

A virtue analysis of recreational marijuana use

EZRA SULLIVAN, O. P.¹ AND NICANOR AUSTRIACO, O. P.²

¹*Pontifical University of St. Thomas Aquinas, Rome, Italy*

²*Departments of Biology and of Theology, Providence College, Providence, RI, USA*

Several empirical studies suggest that recreational marijuana is popularly perceived as an essentially harmless rite of passage that ends as young people settle into their careers and their adult intimate relationships. Is this perception accurate? To answer this question, we evaluate the morality of recreational marijuana use from a virtue perspective guided by the theological synthesis of St. Thomas Aquinas. Since the medical data reveals that recreational marijuana use is detrimental to the well-being of the user, we conclude that it is a vicious activity, an instance of the vice of intoxication, and as such would be morally illicit.

Lay summary: *In contrast to its medical use, the recreational use of marijuana cannot be justified for at least three reasons. First, as scientists have amply documented, it harms the organic functioning of the human body. Second, it impedes our ability to reason and in so doing does harm to us. Finally, it has lasting detrimental effects on the user and his neighbor, even when it occurs in a casual setting. Intoxication is always contrary to the integral good of the person. Thus, the use of marijuana is never warranted even for good, non-medical reasons.*

Keywords: Marijuana, Recreational use, Virtue, Vice, St. Thomas Aquinas, Intoxication

INTRODUCTION

With the flair of a poet and the insight of a great psychologist, Charles Baudelaire famously named the chief effect of cannabis ingestion: he said it produced *les paradis artificiels*, artificial paradises (Baudelaire 1921). His concern was the use of hashish; ours is recreational marijuana. In both cases, the issue is cannabis and its moral implications for the recreational user. Recreational marijuana is one of the most widely used illicit drugs in the world (Degenhardt et al. 2014, 6). In the United States, nearly half of 12th graders have tried marijuana, and 6 percent use it daily

(Jacobus et al. 2009, 559). Between 2007 and 2010, marijuana users in the U.S. increased from 14.4 million to 17.4 million. According to the National Survey on Drug Use and Health, in 2012, among adults, 51.1 percent of males and 40.4 percent of females have used it at least once in their lifetimes. In Canada, a third of all university students use pot (Fischer et al. 2013, 135). The 2007 European School Survey Project on Alcohol and Other Drugs (ESPAD) reported that lifetime use of cannabis among students (age 15–16 years) in Europe ranged from 3 percent in Armenia to 45 percent in the Czech Republic with an average of

19 percent among 35 countries (Hibell et al. 2009).

Studies have shown that recreational marijuana is popularly perceived as essentially harmless, a rite of passage that typically ends as young people settle into careers and adult intimate relationships (Chen and Kandel 1998; Duncan et al. 2006). But is this common perception accurate? To answer this question, we will evaluate the morality of recreational marijuana use from a virtue perspective guided by the theological synthesis of St. Thomas Aquinas. We will begin by distinguishing the medicinal from the recreational use of marijuana, within a Thomistic conceptual framework. We then turn to an investigation of the physical, mental, and psycho-social effects of recreational marijuana use on the user. Since the medical data reveals that recreational marijuana use is detrimental to the well-being of the user, we conclude that it is a vicious activity, an instance of the vice of intoxication, and as such would be morally illicit.

CONTRASTING THE MEDICINAL AND THE RECREATIONAL USE OF MARIJUANA

In considering the morality of marijuana use, we can begin by delineating what marijuana is as a substance. Among substances that are ingested or assimilated by the body, marijuana does not fall into the category of food. The primary characteristic of food is that it is edible, that is, its component parts can be digested primarily in the stomach and act as a source of essential nutrients for the physical organism. Secondary characteristics of food include flavor, odor, and texture. A tertiary characteristic of food is its non-nourishing direct effects on bodily experience: the herb mint, for instance, makes the mouth tingle. In light of these characteristics, it is clear that marijuana is not food. Studies

showing that marijuana increases appetite assume that marijuana itself is not a kind of food (Di Marzo and Matias 2005). New users report extreme discomfort when ingesting marijuana (Kalant 2008), indicating that it is not sought for the sake of its flavor, odor, or texture. Rather, the general aim in using marijuana is to receive its non-nourishing direct effects on bodily experience.

Given that marijuana is sought as a means toward a chemically altered experience, one can distinguish between its medical and its non-medical use. For St. Thomas, the medicinal use of any substance is its use ordered towards the health of the patient: “Health, with which medicine is concerned, is the end of all the medications prepared by the art of the chemist” (Aquinas 1955, 59). In more contemporary language, one can define the use of medicine as the intake of a biochemical agent for the sake of altering the mechanism of the subject’s molecular structure and function to obtain or to preserve his bodily health and, as an extension, his personal well-being (cf. Sgreccia 2012, 583).

Marijuana, here understood as botanical cannabis as distinct from plant extracts and pharmaceutical cannabinoids, has been used as a medication for centuries up to our own time. At the turn of the millennium, the Institute of Medicine in the United States concluded that marijuana could be recommended for pain relief, appetite stimulation, and nausea and vomiting control (Mack and Joy 2000). In more recent years, the medical use of cannabinoids has been linked to the management of neuropathic pain, hypertension, post-stroke neuroprotection, multiple sclerosis, epilepsy, and cancer, among others (Greydanus et al. 2013, 42; cf. Sznitman and Zolotov 2015). Because medicines have healing or minimizing the negative effects of an illness or an injury as their end, they

are good for the human person even if they have deleterious side effects. Thus, chemotherapy to treat a cancer is justifiable by the principle of double effect even if it leads to the foreseen but unintended detrimental consequences of nausea, hair loss, and fatigue (Cataldo 1995). This essay does not address or evaluate the legitimacy of the medical use of marijuana. We note, however, that there are significant blurred boundaries between medical and recreational uses: multiple studies have found that those who used marijuana for purported medical reasons also used it for recreational reasons (Ware et al. 2005; O'Connell and Bou-Matar 2007; Reinerman et al. 2011; Bostwick 2012). Furthermore, patients without recreational experience of marijuana have trouble tolerating its psychoactive effects and often reject continued medical use (Kalant 2008).

In contrast to medicinal use, the recreational use of a substance is ordered, not to the health of the person, but rather to his leisure, or to put it another way, to his recreation. For St. Thomas, the virtue of *eutrapelia* is the virtue of recreating well (Aquinas 1947, II-II, q. 168, aa. 2–4; Herbst 2003). Recreation, or “play” understood in the broad classical sense, is necessary for the overall well-being of the human person, because it facilitates rest, relaxation, refreshment, and strengthening, with a view to enabling him to fulfill the duties of his state of life:

Just as man needs bodily rest for the body's refreshment, because he cannot always be at work, since his power is finite and equal to a certain fixed amount of labor, so too is it with his soul, whose power is also finite and equal to a fixed amount of work ... Now such like words or deeds wherein nothing further is sought than the soul's delight, are called playful or humorous. Hence it is necessary at times to make use of them, in order to give rest, as it were, to the soul.

