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Substance Abuse, Self-Control and Crime

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Abstract

This chapter reviews whether substance abuse can reduce capacity for compliance. It examines scientific findings on the link between substance abuse, self-control and (criminal) behaviour. Research findings indicate that substance abuse may negatively affect levels of self-control, and cause increases in impulsive behaviour. These increases in impulsivity can in turn be linked to criminal behaviour. Moreover, substance abuse is associated with increases in violent behaviour. However, there is variability among substance abusers, and situational factors such as social environment or criminal opportunity play a major role. Rather than merely focusing on people's personal guilt in substance abuse-related misconduct and crimes, the chapter advocates to focus on correcting future behaviour and recommends the implementation of treatment programmes aimed at improving self-control of substance-abusing offenders.

Substance Abuse, Self-Control and Crime

Capacity is a central issue in compliance. People can only obey the law if they are able to do as the law demands. We can note many issues with regard to people's capacity to obey the law. A good example is the knowledge of the law (see Chapter 32): people who do not know the law will be less able to comply. Furthermore, we must consider people's socioeconomic circumstances, as people with less access to employment, housing and education may come to have greater difficulties in leading a law-abiding life (Van Rooij and Fine forthcoming, 2021). The present chapter focuses on a different - and in the study of compliance often overlooked - aspect of capacity for compliance. Namely, a factor that can reduce people's ability to comply: substance abuse.

A large body of scientific work points to the relationship between substance abuse and crime. A systematic review of the prevalence of substance abuse in prisoners found that 18-30% of male prisoners and 10-24% of female prisoners suffer from alcohol abuse or dependence upon reception into custody. For drug abuse or dependence, prevalence ranges from 10% to 48% for men, and rises to 30-60% for women (Fazel et al. 2006). This shows that the prevalence of substance abuse within incarcerated populations is highly variant, but much higher than within the general population (i.e., 2.38% worldwide; Global Burden of Disease Collaborative Network 2018). Outside of the criminal justice system, substance abuse may also play a role in rule-breaking behaviour and non-compliance, as substance use in the workspace is not uncommon (Smith and Davidson 2015). A United States (US) survey study on alcohol use and impairment in the workspace found that alcohol use directly affected approximately 15% of the US workforce (Frone 2006). These findings indicate that there is a relationship between substance abuse and illegal behaviour. In light of this, to understand compliance and to be able to direct future behaviour, it is important to consider the extent to which substance abuse may lead to illegal behaviour. Therefore, this chapter examines whether substance abuse reduces capacity for legal compliance.

The present chapter will look at available empirical evidence regarding the relationship between substance abuse and crime. Its purpose is not to suggest that substance abuse is an excuse for breaking the law, but more practically to understand how such abuse can cause illegal behaviour. Such knowledge

is a critical element in an overall strategy to enhance compliance and reduce crime. Furthermore, there are many ways in which substance abuse and illegal behaviour are related. In most jurisdictions, the use of substances such as drugs in itself constitutes illegal behaviour. In addition, substance abuse may have numerous social effects, such as loss of employment, social bonds or housing, which may well be causes of or catalysts for criminal behaviour (e.g., Henkel 2011; Mowen and Visser 2015; Schütz 2016). However, the present chapter's focus is not on substance use crimes or the social effects of substance abuse, but rather on how substance abuse impairs an individual's capacity for compliance. Therefore, this chapter focuses on how substance abuse affects self-control and impulsivity, two core aspects of the capacity to comply (see generally Chapter 33 and also below in more detail).

Thus, this chapter focuses on the question of how substance abuse relates to self-control and how self-control relates to illegal behaviour. First, the chapter will discuss the methods and the limitations of this research, followed by a brief discussion of general theories on the substance abuse-crime relationship. Subsequently, the chapter will consider the factors that play a role in the development and maintenance of substance abuse, and whether a person is in control of becoming or remaining a substance abuser. Next, the chapter assesses whether someone who abuses licit or illicit substances is capable of controlling their behaviour and complying with legal rules, or whether the abuse incapacitates their compliance. Lastly, a specific section is dedicated to the relationship between substance abuse and violence.

Terminological and methodological notions

Before addressing the chapter's main points, some methodological and terminological issues within this research are discussed. The first area of concern regards the conceptualization and measurement of substance abuse. "Substances" is a broad term that encompasses both licit (e.g., alcohol) and illicit (e.g., opioids, cocaine, amphetamines) intoxicants. Furthermore, for some substances, legal status differs between countries or states (e.g., cannabis; Chatwin 2017). This chapter attempts to provide a systemic overview of the effects of substances on illegal behaviour, with substance abuse referring to both drug and alcohol use-related disorders. However, different types of substances have different effects on behaviour. Where necessary and possible, a distinction is made between different types of substances.

