related problems and academic difficulties, and poorer peer relationships. Certainly, problems with family, school, and peers are partly responsible for adolescents’ substance use. However, adolescents who use alcohol and other drugs likely exacerbate these social difficulties and compound their substance use problems (Tucker et al., 2005).

What happens to adolescents who use alcohol and other drugs after they finish high school? Recent data indicate that the risk for developing chronic substance use
problems increases dramatically after adolescents leave high school, regardless of whether they drop out of high school, graduate and enter the workforce, or graduate and attend college (White, Labouvie, & Papadaratsakis, 2005). Risk for problematic substance use peaks between the ages of 18 and 22 years. By age 25 years, there is usually a dramatic decline in substance use and misuse, especially among people who attended college. This decrease in substance use with age is probably caused by young adults entering the workforce, assuming more adult-like responsibilities, marrying, and having children (Rohrbach, Sussman, Dent, & Sun, 2005; White, McMorris, Catalano, Fleming, Haggerty, & Abbott, 2006).

Substance use problems during adolescence can have negative effects on psychosocial functioning in adulthood. Most adolescents who use alcohol and other drugs during adolescence do not continue to show substance use problems as adults, especially if the onset of their substance use was in later adolescence. However, some adolescents, especially those who begin using substances before age 14 years, show long-term substance use problems. These adolescents are also likely to display lower levels of social competence, decreased employment, and increased likelihood of depression and criminal behavior (S. A. Brown, Myers, & Stewart, 1998; Caspi, Harrington, Moffitt, & Milne, 2002; Chassin, Pitts, & DeLucia, 1999).

**Etiology**

The development of substance use disorders is complex. A model that explains the emergence of substance use problems must take into account a wide range of genetic, biological, psychological, and social-cultural factors. One biopsychosocial model has been offered by Sher (1991) to explain the development of alcohol abuse. Sher’s model suggests that alcohol use disorders can emerge along three possible developmental pathways. First, alcohol abuse can develop when people inherit a genetic or biological sensitivity to the effects of alcohol and derive a great deal of pleasure from its use (the enhanced reinforcement pathway). Second, alcohol abuse can arise when people rely on alcohol to cope with depression or anxiety. In this case, alcohol use is negatively reinforced by the alleviation of psychological distress (the negative affect pathway). Third, alcohol abuse can emerge as part of a larger pattern of antisocial behavior. In this pathway, alcohol use problems emerge in the context of CD (the deviance-prone pathway).

These three pathways to substance use problems are not mutually exclusive; many people abuse alcohol and other drugs for multiple reasons. However, these pathways are useful for organizing our understanding of the etiology of substance use disorders (Chassin, Ritter, Trim, & King, 2003).

**The Enhanced Reinforcement Pathway**

*Genetic Diathesis*

At the beginning of all three pathways lies a biological diathesis toward developing Substance Abuse (see Figure 10.6). Considerable research has shown an association between problematic substance use in parents and the development of substance use
disorders in their offspring. Approximately two-thirds of adolescents who show substance use problems have at least one biological parent with a history of Substance Abuse (Winters, Stinchfield, Opland, Weller, & Latimer, 2000). Substance Abuse is especially common among biological fathers (Henggeler et al., 1996).

Having a parent with a history of Alcohol Dependence increases one’s likelihood of developing a substance use disorder two- to nine-fold (Chassin et al., 2003). Twin and family studies indicate that this association between parent and child substance use is at least partially heritable, with 60% of the variance of alcohol use and 33% of other drug use attributable to genetics (Han, McGue, & Iacono, 1999). Genetic factors predict the likelihood of using alcohol and other drugs, the age at which people first begin using substances, and the overall probability of a substance use disorder (McGue, Pickens, & Svikis, 1992).

Researchers have attempted to identify which genes are responsible for the heritability of substance use problems (O’Brien et al., 2005). It appears that no single gene is responsible; rather, a number of genes likely play important roles. Of particular importance are genes that code for dopamine, serotonin, and endogenous opioid receptors.

**Positive Expectations and Pleasurable Effects**

Although having a parent with a substance use disorder places the child at risk for future substance use problems, the mechanism by which biological diathesis leads to substance use disorders is not known. The enhanced reinforcement pathway assumes that biological diathesis makes offspring unusually sensitive to the pharmacological effects of the substance. For example, individuals who have this biological diathesis may respond more intensely to the effects of alcohol, may experience more pleasure from drinking, or may have fewer negative side effects from drinking excessively (Zuckerman, 2007).

At the same time, as adolescents experiment with alcohol and other drugs, they learn about the effects of these substances on their behavioral, social, and emotional functioning. Eventually, they come to expect substances to be beneficial. As use increases, the substances assume reinforcing properties by either bringing about pleasure (i.e., positive reinforcement) or alleviating distress or boredom (i.e., negative reinforcement).

A biological sensitivity to the effects of the substance and an expectation that the substance will have positive effects can lead to problematic use. For example, adolescents at risk for substance use disorders often have unusually positive expectations for substance use; that is, they expect substances to produce a great number
of benefits with few drawbacks (Van Voorst & Quirk, 2003). Indeed, distorted beliefs in the positive effects of alcohol can increase the frequency or amount of drinking (Barnow, Schultz, Lucht, Ulrich, Preuss, & Freyberger, 2004; Kirisci, Tarter, Vanyukov, Reynolds, & Habeych, 2004). In contrast, adolescents who have negative experiences with alcohol and other drugs, or adolescents who are anxious about substance use, are less likely to develop substance use problems.

The Negative Affect Pathway

Individuals can also develop substance use problems in response to stress and negative affect (see Figure 10.7). Stress can arise from negative early childhood experiences, such as growing up in an abusive or neglectful home. Stress can also be caused by later environmental factors, such as witnessing marital conflict, experiencing disruptions in family and interpersonal relationships, or encountering school-related difficulties (Bond, Toumbourou, Thomas, Catalano, & Patton, 2005; A. M. Libby et al., 2004; A. M. Libby, Orton, Stover, & Riggs, 2005). These stressors, in turn, can cause anxiety, depression, and low self-worth. Adolescents who are unable to cope with these negative emotions may use alcohol and other drugs to alleviate psychological distress.6 Substance use, therefore, is negatively reinforced by the reduction of anxiety and depression. Over time, substance use can increase and lead to abuse (K. G. Anderson, Ramo, & Brown, 2006).