This is in agreement with the statement of the Philosopher that “in the inter-course of this life there is a kind of rest that is associated with games”: and consequently it is sometimes necessary to make use of such things (Aquinas 1947, II-II, q. 168, a. 2).

We may note that as St. Thomas explains, and as our everyday experience confirms, recreation necessarily involves experiencing of pleasure in some way: “Just as weariness of the body is dispelled by resting the body, so weariness of the soul must needs be remedied by resting the soul: and the soul's rest is pleasure” (Aquinas 1947, II-II, q. 168, a. 2). We play to experience delight. Clearly, however, not all play and not all recreation is virtuous. Therefore, according to St. Thomas, one has to keep the following three guidelines in mind to pursue virtuous recreation that truly delights the soul (Aquinas 1947, II-II, q. 168, a. 2). These principles ensure that our recreation is in accordance with right reason and the perfecting of human nature. First, one should not pursue a pleasure that is indecent or directly injurious in word or in deed. Next, one should not pursue a pleasure that destroys the harmony and balance of one's life and of one's mind. Finally, one should seek the delight of the soul in a manner that is well-ordered and appropriate to the person and occasion. If one violates any of these guidelines during recreation, then one has erred. One has engaged in deleterious and vicious rather than virtuous recreation.

THE SHORT-TERM AND LONG-TERM EFFECTS OF RECREATIONAL MARIJUANA USE

Human flourishing includes both physical and mental health, and a complete analysis of the morality of recreational marijuana

use should take both of these dimensions of a person's well-being into consideration. As we will see, in contradiction to the commonplace belief that marijuana used recreationally is essentially harmless, medical science has now shown that it in fact damages the user's physical and mental health in both the short and the long-term. Thus, recreational marijuana is not harmless. It is not safe.

The short-term effects of recreational marijuana use can be directly linked to its most psychoactive ingredient, delta-9 tetrahydrocannabinol (D9-THC). When marijuana is smoked, D9-THC makes its way from the lungs to the bloodstream and thence throughout the body to all of the user's organs including his brain. As it circulates, D9-THC binds to cannabinoid receptors (CBRs), which are ordinarily activated by molecules such as 2-AG (2-archidonoyl glycerol) and AEA (arachidonoyl ethanolamide or anandamide) (Hall and Degenhardt 2009). Part of the body's endocannabinoid system, these endogenous molecules are involved in regulating a variety of emotional and cognitive behaviors in the human organism. D9-THC can over-stimulate a person's cannabinoid receptors, thereby causing the "high" or "stoned" feeling and the other effects associated with the use of cannabis (Hall and Degenhardt 2009; National Institute on Drug Abuse 2012). Importantly, there is data that suggests that the marijuana "high" itself is harmful: Within moments of its ingestion, cannabis decreases cortical dopamine levels, which are critical for high cognitive functions (Stokes et al. 2010). Often this "high" can be accompanied by other effects, including, among others, sensory distortion and hallucinations, panic and anxiety, poor coordination and lowered reaction time, inhibited learning and memory, and increased heart rate (Stokes et al. 2010).

In addition to the short-term effects, there are long-term effects on the recreational user of marijuana, most if not all of which are adverse to the well-being of the user. These detrimental effects are both physiological and cognitive in nature.

Physiologically, marijuana use has numerous adverse effects throughout the body. For example, cannabinoids have been linked to immunosuppression, i.e., the lowering of the activity of the user's immune system, which not surprisingly makes him more vulnerable to infection and to disease (Klein et al. 2003; Tanasescu and Constantinescu 2010). Chronic marijuana use can also lead to extensive airway injury and impairment, and alterations in the structure and the function of the pulmonary macrophages (Tashkin 2001; Aldington et al. 2007). Thus, it is not surprising that chronic users of marijuana have a higher risk for long-term pulmonary diseases including bronchitis and emphysema (Beshay et al. 2007). Finally, among the negative physical effects associated with or caused by smoking marijuana, cardiovascular harms are among the most concerning (Thomas et al. 2014). These include increased risk of myocardial infarction (heart attack), angina (chest pain), and fatal stroke (Jones 2002). However, because of the small number of studies there is still insufficient evidence to assess whether the all-cause mortality rate is elevated among cannabis users in the general population (Calabria et al. 2010). Thus, there is a need for long-term cohort studies that follow cannabis-using individuals into old age when detrimental effects of cannabis use are more likely to emerge among those who persist in using cannabis into middle age and older.

Next, cognitively, researchers have cataloged a growing number of adverse effects in frequent and/or long-term users of

marijuana. Compared to demographically matched controls, marijuana users demonstrated relative cognitive impairments in verbal memory, spatial working memory, spatial planning, and decision-making (Schweinsburg et al. 2008; Tait et al. 2011; Crane et al. 2013; Becker et al. 2014). Even users who do not appear or feel intoxicated continue to manifest impairments over the course of the workweek (Wadsworth et al. 2006b). A meta-analysis suggests that, after chronic and long-term cannabis use, brain size will decrease in affected areas (Rocchetti et al. 2013). In addition, a study has revealed that even casual pot use causes major alterations in the human brain, though it is not clear if these changes are associated with apparent adverse effects in cognition or behavior (Gilman et al. 2014). This is one of several studies showing that regular use of cannabis is associated with altered brain morphology (Lorenzetti et al. 2014).

Significantly, marijuana use promotes addictive behaviors. Human and animal studies show that the THC in cannabis supports “the acquisition and maintenance of robust drug-taking behavior in subjects with no history of exposure to other drugs” (Justinova et al. 2005, 295). Furthermore, marijuana use affects a user’s way of perceiving pleasure. The phenomenology is similar to that of other addictive drugs, especially in the way it reinforces pleasurable feelings of reward: As a person continues to use addictive drugs, he resets his threshold for stimulation of reward to a higher level (Wenger et al. 2003; Hyman et al. 2006; Panagis et al. 2014). This hijacking of the brain’s reward pathways reduces the ability of natural rewards like food, relationships, and sex to trigger delight (Covey et al. 2014). Thus, the marijuana user distorts his ability to enjoy life and all that reality offers.

Among the most significant cognitive and psychiatric dangers posed by marijuana usage is its association with psychosis. Here we understand psychosis as a state of mind characterized by the inability to distinguish between what is real and what is not (Russo et al. 2014). The risk of developing psychosis roughly doubles for regular cannabis users (Van Winkel and Kuepper 2014). It is not clear why this is so. Some suggest that cannabis use is a causal factor for schizophrenia while others suggest that schizophrenics are more likely to use cannabis (Degenhardt et al. 2003). However, there is data that suggests that, unlike alcohol, marijuana use actually precipitates schizophrenia and other psychotic disorders in a significant number of users (Large et al. 2011). Swedish investigators uncovered a dose-response relationship between frequency of cannabis use and risk for schizophrenia in a cohort of just over fifty thousand conscripts (Zammit et al. 2002). These findings have been corroborated by studies undertaken in other parts of the globe (Henquet et al. 2005; Moore et al. 2007; Chadwick et al. 2013).