Moreover, there is considerable variability in the terminology used in the substance abuse literature (Kelly 2004). Scholars generally refer to two distinct terms: substance abuse and dependence (also referred to as addiction; American Psychiatric Association 1994). Substance abuse comprises a maladaptive pattern of continued substance use, despite (for example) possible social and interpersonal problems related to use. Substance dependence can be described as a more severe and uncontrollable form of substance abuse, distinguished by withdrawal symptoms, tolerance to the substance and failed attempts to quit using (American Psychiatric Association 1994). However, in the current version of the Diagnostic and Statistical Manual (DSM-V) of the American Psychiatric Association (APA 2013), this distinction between substance abuse and dependence is no longer made, as the two have been combined as a single “substance use disorder” (SUD). SUD is defined as “a problematic pattern of [substance] use leading to clinically significant impairment or distress” (APA 2013:490). The diagnosis of an SUD requires that a person meets at least two out of 11 diagnostic criteria, occurring within a 12-month period. The disorder exists on a continuum from mild to severe, and the level of severity is determined by the number of diagnostic criteria that are met (APA 2013). The preferred option is to use the term “substance use disorder” in this chapter. However, the problem is that a significant part of the empirical literature does not clearly distinguish between substance use and SUD, uses outdated criteria (i.e., abuse or dependence), or does not use or report standard diagnostic criteria at all. Given that it cannot be determined that all subjects in the reviewed literature meet the requirements for a diagnosis, it would be incorrect to systematically refer to “SUD”. To avoid this issue, one might even argue to refer to “substance use” in general. However, as this chapter seeks to discuss the effects of problematic forms of substance use on behaviour, it will primarily use the term “substance abuse”. To be specific, the term “substance abuse” in this chapter does not equal the DSM-IV diagnosis (APA 1994), but is used as a general indicator for problematic forms of substance use, which may include DSM-diagnosed abuse, dependence and/or SUD. If the literature specifies the effects of dependence or SUD, the chapter will do so accordingly. However, if not specifically mentioned, the results or findings about substance abuse discussed in this review cannot unquestionably be generalised to dependence or SUD.

Additionally, substance abuse research is often cross-sectional. This means that the results show only correlational relationships and it is not possible to draw conclusions on causality. Moreover,

experimental research examining the direct and causal effects of substance abuse on behaviour faces ethical concerns. Given that it is unethical to expose human participants to actual abusive amounts of a substance to test how it affects their behaviour, research is restricted to testing the effects of the general use of different substances, rather than abuse or SUD. When it is not possible to discuss findings specific to substance abuse, this chapter will therefore draw on the effects of general substance usage.

A core methodological issue in the criminological literature on substance abuse concerns the measurement of criminal behaviour. Data on criminal behaviour in research may not always reflect the actual field situation (Hunt 1990). For example, studies on the association between substance abuse and criminal behaviour may focus on the general population, resulting in data that are more representative of “typical” behaviour, but may only include a small subset of people with serious substance abuse problems. Alternatively, studies may focus on a specific sample of substance abusers, which is useful in obtaining detailed information about seriously deviant behaviour, but cannot be generalized to a broader sample (Chaiken and Chaiken 1990). Furthermore, scholars can examine a variety of factors to measure criminal behaviour, including criminal justice system data such as arrest rates, convictions or the prison population, or self-report data (Hunt 1990). All these may provide a slightly different view of the actual amount of criminal behaviour, but they may also all be inaccurate. For example, criminal justice system records may underestimate a subject’s involvement in crime. Self-reports, however, can be distorted as subjects may conceal or exaggerate their illegal activities, have difficulty recalling past behaviour, or find it difficult to understand the questions asked (Chaiken and Chaiken 1990). This is especially true when focusing on substance abuse: data reflecting substance abuse and criminal behaviour can be somewhat distorted, as people who are abusing drugs when committing a crime may be apprehended more easily than people who are not (Hunt 1990). As phrased by Hunt: “[b]oth drug users and offenders are hidden populations; portions of both are inaccessible to research, and truly random samples are beyond the reach of most studies” (Hunt 1990:160). These methodological challenges should be taken into consideration throughout this chapter.

Theories on substance abuse and crime

Substance users are not a uniform group and many users do not commit crimes (Nordstrom and Dackis 2011). Criminally active substance users are not a uniform group, either: for some substance abuse precedes crime; for others it succeeds crime; and for still others they occur simultaneously. This has resulted in three leading theories on the association between substance abuse and crime: 1) substance abuse leads to crime; 2) crime leads to substance abuse; and 3) substance abuse and crime have common causes (Nordstrom and Dackis 2011). Scholars have found evidence for each of these theories. For example, to earn money to obtain drugs, drug users may resort to robbery or other property crimes (McGlothlin et al. 1978). Additionally, criminally active adolescents may find themselves among deviant peers who introduce them to the world of illicit substances (Nordstrom and Dackis 2011). Moreover, family factors such as adverse childhood experiences are risk factors both for criminal behaviour and for the development of a substance use disorder (Dube et al.. 2003; Andrews and Bonta 2010).