The stress and negative affect pathway has not enjoyed widespread empirical support as an explanation for substance use problems among adolescents. Most cross-sectional studies show only moderate associations between adolescents’ ratings of negative affect and their alcohol use. Furthermore, most longitudinal studies have shown that adolescents’ symptoms of depression and anxiety usually do not precede the emergence of their substance use problems. Instead, some data indicate the opposite effect: Adolescent substance use often leads to social and academic problems that elicit depression and anxiety. When mood and anxiety problems predict later substance use, the relationship between mood and substance use is usually weak (S. M. King et al., 2004) or attributable to other factors, such as disruptive behavior problems (Bardone et al., 1998; Goodman & Capitman, 2000; Goodwin et al., 2004; Patton, Coffey, Carlin, Degenhardt, Lynskey, & Hall, 2002; Rao, Daley, & Hammen, 2000).

![Figure 10.7 The Negative Affect Model for Alcohol Use](source: From Sher (1991). Used with permission.)

6Some people use the term “self-medication” to refer to the practice of using substances to alleviate distress.
On the other hand, recent data indicate that the stress and negative affect model might apply to a subset of adolescents who experienced child maltreatment (Libby et al., 2005; B. A. Miller & Mancuso, 2004). Physically abused boys and sexually abused girls show increased likelihood of developing mood problems associated with their victimization. They may rely on alcohol and other drugs to cope with these mood problems.

Furthermore, specific mood and anxiety disorders may place children at risk for substance use problems. For example, adolescents who experience extreme anxiety in social situations often use alcohol to cope with anticipatory anxiety. These adolescents might drink before going to a party, in order to relax. Their repeated alcohol use can lead to abuse (Merikangas, 2005). Adolescents with Bipolar Disorder also show greater likelihood of developing substance use problems (Wilens et al., 2004).

Finally, the stress and negative affect pathway might apply to youths from affluent families. Suburban children living in affluent households may use alcohol and other drugs to cope with depression and anxiety. Furthermore, affluent adolescent boys use alcohol to gain social standing with peers. Luthar and Latendresse (2005) suggest that affluent adolescents lead overly scheduled lives and experience considerable pressure to excel academically, athletically, and socially. At the same time, their parents are often less involved in their lives because of career and social demands. This combination of high stress and low parental supervision places affluent youths at risk.

The Deviance-Prone Pathway

The deviance-prone pathway offers a third explanation for the development of adolescent substance use problems (Chassin et al., 2003). According to this model, adolescent substance use is part of a much larger problem with general antisocial behavior (see Figure 10.8). Consequently, the causes of adolescent substance use problems are similar to the causes of other disruptive behavior problems. These causes include early problems with neurobehavioral inhibition, cognitive and academic delays, peer rejection, and low parental monitoring.

Neurobehavioral Disinhibition

Young children who show neurobehavioral disinhibition are at increased risk for developing substance use problems later in life (Tarter et al., 2003; Zuckerman, 2007). Neurobehavioral disinhibition is characterized by three features: (1) behavioral undercontrol, (2) emotional reactivity, and (3) deficits in executive functioning.

First, children with behavioral undercontrol show high-rate, risky, and impulsive behaviors (Elkins, King, McGue, & Iacono, 2006). These children have a strong need for excitement and are often described as “sensation-seekers” or “daredevils.” The tendency toward behavioral undercontrol is likely inherited; twin and family studies show strong heritability for risk-taking and sensation-seeking behavior (Iacono, Carlson, Taylor, Elkins, & McGue, 1999; Young, Stallings, Corley, Krauter, & Hewitt, 2000). Adults with substance use disorders often display behavioral
Emotional Reactivity

Peer rejection and Association with Deviant Peers

Disruptive Behavior Problems

Academic and School-Related Problems

Behavioral Undercontrol

Emotional Reactivity

Executive Functioning Deficits

Genetic Diathesis to Substance Use

Substance Use Problem

Figure 10.8 The Deviance-Prone Model for Alcohol Use

undercontrol, and they may genetically predispose their children to similar behaviors (King & Chassin, 2004). Indeed, behavioral undercontrol is a strong predictor of later disruptive behavior problems and substance use.

Second, children with neurobehavioral disinhibition display a high degree of emotional reactivity (Chassin et al., 1999). As young children, they display difficult temperaments. Their caregivers describe them as irritable and fussy. Later in childhood, these children often overreact to stress and display a tendency toward irritability, anger, and aggressive outbursts.

Third, children with neurobehavioral disinhibition show deficits in executive functioning (Kirisci, Vanyukov, & Tarter, 2005; Tarter, Kirisci, Habeych, Reynolds, & Vanyukov, 2004). Executive functioning refers to the cognitive processes that allow children to inhibit immediate impulses, plan and prioritize behavior, and achieve long-term goals. Children with deficits in executive functioning display problems with inattention, hyperactivity, and impulsivity.

**Academic and Peer Problems**

According to the deviance-prone model, problems with neurobehavioral disinhibition can interfere with children’s academic performance. Specifically, children who show problems with behavioral undercontrol may have difficulty attending to teachers and adhering to classroom rules. They may also have trouble staying on task in class and completing exams. Deficits in executive functioning can also interfere with children’s abilities to complete assignments in a timely fashion, to plan and organize academic activities, and to accomplish long-term projects. Children with neurobehavioral disinhibition often have negative views of school, earn low grades, and struggle academically (Gau, Chong, Yang, Yen, Liang, & Cheng, 2007).

Problems with disinhibition can also affect children’s interactions with peers. Peers often find these children’s high-rate, disruptive behavior aversive. They may avoid interacting with them in the classroom and during recess. Furthermore, children who display emotional reactivity, especially aggression, are often rejected by peers.

**Association with Deviant Peers**

Academic problems and peer rejection can cause children to distance themselves from classmates and mainstream peer groups. Instead of associating with prosocial peers, these disruptive children associate with other rejected youths. Typically, rejected peers display similar histories of academic and disruptive behavior problems (Pearson, Sweeting, West, Young, Gordon, & Turner, 2006).

Early substance use often occurs when deviant peers introduce children to alcohol and other drugs. Peers model substance use, encourage experimentation, and reinforce continued use over time. Rejected children might initially engage in substance use to gain acceptance into the deviant peer group. Over time, repeated use can lead to an exacerbation of social and academic problems and the development of substance use disorders (Barnes, Hoffman, Welte, Farrell, & Dintcheff, 2006).

