CHAPTER 11

Impulsivity and Aggression

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Aggression is a perplexing phenomenon. It is influenced by many factors (e.g., culture, environment, biology, psychology, neurochemistry) that shape the manner in which it is expressed and perceived. Aggression can have adaptive properties such as self-preservation, protection of one's young, or defense of territory. It is thought to help adolescents develop autonomy, an independent identity, and mastery over their environment (Rome and Itskowitz 1990). In animal models, aggressive behavior has even been demonstrated to serve as a stress management strategy (Williams and Eichelman 1971). Alternatively, aggression can produce destructive behaviors that are directed against others through physical violence or verbal attacks or toward oneself, leading to self-injurious behaviors (SIBs) or suicidality.

Almost every one of us has engaged in an impulsive or aggressive act at some point in our lives, whether it was saying an unkind word we later regretted or making a rash purchase on an extravagant item. Felthous and Barratt (2003) rhetorically posed the question, "Are we not all, mentally disordered or not, capable of acts that are both impulsive and aggressive?" followed by the decisive response "Of course!" (p. 133). They went on to note that the distinguishing feature between pathological and non-pathological behavior is one of severity. Stone (1995) developed a four-zone continuum of aggressive behavior that illustrates this very concept. In Stone's model, severity ranges from culturally

sanctioned outbursts of anger and mild aggressive behaviors such as those exhibited on the playing field or at a political rally to severe impulsivity and aggression, which may lead to the commission of felonies.

Theoretical Models of Aggression

Nearly 40 years ago, Moyer (1968) proposed an early and influential classification of seven categories of aggression: 1) fear-induced (aggression associated with fleeing or attacking a perceived threat); 2) maternal (an attack as a means to protect one's young); 3) inter-male (an attack by a male toward another male in the immediate environment as a way to establish dominance or status); 4) irritable (an attack directed toward some source of frustration such as a threat, intimidation, or environmental condition); 5) sex-related (sexual arousal is frequently associated with increased levels of hostility); 6) predatory (an aggressive act aimed at taking down a prey); and 7) territorial (an attack on an intruder who enters into an area claimed by the attacker).

Contemporary definitions refer to *aggression* as "behavior directed by one individual against another individual (or object or self) with the aim of causing harm" (Bond 1992, p. 1). Other researchers have included the notion of intent. For example, Anderson and Bushman (2002) described aggression as behavior that is intended to cause immediate harm to another individual when the intended victim desires to avoid harm. Bjorkvist and Niemela's (1992) definition of aggression not only includes intent to hurt someone or damage something but also adds affective arousal that has the potential to lead to an overtly aggressive act and displays of intimidation.

In the process of developing the Aggression Questionnaire, Buss and Perry (1992) conducted a series of factor analyses resulting in a model with four separate but related categories of aggression. The first category, Overt Physical Aggression, involves a physical attack on another person that results in harm. In Overt Verbal Aggression, an individual uses words to harm another. The third category, Anger, is the emotional element of aggression, described as the "physiological arousal and preparation for aggression" (p. 457). The fourth category, Hostility, is "feelings of ill will and injustice" (p. 457).

The current literature consistently views aggressive behavior as a dichotomous construct. Although the terminology varies greatly, conceptually the two broad classifications result in *premeditated aggression* (also referred to as predatory, instrumental, callous-unemotional, or proactive) and *impulsive aggression* (often called affective, reactive, emotional, hostile, or expressive) (Cornell et al. 1996; Stanford et al. 2003a).

Premeditated aggression is typically purposeful and aimed at obtaining an object such as a reward or advantage for the aggressor (Hartup 1974). These types of behaviors tend to be carried out in a methodical and deliberate fashion, with the aggressor demonstrating limited physiological arousal (Stanford et al. 2003b). Meloy (2000) found that perpetrators often possess a heightened sense of awareness that permits them to effectively stalk their victim, gathering necessary information in preparation for the aggressive act. Studies of incarcerated populations have also demonstrated that premeditated-predatory aggressors are more psychopathic, as measured by the Psychopathy Checklist–Revised (PCL-R), than those classified as impulsive-affective aggressors (Cornell et al. 1996; Woodworth and Porter 2002).

The second prong of the aggression dichotomy is *impulsivity,* which typically is a response to a perceived provocation with immediate and destructive violence. Individuals who display impulsive-affective aggressive behaviors are commonly labeled "unpredictable" and "short fused." Impulsive aggressive behaviors can be carried out involuntarily, in a burst of rage, with no weighing of potential outcomes. Research has found that individuals with impulsivity disorders tend to have lower verbal scores and executive cognitive functioning impairments based on neuropsychological testing (Villemarette-Pittman et al. 2003). It is hypothesized that the limited cognitive resources of impulsive aggressors allow them to become easily overwhelmed by competing stimuli, which leads to feelings of frustration and helplessness. With limited perceived options, the impulsive aggressor frequently acts before thinking about the impact and likely consequences of the behavior (Meloy 2000).