Goldstein (1985) has developed a conceptual tripartite framework on how substance abuse leads to crime, comprising three models: the economic-compulsive model, the psychopharmacological model and the systemic model. The economic-compulsive model entails the situation described above, in which a substance abuser commits a crime in order to sustain the expensive habit of substance use. To do so, the substance abuser may resort to predatory crimes, such as (violent) property crime, in which they steal either the substance itself or money or property to acquire the substance (Chaiken and Chaiken 1990). Other possible economic-compulsive crimes are consensual crimes, in which both the perpetrator and the “victim” engage in criminal behaviour. One example is drug dealing, where the offender (dealer) and the “victim” (buyer) both participate in an illegal act (Hunt 1990). It should be mentioned that the crimes committed in this model may serve not only to acquire the substance, but also to support the substance abuser in other life necessities. According to the psychopharmacological model, substances directly affect behaviour by reducing inhibitions and prompting aggression, often leading to criminal infractions (Goldstein 1985). In the systemic model, the relationship between criminal behaviour and substance abuse can be explained by the traditionally violent nature of the drug market and trafficking industries (Goldstein 1985). Here one may imagine rival gang disputes, retaliations (for example for fake drug sales, failing to pay debts, or robberies of drug dealers) and the elimination of police witnesses.

Many users become involved in drug dealing (e.g., economic-compulsive model) and may therefore also become involved in systemic violence (Hunt 1990).

Originally, the tripartite framework was developed to illustrate the relationship between violence and substance abuse, but it can be argued that other types of crime also fit into the models. For example, a property crime committed to obtain money to buy drugs (economic-compulsive model) does not necessarily have to be violent. Furthermore, not every type of substance fits within each separate model. For example, the relationship between the psychopharmacological effects of alcohol and violence are quite apparent (Boles and Miotto 2003), but for opioids the research findings are less clear. Likewise, for cocaine or opioids, the economic-compulsive model is evident, but it seems less obvious that someone would resort to crime to purchase alcohol, if only because alcohol is so much easier to obtain. Lastly, it is important to keep in mind that the models are not mutually exclusive and that multiple models may apply to a single situation. For example, a heroin addict who wants to commit a robbery to be able to procure drugs (economic-compulsive model) may first drink large amounts of alcohol to remove impulse control and thereby encourage himself to do so (psychopharmacological model; Goldstein 1985).

These theories provide a solid theoretical background for this chapter. Next, the main part of this chapter focuses on 1) how substance abuse develops, and which risk factors play a role; 2) how substance abuse affects self-control; 3) how self-control affects criminal behaviour; and 4) how substance abuse relates to violence.

The development of substance abuse

Over the past century, many social and neurobiological scientists have researched the factors that predict and influence the onset of substance abuse. This section will discuss these risk factors under three broad categories: impulsivity, social influences and genetics. In addition, scholars have researched the factors that influence the persistence of substance abuse, and this section discusses how these factors may hinder someone from managing or overcoming their substance abuse.

Impulsivity

Impulsivity has received substantial interest as a contributing factor to the development of substance abuse (Hyman 2007; Hester et al. 2010; Coskunpinar et al. 2013; Smith et al. 2014). Psychologists view impulsivity as a multidimensional construct consisting of several, independent, interactive processes, including lack of persistence, novelty seeking, reward dependence, risk-taking, inattention and negative urgency (Evenden 1999; Coskunpinar et al. 2013). The two most commonly identified processes are impaired decision making and impaired behavioural inhibitory control (De Wit 2009). In the DSM-V, impaired control is implicated in the criteria for the diagnosis of a substance use disorder by “often taking the substance in larger amounts or over a longer period than was intended” and “reporting multiple unsuccessful efforts to decrease or discontinue use” (APA 2013:483). Furthermore, research has found that impulsivity is a pre-existing marker of vulnerability for substance use disorders (Verdejo-García et al. 2008). Impulsivity contributes to the onset of drug use, as people with more impulsive traits are more likely to experiment with drugs, use drugs more regularly and develop a substance use disorder (De Wit 2009). A meta-analysis (a comprehensive statistical review of existing studies) by Coskunpinar et al. (2013) sought to examine the effects of different constructs of impulsivity (i.e., lack of perseverance, lack of planning, sensation seeking, negative urgency and positive urgency) on alcohol use. For alcohol-related problems and dependence, the largest effects were found for lack of planning and negative urgency (the tendency to act rashly when experiencing extreme negative emotions). Overall, these findings show that impulsivity can be regarded as a risk factor for the development of substance abuse.

Social influences

Research has found that substance abuse is also associated with social influences. Studies have for instance found a relationship between substance abuse and several negative childhood and familial circumstances, such as physical or sexual abuse (Kendall-Tackett et al. 1993; Heffernan et al. 2000; Kendler et al. 2000) and familial alcoholism (Chassin et al. 2004). Furthermore, a large study has found that adverse childhood experiences (e.g., childhood abuse, neglect or household dysfunction) have a strong and gradually increasing relationship with drug use problems, indicating that the more adverse experiences a child is involved in, the greater the likelihood of drug use problems (Dube et al. 2003).