The relationship between deviant peers and substance use may be different for boys and girls. Some girls associate with deviant peers for the same reasons as boys:
They are ostracized by prosocial peers because of their behavioral and academic problems. However, early pubertal maturation also increases the likelihood that girls will associate with deviant peers. Older boys, in particular, may introduce early-maturing girls to alcohol and other drugs, encourage antisocial behavior, and pressure them to engage in sexual activity. Despite their appearance, these early-developing girls may lack the maturity to resist social pressures. Indeed, early-developing girls show greater consumption of alcohol and other drugs than typically developing girls. Furthermore, they are more likely to develop substance use problems than their typically developing peers (Andrews, 2005).

**Protective Factors**

The association between academic/peer problems and children’s substance use is moderated by parenting. Parents can affect their children’s likelihood of developing substance use problems in two ways. First, children whose parents monitor their daily activities are less likely to develop substance use problems, regardless of their academic and peer status (Barnes et al., 2006). Parents who monitor their children provide fewer opportunities for their children to associate with deviant peers and experiment with alcohol and other drugs (Gau et al., 2007).

Second, parents who provide sensitive and responsive care to their children and discipline their children in a consistent and noncoercive manner can reduce the likelihood of their children’s substance use (Parker & Benson, 2005). In contrast, parents who interact with their children in a hostile or coercive fashion can cause children to further distance themselves from the family and affiliate more strongly with deviant peers (Urberg, Luo, Pilgrim, & Degirmencioglu, 2003). King and Chassin (2004) found that parents’ use of consistent, noncoercive discipline can protect some disruptive adolescents from developing substance use problems. However, they also found that adolescents with a strong genetic diathesis to behavioral undercontrol often developed substance use disorders regardless of the quality of parental care.

**Treatment**

**Primary Prevention Programs**

Primary prevention programs target all youths, regardless of their risk status for developing a psychological disorder. Primary prevention programs generally fall into two categories: school-based programs and community-based programs.

**D.A.R.E.**

D.A.R.E. is the best-known school-based program designed to prevent substance use problems. D.A.R.E. originated in Los Angeles in 1983. It was originally intended to increase contact between police and school-age children. The program consisted of weekly visits by uniformed police officers to fifth- and sixth-grade classrooms.
Officers discussed the dangers of substance use, ways to avoid peer pressure to use alcohol and other drugs, and techniques to promote abstinence. It has since been expanded to elementary and junior high school classrooms across the United States.

Despite its popularity, D.A.R.E. does not appear to be effective in reducing alcohol and other drug use. The first meta-analysis of D.A.R.E., funded by the National Institute of Justice, revealed that children who did and did not participate in D.A.R.E. had equal rates of substance use by early adolescence (Ennett, Tobler, Ringwalt, & Flewelling, 1994). Other randomized controlled studies showed that D.A.R.E. produced increases in children’s knowledge of substance use problems but did not cause changes in children’s substance use or abuse (Clayton, Cattarello, & Johnstone, 1996; Dukes, Stein, & Ullman, 1997; Rosenbaum, Gordon, & Hanson, 1998).

Media Campaigns

Two national media campaigns have also targeted alcohol and other drug use among children and adolescents (O’Brien et al., 2005). Beginning in 1987, the Partnership for a Drug Free America (PDFA) produced television ads designed to provide substance abuse education to youth and their parents. Evaluation of the campaign indicated that it was successful in reaching a large number of families across the United States. Furthermore, the media campaign coincided with an overall decrease in substance use among American youth. Proponents of the program concluded that it was effective in preventing substance use problems. However, critics argued that the general decrease in substance use actually preceded the onset of the media campaign; therefore, it may be inappropriate to attribute this reduction in substance use to the campaign.

In the late 1990s, a second media campaign was conducted by the White House Office of National Drug Control Policy. This campaign resembled the PDFA campaign and consisted largely of television ads directed toward parents and children. The ads were designed to (1) increase parent-child communication about alcohol and other drugs, (2) increase parental monitoring of children’s peer groups and after-school activities, (3) decrease children’s positive beliefs and expectations about substance use, and (4) decrease youths’ actual use of alcohol and other drugs.

An evaluation of the campaign demonstrated that the program reached a large number of families. It also increased parent-child communication about substance use. However, the campaign was largely unable to increase parental monitoring or decrease children’s subsequent substance use. In fact, exposure to the media campaign was actually associated with an increase in children’s intentions to use marijuana! It is possible that youths who were told to abstain from certain drugs, like marijuana, strongly resented these prohibitions. To exert their autonomy, they may have decided to use the drug.

Overall, evaluations of school- and media-based prevention campaigns have not been encouraging. Nevertheless, policymakers will likely continue to implement these programs, despite limited evidence regarding their effectiveness. All too often, people form opinions and shape public policy based on anecdotal evidence rather than on carefully collected data (Birkeland, Murphy-Graham, & Weiss, 2005).
In the case of D.A.R.E., policy informed by anecdotal impressions and ideology alone seems to have resulted in a considerable loss of time and money. In the case of certain media campaigns, failure to evaluate outcomes may have caused an increase in the behavior the program was designed to prevent.

**Secondary Prevention Programs**

Secondary prevention programs are designed for youths at risk for developing substance use problems. Most secondary prevention programs are ecologically based; that is, they target at-risk youth in certain areas or neighborhoods (Pumariega, Rodriguez, & Kilgus, 2004). Programs are usually designed for middle-school students who are about to make the transition from childhood to early adolescence. Program developers reason that a successful transition from preadolescence to adolescence can protect youths from developing substance use problems.

Ecologically based prevention programs target multiple risk factors simultaneously. First, information is provided to adolescents about substance use and misuse. Adolescents are also taught techniques to avoid substance use with peers. Second, parents are taught about adolescent substance use problems and steps that they can take to decrease the likelihood that their adolescents will use alcohol and other drugs. Many programs emphasize the importance of improving parent-child communication, monitoring children’s friends and activities, and setting clear but developmentally appropriate limits on children’s behavior. Third, ecologically based programs address the child’s larger social system: school, peers, and the community. Some programs offer after-school activities to promote abstinence to entire peer groups. Other programs work with community officials and police to limit adolescents’ access to alcohol and other drugs.