The Etiology of Aggression and Impulsivity

To better understand aggressive and impulsive behaviors, it is helpful to examine the various potential sources and pathways that can contribute to them. These behaviors have multiple causes (e.g., genetics, social learning, environment, mental illness, substance abuse), each with a substantial and valuable body of research. This chapter focuses on prenatal development, early childhood trauma, traumatic brain injury, and neurochemistry as contributors to aggression and impulsivity.

Prenatal Development

Prenatal risk factors such as maternal use of alcohol, tobacco, or cocaine and pregnancy/birth complications have been linked to developmental delays and behavioral problems in children and to antisocial behavior

and violent offending in adults (Raine 2002). Exposure to these risk factors may directly or indirectly affect the structure and function of the developing fetal brain, leading to long-term damage to central nervous system neurotransmitter pathways (Ernst et al. 2001). For example, children of mothers who smoked were found to be twice as likely to have a criminal record by age 22 (Räsänen et al. 1999). In addition, 6- or 7-year-old girls who had been exposed to cocaine in utero were significantly more likely to score in the abnormal range on the Aggression subscale of the Child Behavioral Checklist than control subjects (Sood et al. 2005). However, these risk factors are rarely found independent of other psychosocial complications such as poverty, poor parenting skills, and limited access to medical care and educational opportunities.

Childhood Trauma

Childhood trauma has been associated with impulsive and aggressive behaviors, including self-destruction and suicidal behavior in later years (Briere and Runtz 1990). Brodsky et al. (2001) examined 136 adults with major depression and found that participants with a history of physical or sexual abuse were more likely to have made a suicide attempt and had higher levels of impulsivity, aggression, and comorbid borderline personality disorder than participants with no abuse history. The researchers assert that childhood trauma may constitute an environmental risk factor that leads to the development of both suicidality and impulsivity. Similarly, Roy (2005) studied 268 abstinent drug-dependent patients and found a significant positive correlation between impulsivity and risk-taking scores on the Barratt Impulsivity Scale and scores of abuse and neglect on the Childhood Trauma Questionnaire.

Traumatic Brain Injury and Brain Dysfunction

Aggression and impulsivity have been associated with dysfunction in various regions of the brain, most notably the temporal and frontal lobes (Liu and Wuerker 2004). These regions of the brain regulate executive functions, and damage to these regions has been shown to lead to intermittent emotional dyscontrol, an increase in impulsivity, a reduction in self-regulation, and the diminished capacity to consider the outcomes of behaviors (Golden et al. 1996). Violent offenders have been found to have poor functioning in the frontal and temporal regions of the brain as evidenced by neuropsychological tests (Raine 2002), excessive slow-wave electroencephalographic activity (Stoff et al. 1997), and a reduced glucose metabolism in the prefrontal brain region as shown

in brain imaging studies (Raine et al. 1997). Grafman et al. (1996) studied Vietnam veterans who had penetrating head injuries and found they had higher verbal aggression scores than control subjects and patients with lesions in other areas of the brain. A study evaluating 89 patients with traumatic brain injury found that those who scored high on the Overt Aggression Scale had a preinjury history of mood disorder, alcohol and drug abuse, and aggressive behaviors (Tateno et al. 2003). These findings indicate that postinjury behavior may be reflective of preexisting impulsive and aggressive tendencies.

Neurochemistry

Neurotransmitters are chemicals that send information between neurons in the brain and help to regulate mood, thinking, and behaviors (Berman and Coccaro 1998). Among the many known neurotransmitters, the most studied in relation to aggression and impulsivity are serotonin, norepinephrine, dopamine, and γ-aminobutyric acid (GABA). The majority of the studies suggest that GABAergic and serotonergic systems inhibit predatory aggression, and the noradrenergic and dopaminergic systems stimulate affective aggression (Eichelman 1988). Low levels of serotonin have been associated with increased rates of aggression, impulsivity, depression, and suicidality. Coccaro (1996) found lower serotonin levels in suicide victims, particularly those who used a violent suicide method, when compared with accident victims. In addition, Coccaro and Kavoussi (1997) examined 40 patients with personality disorders and a history of impulsive aggression and found that fluoxetine, a selective serotonin reuptake inhibitor, reduced scores of aggression and irritability on the Overt Aggression Scale.

