

Press Release

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SAFE Glen Cove Coalition: Cannabis and the Mind

According to three recent studies published in The Journal of Psychopharmacology, Neuropsychopharmacology, and the International Journal of Neuropsychopharmacology, Cannabis can influence a number of cognitive and psychological processes.

The United Nations Office on Drugs and Crime reported that, in 2018, approximately 192 million people worldwide aged between 15 and 64 used cannabis recreationally. Young adults in particular, with 35% of people between the ages of 18 and 25 using it, while only 10% of people over the age of 26 do. This data indicates that the main users are adolescents and young adults, whose brains are still in development. They may therefore be particularly vulnerable to the effects of cannabis use on the brain in the longer term.

Tetrahydrocannabinol (THC) is the main psychoactive compound in cannabis. It acts on the brain's "endocannabinoid system", which are receptors which respond to the chemical components of cannabis. The cannabis receptors are densely populated in prefrontal and limbic areas in the brain, which are involved in reward and motivation. They regulate signaling of the brain chemicals dopamine, gamma-aminobutyric acid (GABA) and glutamate.

Cannabis use can affect cognition, especially in those with cannabis-use disorder. This is characterized by the persistent desire to use the drug and disruption to daily activities, such as work or education. It has been estimated that approximately 10% of cannabis users meet the diagnostic criteria for this disorder. Researchers tested the cognition of 39 people with the disorder (asked to be clean on the day of testing), and compared it with that of 20 people who never or rarely used cannabis. Participants with cannabis use disorder had significantly worse performance on memory tests from the Cambridge Neuropsychological Test Automated Battery (CANTAB) compared to the controls, who had either never or very rarely used cannabis. It also negatively affected their executive functions which are mental processes including flexible thinking.

This effect seemed to be linked to the age at which people started taking the drug – the younger they were, the more impaired their executive functioning was. Cognitive impairments have been noted in mild cannabis users as well. Such users tend to make riskier decisions than others and have more

problems with planning. Although most studies have been conducted in males, there has been evidence of sex differences in the effects of cannabis use on cognition. Researchers showed that, while male cannabis users had poorer memory for visually recognizing things, female users had more problems with attention and executive functions. These sex effects persisted when controlling for age; IQ; alcohol and nicotine use; mood and anxiety symptoms; emotional stability; and impulsive behavior.

Cannabis use can also affect how a person feels thereby further influencing their thinking. For example, some previous research has suggested that reward and motivation – along with the brain circuits involved in these processes – can be disrupted when we use cannabis. This may affect performance at school or work as it can make us feel less motivated to work hard, and less rewarded when we do well.

Using a brain imaging task whereby participants were placed in a scanner and viewed orange or blue squares. The orange squares would lead to a monetary reward, after a delay, if the participant made a response. This set up helped us investigate how the brain responds to rewards. Findings showed that the effects on the reward system in the brain were subtle, with no direct effects of cannabis in the ventral striatum. However, the participants were moderate cannabis users. The effects may be more pronounced in cannabis users with more severe and chronic use, as seen in cannabis use disorder. There is also evidence that cannabis can lead to mental health problems such as anhedonia – an inability to feel pleasure – in adolescents. Interestingly, this effect was particularly pronounced during the COVID-19 pandemic lockdowns.

Cognitive and psychological effects of cannabis use are ultimately likely to depend to some extent on dosage (frequency, duration and strength), sex, genetic vulnerabilities and age of onset. But we need to determine whether these effects are temporary or permanent. One article summarizing many studies has suggested that with mild cannabis use, the effects may weaken after periods of abstinence. Regardless, researchers maintain it is clearly worth considering the effects that prolonged cannabis use can have on the mind – particularly for young people whose brains are still developing.

The SAFE Glen Cove Coalition is concerned about marijuana use and its consequences on the health and development of youth. To learn more about the SAFE Glen Cove Coalition please follow us on www.facebook.com/safeglencovecoalition or visit SAFE's website to learn more about marijuana use at www.safeglencove.org.