Finally, the effects of marijuana use extend beyond the user. For example, a recent study published in the *Annals of Emergency Medicine* has suggested that decriminalizing pot will likely lead to an increase in cases of children being unintentionally exposed to the drug, as measured by increased call volume to poison centers in the United States (Wang et al. 2014). Not surprisingly, some data suggests that cannabis amplifies risk factors associated with accidents and injuries, especially within the first sixty minutes after use (Wadsworth et al. 2006a; Pulido et al. 2011). Recreational marijuana use impacts not only the personal good of the user but also the common good of his family and his community.

A VIRTUE ANALYSIS OF RECREATIONAL MARIJUANA USE

As we noted, for St. Thomas, recreation is virtuous if it is according to right reason. Pursuing recreation that damages the self and others to a grave extent is not reasonable. Thus, because it damages persons gravely, recreational marijuana use to experience the “high” is a vicious activity. More specifically, in our view, it is an instance of the vice of intoxication.

Intoxication from alcohol is usually called “drunkenness,” while intoxication from a drug is often called a “high.” It is a result of the inordinate desire for and voluntarily excessive use of an intoxicant, such that the user is deprived of reason. An intoxicant is an ingested substance that gives the user a feeling of exhilaration, elevation, and delight according to the mode of its chemical composition: cocaine acts in one way, wine in another, other intoxicants in other ways, different for each chemical composition. Intoxicants affect the entire person but particularly target the brain, consequently affecting neurological activity and in certain circumstances entirely impeding rationality. Intoxication is *complete* when the user’s use of his reason is completely impeded.¹ This happens, for example, when after drinking a large amount of alcohol the user acts in a plainly irrational manner, such that he cannot distinguish right from wrong and cannot remember his notable actions later. Intoxication is *incomplete* if the mind is altered for a short time, if rationality is impeded to a noticeable degree, if the person retains some mastery over himself, and if he does not do anything contrary to reason because of the intoxicant.

The viciousness of intoxication is a common theme in the Sacred Scriptures. For instance, with an acute phenomenology of the dangers of intoxication, the

book of Proverbs gives a sharp warning against drunkenness:

Who has woe? Who has sorrow? Who has strife? Who has complaining? Who has wounds without cause? Who has redness of eyes? Those who tarry long over wine, those who go to try mixed wine. Do not look at wine when it is red, when it sparkles in the cup and goes down smoothly. At the last it bites like a serpent, and stings like an adder. Your eyes will see strange things, and your mind utter perverse things. You will be like one who lies down in the midst of the sea, like one who lies on the top of a mast. “They struck me,” you will say, “but I was not hurt; they beat me, but I did not feel it. When shall I awake? I will seek another drink.” (Prov. 23:29–35)

This biblical passage brilliantly describes the varied and detrimental effects of an intoxicant from the perspective of an abuser: it harms the physical organism and endangers health (“redness of eyes”); it fascinates the user (“it sparkles”); it harms the person in general (it “bites” and “stings”); it creates a false reality (“your eyes will see strange things”); it destabilizes the user and at times makes him nauseous (“like one who lies at the top of the mast”); it dulls the physical senses, especially the sense of touch (“they beat me but I did not feel it”); and it creates dependency and addiction (“when shall I awake? I will seek another drink”). Another passage from Sacred Scripture rounds out the detriments of intoxication: “Wine drunk to excess is bitterness of soul, with provocation and stumbling. Drunkenness increases the anger of a fool to his injury, reducing his strength and adding wounds” (Sir. 31:29–30). This highlights an ironic effect of intoxication: it is often sought for the sake of pleasure, but it ends in bitterness and provokes a person morally to stumble. Instead of

leading to communal peace and authentic recreation, it is associated with violence and anger, wastefully dissipating a user's strength. It also endangers a person's fortune and thereby wounds the common good. In sum, intoxication is detrimental to the human person, and it undermines his dignity and his relation to others in many ways. In light of this, Christ counseled his disciples: "Take heed to yourselves lest your hearts be weighed down with dissipation and drunkenness and cares of this life" (Lk. 21:24).

To understand why intoxication is a vice from a philosophical perspective, we return to St. Thomas to discern how it violates his three guidelines for virtuous recreation. First, instead of truly refreshing the person, intoxication harms the organic functioning of the body. As we saw above, this has been amply documented by researchers investigating the effects of recreational marijuana use. Next, intoxication causes a person's rationality to be obscured or abandoned. Aristotle famously insisted that rationality is part of our very essence. In fact, it is the characteristic that separates us from beasts. Rationality encompasses more than mathematical calculation. It also includes the use of wit, of imagination, of memory, of contemplation, of meditation, of prudential deliberation. To impede our rationality therefore is to do harm to ourselves. As we saw above, recreational marijuana use has numerous adverse effects that impede human cognition. Finally, intoxication can never be appropriate to any persons or circumstances because of its lasting detrimental effects to the user and his neighbor, even when it occurs in a casual setting. We have seen that marijuana use entails a high, which indicates some level of intoxication. Thus marijuana is contrasted with alcohol, which can be consumed moderately without the user becoming intoxicated; in fact, moderate

alcohol use has been linked to beneficial health effects (Collins et al. 2009). Aside from medical uses, then, marijuana cannot be consumed in a morally legitimate way. Therefore, the recreational use of marijuana is always a vicious activity.

Pope St. John Paul II would agree. He describes the difference between temperate drinking of alcohol and drug abuse in the following way:

Whereas the moderate use of alcohol as a drink does not, in fact, clash with moral prohibitions, and only abuse is to be condemned; taking drugs is, on the contrary, always illicit because it involves an unjustified and irrational renunciation of thinking, willing, and acting as free persons (John Paul II 1991)

Precisely because complete intoxication severely diminishes or entirely incapacitates rationality, St. Thomas regarded it as a grave fault:

With regard to drunkenness we reply that it is a mortal sin by reason of its genus; for, that a man, without necessity, and through the mere lust of wine, make himself unable to use his reason, whereby he is directed to God and avoids committing many sins, is expressly contrary to virtue (Aquinas 1947, I-II, q. 88, a. 5, ad 1).

Though St. Thomas directed his argument against intoxication caused by wine, we are convinced that he would have condemned intoxication caused by marijuana as well, and for the same reason.