The noradrenergic system affects attention to stimuli, arousal levels, and responses to stressors (Berridge and Waterhouse 2003) and is one of the fastest-responding neurochemical systems (Haller et al. 1998). Norepinephrine is involved in the fight-or-flight response and has been linked to aggressive behavior (Haden and Scarpa 2007). In a study measuring aggressive behavior and norepinephrine levels, Gerra et al. (1997) experimentally induced aggression using a free-operant procedure in 15 males with "low normal" and 15 males with "high normal" basal aggressivity (based on scores on the Buss-Durkee Hostility Inventory and other measures). They found no differences between the groups in base rate plasma norepinephrine levels. However, during the task, norepinephrine levels were significantly higher in the high group than the low group. These findings suggest that high-aggressive individuals respond more intensely, and their norepinephrine increases

to higher levels when they are presented with frustrating situations, than is the case in low-aggressive individuals.

The remainder of this chapter focuses on formal disorders (i.e., intermittent explosive disorder [IED], pyromania, intellectual disabilities, and autism) and distinct symptoms (i.e., impulsive suicide and SIB) within which aggression or impulsivity are core determinants.

Discussion

Intermittent Explosive Disorder

Case Example 1

J.W. is a 30-year-old man with a long history of fights and assaultive behavior. He was referred by a judge for anger management classes several years ago. J.W. was walking down the street when he inadvertently bumped into a stranger. The stranger said, "Why don't you watch where you're going!" Infuriated, J.W. turned on the stranger and started pummeling him into unconsciousness. Minutes later, when onlookers pulled him off of his victim, J.W. was upset and remorseful over his behavior.

IED is categorized in DSM-IV-TR (American Psychiatric Association 2000) as an impulse-control disorder not elsewhere classified and is the only diagnosis with recurring acts of aggression as the primary symptom. The inclusion criteria for IED consist of 1) distinct episodes of serious assault against others or destruction of property, 2) behavior that is grossly out of proportion to any precipitating provocation or psychosocial stressor, and 3) explosive episodes that are not better accounted for by another mental disorder, substance use, or a medical condition. As in most of the impulse-control disorders, the individual feels a sense of tension or affective arousal before committing the explosive behavior, may experience pleasure or gratification during the act, and may feel relief or regret after the act.

IED is rare in terms of prevalence, and research has revealed similar rates of lifetime incidence. For example, Coccaro et al. (2004) evaluated 253 participants for the Baltimore Epidemiologic Catchment Area Follow-Up study and found lifetime rates of 4.0%. In a survey of 9,282 U.S. adults, Kessler et al. (2006) found slightly higher rates ranging from 5.4% to 7.3%. IED behaviors typically become apparent in childhood, often in the form of temper tantrums. Explosive outbursts tend to peak during the teen years and to decline after age 30, with only about 7% of new cases occurring after this age (McElroy et al. 1998). Research has found incidents of IED to occur earlier for men (13 years of age) than for women (19 years) (Coccaro et al. 2005).

In a study of 27 individuals who met the criteria for IED, participants described their aggressive impulses as "a need to attack," "an adrenaline rush," "a need to defend oneself," and "an urge to kill" (McElroy et al. 1998). The aggressive episodes were associated with physical or autonomic symptoms such as heart palpitations, chest tightness, head pressure, a loss of awareness, and affective symptoms such as irritability, euphoria, and racing thoughts. The outbursts were often in response to an external stressor (typically a minor disagreement with someone), but many reported that the aggressive episodes were spontaneous. The aggressive episodes occurred approximately nine times per month, and although the duration of a specific episode was relatively brief (22 minutes), the outcomes had devastating repercussions resulting in destruction of property, serious assault on another person, assault with a weapon, attempted homicide, and homicide. Not surprisingly, individuals with IED have difficulties in maintaining employment, financial stability, and meaningful relationships.

The usefulness of classifying IED as a separate diagnosis has come under criticism because aggressive impulses occur in a wide range of psychiatric and medical disorders (Coccaro 2003). McElroy et al. (1998) found a high comorbidity rate among IED patients and mood disorder, anxiety disorders, and other impulse-control disorders. Coccaro et al. (2005) found a substantial amount of lifetime comorbidity among IED patients with mood disorders, anxiety disorders, and alcohol/drug disorders. Nearly a quarter of the patients in a study conducted by Lejoyeux et al. (1999) who met the criteria for alcohol dependence also met the criteria for IED.

Some researchers have raised concerns about the value of the criteria for IED, noting several limitations and ambiguities. For example, Coccaro (2003) pointed out that DSM-IV-TR does not set parameters for the frequency of the aggressive acts, the time span between episodes, or the severity of the outbursts. In addition, it is difficult to determine whether an aggressive outburst is more likely to be caused by another personality disorder, such as antisocial personality disorder. The current definition may be underestimating the number of individuals with IED by excluding individuals with frequent but less severe aggressive actions.