To illustrate, the authors found that when a person experiences five or more adverse childhood experiences (for example, parental divorce, emotional or physical neglect and abuse, and having an incarcerated household member), they are seven to ten times more likely to report problems with illicit drug use, addiction and parenteral (injected) drug use compared to someone with no adverse childhood experiences. Significantly, 42% of the respondents reported having two or more adverse experiences, illustrating that a large group of people has an increased risk of developing a drug use problem. Furthermore, Dube et al. (2003) have found that adverse childhood experiences are most strongly associated with initiation of drug use by the age of 14. This is a key point, as King and Chassin (2007) have found that early drug use increases the likelihood of drug dependence by young adulthood. Moreover, research indicates that the relationship between social influences and substance abuse can be both direct and indirect. For example, scholars have found that familial alcoholism may lead to increased impulsivity (Chassin et al. 2004). As impulsivity is a major contributor to the development of substance abuse, familial alcoholism may lead to substance abuse both directly and indirectly, mediated by impulsivity. Altogether, it can be concluded that social influences, particularly those pertaining to familial and household circumstances, can strongly increase the likelihood of developing problems related to substance abuse.

Genetics

Another factor that contributes to the risk of developing a substance use disorder is genetic heritability. Heritability is the proportion of the variance in the population that can be attributed to genes (Agrawal and Lynskey 2008). The other contributing factor is environmental variation, including shared environment and non-shared environment.¹ Numerous large studies have sought to assess heritability by comparing mono- and dizygotic twin pairs. Among both male and female twin pairs, scholars have found that heritability for alcoholism ranges from 50% to 70% (e.g., Heath 1995; Prescott and Kendler 1999; Tsuang et al. 2001). Furthermore, for cannabis (34-78%; e.g., Agrawal and Lynskey 2006) and other

¹ In this context, shared environment encompasses environmental factors that one has in common with another person (e.g., shared household circumstances between siblings). Non-shared environment includes all factors that make people different from each other (e.g., different social groups or education; Agrawal and Lynskey 2008).

illicit drugs (22-87%; e.g., Tsuang et al. 1996; Kendler and Prescott 1998; Kendler et al. 1999), genetic influences can play a large role. Moreover, research has found that people who suffer from substance abuse or dependence are by nature less sensitive to natural rewards, which is associated with a genetic variant that causes a reduction of dopamine receptors and dopamine activity in the brain (Volkow et al. 2002; Franken et al. 2006; Lee et al. 2007). This is in turn linked to impulsivity (Lee et al. 2009; Ghahremani et al. 2012) and increased substance-seeking behaviour (Volkow et al. 2002).

Genes do not only play a role in the initiation of drug use, but also in the passage from substance use or abuse to addiction and relapse. Moreover, previously mentioned risk factors such as impulsivity and risk taking also have a partial genetic basis (Kreek et al. 2005). However, it should be noted that genetic vulnerability does not imply that a substance use disorder will always occur. Currently, research focuses on the interaction between genes and environment (Agrawal and Lynskey 2008). Scholars have found that some genetic predispositions are only expressed under certain circumstances. For example, marriage may be a safeguard for genetic predisposition to alcoholism (Heath et al. 1989). Additionally, a study by Rose et al. (2001) found that heritability for alcohol consumption frequency was higher for adolescent twins living in an urban versus a rural neighbourhood. The authors argue that this is most likely due to the greater degree of religiosity and social contact in rural neighbourhoods, thereby increasing the portion of shared environment in the variance, and limiting the impact of heritability. Thus, it should be kept in mind that genes and environment do not act independently of each other (Agrawal and Lynskey 2008).

Desisting from and managing substance abuse

From choice theorists' perspective, people continue to abuse substances to seek pleasure and to avoid the uncomfortable feeling of withdrawal (Kennett et al. 2015). Even though there are some clear risk factors for the development of substance abuse, some scholars argue that people are still capable of desisting from the substance or at least of managing their use (e.g., Heyman 2009; Morse 2011). Morse (2017) reasons that people who continue their substance use do so intentionally, despite the fact that it may result in criminal behaviour. Arguments to support this involve cases of people who abstain from drugs whenever the market price rises or police are present (Morse 2011), or who eventually quit their

substance habit without treatment and were thus not incapable of controlling themselves and their behaviour (Heyman 2009). By contrast, Baumeister et al. (1998) have proposed that people indeed are able to regulate themselves, but that this self-control is a limited resource. Substance users may initially be able to control themselves and refrain from using a substance, but eventually the cognitive resource of self-control becomes exhausted (ego-depletion; Baumeister et al. 1998) and their powers of resistance become overwhelmed. Furthermore, although there may be people who abstain from drugs without any treatment, there is also a significant group of substance abusers who continue their use, despite severe physical, social and psychological consequences, knowing that it might even result in their death (Kennett et al. 2015). Thus, it seems that desisting from and managing substance abuse is not a matter of course for everyone.