Next, it is important to establish the intended purpose behind the use of recreational marijuana. The widely used Marijuana Motives Measure (MMM) identified five kinds of motives for using botanical cannabis, namely: enhancement, social, coping, conformity, and expansion (Simons et al. 1998). These findings have been confirmed in later studies (Benschop et al. 2015), along with an additional

motive, “routine,” which includes reasons of boredom, habit, and/or addiction. It should be noted that the identified motives are non-exclusive, that is, many overlap and a single user often has more than one motive at the same time. For example, “enhancement” centers around positive experiences with reasons such as “because I like the feeling”; this broad motive partly matches with the “social” reason, “because it helps me enjoy a party,” for the latter reason names a specific context in which a pleasurable, enhanced feeling is sought. Similarly, while “expansion” centers on intellectual goods such as “to know myself better,” “to expand my awareness,” it also includes “to be more open to experiences,” which could match with the “social” and “enhancement” motives previously listed since presumably few if any users would want to open themselves to unpleasant experiences.

When pot smokers, proposing that they use marijuana for one or more of the aforementioned motives, experience pleasure, they justify their action by noting that these ends are good for the person. In response, we will discuss how some of these motives and their specified reasons are good, some are unequivocally negative, most are morally ambiguous, and at least two are rather concerning.

No reasonable moral analysis would argue against the goodness of reasons such as the desire to know oneself better, to be sociable, to celebrate a special occasion, to be more creative, or to relax and release stress. However, in the context of marijuana use, these goods are sought *by means of* or at least *alongside of* its intoxicating effects. One researcher suggests: “For recreational users, access to marijuana has always been about getting intoxicated” (Bostwick 2012). Even if this is an exaggeration, it points to an important truth: the primary and well-known effect of marijuana is the high, or intoxication, that it

produces. If someone seeks a good without intoxication, then (aside from ignorance) he will not use marijuana. There are a myriad of ways to be creative, to relax, etc., without marijuana. If he seeks a non-intoxicating good through the use of marijuana, then the intoxicating side effect will render his decision morally deficient. As we have already shown, intoxication is always contrary to the integral good of the person. Thus, the use of marijuana is not justified even for good, non-medical reasons.

Among the morally negative reasons for using marijuana, “to get high” is, in our assessment, the same as “to be intoxicated.” Here we can recall our previous discussion on the morally problematic nature of intoxication. Furthermore, we note with misgiving that growers of cannabis in the United States, Europe, and Australia have been continuously developing strains of marijuana with greater D9-THC content (Cascini et al. 2012). While acknowledging many factors that affect THC levels, an Australian study showed that THC levels were the highest on record, at an average 15 percent, with one sample at about 40 percent (Swift et al. 2013). This is a marked increase from an average of 3.4 percent in the US in 1993 and 8.8 percent in 2008 (Mehmedic et al. 2010). Because THC is a psychotropic chemical, its increase entails an increase of all of the negative effects of “higher highs,” whether a user seeks them exclusively or not, making modern strains of marijuana that much more damaging for users.

Reasons provided for using marijuana recreationally are very often morally ambiguous. Without more information, one cannot make an accurate ethical assessment of reasons such as, “because I like the feeling,” “because it helps me enjoy a party,” “to be liked,” and “to be open to more experiences,” or the more

prosaic “out of boredom” and “out of habit.” One could name such reasons for deeds of kindness as much as for acts of cannibalism. With respect to pleasure, the virtue of temperance comes to the fore. Pleasure is morally neutral; it is good insofar as it is sought in a “tempered” way, as a natural mechanism made to enhance human functions. The intemperate pursuit of pleasure, contrastingly, is morally corrupted insofar as it is attached to an action that is contrary to human flourishing. A similar analysis shows that to act out of habit is only good insofar as the habit is directed toward a good end, using good means, in the fitting circumstances. In the case of motives of conformity with one’s social group, we must distinguish between positive peer pressure that urges a person toward virtue and the negative side of peer pressure that tempts a person toward vice. An adequate moral assessment of marijuana use therefore must ask questions such as, “Do the feelings the marijuana user seeks *promote human flourishing*? Is being open to intoxicating experiences a *disordered* desire?” The answers to these questions would then lead to our analysis above that showed that marijuana may not legitimately be used as a means to a good end. In sum, morally ambiguous motives do not justify the recreational use of marijuana.

We are particularly concerned about reasons for using marijuana such as, “it helps me when I feel depressed or nervous” and “it cheers me up when I am in a bad mood.” Reasons like these give voice to those who use marijuana to self-medicate their psychosis (Kavanagh et al. 2004; Schofield et al. 2006). The correlation between psychosis and regular cannabis use is concerning enough (Os et al. 2002; Ruiz-Veguilla et al. 2013), but several reasons compound our alarm. For example, studies show that adults with serious psychological distress and

depression were more likely than adults without these symptoms to use marijuana, however they were also equally or more likely to attempt to quit or self-regulate their marijuana use and at the same time were less successful in their attempts (Shi 2014). In other words, a significant number of hurting people use marijuana hoping it will help their depression or distress, but they come to find not only that they want to quit using it, but that they cannot quit using it. As we noted above, regular marijuana use tends to foster addictive behaviors (Justinova et al. 2005). This is especially disturbing in light of how cannabis can exacerbate negative consequences associated with psychotic disorders (Green et al. 2004; Moore et al. 2007). In addition, with the rise of marijuana legalized for medicinal use, there is good reason to think that adolescents will begin to use it as part of their self-medication strategy: a multinational adolescent cohort study showed that 20.4 percent of males and 14.8 percent of females self-medicated with prescription antianxiety drugs (Shehnaz et al. 2014, table 2).

The final concerning motive for using marijuana centers around reasons such as, “to forget my worries” and “to forget about my problems.” A full 91 percent of users reported the latter as a motive for their use (Simons et al. 1998). This result fits with the finding that “escape and avoidance of negative affect is the prepotent motive for addictive drug use” (Baker et al. 2004, 33). This is unfortunate for many reasons. From a pragmatic perspective, this behavior will be ineffective. Any drug used for the sake of escape cannot achieve its purpose, since after the effects of the drug wear off and reality reasserts itself. As one researcher observed, “The weight of the evidences indicates that cannabis creates cognitive dulling rather than reduction in anxiety, indifference rather than relaxation,

and amotivation rather than inner peace, all closer to psychopathology than to well-being” (Svrakic et al. 2012). Furthermore, individuals with avoidant behavior have been found to lack awareness into their own emotional state (Stevens 2014), and individuals with anxiety disorders often avoid facing their fears even if they miss potential rewards (Pittig et al. 2014). Here the virtue of fortitude comes to the fore: it helps a person to develop responsibility toward the mundane duties of one’s state in life, including responsibility toward one’s neighbor. Individuals do not have a right to abdicate their personal dignity or to harm themselves (PCHCM 2001). The Pontifical Council for the Family rightly notes, “it is not drugs that are in question, but the human, psychological and existential issues implicit in this kind of behavior [i.e., in drug abuse]” (PFC 1997, no. 6). The Pontifical Council goes on to say: “It is not the product that creates the addiction, but the person who feels the need for it” (PFC 1997, no. 6). Or to put it another way, “Drugs are not the drug user’s main problem. Drug consumption is merely a deceptive answer to the lack of a positive meaning of life” (PFC 1992). From this perspective, the persistent use of marijuana at times indicates an attempt to medicate oneself from reality; it would then be an act of despair. Pope St. John Paul II explained,

A correspondence has to be recognized between the deadly pathology caused by drug abuse and a pathology of the spirit which leads a person to flee from self and to seek illusory pleasures in an escape from reality, to the point that the meaning of personal existence is totally lost (PFC 1992).