Pyromania

Case Example 2

R.J. is 23 years old and has had a fascination with fires since early childhood. In the past he has set many small, contained fires and enjoyed watching the resultant blazes. Tonight, he is sitting in his room fondling

a book of matches. At his ease, he happily remembers the tension and excitement he felt when he set fire to an abandoned garage the previous night.

Pyromania is designated as an impulse-control disorder not elsewhere classified in DSM-IV-TR, along with IED, kleptomania, pathological gambling, trichotillomania, and impulse-control disorder not otherwise specified. The diagnosis itself has an unstable history in DSM: it was included in DSM-I (American Psychiatric Association 1952) as an obsessive-compulsive reaction; omitted from DSM-II (American Psychiatric Association 1968); and reinstated in DSM-III (American Psychiatric Association 1980) as a distinct disorder of impulse control. In DSM-IV-TR it is defined as repeated, deliberate, and purposeful fire setting and is associated with tension before the act; fascination with fire; and gratification when setting, witnessing, or putting out fires. The fire setting is not committed for monetary gain, revenge, as an expression of sociopolitical ideology, to conceal a criminal act, to express anger or vengeance, to improve one's living circumstances, in response to a delusion or hallucination, or as a result of impaired judgment. Finally, the impulse to set fires cannot be better accounted for by another diagnosis.

True pyromania is rare. Rasanen et al. (1995) studied arson defendants in Finland from 1975 to 1993 and found only 4% of their sample to have pyromania. Ritchie and Huff (1999) examined the mental health records and/or prison files of 283 arsonists, and pyromania was diagnosed in only three cases (1.3%). A slightly higher rate was identified in a study conducted by Repo et al. (1997) between 1978 and 1991 in which 14.2% of 304 male Finnish arsonists were diagnosed with pyromania. The low rates of pyromania found in these fairly recent studies calls into question the substantial number of arsonists who were diagnosed with pyromania (39%) in Lewis and Yarnell's (1951) classic work of nearly 1,500 pathological fire setters. The later results almost certainly reflect the changes in diagnostic criteria, which have become more structured and narrowly defined in the intervening decades.

Several risk factors associated with pyromania are consistently found in the literature. Barker (1994) found men to be much more likely than women to have a fascination with fire, and Kafry (1980) found boys to be more interested than girls in fire setting. Large percentages of pathological fire setters are unemployed and live alone (Ritchie and Huff 1999). Lejoyeux et al. (2006) described people with pyromania as individuals with a keen interest in fires who like watching fires and setting off false fire alarms. Their fascination with fires often leads them to seek employment as firefighters. In a study by Lindberg et al. (2005) of

90 arson recidivists, three were diagnosed with pyromania. All three of these arsonists worked as volunteer firefighters.

There is a consistent link reported between fire setting and mental illness. Ritchie and Huff (1999) found that nearly all (90%) of the subjects in their study had a history of mental health issues; 36% of these individuals also had a diagnosis of either schizophrenia or bipolar disorder. Two-thirds of the sample (64%) were abusing alcohol or drugs at the time of the fire setting, and the fire-setting act of half of the sample was judged "very impulsive" by the researchers. In a 5-year study conducted by Leong and Silva (1999) of court-ordered outpatient forensic psychiatric evaluation of individuals charged with arson, nearly half (43.8%) were diagnosed as psychotic, 15.6% as mentally retarded, and 15.6% with alcohol abuse.

Aggressive Behavior in Individuals With Intellectual Disabilities

Case Example 3

W.P. is a 35-year-old woman with moderate intellectual disability deriving from fetal alcohol syndrome. She was recently placed in a group home after the death of her parents several months ago. She has never needed psychiatric care in the past. She does well at her job placement until it is time to leave. At that point, on a fairly consistent basis over the past few weeks, this normally pleasant woman hits anyone who attempts to persuade her to board her minivan for the ride back to her group home.

In contrast to the aforementioned disorders, the following discussion of impulsivity and aggression occurs in the context of other disorders where sudden, unpredictable, and violent behavior may occur. *Intellectual disability* has been defined as "significantly subaverage intellectual functioning resulting in or associated with a concurrent impairment in adaptive behaviour" (Strongman 1985, p. 202). Holland et al. (2002) defined it as significantly impaired intellectual ability and significantly impaired social functioning, with these conditions present from childhood. DSM-IV-TR uses the term *mental retardation* and has three inclusion criteria: a score of 70 or below on an individually administered IQ test, deficits in two adaptive functioning areas (i.e., communication, self-care, home living, social/interpersonal skills, use of community resources, self-direction, functional academic skills, work, leisure, health, and safety), and the onset of the impairment occurring before the age of 18 years.

