

Effects of Marijuana Use on Impulsivity and Hostility in Daily Life

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Opinion

Marijuana remains the most commonly used illicit drug [1], and its use continues to grow, especially among its top users, young adults. Changes in legal status, awareness of low associated risks, and availability of marijuana in social situations are associated with increased usage of recreational marijuana [2]. One in five young adults has used marijuana in the past month, and more than one-third of young adults have used marijuana in the past year. The adverse effects of chronic marijuana use are increasingly well documented, but there are also many young adults who use marijuana at the subliminal level. The use of recreational marijuana, one or more uses of marijuana without associated use disorders [3], is becoming more common. Further understanding of whether increased exposure to recreational marijuana increases the risk of adverse psychological and behavioral effects is a necessary tool for research. There is increasing evidence that the use of marijuana has a lasting effect on the cognitive and regulatory networks of the brain. These effects may increase a person's susceptibility to the acute effects of marijuana on impulsivity and broader neurocognition. Users of recreational marijuana report increased impulsive characteristics, impulsive behavior, and deficiencies in inhibitory control compared to non-drug users, but are similar to drinking. These results suggest that impulsive dysregulation is also observed in recreational users. There is also evidence from experimental methods that marijuana affects impulsivity immediately after administration. This includes reduced suppression control and measurable changes in risky behavior compared to placebo [4]. However, it is unclear whether the use of recreational marijuana in daily life will bring about similar changes in individual impulse regulation. The use of marijuana is also associated with adverse effects on interpersonal relationships. Laboratory studies have shown that individuals under the influence of marijuana have systematically changed their interpersonal behavior and experience, including withdrawal of interpersonal relationships, hostility, and diminished interpersonal skills. Despite subjective reports of increased sensation and perception, individuals exposed to acute THC showed an objective decrease in the number of interpersonal interactions involved and the expression of empathic communication. This suggests that the use of marijuana has a significant impact on interpersonal behavior that users are unaware of. Further research identified social and emotional deficiencies in marijuana users and increased hostility or aggression. Chronic marijuana users show inactivation of the anterior cingulate cortex (ACC) and amygdala in response to an unconscious presentation of emotional face, but normal control shows increased activation [5]. This can manifest itself in inappropriate interpersonal reactions and altered perceptions of others' interpersonal behavior, as ACC is involved in monitoring errors and modifying / suppressing behavior in response to changing circumstances and environments. However, it is unclear whether each use of marijuana causes these effects on interpersonal behavior and social emotional processing, and whether these changes in interpersonal behavior (such as hostility) can be observed throughout daily life.

Research to date has primarily used experimentally controlled laboratory methods to examine associations between marijuana use and impulse control and interpersonal behavior; although valuable, this approach limits generalizability of the findings (e.g., to day to day

experiences of individuals in natural contexts). Ecological Momentary Assessment (EMA) is a validated and reliable method to uniquely capture substance use –as well as important social, contextual, and behavioral information in daily life via real world data collection. Frequently implemented via smartphone technology, EMA offers several advantages in examining complex directional relationships by assessing variations in experiences, environmental exposures, and psychological states within and outside the context of drug or alcohol use. These methods improve upon traditional timeline follow back approaches by capturing intra individual variability in behaviors and experiences over time, while having minimal impact on behavior. EMA has been used to monitor alcohol and drug use in community adult and adolescent samples and has been widely used in studies to understand effects of alcohol and drug use, drug craving and relapse outcomes. Despite increasing marijuana use, few studies have investigated the actual impact of recreational marijuana use on everyday experience. Some studies have used the diary method to examine psychological status as a predictor of marijuana use in normal users. Regular marijuana user surveys have shown that retroactive reporting of frequency of use is extremely unreliable in predicting momentary use [6]. These results demonstrate the usefulness and validity of assessing marijuana use using the EMA method. However, less work has been done on this methodology to investigate the potential behavioral and psychological effects of marijuana use on the actual outcomes of recreational marijuana users.

Conclusion

Marijuana use is associated with changes in impulse control and hostility in daily life. This may be one route by which deleterious effects of marijuana are observed for mental health and psychosocial functioning. Given the increasing prevalence of recreational marijuana use and the potential legalization in some states, further research on the potential consequences of marijuana use in young adults' day-to-day life is warranted.

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