The incapacity to manage substance abuse can be explained by neurobiology, specifically the brain reward system. The reward system consists of the brain parts that are responsible for the feeling of reward, motivational aspects, memory and control over the eventual behaviour (for the specific brain regions, see Goldstein and Volkow 2002). This system is responsible for the reinforcement of behaviour that promotes survival and reproduction (Bozarth 1994). Dopamine has an important function in the reward system (Baler and Volkow 2006). Dopamine is a neurotransmitter, an organic chemical substance that exists naturally in the brain. It plays a role in experiencing the feeling of pleasure and is also associated with the pleasurable effect of substances (Franken et al. 2005). Substances elicit very complex effects in many diverse brain areas, and the pharmacological mechanisms by which the reward system is affected differ for each class of substance (APA 2013).² Ultimately, however, all substances influence the levels of dopamine that are present in the brain (Hyman 2007). This can lead to long-term effects on the brain, in the form of lasting neurological changes in the reward system (Baler and Volkow 2006). For example, Hyman (2007) has noted that similar to natural rewards, substances can cause the release of dopamine into the brain, but on a larger scale. Hereby, the substances influence the brain's reward system so that every time the person takes the substance, the brain receives a signal that it is "better than expected", resulting in increased motivation for substance-seeking behaviour. The large

² For a more detailed explanation of the effects of different types of substances on the brain reward system, see Baler and Volkow (2006).

amounts of dopamine that are present in the brain due to the substance can result in a sensitization of the dopamine system (Berridge 2009). As a consequence, the intensity of “wanting” the substance may exceed the expectations of how much someone will like the substance, and outlast all feelings of withdrawal. Therefore, even after the symptoms of physical withdrawal have passed, a person can still relapse (Kennett et al. 2015).

The effects of substance abuse on self-control and criminal behaviour

The next question this chapter addresses is whether substance abuse impairs human behaviour and one’s capacity to comply with the law. This is a core question to understand the relationship between substance abuse and crime. This section focuses on how substance abuse affects people’s ability to control themselves. The subsequent section will then link (lack of) self-control to criminal behaviour.

Self-control

Following the law and self-managing one’s behaviour requires some form of self-control. Self-control can be defined as “the overriding or inhibiting of automatic, habitual, or innate behaviours, urges, emotions or desires that would otherwise interfere with goal-directed behaviour” (Muraven et al. 2006:524). The prefrontal cortex (PFC), a brain area responsible for executive functions such as planning and decision making, plays an important role in the exertion of self-control (Goldstein and Volkow 2011; Cohen et al. 2013). The chronic effects of substance abuse may lead to structural changes in the PFC (e.g., grey matter reductions) that result in impaired behavioural self-control (Goldstein and Volkow 2011).

An important component of the self-control of behaviour is impulsivity. Impulsivity may not only affect the development of substance abuse; it can also influence criminal behaviour as a consequence of substance abuse. Research has found that levels of impulsivity are high in individuals with a history of substance abuse, and that these individuals are impaired on tasks that require inhibitory control or decision making (De Wit 2009). For example, on a delayed reward discounting task, scholars have found that compared to controls, substance abusers have an increased tendency to prefer a smaller, more immediate reward over a larger but delayed reward, indicating impaired decision making (for a

meta-analysis of 46 studies on several different substances, see MacKillop et al. 2011). Furthermore, research has found that substance abusers have greater difficulty in inhibiting a response that has already been initiated, while there is no impairment of their ability to execute responses in terms of speed and accuracy (e.g., the stop-signal task; Logan 1994). Smith et al. (2014) analysed 97 studies on substance abuse and response inhibition and found that impairments in inhibitory control and substance use disorders for most substances are associated; only for cannabis and opioid use the authors found no association with impairments in inhibitory control.