Hence, a viewpoint of faith indicates that the motives undergirding drug abuse and chosen intoxication are ultimately of a spiritual nature.

CONCLUSION

Reality is an adventure that calls for our full engagement. If we try to reach God, the ultimate reality, through the magical key of drugs, we will find that we have only locked ourselves into a dungeon of our own making. Unfortunately, it seems that the drug culture does not recognize this crucial truth. Prof. Michael Pollan, described by *The New York Times* as a “liberal foodie intellectual” (Kamp 2006), perceptively shows how the account of Adam and Eve’s fall can be interpreted from the perspective of the drug culture. According to Pollan, natural man and woman looked to the tree of knowledge of good and evil for enlightenment and godhood: “There was spiritual knowledge to be had from nature, from a plant” (Pollan 2002, 18). But, he continues, God “can’t pretend the tree of knowledge doesn’t exist, not when generations of plant worshipping and consuming pagans know better.” Consequently, the tree continues to grow, but is ringed about in a powerful taboo — “taste it and you will be punished” (Pollan 2002, 18). According to the biblical account, the illicit use of the plant brought about the experience of pain, emotional disorder, and difficulty in working the land. Pollan calls this classic account “the drug war’s first victory” (Pollan 2002, 19). Instead of believing this account, he suggests that we should let nature “have her way with us now and again,” because using psychoactive substances could check our pride and perhaps help develop insight and creativity (Pollan 2002, 19). In the end, Pollan’s position amounts to the claim that drugs can be used to gain enlightenment. As we have seen, however, this exalted vision for drug use is a mere illusion.

Cardinal Ratzinger summarized the issue well: “Drugs are the pseudo-mysticism of a world that does not believe

yet cannot rid the soul's yearning for paradise" (Ratzinger 2010, 26). The user entertains a fantasy of tasting divinity, and the final result is subversion of reality. Baudelaire came to a similar conclusion. After describing the moral erosion of the regular user of cannabis, he noted that the hashish high created a delusion of grandeur but resulted only in hot air: "I will not describe the heavy fantasies of one high on hashish: who would read them with pleasure? Who would agree to read them?" (Baudelaire 1921, 234). In other words, the foolishness of drug-induced writings indicates the emptiness of the recreational cannabis user's experience: what seems to be an insight turns out merely to be a chemical high; what seemed to be the Muse was in fact muddled thinking. Drugs, including the recreational use of marijuana, dull and destroy human flourishing. They take the human person out of the world in which he lives: Out of his body; out the world of responsibility; and out of the difficult but beautiful search for ultimate happiness. Baudelaire reminds us that even ugliness and pain have something to teach us; they call for redemption, not escape. He preferred to wonder at our disturbing reality rather than to wander in an artificial paradise, and he invites us to do the same. If we find that all is not well, that we are cast out of Eden into a world marred by sin, this too is helpful. "The only dreadful thing in life is to be content with life," Bede Jarrett insisted, for God alone can satisfy us (Jarrett 1935, 26). As the Pontifical Council for the Family said, "Only in Christ can every person find his true treasure, the real and definitive reason for all his existence. The words of Christ take on an extraordinary meaning with regard to the drug user: 'Come to me, all you who are weary and find life burdensome, and I will refresh you' (Matt 11:28)" (PFC 1992).

END NOTES

1. For further discussion, see the analysis of *sobrietate* and *ebrietate* in Prümmer (1958, 516–522).

REFERENCES

- Aldington, Sarah, Mathew Williams, Mike Nowitz, Mark Weatherall, Alison Pritchard, Amanda McNaughton, Geoffrey Robinson, and Richard Beasley. 2007. Effects of cannabis on pulmonary structure, function and symptoms. *Thorax* 62, no. 12: 1058–63. doi:10.1136/thx.2006.077081.
- Aquinas, Thomas. 1947. *Summa theologiae*. trans. Fathers of the English Dominican Province. New York: Benziger.
- Aquinas, Thomas. 1955. *Summa contra gentiles: On the truth of the Christian faith*. Book I: god. Trans. Anton C. Pegis, Garden City, NY: Doubleday & Company.
- Baker, Timothy B., Megan E. Piper, Danielle E. McCarthy, Matthew R. Majeskie, and Michael C. Fiore. 2004. Addiction motivation reformulated: an affective processing model of negative reinforcement. *Psychological Review* 111, no. 1: 33–51. doi:10.1037/0033-295X.111.1.33.
- Baudelaire, Charles. 1921. Poem of hashish. *Les Paradis artificiels* [originally 1860]. In: *Oeuvres Complètes de Charles Baudelaire*, ed. F.-F. Gautier. Paris: Éditions de la Nouvelle Revue Française.
- Becker, Mary P., Paul F. Collins, and Monica Luciana. 2014. Neurocognition in college-aged daily marijuana users. *Journal of Clinical and Experimental Neuropsychology* 36, no. 4: 379–98. doi:10.1080/13803395.2014.893996.
- Benschop, Annemieke, Nienke Liebrechts, Peggy van der Pol, Rick Schaap, Renate Buisman, Margriet van Laar, Wim van den Brink, Ron de Graaf, and Dirk J. Korf. 2015. Reliability and validity of the marijuana motives measure among young adult frequent cannabis users and associations with cannabis dependence. *Addictive Behaviors* 40, (January): 91–95. doi:10.1016/j.addbeh.2014.09.003.
- Beshay, Morris, Heiko Kaiser, Dagmar Niedhart, Marc A. Reymond, and Ralph