Researchers evaluated the effectiveness of 48 secondary prevention programs using a sample of approximately 10,000 adolescents (Sambrano et al., 2005). Roughly half of the sample participated in a prevention program while the remaining adolescents served as controls. Results of the evaluation were disappointing. Overall, adolescents who participated in the prevention programs did not differ in their alcohol and marijuana use compared to controls. However, when researchers looked at the data more carefully, they noticed that the programs that provided high-intensity, comprehensive services reduced substance use more than controls. These findings indicate that all prevention programs are not equal. To be effective, prevention programs must target multiple risk factors in the adolescent’s life and teach skills to avoid substances and develop positive relationships with peers.

**Psychosocial Treatments**

*Inpatient Treatment and Twelve-Step Programs*

Some adolescents with serious substance use disorders participate in 28-day inpatient treatment programs. Although inpatient treatment programs vary, most have three goals: (1) to attend to the adolescent’s immediate medical needs and to
detoxify her body, (2) to help the adolescent recognize the harmful effects of the substance on her health and functioning, and (3) to improve the quality of the adolescent’s relationships with others.

To accomplish these goals, nearly all inpatient programs require adolescents to abstain from alcohol and other drug use during treatment. Staff members educate adolescents about the process of substance dependence and the physiological, psychological, and social effects of substance use. Inpatient programs typically provide individual and group therapy to adolescents. Staff members also offer family therapy sessions designed to improve parent-adolescent communication and problem solving. Before the end of treatment, staff members help the adolescent and family members prepare for a return to school and home.

Most inpatient programs incorporate 12-step philosophies into their treatment package. Twelve-step programs include Alcoholics Anonymous (AA) and Narcotics Anonymous (NA). Proponents of these programs conceptualize alcohol and other drug use as a disease. From this perspective, substance abuse and dependence is a medical disorder that develops because of genetics; is maintained because of biology and “brain chemistry”; and deleteriously affects the person’s social, emotional, and spiritual life. Proponents of 12-step programs argue that individuals must first acknowledge that they have the disease and that they are powerless to overcome its effects.

Participants progress through a series of 12 steps designed to help them cope with their substance use and remain abstinent. At some point in their participation, they must recognize their inability to overcome their substance use problem and they must surrender themselves to a “higher power.” Indeed, they are taught to rely on spirituality and support from others to cope with urges to drink or use other drugs. Participants attend group meetings to gain the support of other people struggling with substance use disorders. Each participant also selects a mentor who provides individual support and advice to help her maintain sobriety.

Twelve-step programs are the most frequently used means of treating Substance Abuse and Dependence in the United States. Typically, 12-step programs are initiated during inpatient treatment. After the individual completes inpatient treatment, he or she is encouraged to continue participating in 12-step programs in the community. Very often, individuals participate in 12-step group meetings while simultaneously meeting with an individual therapist.

Twelve-step programs have demonstrated efficacy among adults with substance use problems. However, less information is available regarding the efficacy of 12-step treatment for adolescents (Elliott, Orr, Watson, & Jackson, 2005). Twelve-step programs that are administered as part of inpatient treatment tend to be highly effective, probably because adolescents are living in controlled environments with limited opportunities for substance use. Some participants are able to maintain treatment gains 6 to 12 months after program completion (Winters et al., 2000). However, adolescents released from these inpatient programs usually have high rates of relapse. Approximately 60% relapse within 3 months of discharge and as many as 80% relapse within one year (Kaminer & Bukstein, 2005).
Cognitive-Behavioral Therapies

Cognitive-behavioral therapy (CBT) for substance use disorders has gained considerable popularity in recent years (Waldron & Kaminer, 2004). Practitioners of CBT view problematic substance use as a learned behavior that is acquired and maintained in four ways.

First, people often learn to use alcohol and other drugs through operant conditioning. For example, alcohol can be positively reinforcing to the extent that it gives people a subjective sense of satisfaction and well-being or enhances enjoyment during social interactions. Alcohol can also be negatively reinforcing to the extent that it reduces tension or alleviates pain. Over time, the reinforcing properties of alcohol lead to increased use.

Second, through classical conditioning, people learn to associate substance use with certain situations or mood states. For example, an adolescent might use marijuana with a certain group of friends. He discovers that smoking with these friends allows him to relax and have a good time. Through classical conditioning, he associates this group of friends with marijuana use. In the future, these friends might serve as a trigger or “stimulus cue” for him to use again.

Third, substance use is often maintained through social learning. Specifically, family members sometimes model substance use. Adolescents might view substance use as an acceptable means to cope with stress or facilitate social interactions. Similarly, peers often model and reinforce drug and alcohol use, communicating that to gain social approval, drug and alcohol use is not only acceptable, but expected.

Fourth, adolescents’ beliefs mediate the relationship between events that trigger substance use and consumption of alcohol and other drugs (J. S. Beck, Liese, & Najavits, 2005). Strictly speaking, events do not cause people to use substances; rather, people’s interpretations and thoughts about events lead to either substance use or abstinence. Adolescents often hold distorted beliefs about situations that prompt their substance use (see Figure 10.9). These distorted beliefs elicit drinking or other drug use.

To understand the way beliefs mediate the relationship between events and behavior, consider the following example. Sam is a shy tenth grader who has been

**Activating Event**
- Going to a party
- Feeling uptight
- Friends offer a drink

**Beliefs**
- “A drink will help me relax.”
- “I’ll have more fun with my friends.”

**Consequence**
- Accepting the drink

**Figure 10.9** Cognitive Model for Adolescent Alcohol Use

Note: Cognitions mediate the relationship between events and people’s overt behavior. Adolescents who believe that alcohol will facilitate social interactions or help them have more fun are more likely to drink than adolescents who believe that alcohol will not produce pleasurable effects.
invited to a party. When his friends pick him up to go the party, they offer him some beer to help him relax. Sam's decision to drink or abstain will depend largely on his thoughts about the situation. Beliefs such as “Having a couple of drinks will help me relax and get into a good mood” will increase his likelihood of accepting the drink. Alternatively, beliefs such as “I'll be OK without the drink; Jim isn't having any” may lead him to decline the drink.