Within this research, it remains unclear whether the impulsivity traits were already present before the substance abuse, or whether they are a direct consequence of the substance. Several scholars have examined the acute effects of substances on impulsivity (see De Wit 2009). However, this research has limitations, as due to the aforementioned ethical reasons, it is restricted to testing the effects of substance use, rather than abuse or SUD. Research has found that alcohol reduces inhibitory control even at doses that do not lead to an overall impairment in cognitive functioning (Field et al. 2010). Furthermore, moderate doses of alcohol have been found to impair performance on a response-inhibition task (i.e., the stop-signal task), by reducing the frequency of inhibiting responses and increasing the time needed to inhibit a response (Fillmore 2003). For cocaine, similar effects have been found (Fillmore and Rush 2002). Conversely, psychostimulants such as methylphenidate (Ritalin) or d-amphetamine have been found to improve response inhibition (De Wit et al. 2000), consistent with results found in children treated for Attention-Deficit/Hyperactivity Disorder (ADHD) with this class of drugs (De Wit 2009). However, these effects seem to be confined to a specific dose (amount) of the substance (Fillmore 2003). For delayed reward discounting tasks, scholars have failed to find effects of acute drug administration (De Wit 2009). It therefore seems that of the impulsivity traits, behavioural inhibition is more sensitive to acute drug effects than impaired decision making. However, as mentioned earlier, these studies are not specific to substance abuse. A different method by which to study the acute effects of substance abuse is to use animal studies. For example, a laboratory animal study has found that chronic drug use may lead to cognitive dysfunction in regions of the PFC that can result in incapacity in response inhibition (Jentsch and Taylor 1999). In another animal study, Logue et al. (1992) found that exposing rats to a prolonged period of cocaine use reduced their preference for later, but larger, rewards. Similar

effects on delayed reward discounting have been found for alcohol (De Wit and Mitchell 2010). In conclusion, the findings are inconsistent across tasks and types of substances, and the effects of substance abuse on self-control may therefore differ between individuals. However, in general the scientific findings show that substance abuse can influence levels of self-control and may stimulate increases in impulsive behaviour (De Wit 2009).

Criminal behaviour

Now that we know that there is a link between substance abuse and impulsivity and self-control, the next question addresses the connection between increased impulsivity and criminal behaviour. In criminology, the major theory on this subject is *A General Theory of Crime* by Gottfredson and Hirschi (1990). The authors propose that a lack of self-control – in combination with criminal opportunity – is the major cause of crime. Neither self-control nor opportunity are standalone causes of crime. Rather, it is the interaction between the two that underlies criminality. Self-control, in the view of Gottfredson and Hirschi (1990), is a personality construct that is caused by early childhood family factors. Negative factors, such as deficient behavioural monitoring by one's parents, failure to detect deviant behaviour and a lack of punishment for such behaviour, underlie a lack of self-control (Grasmick et al. 1993). Following Gottfredson and Hirschi (1990), people with low self-control are more vulnerable to temptations of the moment; when their desires are at odds with their long-term goals, people with greater self-control will be able to restrain themselves, while those lacking self-control will choose immediate desires. Self-control comprises several factors, including impulsivity, risk seeking and lack of perseverance. According to Gottfredson and Hirschi (1990), these are not independent factors that separately explain self-control, but together form the unidimensional construct of self-control.³ This differs from the substance abuse literature, which has focused more on impulsivity by itself and the distinct, independent processes that underlie it (Evenden 1999). Moreover, in the substance abuse literature, aforementioned factors such as lack of perseverance or risk seeking are regarded as part of the independent processes within impulsivity (Evenden 1999). Furthermore, increased impulsivity is not

³ For more detailed information on self-control theory, see Chapter 33.

regarded as solely derived from a dysfunctional childhood education, as in Gottfredson and Hirschi's (1990) research, but as at least partly caused by genetic and neurobiological factors (Kreek et al. 2005; Goldstein and Volkow 2011). Lastly, self-control is regarded as a more dynamic and changeable trait (e.g., Baumeister and Vonasch 2015), compared to the relatively stable trait that is established in childhood in Gottfredson and Hirschi's (1990) theory. Nevertheless, *A General Theory of Crime* has proved useful in explaining the substance abuse-crime relationship through self-control and (different dimensions of) impulsivity.

Several researchers have empirically tested Gottfredson and Hirschi's (1990) theory and have found that low self-control is indeed an important factor in explaining criminal behaviour (for meta-analyses, see Pratt and Cullen 2000 or Vazsonyi et al. 2017).⁴ Scholars have also examined the effects of the underlying processes of impulsivity. For example, Dahlbäck (1990) found criminality and risk-taking to be related, especially under circumstances where detection was more uncertain. More specifically, when detection was extremely likely (i.e., no opportunity) or very unlikely, the level of self-control did not affect criminal behaviour. This is in line with research by Grasmick et al. (1993), who found that although the interaction between self-control and opportunity indeed affected crime, opportunity also had an isolated effect. To summarize, in line with Gottfredson and Hirschi (1990), a lack of self-control can be an important explanatory factor for criminal behaviour (Pratt and Cullen 2000). Therefore, through its impairing effect on self-control, substance abuse may indirectly reduce one's capacity to comply, potentially leading to illegal behaviour.⁵

Substance abuse and violence

Next to illegal behaviour in general, a significant number of researchers have specifically focused on the link between substance use (or abuse) and violent behaviour (see Duke et al. 2018). This relationship

⁴ Chapter 33 discusses the empirical status of Gottfredson and Hirschi's theory in more detail.