Aggressive behavior can have a severe negative impact on individuals with intellectual disabilities and their caregivers. Aggression often becomes a barrier to less-restrictive residential options, educational opportunities, competitive employment, and general social acceptability (Bruininks et al. 1994). In addition, aggressive behavior in individuals with intellectual disability is also associated with greater service costs, higher staff turnover rates (Sigafoos et al. 1994), more frequent referrals to mental health professionals (Maguire and Piersel 1992), increased risk for victimization (Rusch et al. 1986), and criminal activity (Crocker and Hodgins 1997). Aggressive behavior may contribute to these individuals being admitted to institutions and being prescribed antipsychotic and behavior control medication (Aman et al. 1987).

The concept of aggressive behavior in individuals with intellectual disability is very broad, and a consistent definition is lacking. McClintock et al. (2003) conducted a meta-analysis of research on aggressive behavior in these individuals, reviewing 86 articles from 1968 to 1997. The researchers found a wide range of terms used to describe aggressive behavior, including physical aggression, threatening others, SIB, destruction of property, and hitting. Deb et al. (2001) considered aggressive behavior to encompass "aggression, destructiveness, self-injurious behavior, temper tantrum, over-activity, screaming/shouting, scattering objects around, wandering, night-time disturbance, objectionable personal habits, antisocial behavior, sexual delinquency, and attention-seeking behaviors" (p. 507). A possible explanation for the variation in describing aggressive behavior is that the descriptions are often based on the perception of caregivers who must manage or endure the behaviors and may be influenced by their coping ability. In addition, the labeling of aggressive behavior may be dependent on the environment. In other words, some behavior may be tolerated in an institutional setting but not in a family setting.

Prevalence rates of aggressive behavior for individuals with intellectual disabilities vary from 2% to 60% based on a variety of factors, such as level of behavioral severity, age, gender, and type of residential environment (Davidson et al. 1994). Males with intellectual disabilities tend to have higher rates of aggressive behavior than females (Harris 1993), and aggressive behavior tends to peak around adolescence (Davidson et al. 1994). Acts of aggression tend to increase with the severity of disability (Davidson et al. 1994); however, higher-functioning individuals tend to act aggressively toward others and lower-functioning individuals tend to engage in SIB (Emerson et al. 1997). Acts of aggression were higher in institutional settings (38%) than in community settings (11%) according to a survey of service providers (Harris 1993).

Notably, deinstitutionalization has not been found to reduce an individual's aggressive behavior (Larson and Lakin 1989).

Individuals with an intellectual disability often have skill deficits in a variety of areas (e.g., attention span, impulse control, memory, neurological functioning, communication skills, and social skills), which may increase the probability of aggression (Allen 2000). For example, in a study measuring the ability of aggressive and nonaggressive individuals with intellectual disabilities to label facial expressions, aggressive individuals were more likely than their nonaggressive peers to mislabel "angry" and "sad" facial expressions, and to label "anger" when they were unsure (Walz and Benson 1996).

Aggressive Behavior in Individuals With Autism

Case Example 4

M.R. is 28 years old and has been in psychiatric care throughout his life. He is currently on a trial of a new anticonvulsant. He sits quietly rocking back and forth, chewing on his already bleeding left wrist. When Jim, his caregiver, attempts to intervene, this startles him. M.R. then furiously swings his arms, hitting Jim repeatedly.

The term *autism*, derived from the Greek word for "self," was coined by Leo Kanner (1943), a child psychiatrist, to describe the extreme aloneness he viewed as the central trait of the disorder. Autism spectrum disorder (ASD), as it is now called, is currently recognized as a neurodevelopmental disorder (Aicardi 1998). According to DSM-IV-TR, to be diagnosed with autistic disorder an individual must exhibit 6 or more of the 12 identified behaviors, with at least two from the social interaction domain and one each from the communication, repetitive, and stereotyped patterns domains. In addition, delays in social interaction, language, or symbolic or imaginative play must be evident before the age of 3 years.

Prevalence rates of ASD range from 0.7 to 72.6 per 10,000, depending on the diagnostic criteria used in the studies (Williams et al. 2006). Fombonne (1999) reviewed 23 studies on autism and found that prevalence rates significantly increased with publication year, indicating improved diagnostic criteria and methods along with greater availability of services. For example, Croen and Grether (2003) found that 75% of individuals with autism had some level of intellectual disability and proposed that the increase in the prevalence of autism may be attributable to the reclassification of some individuals' diagnoses from intellectual disability to autism. Fombonne (2003) also found a higher rate of boys

than girls being affected; intellectual disabilities in about two-thirds of the sample; and a relatively high rate of epilepsy.