The techniques used in CBT target each of the four ways substance use problems develop and are maintained: (1) operant conditioning, (2) classical conditioning, (3) social learning, and (4) ways of thinking. First, the therapist asks the adolescent to monitor her substance use and note environmental factors or mood states that precede substance use. For example, an adolescent might discover that she only drinks when she is nervous before or during a party. With this information, the therapist and adolescent try to find ways for her to avoid feelings of nervousness that trigger alcohol use. The adolescent might decide to ask a friend to go to parties with her so that she does not experience as much anticipatory anxiety.

Second, the therapist encourages the adolescent to consider the consequences of her substance use. Specifically, the therapist and adolescent might conduct a cost-benefit analysis of using alcohol or other drugs (see Figure 10.10). For example, the adolescent might list certain benefits of drinking before attending a party: it helps her relax; it allows her to have a good time. However, these benefits might be overshadowed by potential drawbacks: she drinks too much and gets sick; she feels guilty afterward; her parents become angry.

![Figure 10.10](cost-benefit-analysis.png)

**Figure 10.10** Cost-Benefit Analysis of Alcohol Use

Source: Based on J. S. Beck et al. (2005).

Note: Cognitive-behavioral therapists often ask adolescents to consider the pros and cons of (1) abstinence and (2) continued drinking.
Third, to help adolescents avoid substance use, therapists teach their clients specific skills to reduce the reinforcing effects of alcohol. The skills that they teach depend largely on the adolescents’ reasons for using. Adolescents who consume alcohol to reduce anxiety before a party might benefit from relaxation or social skills training. If they felt more relaxed or confident before the party, they might experience less desire to drink. Adolescents who drink in order to gain peer acceptance might be taught alcohol refusal skills. During the session, the therapist and adolescent might generate and practice ways to refuse alcohol when peers offer it.

Fourth, most cognitive-behavioral therapists examine the beliefs that adolescents have about substances and challenge distorted cognitions that lead to problematic use. Many adolescents overestimate the benefits of alcohol and dismiss its potentially harmful effects. An adolescent might reason, “It’s fun to get wasted with my friends; we always have a great time.” The therapist might encourage the adolescent to look at his alcohol use more objectively, by considering the negative consequences of use.

Similarly, an adolescent might overestimate the frequency with which peers use alcohol and other drugs, claiming, “I drink about as much as everybody else.” In response, the therapist might share data regarding typical alcohol use among adolescents of the same age and gender. Consider the following transcript of a therapy session:

Therapist: We’ve been talking for quite a while and I’ve noticed that you put a lot of pressure on yourself to drink when you’re hanging out.

Adam: Well, sort of. It’s more like the other guys put a lot of pressure on me. I’m fine when I’m with them most of the time. It just gets a little hard when I go to parties or things like that.

Therapist: So, when you go to one of these parties, what’s it like?

Adam: Well, I usually see a lot of my friends and the other kids from school. They look like they’re drinking and having a good time. It’s like they expect me to drink too. And I want to have a good time, too—to have fun. I also don’t want to let them down and ruin their fun.

Therapist: You mean if you don’t drink, you might be ruining their good time?

Adam: Yeah, I guess. I just think that they’d think, “What’s the matter with him. Doesn’t he want to have fun? Does he think he’s better than the rest of us?” It makes me nervous.

Therapist: And how do you know that’s what’s going through their minds? What’s the evidence?

Adam: I don’t know. I can just tell, you know. I get real nervous about the situation and I can just tell that’s what they’re thinking.

Therapist: It sounds to me like you’re reasoning with your emotions, not with your head. This can sometimes get us into a lot of trouble and cause...
us to feel nervous. Let’s see if we can look at the situation a little more objectively. Was everyone else at the party drinking?

Adam: Yeah, most people.

Therapist: But not everyone?

Adam: No, there were a few guys who weren’t drinking.

Therapist: Did the other kids make fun of these other guys?

Adam: No. Everyone was OK with it.

Therapist: And did you think these kids (who didn’t drink) were somehow weird or strange or better than you?

Adam: No. I guess I didn’t think anything of it. Everyone just wanted to have a good time.

Therapist: So no one at the party was really interested in who drank and who didn’t. They were more interested in having fun themselves.

Adam: Yeah. I guess so, now that I think about it.

Within the past 10 years, a number of randomized controlled studies involving adolescents with substance use problems have shown CBT to be efficacious (Patterson & O’Connell, 2003). Adolescents who participate in CBT show greater reductions in substance use than adolescents who receive individual supportive therapy, group therapy, or information about substance use problems alone (Kaminer, Blitz, Burleson, Sussman, & Rounsaville, 1998; Kaminer et al., 2002; Waldron et al., 2001).

Motivational Enhancement Therapy

Another method of treatment involves motivational enhancement therapy, sometimes referred to as “motivational interviewing” or “motivational counseling” (Tevyaw & Monti, 2004). The primary goal of motivational enhancement therapy is to increase the adolescent’s desire to reduce his alcohol consumption. Practitioners of motivational enhancement therapy recognize that most adolescents are referred to therapy by parents, teachers, or other adults; rarely do adolescents seek treatment themselves. Consequently, adolescents usually have low motivation to participate in treatment and less motivation to change their drinking habits.

Practitioners of motivational enhancement therapy help adolescents increase their willingness to change. Adolescents progress through a series of steps, or stages of change, as they move from a state of low motivation to change to a state of high readiness to change (Prochaska, DiClemente, & Norcross, 1992). The stages are pre-contemplation (not recognizing that their alcohol use is a problem), contemplation (considering the possibility that their alcohol use is problematic), preparation (making initial steps to change, such as making an appointment with a therapist), action (changing behavior), and maintenance (avoiding relapse).

To increase the adolescent’s motivation to change, the therapist uses five principles of motivational enhancement (Miller & Rollnick, 2002). First, she approaches
the adolescent in an accepting and nonjudgmental way. The therapist communicates warmth and genuine concern for the adolescent and avoids signs that she disapproves of the adolescent’s alcohol use or disagrees with his attitudes about drinking. Second, she actively listens to the adolescent’s point of view in order to accurately understand his perspective. The therapist’s initial goal is to understand and accept the adolescent, not to persuade him to adopt others’ beliefs about drinking. Third, the therapist highlights discrepancies between the adolescent’s short- and long-term goals and his current alcohol use. For instance, the therapist might surmise that athletic achievement is important to the adolescent. She might ask him whether drinking, which jeopardizes his eligibility to compete, is consistent with his goal to be a star athlete. Fourth, the therapist rolls with resistance and avoids argumentation. If the adolescent becomes defensive, angry, or avoidant, the therapist assumes it is because she is not adequately understanding and appreciating the adolescent’s perspective. Fifth, the therapist supports any commitment to change, no matter how small. The therapist sees herself as being “in the adolescent’s corner,” that is, supporting and encouraging his decisions regardless of whether they agree with her own. For example, the therapist might support the adolescent’s decision to cut back on his drinking, even if this falls short of complete abstinence.