⁵ Apart from how substance abuse leads to criminal behaviour through low self-control, scholars have also looked at how the effects of substance abuse can be linked to criminal behaviour through the impaired brain reward system. The excess of dopamine in the brain reward system that is present due to the substance causes the substance to become overvalued compared to other (rational) goals, such as family or work obligations, self-care and compliance with the law (Hyman 2007). Thus, when prolonged substance abuse alters the brain reward system, substance seeking becomes a primary motivator, despite its adverse consequences (Volkow and Li 2004). This may result in extreme compulsive behaviour to obtain the substance, such as committing an economic-compulsive or violent crime.

is pronounced: in many violent events, alcohol and drugs are present in both the offenders and the victims (Boles and Miotto 2003). Furthermore, specific forms of violence are illegal in themselves. Thus, through their potential effects on violence, substance abuse and (in)capacity for legal compliance are directly related.

Given that different substances have different effects on violent behaviour, most research discusses the effects separately by type of substance (e.g. Boles and Miotto 2003) and this section will do so accordingly. Violent behaviour can occur during the various phases of substance use, such as acute intoxication, withdrawal, or substance-induced psychosis. Furthermore, violence may occur both in individuals who do and do not suffer from a substance use disorder (Boles and Miotto 2003). Although this chapter focuses on substance abuse rather than use, it is difficult to make a clear distinction between the two when discussing the relationship with violence. Therefore, this section will discuss the psychopharmacological effects of the use of different types of substances in general.

When examining the acute effects of intoxication on violence, scholars have consistently found a complex relationship between the two (Fagan 1990). For example, the association between violence and substance use is mediated by shared common causes such as a negative family situation (e.g., harsh punishment, lack of parental supervision, aggression or substance abuse in the family), or psychopathology (such as antisocial personality disorder). Furthermore, it should be mentioned that the best predictor for future violence is a history of violent behaviour. Accordingly, few studies have found aggressive behaviour not to precede substance abuse (Fagan 1990). For instance, Warshaw and Messite (1996) have found that many people act violently when under the influence of substances, but this effect is more pronounced for people who already behave violently when sober. In addition, some scholars argue that substances such as alcohol merely serve as a triggering mechanism to prompt violent acts in people who already have a tendency to be violent, and find themselves in situations that may lead to aggression (e.g., fightbars; Boles and Miotto 2003). Nevertheless, this section will discuss the substance-violence relationship to examine whether there is a direct connection between the substance and the violent behaviour that may affect one's capacity for legal compliance.

The most commonly cited substance related to violence is alcohol (Boles and Miotto 2003). When considering the specific effects of alcohol on violence, there is evidence that it reduces inhibitions

of (for example) fear. As a result, the capacity to plan behaviour in response to threatening situations may decrease, potentially resulting in violent behaviour (Boles and Miotto 2003). Moreover, alcohol can influence neurochemical systems that mediate violent behaviour (Miczek et al. 1993).

The most pronounced link with violence and drugs has been found for stimulants such as (meth)amphetamines and cocaine (Boles and Miotto 2003). For methamphetamines in particular, scholars have found that chronic use can lead to prolonged and persistent psychosis, including paranoia, hallucinations and impaired reality testing (Fischman and Haney 1999). In a meta-analysis of 204 studies, Douglas et al. (2009) have found that psychosis is a risk factor for violence to others. The findings show that psychosis is associated with a 49-68% increase in the likelihood of engaging in violence relative to the likelihood in the absence of psychosis. Specifically, the so-called “positive symptoms” of psychosis, including paranoia and suspiciousness, are related to increased odds of violent behaviour (Douglas et al. 2009). Scholars have found that chronic amphetamine use can lead to frightening delusions, hypervigilance and hyperawareness, which are related to the positive symptoms of psychosis that can result in violence (Fischman and Haney 1999). Fischman and Haney (1999) have also examined the effects of cocaine on violence, finding that use or abuse of (intranasal) cocaine can lead to more short-duration psychosis, with similar characteristics to psychosis resulting from (meth)amphetamines, potentially also leading to violence. The association between crack cocaine and violence is greater than for intranasal cocaine, as the rapid onset and offset of the intoxication effects are expected to cause higher levels of irritation and aggression (Fischman and Haney 1999).

Contrary to stimulant drugs, marijuana or opioids tend to depress activity (Boles and Miotto 2003). With marijuana, there is some evidence that the substance can induce psychiatric symptoms, such as paranoia, anxiety, panic attacks and psychosis, but this has been found only in individuals who already have a predisposition to psychiatric illness (Gold and Tullis 1999). When taken in high doses, marijuana can have psychoactive effects, resulting in paranoia with suspiciousness and delusions that may lead to violence. However, marijuana use in small doses has been found to (temporarily) inhibit violent responses and, in general, scholars have concluded that marijuana use either reduces violent behaviour or leaves it unaffected (Reiss and Roth 1993). With opioids, there is no evidence of a link with violent behaviour, apart from the effects caused by withdrawal (Roth 1994). It is more likely that opioids

temporarily inhibit such behaviour. During withdrawal, however, opioid-dependent individuals experience agitation, aggression, craving, irritability, anxiety and physical pain. This may result in overly defensive and aggressive responses to provocative situations (Roth 1994), and possibly violent attempts to obtain more drugs to reduce the withdrawal symptoms (Goldstein 1985).