Aggression is a common behavioral characteristic of autism and may include impulsivity, aggression toward others, SIB, destruction of property, disruption to the environment, stereotypy, and other socially unacceptable behaviors (McDougle et al. 2003). Although the inappropriate or aggressive behavior may be objectionable, the intention of the behavior is not necessarily malicious (Dewey 1991). The impairments in brain functioning and neurological activity commonly found in autism may reduce one's capacity for social interaction, verbal and nonverbal communication, and the ability to alter behavior and emotional states in response to another's action or perceived feelings. For example, Williams et al. (2005) compared the memories of non–intellectually disabled adults with autism and a control group. The participants with autism did not demonstrate any deficits in word pairs, stores, or verbal working memory. However, on tests measuring immediate and delayed recall of faces and family scenes, there was significant impairment. The research suggests that a lack of social connectiveness and empathy may predispose individuals with autism toward acts of aggression (Rogers et al. 2006).

Impulsive Suicide

Case Example 5

After 65 years of life, K.T. has coped with several serious illnesses and repeated bouts of depression. He has been treated by a psychiatrist for the past few years, with only modest symptomatic improvement. The past 3 months have been filled with unremitting depression. K.T. feels hopeless and has intermittently considered ending his life. The three drinks he just had seem to make the decision easier. He hits the car's accelerator and aims head on for the gap in the guard rail, with the river 100 feet below.

Suicide ranks among the top 10 causes of death for individuals in all age groups in several Western countries (World Health Organization 2006). *Suicide attempts* have been defined as "potentially self-injurious behavior with a nonfatal outcome, for which there is evidence (either implicit or explicit) that the person intended at some (nonzero) level to kill himself/herself" (O'Carroll et al. 1996, p. 247). Terms such as *parasuicide, deliberate self-harm,* and *suicidal gestures* are considered SIBs that may have the appearance of a suicide attempt but may not have the associated intention of ending one's life. Using data from the National Comorbidity Survey of 5,877 respondents, Nock and Kessler (2006) found

4.6% of the sample had made a suicide attempt, 2.7% reported doing so with the intent to die, and 1.9% committed the act as a way to communicate distress to others with no intent to die.

To date, a prior suicide attempt is among the best predictors of eventual death by suicide (Goldstein et al. 1991). In a 5-year follow-up of 1,573 suicide attempters, Nordstrom et al. (1995) found the risk of recurrent suicidal behavior to be 11% for attempted suicide and 6% for ultimately completed suicide. Rates were highest among young men. Johnsson-Fridell et al. (1996) reported a 13% suicide completion rate among inpatients within 5 years of attempted suicide. In a study examining lifetime history of suicide attempts and methods of 1,397 suicides in Finland, Isometsä and Lonnqvist (1998) found that 56% of fatal suicides occurred on the first attempt (62% of males and 38% of females), and the risk of suicide completion was highest during the first year after a suicide attempt. With such high fatality figures, particularly for men, using previous suicide attempt as a predictor of suicide completion has limited preventive value.

Risk factors associated with suicidal behavior include male gender, fewer years of education, being young, and residence in the southern or western regions of the United States (Nock and Kessler 2006). Based on psychological autopsies, a 6-month prevalence rate of an Axis I diagnosis has been found in 88% of suicide completers (Lesage et al. 1994). Specifically, depressive (major depressive episode and mania), impulsive (drug abuse and dependence), and aggressive (conduct disorder and antisocial personality disorder) behaviors and psychiatric comorbidity increase the risk of suicide attempts (Nock and Kessler 2006), with major depression being the most common psychiatric disorder associated with suicide and attempted suicide (Henriksson et al. 1993). Childhood trauma has been associated with self-destruction and suicidal behavior in later years (Briere and Runtz 1990) and contributes to a younger age of onset of suicidal behaviors, often beginning in childhood or adolescence (Brodsky et al. 2001).

Impulsivity has been conceptualized as action without planning or reflection; it differs from premeditated behavior by having a short response time, lack of reflection, and a dissociation between action and consequence (Barratt et al. 1999). Impulsivity, along with other disinhibiting moderators such as substance use or significant current distress, is strongly associated with self-destructive behaviors, including suicidal behavior (Dumais et al. 2005). *Impulsive suicidal behavior* has been defined as a suicide attempt with less than 5 minutes of premeditation (Simon et al. 2001). Using this definition of impulsive suicidality, prevalence rates range from 24% for nearly lethal suicide attempts by

individuals 13–34 years old (Simon et al. 2001) to 40% for hospital patients treated for self-injury (Williams et al. 1980).