Practitioners of motivational enhancement therapy usually do not see abstinence as the primary goal of therapy. Instead, these practitioners often adopt a harm reduction approach to treatment (Miller, Turner, & Marlatt, 2001). According to the harm reduction perspective, the primary goal of therapy is to help adolescents identify and avoid alcohol use that has great potential for harm. For example, the therapist might support the adolescent’s decision to drink fewer than four beers at a party, even if this decision might not make the adolescent’s parents very happy. Any reduction in alcohol use that decreases risk or harm to the adolescent is viewed as successful.

Many people, especially parents, question the ethics of using a harm reduction approach with adolescents under 18 years of age. After all, is it appropriate for therapists to support an adolescent’s decision to engage in an illegal behavior? Although ethical questions like these cannot easily be answered, we should consider three points. First, therapists who adopt a harm reduction perspective must obtain parental consent prior to treatment. Although adolescents have basic rights to autonomy and self-determination, parents have the ultimate responsibility for their children’s welfare and development. The therapist cannot ethically proceed with a harm reduction approach to therapy without parental consent. Second, most therapists who adopt a harm reduction perspective would probably argue that abstinence is the ideal goal of therapy. To the extent that abstinence has low probability, any reduction in alcohol use can be seen as beneficial. Finally, practitioners need to consider empirical data, in addition to personal beliefs, when they judge the merits of a harm reduction approach to treatment. If harm reduction works and clinicians do not use it, can they defend their practice?7

7The American Academy of Child and Adolescent Psychiatry (2005) identifies abstinence as the primary goal of treatment for adolescent substance abuse. Harm reduction can be an acceptable, implicit method of treatment as long as professionals do not advocate the use of alcohol and other drugs in therapy.
Emerging data indicate that motivational enhancement therapy can be effective for high school students at risk for substance use problems. In two studies, adolescents who presented to an emergency department because of an alcohol-related event were randomly assigned to either one session of motivational enhancement therapy or usual care. At six-month follow-up, adolescents who participated in motivational enhancement therapy showed lower rates of alcohol-related problems and injuries than controls. Furthermore, adolescents with the lowest motivation to change before treatment showed the greatest benefits from their participation in treatment (Monti, Barnett, O’Leary, & Colby, 2001; Monti et al., 1999).

Two additional studies examined the efficacy of motivational enhancement among high school students who frequently used alcohol and marijuana (Grenard, Ames, Wiers, Thush, Stacy, & Sussman, 2007; McCambridge & Strang, 2004). Adolescents received either one session of motivational enhancement therapy or no intervention. Three months later, adolescents who participated in motivational enhancement therapy showed significant reductions in alcohol and marijuana use. Furthermore, reductions were greatest among adolescents who showed the most frequent use before treatment (see Figure 10.11).

**Figure 10.11** Efficacy of Motivational Enhancement Therapy for Adolescents With Alcohol or Marijuana Use Problems

Source: Based on McCambridge and Strang (2004).

Note: Individuals in the treatment group received only one session of motivational enhancement. Three months later, they were less likely to use drugs than adolescents who served as controls.
Family Therapies

The most extensively studied treatment for adolescent substance use problems is family therapy (Hogue, Dauber, Samuolis, & Liddle, 2006; Liddle, 2004). Practitioners of family therapy view adolescent substance use as a family problem. The causes of adolescent substance abuse must be understood in light of the adolescent’s family and her surrounding social system. Consequently, family therapists are interested in how the adolescent’s relationships with parents, home environment, and school/neighborhood influence her substance use. Since all three ecological factors are interconnected, change in any one factor can affect all of the others. For example, increasing parents’ involvement in the adolescent’s activities could improve the adolescent’s commitment and attitude to school. Helping the adolescent manage anger could enhance her relationship with parents and decrease her likelihood of seeking support from deviant peers.

Although the therapeutic tactics used by family therapists vary, they usually share two objectives. One objective is to help parents manage their adolescent’s substance use. This component of treatment typically involves education about normal and atypical adolescent development, the causes and consequences of adolescent substance abuse, and the role parents play in their adolescent’s alcohol use. Therapists usually stress the importance of placing developmentally appropriate limits on adolescents’ behavior, disciplining adolescents in a manner that is fair and consistent, and monitoring adolescents’ activities.

The second objective of family therapy is to improve the quality of family functioning. Typically, therapists meet with adolescents and parents together and observe the quality of family interactions. Most therapists are chiefly interested in patterns of communication among family members. For example, some families avoid direct confrontation with each other and rarely talk about topics that make them angry, worried, or upset. Other families show frequent emotional outbursts and criticism toward each other, behaviors that often leave family members feeling isolated or rejected. Therapists often point out these communication patterns and teach family members to use different, more effective strategies (Hogue et al., 2006).

Family therapists are usually interested in the way parents and adolescents solve problems. They want to know how well parents balance the adolescent’s needs for autonomy with their desire to direct their adolescent’s activities. Some parents adopt authoritarian practices that deny adolescents appropriate self-determination. Excessive parental control can cause adolescents to defy parental commands. Other parents are overly permissive. These parents place too few constraints on their adolescents’ activities. Permissive parenting increases adolescents’ opportunities to associate with deviant peers (Hogue et al., 2006).

One type of family therapy that has been used for adolescents with substance use problems is multidimensional family therapy (MDFT; Liddle, Oakof, Diamond, Parker, Barrett, & Tejeda, 2001). MDFT targets four dimensions of family functioning that are relevant to the adolescent’s well-being: (1) the adolescent’s substance use, (2) the caregiving practices of the adolescent’s parents, (3) the quality of the parent-adolescent relationship, and (4) other social factors that can influence the adolescent’s substance use, such as his peer relationships or involvement in school.
MDFT involves a series of individual sessions with the adolescent, individual sessions with the parents, and combined family sessions over the course several months. Individual sessions with the adolescent focus on increasing the adolescent’s social skills and involvement with prosocial peers, helping the adolescent recognize and manage negative emotions, and reducing the adolescent’s contact with deviant peer groups.

