

## Effects of Cannabis and Cocaine on Driving Related Tasks of Perception, Cognition, and Action

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**Abstract :** Objective: Cannabis and cocaine are associated with a range of mental and physical effects that can impair aspects of human behavior. Driving is a complex cognitive behavior that is an essential part of everyday life and can be broken down into many subcomponents, each of which can uniquely impact road safety. With the growing movement of jurisdictions to legalize cannabis, there is an increased focus on impairment and driving. The purpose of this study was to identify driving-related cognitive-performance deficits that are impacted by recreational drug use. Design and Methods: With the assistance of law enforcement agencies, we recruited over 300 participants under the influence of various drugs including cannabis and cocaine. These individuals performed a battery of computer-based tasks scientifically proven to be related to on-road driving performance and designed to test response-speed, memory processes, perceptual-motor skills, and decision making. Data from a control group with healthy non-drug using adults was collected as well. Results: Compared to controls, the drug group showed deficits in all tasks. The data also showed clear differences between the cannabis and cocaine groups where cannabis users were faster, and performed better on some aspects of the decision-making and perceptual-motor tasks. Memory performance was better in the cocaine group for simple tasks but not more complex tasks. Finally, the participants who consumed both drugs performed most similarly to the cannabis group. Conclusions: Our results show distinct and combined effects of cannabis and cocaine on human performance relating to driving. These differential effects are likely related to the unique effects of each drug on the human brain and how they distinctly contribute to mental states. Our results have important implications for road safety associated with driver impairment.

**Keywords :** driving, cognitive impairment, recreational drug use, cannabis and cocaine

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