Individuals who engage in impulsive suicidal behavior tend to use more violent methods, such as firearms, hanging, cutting, and jumping (Simon et al. 2001), than their nonimpulsive counterparts. At the same time, impulsive suicide attempters have lower expectations of dying from their actions (Swann et al. 2005). Despite the impulsive attempters' lower expectations of dying than nonimpulsive attempters, the destructive outcomes are comparable in terms of severity of injuries, reversibility of condition, and admission into intensive care (Simon et al. 2001). The incongruous thought process involved in these attempts is consistent with a defining construct of impulsivity: the disconnect between action and intention (Swann et al. 2005).

Impulsivity does not appear to increase the risk of suicide independently. Simon et al. (2001) suggested that suicidal behavior may be associated with the inability to control aggression-related impulsive behavior rather than with impulsivity in general. For example, the researchers examined indicators of impulsive behavior such as prior arrests, quitting a job without a source of income, having multiple sex partners, and alcohol use within 3 hours of the suicide attempt and found no relationship to impulsive suicidal behavior. However, being in a physical fight in the past year was associated with impulsive suicide attempts. Zouk et al. (2006) examined the psychiatric records of 164 suicide cases using the Barratt Impulsivity Scale. Individuals who scored 75 or higher (which was the 70th percentile for the group) were labeled impulsive and scored significantly higher on the Buss-Durkee Hostility Inventory than their nonimpulsive peers (defined by a score equal to or below the 30th percentile on the Barratt scale), suggesting that aggression is a serious risk factor for impulsive suicidal behavior. Dumais et al. (2005) found impulsive and aggressive behaviors to be associated with suicidality in 104 males diagnosed with major depression. However, they asserted that the relation of aggressive and impulsive behaviors and suicide may be better explained by Cluster B personality disorder and alcohol/drug abuse.

Self-Injurious Behaviors

Case Example 6

B.D. has been in psychiatric care for a decade. Her problems have included an eating disorder, emotional instability, intense unstable relationships, and SIBs. Finding a space on her inner thigh not already scarred, the 25-year-old cuts herself. As she watches the blood flow, the

intense roiling emotions she had felt moments before give way to a sense of relaxation and peace.

SIB involves deliberate and often repetitive harm to one's own body without suicidal intent (Favazza 1998). A typical pattern for SIB begins with an overwhelming psychological distress such as anger, anxiety, tension, fear, or a sense of loss. An individual often responds to the overwhelming emotion by isolating and dissociating. In carrying out SIB, there is an absence of suicidal intent and often a lack of pain. The precipitating tension is relieved by the SIB, and individuals report feeling a sense of calm, often followed by disgust and/or guilt (Suyemoto 1998).

SIBs can be very diverse in terms of specific behaviors, severity, and frequency. Simeon and Favazza (2001) proposed four classifications of SIBs—major, stereotypic, compulsive, and impulsive—as a way to help understand and treat the disorder. *Major* SIBs tend to be severe, potentially lethal, and irreversible, such as castration, eye enucleation, and amputation of extremities. This category of SIB is relatively rare and is associated with schizophrenia, intoxication, neurological conditions, bipolar disorder, and severe personality disorders. The impetus for major SIB is often associated with sin, religious delusions, sexual temptation, punishment, and salvation (DeMuth et al. 1983). *Stereotypic* SIBs tend to be repetitive and lack symbolism or affect. The behaviors can be occasional or chronic, such as head banging, eyeball pressing, and finger biting (Favazza and Simeon 1995). These types of SIBs are common in individuals with mental retardation (Griffin et al. 1986), autism (Christie et al. 1982), and Tourette's syndrome (Robertson et al. 1989). *Compulsive* SIBs are ritualistic and repetitive behaviors such as trichotillomania, nail biting, skin picking, and skin scratching (Simeon 2006). Individuals with this type of behavior often report that the behaviors occur unintentionally. The behaviors are typically associated with mounting anxiety followed by relief. *Impulsive* SIBs include skin cutting, skin burning, poisoning, and self-hitting. These behaviors tend to provide short-term relief from unbearable psychological states (Simeon 2006).