Individual sessions with parents include teaching parents about the causes of adolescent substance use disorders, outlining ways parenting behaviors can contribute to these disorders, and helping parents monitor and discipline adolescent behavior. The therapist also tries to stress the importance of parents’ taking an interest in their adolescents’ activities.

Family sessions are dedicated primarily to improving dyadic communication and problem-solving skills. Near the end of treatment, family sessions are meant to help maintain treatment gains and develop a plan in case of relapse. Throughout the course of treatment, therapists can help families manage specific problems involving systems outside the family. For example, the therapist might facilitate the adolescent’s participation in court-ordered substance counseling or his return to school after suspension.

Family therapy for adolescent substance use problems has been supported by a number of randomized controlled trials. For example, Liddle, Rowe, Dakof, Ungaro, and Henderson (2004) randomly assigned 80 children and adolescents (11–15 years) with marijuana use problems to two treatment conditions: (1) MDFT or (2) traditional group therapy. Outcomes were assessed six weeks into treatment and at termination. Results showed that adolescents in both groups displayed reductions in marijuana use. However, MDFT produced more rapid results and was more effective than group therapy in improving adolescents’ social, emotional, behavioral, and academic functioning.

Results of other studies indicate that family therapies are efficacious in reducing the use of alcohol, marijuana, and other drugs relative to controls (Ozechowski & Liddle, 2000). Furthermore, family therapies have been shown to be more efficacious than individual supportive therapy, group supportive therapy, and family-based education about substance use (Liddle, 2004).

Comparison of Treatments

Until recently, little was known about the relative efficacy of treatments for adolescent substance use problems. The most promising treatments, CBT, motivational enhancement therapy, and family systems therapy, had been studied independently. Recently, the Center for Substance Use Treatment conducted the first large-scale comparison study to determine which treatment reduced adolescent substance use in the most time- and cost-effective manner (Dennis et al., 2002). This comparison study, the Cannabis Youth Treatment Study, has provided researchers and clinicians with new information about the treatment of adolescent substance use problems.

Dennis and colleagues (2004) conducted two studies administered at four treatment centers across the country. Participants were 600 adolescents with marijuana use problems.
use problems and their parents. Most adolescents reported daily or weekly marijuana use; almost 20% also reported daily or weekly alcohol use.

In the first study, adolescents were randomly assigned to one of three treatment conditions (Diamond et al., 2002). The first group received five sessions of motivational enhancement therapy and CBT (MET/CBT 5). The second group received 12 sessions of the same treatment (MET/CBT 12). The third group received 12 sessions of motivational enhancement therapy and CBT and an additional 6 sessions of family supportive therapy (MET/CBT 12 + Family Support). The parent/family sessions were designed to improve parents’ behavior management skills, improve parent-adolescent communication, and increase parents’ involvement in their adolescent’s treatment. Researchers assessed adolescent outcomes 12 months after treatment. Results of the first study showed that all three forms of treatment were equally efficacious in reducing adolescent substance use. Five sessions of MET/CBT was the most time- and cost-efficient treatment.

In the second study, adolescents were randomly assigned to one of three treatment conditions (Diamond et al., 2002). The first group received five sessions of MET/CBT. The second group participated in a behaviorally based family therapy program. The third group participated in 15 sessions of MDFT. Results of the second study yielded similar findings. Adolescents in all three treatments showed similar reductions in substance use. In this study, however, MET/CBT 5 and the behaviorally based family therapy program were the most cost-effective interventions.

Results of the Cannabis Youth Treatment Study seem to suggest that five sessions of MET/CBT can be sufficient to treat adolescent substance use disorders (see Figure 10.12). However, other research indicates that family therapy may be an important supplement to motivational enhancement and cognitive-behavioral interventions. Liddle and colleagues (Liddle & Hogue, 2001; Liddle & Rowe, 2006; Waldron et al., 2001) compared CBT with family therapy for adolescents with alcohol use problems. Overall, they found that both CBT and family therapy were efficacious in reducing substance use; however, family therapy sometimes produced more rapid reductions in alcohol use and more lasting abstinence than CBT. The superiority of family therapy over CBT is attributable to its greater emphasis on decreasing family conflict, improving parent-adolescent communication, and strengthening parenting skills (Hogue, Liddle, Dauber, & Samuolis, 2004). Indeed, many professional organizations recommend including families in the treatment of adolescent substance use disorders, even when practicing motivation enhancement therapy and CBT (American Academy of Child and Adolescent Psychiatry, 2005).

Relapse Prevention

Results of the Cannabis Youth Treatment Study highlighted a glaring problem in the treatment of adolescent substance use disorders: Most adolescents who respond to treatment will eventually relapse. In the cannabis study, 66%–83% of adolescents who participated in treatment had either not responded to therapy or had relapsed within 12 months of completing therapy (Diamond et al., 2002). Across other studies of adolescents with alcohol use problems, approximately 50% of youths relapse
within three months after treatment, 66% relapse after six months, and as many as 75%–80% relapse after one year (Wagner & Austin, 2006).

Therapists have begun to systematically address the possibility of relapse during the course of therapy. Indeed, Marlatt and Gordon (1985) developed a relapse prevention component to therapy for adults with substance use problems. This approach has subsequently been adapted for use with adolescents (Patterson & O'Connell, 2003).

Relapse prevention is most often used with motivational enhancement and cognitive-behavioral therapy. After the adolescent has shown a decrease in substance use, the therapist begins to discuss the possibility of relapse. The therapist might mention that relapse is likely when the adolescent encounters any high-risk situations. High-risk situations usually involve stimulus cues that trigger substance use. Cues might include certain people (e.g., friends who expect the adolescent to drink with them), situations (e.g., parties or being alone), and negative mood states (e.g., feeling depressed or bored). The strongest stimulus cues seem to be exposure to family members and friends who use substances (Latimer, Newcomb, Winters, & Stinchfield, 2000).