- A. Schmid. 2007. Emphysema and secondary pneumothorax in young adults smoking cannabis. *European Journal of Cardio-Thoracic Surgery* 32, no. 6: 834–38. doi:10.1016/j.ejcts.2007.07.039.
- Bostwick, J. Michael. 2012. Blurred boundaries: the therapeutics and politics of medical marijuana. *Mayo Clinic Proceedings* 87, no. 2: 172–86. doi:10.1016/j.mayocp.2011.10.003.
- Calabria, Bianca, Louisa Degenhardt, Wayne Hall, and Michael Lynskey. 2010. Does cannabis use increase the risk of death? Systematic review of epidemiological evidence on adverse effects of cannabis use. *Drug and Alcohol Review* 29, no. 3: 318–30. doi:10.1111/j.1465-3362.2009.00149.x.
- Cascini, Fidelia, Carola Aiello, and Gianluca Di Tanna. 2012. Increasing delta-9-tetrahydrocannabinol (Δ -9-THC) content in herbal cannabis over time: systematic review and meta-analysis. *Current Drug Abuse Reviews* 5, no. 1: 32–40.
- Cataldo, Peter J. 1995. The principle of the double effect. *Ethics Medics* 20: 1–3.
- Chadwick, Benjamin, Michael L. Miller, and Yasmin L. Hurd. 2013. Cannabis use during adolescent development: susceptibility to psychiatric illness. *Frontiers in Psychiatry* 4: 129. doi:10.3389/fpsyt.2013.00129.
- Chen, K., and D. B. Kandel. 1998. Predictors of cessation of marijuana use: an event history analysis. *Drug and Alcohol Dependence* 50, no. 2: 109–21. PMID: 9649962.
- Collins, Michael A., Edward J. Neafsey, Kenneth J. Mukamal, Mary O. Gray, Dale A. Parks, Dipak K. Das, and Ronald J. Korthuis. 2009. Alcohol in moderation, cardioprotection, and neuroprotection: epidemiological considerations and mechanistic studies. *Alcoholism: Clinical and Experimental Research* 33, no. 2: 206–19. doi:10.1111/j.1530-0277.2008.00828.x.
- Covey, Dan P., Jennifer M. Wenzel, and Joseph F. Cheer. 2014. Cannabinoid modulation of drug reward and the implications of marijuana legalization. *Brain Research* (November). doi:10.1016/j.brainres.2014.11.034.
- Crane, Natania A., Randi Melissa Schuster, Paolo Fusar-Poli, and Raul Gonzalez. 2013. Effects of cannabis on neurocognitive functioning: recent advances, neurodevelopmental influences, and sex differences. *Neuropsychology Review* 23, no. 2: 117–37. doi:10.1007/s11065-012-9222-1.
- Degenhardt, Louisa, Wayne Hall, and Michael Lynskey. 2003. Testing hypotheses about the relationship between cannabis use and psychosis. *Drug and Alcohol Dependence* 71, no. 1: 37–48.
- Degenhardt, Louisa, Harvey Whiteford, and Wayne D. Hall. 2014. The global burden of disease projects: what have we learned about illicit drug use and dependence and their contribution to the global burden of disease? *Drug and Alcohol Review* 33, no. 1: 4–12. doi:10.1111/dar.12088.
- Di Marzo, Vincenzo, and Isabel Matias. 2005. Endocannabinoid control of food intake and energy balance. *Nature Neuroscience* 8, no. 5: 585–89. doi:10.1038/nn1457.
- Duncan, Greg J., Bessie Wilkerson, and Paula England. 2006. Cleaning up their act: the effects of marriage and cohabitation on licit and illicit drug use. *Demography* 43, no. 4: 691–710.
- Fischer, Benedikt, Meghan Dawe, Fraser McGuire, Paul A. Shuper, Rielle Capler, Dan Bilsker, Wayne Jones, Benjamin Taylor, Katherine Rudzinski, and Jürgen Rehm. 2013. Feasibility and impact of brief interventions for frequent cannabis users in Canada. *Journal of Substance Abuse Treatment* 44, no. 1: 132–38. doi:10.1016/j.jsat.2012.03.006.
- Gilman, Jodi M., John K. Kuster, Sang Lee, Myung Joo Lee, Byoung Woo Kim, Nikos Makris, Andre van der Kouwe, Anne J. Blood, and Hans C. Breiter. 2014. Cannabis use is quantitatively associated with nucleus accumbens and amygdala abnormalities in young adult recreational users. *Journal of Neuroscience* 34, no. 16: 5529–38. doi:10.1523/JNEUROSCI.4745-13.2014.
- Green, Bob, David J. Kavanagh, and Ross M. C. D. Young. 2004. Reasons for cannabis use in men with and without psychosis. *Drug and Alcohol Review* 23, no. 4: 445–53. doi:10.1080/09595230412331324563.
- Greydanus, D. E., E. K. Hawver, M. M. Greydanus, and J. Merrick. 2013. Marijuana: current concepts. *Frontiers in Public Health* 1: 42. doi:10.3389/fpubh.2013.00042.