The prevalence of any SIB in the general public has been estimated to be 4% (Briere and Gil 1998). However, prevalence rates vary greatly based on selected populations. For example, in a study of 15- and 16-year-old students in England, researchers (Hawton et al. 2002) found that 6.9% of their sample had engaged in at least one act of deliberate self-harm in the previous year. The primary method of harm was cutting (two-thirds) and poisoning (less than one-third). Multiple acts of

SIB were reported by about half of those acknowledging SIB. Matsumoto et al. (2005) studied 201 adolescents in a juvenile detention center in Japan and found 16.4% had cut their wrists or forearms at least once, and 28.4% had burned themselves at least once. This was found to be significantly higher than the incidence among Japanese university students, where the overall rate was 3.3% (males 3.1% and females 3.5%; Yamaguchi et al. 2004). Prevalence rates for U.S. college students have ranged from 12% (Favazza et al. 1989) to 17% (Whitlock et al. 2006). In a study of male prisoners, Shea (1993) found prevalence rates of 6.5%–25%. SIB in adult psychiatric populations can range from 4% (Darche 1990) to 20% (Langbehn and Pfohl 1993). In adolescent inpatients the prevalence rate can range from 40% (Darche 1990) to 61% (DiClemente et al. 1991). SIB may occur in up to 60% of individuals with Tourette's syndrome (Eisenhauer and Woody 1987). The differences in prevalence rates may be attributed to the various definitions of SIB, different study populations, and the reporting mechanisms for SIB.

SIB can serve multiple functions simultaneously. Paris (2005) identified five psychological functions of SIB: 1) relief from negative mood states; 2) distraction, encouraging the individual to refocus attention from psychological pain to physical pain; 3) communication of distress, as the behaviors come to the attention of significant others or therapists; 4) expression of emotions such as guilt or anger; and 5) dissociation from the current state while engaging in SIB.

SIB has been associated with psychological disorders such as borderline personality disorder (Paris 2005), antisocial behavior (Suyemoto 1998), and eating disorders (Paul et al. 2002). Other indicators of SIB include depression, anxiety, impulsivity, and low self-esteem (Herpertz et al. 1997). In a study of adolescent students in England, researchers (Hawton et al. 2002) found that SIB was more common in females than in males, and the presence of SIB increased with greater consumption of cigarettes, alcohol, and drugs. SIB has been associated with childhood adversities such as physical abuse, sexual abuse, and parental neglect. It is also related to environmental factors such as being bullied, having a family member who had attempted suicide, and knowing a peer who had engaged in SIB. Individuals who engage in SIB have also been found to have impulsive behavioral traits (Simeon et al. 1992). For example, individuals who carried out SIB had fewer future-oriented problem-solving abilities and were more likely to be involved with other impulsive behaviors such as suicide attempts, substance abuse, bingeing, and promiscuity (Herpertz et al. 1997).

Key Points

- Impulsivity and aggression may be useful or destructive behaviors, depending on the context. They are characteristic of a range of disorders and of symptoms of mental illness that may result in significant functional impairment, morbidity, and mortality.
- Intermittent explosive disorder (IED), an impulse-control disorder, is the only DSM-IV-TR diagnosis with recurrent aggressive acts as the primary symptom. People with IED describe "a need to attack," "an adrenaline rush," "a need to defend oneself," and "an urge to kill." Episodes may be infrequent and brief but can have devastating results such as destruction of property, serious assault, or even homicide. People with IED have difficulties maintaining employment, financial stability, and meaningful relationships.
- Pyromania is the repeated failure to resist the impulse to set motiveless fires. Risk factors associated with pyromania are male gender, unemployment, living alone, and a keen interest in fires.
- For people with intellectual disabilities, aggressive behavior can have a severe negative impact on residential, education, and employment opportunities. Acts of aggression tend to increase with severity of disability, but higher-functioning individuals tend to act aggressively toward others and lower-functioning individuals to engage in self-injurious behavior (SIB). Skill deficits in attention span, impulse control, memory, neurological functioning, communication skills, and social skills may be present and may increase the probability of aggression.
- In individuals with autism, aggression is common and may include impulsivity, aggression toward others, SIB, destruction of property, disruptiveness, stereotypy, and other socially unacceptable behaviors, not necessarily with malicious intent. Impairments commonly found in autism may reduce the capacity for social interaction, communication, and ability to alter behavior and emotional states in response to another's action or perceived feelings.
- Suicide is a major public health concern and is a leading cause of death in several Western countries. A prior suicide attempt is one of the best predictors for eventual death by suicide; however, the preventive value of this is limited because more than half of fatal suicides occur on the first attempt. Those who engage in impulsive suicide (with less than 5 minutes of premeditation) use more violent methods, have lower expectations of dying from their actions, and have comparable destructive outcomes to their nonimpulsive counterparts.

- Self-injurious behavior is deliberate, repetitive harm (e.g., cutting, burning, poisoning) to one's own body without suicidal intent. A typical pattern for SIB is an initial overwhelming distress with subsequent emotional dissociation; a lack of pain while carrying out the SIB; and relief of tension, possibly followed by a sense of guilt. SIB can serve psychological functions, such as relief from negative mood states, distraction, communication of distress, expression of emotions, and dissociation from one's current psychological state.

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