Stimulus cues can trigger relapse even if adolescents have been abstinent for long periods of time. Often, adolescents feel shame and guilt after breaking a period of

Figure 10.12  The Cannabis Youth Treatment Study
Source: From Dennis et al. (2004). Used with permission.
Note: All groups of adolescents who participated in treatment showed similar rates of recovery. Five sessions of MET/CBT or behavioral treatment were most time- and cost-effective. Notice that only about 20%–30% of youths showed recovery at follow-up.
abstinence, an experience referred to as the abstinence violation effect (Marlatt & Gordon, 1985). Adolescents may interpret their relapse to internal, stable, and global causes; that is, they blame their relapse on their weak morals, their lack of will power, or their general inability to control their lives. Consequently, many adolescents continue to use, believing that abstinence is impossible.

Adolescents’ thoughts about the relapse greatly affect their ability to maintain sobriety. After having one drink, many adolescents show a number of cognitive distortions that make them more likely to continue their alcohol use. For example, many adolescents engage in catastrophic thinking; that is, they expect the worst possible consequences from “falling off the wagon.” They might reason, “Well, now that I’ve had one drink, everything is ruined. I’m going to hit rock bottom again, my parents are going to kill me, I’m going to get kicked out of school, and I’m probably not going to graduate.” As a result of catastrophic thinking, adolescents conclude, “I guess there’s no use; I might as well get drunk.”

Therapists who incorporate relapse prevention into their treatment not only help clients develop a plan for responding to a possible relapse, but they also teach youths to learn from the relapse experience. First, the therapist encourages the client to identify stimulus cues that might lead to relapse and generate ways to avoid these cues. Second, the therapist and client might create a concrete strategy for dealing with a relapse. For example, if the adolescent uses alcohol, she might agree to contact the therapist or a support group member immediately, before she has another drink. The therapist or friend might then encourage her to avoid the situation that triggered the relapse and take steps to maintain sobriety. The therapist might help the client to attribute the relapse to external, transient causes (e.g., a stressful day, a lot of pressure from friends) rather than to personal weakness.

Similarly, the therapist might challenge the adolescent’s catastrophic thoughts or other cognitive distortions that could increase his likelihood of drinking even more. Consider the following transcript from a therapy session:

Mike: Before I knew it I had had five or six beers at the party and I was doing a lot of stupid stuff. At first, I felt really good. But then I just thought, “What a loser.” I’d been so good not drinking for those months and now I just threw that all away.

Therapist: You felt as if all your work had been for nothing?

Mike: Exactly. Like, no matter what I do, I’m going to end up a drunk like my dad. I figure, what’s the use?

Therapist: It sounds like you’re being a little too hard on yourself. Just because you had a few drinks at the party that night, does that really mean you’re going to be a drunk? After all, wasn’t there a lot of encouragement from friends to drink that night?

Mike: Well, yeah. I really wanted to have a good time with everybody else.

Therapist: And you didn’t get into any serious trouble like last time [when you drove off the road and hit a tree]?
Mike: No, I made it home fine.

Therapist: Then maybe we can look at the situation a little more closely and learn from it. Maybe we can see what triggered your decision to drink and figure out how to avoid these triggers in the future.

As the above narrative suggests, the therapist encourages the adolescent to view the lapse as a possible learning experience rather than a sign of failure. If the adolescent views the lapse as an indicator that she is “back at rock bottom,” then she might drink even more heavily. Alternatively, the therapist and client might analyze the antecedents and consequences of the lapse and develop ways to avoid another lapse in the future.

Researchers are only beginning to study factors that affect the likelihood of relapse among junior and senior high school students. Our current knowledge of relapse among adolescents can be summarized as follows. First, adolescents seem to relapse for different reasons than adults. Adolescents are more likely than adults to relapse because of exposure to substance-using peers, pressure or encouragement from friends, and a desire to enhance mood or enjoy the pleasurable effects of the drug. In contrast, adults often relapse when depressed, anxious, or otherwise distressed (McCarthy, Tomlinson, Anderson, Marlatt, & Brown, 2005; Ramo, Anderson, Tate, & Brown, 2005). Second, adolescents’ self-efficacy regarding their ability to abstain is inversely related to their likelihood of relapse. Adolescents who are confident that they can resist the pleasurable effects of substances and avoid social pressures to use are more likely to maintain abstinence (Burleson & Kaminer, 2005). Third, adolescents who do not regard their substance use as problematic are far more likely to relapse than adolescents committed to long-term behavior change (Callaghan, Hathaway, Cunningham, Vettese, Wyatt, & Taylor, 2005; Ramo et al., 2005). Since both situational (e.g., peers) and cognitive (e.g., beliefs, readiness to change) factors affect likelihood of relapse, both are targets of relapse prevention.

**Update: Erica**

Although Erica did not meet diagnostic criteria for Substance Abuse, her drinking was beginning to be problematic. Erica was at particular risk for substance use problems because her friends often encouraged her to drink at parties and her parents did not monitor her behavior.

Randy continued to meet with Erica for 12 sessions of outpatient therapy. He used the principles of motivational enhancement therapy to help Erica increase her readiness to change her drinking behavior. Both Randy and Erica agreed that it was probably unrealistic for her to avoid drinking at parties altogether. However, Randy helped Erica weigh the benefits of drinking (e.g., having fun) with the potential costs of earning lower grades in school and getting arrested.

Erica completed mandated therapy and community service. Several months after termination, Erica called Randy to thank him for being her counselor. Apparently, one of Erica’s friends was seriously injured in an alcohol-related car accident. “I suppose that could have just as easily been me,” said Erica.
Critical Thinking Exercises

1. Differentiate substance use, substance abuse, and substance dependence. Re-read the account of Erica at the beginning of the chapter. Does she show alcohol use, abuse, or dependence?

2. What physiological changes explain the biphasic effects of alcohol? How can the biphasic effects lead adolescents to binge drink?

3. Many adults use alcohol and marijuana to alleviate anxiety and depression. To what extent does the negative affect model explain adolescent alcohol and drug use?

4. Compare and contrast the 12-step approach to treating adolescent alcohol abuse with cognitive-behavioral therapy. According to these models, (a) what causes alcohol abuse; (b) what is the best way to treat substance abuse problems?

5. Some clinicians who treat adult substance use disorders adopt a “harm reduction” approach. Why is harm reduction controversial when it is used with adolescents? What is the evidence (for or against) using a motivational enhancement/harm reduction approach to treat adolescents with substance use problems?