- Hall, Wayne, and Louisa Degenhardt. 2009. Adverse health effects of non-medical cannabis use. *Lancet* 374: 1383–1391.
- Henquet, Cécile, Robin Murray, Don Linszen, and Jim van Os. 2005. The environment and schizophrenia: the role of cannabis use. *Schizophrenia Bulletin* 31, no. 3: 608–12. doi:10.1093/schbul/sbi027.
- Herbst, W. 2003. *Eutrapelia*. *New catholic encyclopedia*. 2nd ed. Washington, DC: Catholic University of America.
- Hibell, Björn, Ulf Guttormsson, Salmé Ahlström, Olga Balakireva, Thoroddur Bjarnason, Anna Kokkevi, Ludwig Kraus. 2009. *ESPAD (The European School Survey Project on Alcohol and Other Drugs) Report 2007. Substance use among students in 35 European countries*. Stockholm: Swedish Council Information Alcohol Other Drugs.
- Hyman, Steven E., Robert C. Malenka, and Eric J. Nestler. 2006. Neural mechanisms of addiction: the role of reward-related learning and memory. *Annual Review of Neuroscience* 29: 565–98. doi:10.1146/annurev.neuro.29.051605.113009.
- Jacobus, J., S. Bava, M. Cohen-Zion, O. Mahmood, and S. F. Tapert. 2009. Functional consequences of marijuana use in adolescents. *Pharmacology, Biochemistry, and Behavior* 92, no. 4: 559–65. doi:10.1016/j.pbb.2009.04.001.
- Jarrett, Bede. 1935. *No abiding city: Lenten conferences given at our lady of victories, 1932*. London: Burns, Oates & Washbourne, Limited.
- John Paul II, Pope. 1991. *Address of the holy father to participants in the VI International Congress organized by the pontifical council for pastoral assistance to health care workers*. Rome: Libreria Editrice Vaticana.
- Jones, Reese T. 2002. Cardiovascular system effects of marijuana. *Journal of Clinical Pharmacology* 42, (11 Suppl.): 58S–63S.
- Justinova, Zuzana, Steven R. Goldberg, Stephen J. Heishman, and Gianluigi Tanda. 2005. Self-administration of cannabinoids by experimental animals and human marijuana smokers. *Pharmacology, Biochemistry, and Behavior* 81, no. 2: 285–99. doi:10.1016/j.pbb.2005.01.026.
- Kalant, H. 2008. Smoked marijuana as medicine: not much future. *Clinical Pharmacology & Therapeutics* 83: 517–519. doi:10.1038/sj.clpt.6100497.
- Kamp, David. 2006. Deconstructing dinner. *New York Times*, April 23. <http://www.nytimes.com/2006/04/23/books/review/23kamp.html?pagewanted=all>.
- Kavanagh, David J., Geoffrey Waghorn, Linda Jenner, David C. Chant, Vaughan Carr, Mandy Evans, Helen Hemnan, Assen Jablensky, and John J. McGrath. 2004. Demographic and clinical correlates of comorbid substance use disorders in psychosis: multivariate analyses from an epidemiological sample. *Schizophrenia Research* 66, no. 2–3: 115–24. doi:10.1016/S0920-9964(03)00130-0
- Klein, Thomas W., Cathy Newton, Kellie Larsen, Lily Lu, Izabella Perkins, Liang Nong, and Herman Friedman. 2003. The cannabinoid system and immune modulation. *Journal of Leukocyte Biology* 74, no. 4: 486–96. doi:10.1189/jlb.0303101.
- Large, Matthew, Swapnil Sharma, Michael T. Compton, Tim Slade, and Olav Nielssen. 2011. Cannabis use and earlier onset of psychosis: a systematic meta-analysis. *Archives of General Psychiatry* 68, no. 6: 555–61. doi:10.1001/archgenpsychiatry.2011.5.
- Lorenzetti, Valentina, Nadia Solowij, Alex Fornito, Dan Ian Lubman, and Murat Yucel. 2014. The association between regular cannabis exposure and alterations of human brain morphology: an updated review of the literature. *Current Pharmaceutical Design* 20, no. 13: 2138–67.
- Mack, Alison, and Janet Joy. 2000. *Marijuana as medicine? The science beyond the controversy*. Washington, DC: National Academy Press. http://www.nap.edu/catalog.php?record_id=9586.
- Mehmedic, Zlatko, Suman Chandra, Desmond Slade, Heather Denham, Susan Foster, Amit S. Patel, Samir A. Ross, Ikhlas A. Khan, and Mahmoud A. ElSohly. 2010. Potency trends of Δ^9 -THC and other cannabinoids in confiscated cannabis preparations from 1993 to 2008*. *Journal of Forensic Sciences* 55, no. 5: 1209–17. doi:10.1111/j.1556-4029.2010.01441.x.
- Moore, Theresa H. M., Stanley Zammit, Anne Lingford-Hughes, Thomas R. E. Barnes, Peter B. Jones, Margaret Burke, and Glyn Lewis. 2007. Cannabis use and risk of psychotic or affective mental health

- outcomes: a systematic review. *Lancet* 370, no. 9584: 319–28. doi:10.1016/S0140-6736(07)61162-3.
- National Institute on Drug Abuse. 2012. *Research report: marijuana abuse*. Washington, DC: National Institutes of Health. <http://www.drugabuse.gov/publications/research-reports/marijuana>.
- O'Connell, Thomas J., and Ché B. Bou-Matar. 2007. Long term marijuana users seeking medical cannabis in California (2001–2007): demographics, social characteristics, patterns of cannabis and other drug use of 4117 applicants. *Harm Reduction Journal* 4: 16. doi:10.1186/1477-7517-4-16.
- Os, J. van, M. Bak, M. Hanssen, R. V. Bijl, R. de Graaf, and H. Verdoux. 2002. Cannabis use and psychosis: a longitudinal population-based study. *American Journal of Epidemiology* 156, no. 4: 319–27. doi:10.1093/aje/kwf043.
- Panagis, George, Brian Mackey, and Styliani Vlachou. 2014. Cannabinoid regulation of brain reward processing with an emphasis on the role of CB1 receptors: a step back into the future. *Frontiers in Psychiatry* 5 (July): 1–20. doi:10.3389/fpsy.2014.00092.
- Pittig, Andre, Matthias Brand, Mirko Pawlikowski, and Georg W. Alpers. 2014. The cost of fear: avoidant decision making in a spider gambling task. *Journal of Anxiety Disorders* 28, no. 3: 326–34. doi:10.1016/j.janxdis.2014.03.001.
- Pollan, Michael. 2002. Avenali lecture: cannabis, forgetting, and the botany of desire. Occasional Papers of the Doreen B. Townsend Center for the Humanities, no. 27. Berkeley: Doreen B. Townsend Center for Humanities.
- Pontifical Council for the Family (PFC). 1992. From despair to hope: family and drug addiction. *Origins* 22, no. 12: 206–13.
- Pontifical Council for the Family (PFC). 1997. Should 'Soft' Drugs Be Legalized? *L'Osservatore Romano*, Weekly English Edition, February 19. <https://www.ewtn.com/library/CURIA/PCFDRUGS.HTM>.
- Pontifical Council for Health Care Ministry (PCHCM). 2001. *Church: drugs and drug addiction*. Vatican: Libreria Editrice Vaticana, no. 43.
- Prümmer, Dominicus M. 1958. *Manuale Theologiae Moralis*, vol. 2. Rome: Herder.
- Pulido, José, Gregorio Barrio, Pablo Lardelli, María J. Bravo, M. Teresa Brugal, Albert Espelt, Luis de la Fuente, Mireia Ambrós, M. José Belza, Yolanda Castellano, Antonia Domingo-Salvany, , Fermín Fernández, Gemma Molist, Albert Sánchez-Niubó, Sara Santos, Luis Sordo, Fernando Vallejo, The Itinere Project Group. 2011. Cannabis use and traffic injuries. *Epidemiology* (Cambridge, MA) 22 (4): 609–10. doi:10.1097/EDE.0b013e31821db0c2.
- Ratzinger, Joseph. 2010. *A turning point for Europe?: the church in the modern world: assessment and forecast*. San Francisco: Ignatius Press.
- Reinarman, Craig, Helen Nunberg, Fran Lanthier, and Tom Heddleston. 2011. Who are medical marijuana patients? Population characteristics from nine California assessment clinics. *Journal of Psychoactive Drugs* 43, no. 2: 128–35. doi:10.1080/02791072.2011.587700.
- Rocchetti, Matteo, Alessandra Crescini, Stefan Borgwardt, Edgardo Caverzasi, Pierluigi Politi, Zerrin Atakan, and Paolo Fusar-Poli. 2013. Is cannabis neurotoxic for the healthy brain? A meta-analytical review of structural brain alterations in non-psychotic users. *Psychiatry and Clinical Neurosciences* 67, no. 7: 483–92. doi:10.1111/pcn.12085.
- Ruiz-Veguilla, Miguel, María Luisa Barrigón, Laureano Hernández, José Luis Rubio, Manuel Gurpegui, Fernando Sarraeua, Jorge Cervilla, Blanca Gutiérrez, Anthony James, and Maite Ferrin. 2013. Dose-response effect between cannabis use and psychosis liability in a non-clinical population: evidence from a snowball sample. *Journal of Psychiatric Research* 47, no. 8: 1036–43. doi:10.1016/j.jpsychires.2013.03.003.
- Russo, Manuela, Stephen Z. Levine, Arsime Demjaha, Marta Di Forti, Stefania Bonaccorso, Paul Fearon, Paola Dazzan, Carmine M. Pariante, Anthony S. David, Craig Morgan, Robin M. Murray and Abraham Reichenberg. 2014. Association between symptom dimensions and categorical diagnoses of psychosis: a cross-sectional and longitudinal investigation. *Schizophrenia Bulletin* 40, no. 1: 111–19. doi:10.1093/schbul/sbt055.