Thus, the findings on different types of substances are ambiguous (Parker and Auerhahn 1998). However, Duke et al. (2018) have identified and statistically reviewed 32 meta-analyses, showing that the combined use of alcohol and illicit drugs increases the association between substance use and violence relative to alcohol use alone.⁶ Moreover, with regard to substance abuse specifically, there is evidence that as drug and alcohol use becomes more abusive, the strength of the relationship between violence and substance use increases (Fagan 1990). Overall, research has shown that substance use and abuse (in particular of alcohol and stimulant drugs) are associated with increases in violent behaviour (Boles and Miotto 2003), although this effect is more pronounced in individuals who already have violent tendencies when sober (Fagan 1990). In general, these findings suggest that substances can influence the capacity for legal compliance and may cause violent (criminal) behaviour.

Conclusion and recommendations

This chapter has reviewed the existing evidence on whether substance abuse affects the capacity to control one's behaviour and comply with the law. Throughout the chapter, the impairment of self-control and impulsivity have played a major role, both as risk factors for the development of substance abuse and as consequences of substance abuse. The findings suggest that substance abuse impairs self-control and increases impulsivity. In doing so, substance abuse may cause people to become unable to control their behaviour and impair their capacity for legal compliance. Moreover, some substances can directly provoke violent and aggressive behaviour, which may lead to violent crimes.

The relationship between substance abuse and capacity for legal compliance requires some nuance. Specifically, if substances have a direct effect on the brain, why do individual responses to them

⁶ Duke et al. (2018) used a combined measure of all types of illicit drugs, providing an overall image of the effects of combined alcohol and drug use. Conclusions regarding the specific effects of different types of illicit drugs in combination with alcohol use cannot be drawn from this study.

vary? Here it is important to keep in mind that context is everything. Situational factors may explain the variability between substance abusers in their propensity to engage in criminal behaviour. For example, one's social environment has been found to be a much more powerful contributor to violent behaviour than pharmacological effects linked to both cocaine and alcohol (Parker and Auerhahn 1998). Furthermore, as mentioned earlier, criminal opportunity is an important factor in explaining the relationship between self-control and crime (Grasmick et al. 1993). This, in combination with individual susceptibility to impulsive and/or violent behaviour, has a major effect on one's propensity to engage in crime as well as the extent to which substance abuse affects the capacity to legally comply. Moreover, other theories on how substance abuse and crime are associated, such as the systemic or economic-compulsive model (Goldstein 1985), should not be disregarded when trying to find an explanation or resolution for the large numbers of substance-related crimes.

As mentioned at the beginning of this chapter, the goal here is not to propose that existing findings regarding capacity imply that substance abuse is an excuse for breaking the law. Among scholars of substance abuse and criminal behaviour, there exists a debate concerning whether offenders with a substance use disorder are responsible for their actions (Morse 2017) or not (Kennett et al. 2015). Scholars tend to assess this from an *ex post* viewpoint: how should we respond to the past criminal behaviour of the substance-abusing offender? By contrast, this contribution advocates to take an *ex ante* viewpoint and focus on how legal incentives can be used to enhance future compliance with the law. In this regard, the main objective is not to determine whether a person is responsible for their actions or not, but rather to increase their capacity to comply and prevent illegal behaviour in the future. The next question is thus how this can be achieved, and how we can direct and change future behaviour.

This chapter has illustrated that there is a relationship between substance abuse and crime. To change behaviour and facilitate compliance, it may therefore be useful to address substance abuse directly. A possible intervention is substance abuse treatment. Scholars have focused on the effects of substance abuse treatment on criminal behaviour, studying recidivism in particular (Weekes et al. 2013). Meta-analyses have revealed interesting insights regarding for example the effects of different types of treatment (Latimer et al. 2006; Mitchell et al. 2007) and mandated versus voluntary treatment (Parhar et al. 2008; Werb et al. 2016). Importantly, an effective programme should focus on the principles of risk,

need and responsivity (RNR) from Andrews and Bonta's (2010) *The Psychology of Criminal Conduct* (Weekes et al. 2013). RNR programmes are tailored to offenders' risks of reoffending as well as their criminogenic needs (e.g., work, family, personal factors). Moreover, it is crucial to select a programme to which the offender is responsive. Personal factors such as stress and family dysfunction that may undermine the efficacy of the intervention should be taken into account (Volkow and Li 2004). Lastly, it is important to develop and administer programmes specifically focused on improving self-control, for example through incorporating medicinal interventions or behavioural training to control inhibition (Smith et al. 2014). In this manner, even if the offender is fully responsible for their behaviour, we can serve both offender and society best.

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