- Schofield, David, Chris Tennant, Louise Nash, Louisa Degenhardt, Alison Cornish, Coletta Hobbs, and Gail Brennan. 2006. Reasons for cannabis use in psychosis. *Australian and New Zealand Journal of Psychiatry* 40, no. 6–7: 570–74. doi:10.1111/j.1440-1614.2006.01840.x.
- Schweinsburg, Alecia D., Sandra A. Brown, and Susan F. Tapert. 2008. The influence of marijuana use on neurocognitive functioning in adolescents. *Current Drug Abuse Reviews* 1, no. 1: 99–111.
- Sgreccia, Elio. 2012. *Personalist bioethics*. trans. John A Di Camillo and Michael J. Miller. Philadelphia: The National Catholic Bioethics Center.
- Shehnaz, Syed Ilyas, Anoop Kumar Agarwal, and Nelofer Khan. 2014. A systematic review of self-medication practices among adolescents. *Journal of Adolescent Health* 55, no. 4: 467–83. doi:10.1016/j.jadohealth.2014.07.001.
- Shi, Yuyan. 2014. At high risk and want to quit: marijuana use among adults with depression or serious psychological distress. *Addictive Behaviors* 39, no. 4: 761–67. doi:10.1016/j.addbeh.2013.12.013.
- Simons, Jeffrey, Christopher J. Correia, Kate B. Carey, and Brian E. Borsari. 1998. Validating a five-factor marijuana motives measure: relations with use, problems, and alcohol motives. *Journal of Counseling Psychology* 45, no. 3: 265–73. doi:10.1037/0022-0167.45.3.265.
- Stevens, Francis L. 2014. Affect regulation styles in avoidant and anxious attachment. *Individual Differences Research* 12, no. 3: 123–130.
- Stokes, Paul R. A., Alice Egerton, Ben Watson, Alistair Reid, Gerome Breen, Anne Lingford-Hughes, David J. Nutt, and Mitul A. Mehta. 2010. Significant decreases in frontal and temporal [11C]-raclopride binding after THC challenge. *NeuroImage* 52, no. 4: 1521–27. doi:10.1016/j.neuroimage.2010.04.274.
- Svrakic, Dragan M., Patrick J. Lustman, Ashok Mallya, Taylor Andrea Lynn, Rhonda Finney, and Neda M. Svrakic. 2012. Legalization, decriminalization & medicinal use of cannabis: a scientific and public health perspective. *Missouri Medicine* 109, no. 2: 90–98.
- Swift, Wendy, Alex Wong, Kong M. Li, Jonathon C. Arnold, and Iain S. McGregor. 2013. Analysis of cannabis seizures in NSW, Australia: cannabis potency and cannabinoid profile. *PLoS One* 8, no. 7: e70052. doi:10.1371/journal.pone.0070052.
- Sznitman, Sharon R., and Yuval Zolotov. 2015. Cannabis for therapeutic purposes and public health and safety: a systematic and critical review. *International Journal on Drug Policy* 26, no. 1: 20–29. doi:10.1016/j.drugpo.2014.09.005.
- Tait, Robert J., Andrew Mackinnon, and Helen Christensen. 2011. Cannabis use and cognitive function: 8-year trajectory in a young adult cohort. *Addiction* (Abingdon, England) 106, no. 12: 2195–2203. doi:10.1111/j.1360-0443.2011.03574.x.
- Tanasescu, Radu, and Cris S. Constantinescu. 2010. Cannabinoids and the immune system: an overview. *Immunobiology* 215, no. 8: 588–97. doi:10.1016/j.imbio.2009.12.005.
- Tashkin, D. P. 2001. Airway effects of marijuana, cocaine, and other inhaled illicit agents. *Current Opinion in Pulmonary Medicine* 7, no. 2: 43–61.
- Thomas, Grace, Robert A. Kloner, and Shereif Rezkalla. 2014. Adverse cardiovascular, cerebrovascular, and peripheral vascular effects of marijuana inhalation: what cardiologists need to know. *American Journal of Cardiology* 113, no. 1: 187–90. doi:10.1016/j.amjcard.2013.09.042.
- Van Winkel, Ruud, and Rebecca Kuepper. 2014. Epidemiological, neurobiological, and genetic clues to the mechanisms linking cannabis use to risk for nonaffective psychosis. *Annual Review of Clinical Psychology* 10: 767–91. doi:10.1146/annurev-clinpsy-032813-153631.
- Wadsworth, E. J. K., S. C. Moss, S. A. Simpson, and A. P. Smith. 2006a. A community based investigation of the association between cannabis use, injuries and accidents. *Journal of Psychopharmacology* 20, no. 1: 5–13. doi:10.1177/0269881105056642.
- Wadsworth, E. J. K., S. C. Moss, S. A. Simpson, and A. P. Smith. 2006b. Cannabis use, cognitive performance and mood in a sample of workers. *Journal of*

- Psychopharmacology* 20, no. 1: 14–23. doi:10.1177/0269881105056644.
- Wang, George S., Genie Roosevelt, Marie-Claire Le Lait, Erin M. Martinez, Becki Bucher-Bartelson, Alvin C. Bronstein, and Kennon Heard. 2014. Association of unintentional pediatric exposures with decriminalization of marijuana in the United States. *Annals of Emergency Medicine* 63, no. 6: 684–89. doi:10.1016/j.annemergmed.2014.01.017.
- Ware, M. A., H. Adams, and G. W. Guy. 2005. The medicinal use of cannabis in the UK: results of a nationwide survey. *International Journal of Clinical Practice* 59, no. 3: 291–95. doi:10.1111/j.1742-1241.2004.00271.x.
- Wenger, Tibor, Gabriella Moldrich, and Susanna Furst. 2003. Neuromorphological background of cannabis addiction. *Brain Research Bulletin* 61, 2: 125–28. doi:10.1016/S0361-9230(03)00081-9.
- Zammit, Stanley, Peter Allebeck, Sven Andreasson, Ingvar Lundberg, and Glyn Lewis. 2002. Self reported cannabis use as a risk factor for schizophrenia in Swedish conscripts of 1969: historical cohort study. *BMJ* 325, no. 7374: 1199. doi:10.1136/bmj.325.7374.1199.