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Original article

An examination of the relationships between cannabis use, driving under the influence of cannabis and risk-taking on the road



Étude des relations entre l'usage de cannabis, la conduite sous l'effet du cannabis et la prise de risque sur la route

J. Bergeron^{a,*}, J. Langlois^a, H.S. Cheang^b

^a Université de Montréal, C.P. 6128, succursale Centre-ville, Montréal (Qc), Canada, H3C 3J7

^b Centre for Research on Brain, Language, and Music - McGill University, 3640, rue de la Montagne, Montréal (QC), Canada, H3G 2A8

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ABSTRACT

Introduction. – Some studies have suggested that regular cannabis users appear to exhibit a general reckless driving style that may contribute to an inflated estimate of collisions related to driving under the influence of cannabis (DUIC) among this group.

Objective. – This study investigated whether patterns of cannabis use would predict levels of self-reported unsafe driving behaviours and levels of performance observed in a driving simulator.

Method. – The study investigated 48 young cannabis users with respect to frequency of cannabis consumption, alcohol use, driving exposure, self-reported dangerous driving habits, impulsivity, sensation seeking and performance in a driving simulator.

Results. – Cannabis use was positively associated with DUIC, with sensation seeking and with self-reports of risky driving. An ANOVA confirmed a significant effect of levels of consumption of cannabis among participants on self-report risk-taking in driving. Moreover, the observed behaviours during the simulation tasks correlated with risky driving habits, and with the self-reported frequency of driving in the hour following smoking cannabis or immediately after drinking alcohol.

Conclusion. – Since cannabis usage and DUIC appear to be related to an overall reckless style of driving, it is proposed that public safety policies should be more holistic, simultaneously targeting multiple on-road dangerous behaviours for intervention.

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RÉSUMÉ

Selon certaines études, les personnes consommant régulièrement du cannabis adopteraient des comportements de conduite dangereux pouvant contribuer à une surestimation des collisions attribuées à la conduite sous l'effet du cannabis. La présente étude a pour but de vérifier si la fréquence de consommation de cannabis peut prédire des niveaux auto-rapportés de conduite risquée ainsi que les performances dans un simulateur de conduite. L'étude a fait appel à 48 jeunes consommateurs de cannabis pour évaluer la fréquence de la consommation de cannabis et d'alcool, l'expérience de conduite, les comportements à risque sur la route et sur simulateur, de même que l'impulsivité et la recherche de sensations. Les résultats indiquent que la fréquence d'usage de cannabis est associée à la conduite sous influence du cannabis, à la recherche de sensations et aux comportements avoués de prise de risque sur la route. Une analyse de variance a confirmé un effet significatif des niveaux de consommation de cannabis sur la prise de risque au volant. De plus, les comportements observés pendant les tâches de conduite sur simulateur étaient corrélés avec les habitudes risquées sur la route, et avec la fréquence de conduite dans l'heure suivant la consommation de cannabis ou d'alcool.

* Corresponding author.

E-mail addresses: jacques.bergeron@umontreal.ca (J. Bergeron), julie.langlois@umontreal.ca (J. Langlois), cheang.henry@gmail.com (H.S. Cheang).

Comme la consommation de cannabis et la conduite après usage de cannabis apparaissent reliées à un style dangereux de conduite, les politiques publiques d'intervention devraient porter simultanément sur un large éventail de comportements à risque.

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1. Introduction

Much of the early research assessing the effects of cannabis (marijuana) on driving performance was done in experimental settings in measuring basic cognition and psychomotor functions (Asbridge, Hayden, & Cartwright, 2012). The results of these studies are generally consistent: at increased doses, cannabis impairs a variety of skills involved in the driving task (Bates & Blakely, 1999; Berghaus, Scheer, & Schmist, 1995). Delta9 tetrahydrocannabinol (THC), the active metabolite of cannabis, induces dose-related decrements in short-term memory, divided attention and vigilance, reaction time, tracking, and coordination (Kurtzthaler et al., 1999; Moskowitz, 1985). As noted by Lenné et al. (2010) and by Richer and Bergeron (2009), more ecologically valid research using driving simulators, in closed and open driving circuits, indicated that moderate and high concentrations of THC also decrease the ability to maintain stable driving as measured by increases in speed and lateral position variability and by headway variability.

Most studies looking specifically at the risk of collision associated with driving under the influence of cannabis (DUIC) have found an increase (Blows, Ivers et al., 2005; Drummer et al., 2004; Laumon, Gadegbeku, Martin, & Biecheler, 2005); others have found that cannabis use does not appear to be associated with an increase in collision risk (Bates & Blakely, 1999; Smiley, 1999). A population survey of a representative sample of adult drivers (Mann et al., 2007) revealed that the odds of reporting collision involvement was significantly higher among cannabis users, and among those who reported driving after cannabis use. More recently, a systematic review of observational studies and meta-analysis of studies examining acute cannabis consumption and motor vehicle collisions (Asbridge et al., 2012) found a near doubling of risk of a driver being involved in a collision resulting in serious injury or death, while the influence of cannabis use on minor collisions remained unclear.

A further point to consider is that, while cannabis use is very likely to impair driving ability and to increase the risk of being involved in an accident, there is as yet no overwhelming evidence that cannabis use in isolation contributes more to motor collisions than other characteristics inherent to cannabis users. As noted in a growing body of literature, individuals driving under the influence of cannabis seem to exhibit a general reckless driving style putting them at higher risk to be involved in traffic crashes (Bédard, Dubois, & Weaver, 2007; Fergusson, Horwood, & Boden, 2008; Kilmer, Hunt, Lee, & Neighbors, 2007; Lopez-Quintero & Neumark, 2010). In a recent study, Richer and Bergeron (2009) compared DUIC drivers and non-DUIC drivers with respect to self-reported dangerous driving habits, behaviours observed in a driving simulator, psychological predictors and crash involvement. Results indicated that sensation seeking and impulsivity are independent psychological predictors of DUIC and suggest that DUIC is associated with self-reported and observed risky driving. This study confirms that self-reported cannabis use is associated with a risky driving style (Fergusson et al., 2008), including a broad range of dangerous on-road behaviours, and is consistent with the problem driving behaviour theory about a general risk-taking propensity (Jessor, Donovan, & Costa, 1991; Jonah, 1990). It seems important to control for dangerous driving habits when assessing the association between DUIC and collision involvement. A general dangerous driving style could contribute to an over-estimation of DUIC-related collisions among DUIC drivers.

1.1. DUIC and the trivialization of cannabis use

Over a span of 20 years, rates of cannabis use have actually doubled in the very countries in which driving under the influence of alcohol (DUIA) and other risky driving behaviours have been reduced (World Drug Report, 2011). Despite being regulated in many jurisdictions, cannabis is the most frequently consumed illegal drug worldwide, and its use appears to be an increasingly common phenomenon (Asbridge et al., 2012; Young, 2011). Results from the 2009 Canadian Alcohol and Drug Use Survey have indicated that 11.4% of Canadians overall and 33% of those aged 15–24 years used cannabis at least once in the previous year. Extrapolating from surveys, more than 70% of individuals between 18–25 years of age have consumed cannabis at least once in their lives, while up to 30% of these same individuals will have used cannabis within the 12 previous months (Health Canada, 2009). At the same time, cannabis is second only to alcohol among psychoactive substances found in the bodily fluids of drivers involved in collisions (Beasley, Beirness, & Porath-Waller, 2011). Further deconstruction of these figures reveals that cannabinoids can be detected in the bodily fluids of 1.4 to 27.5% of all drivers killed in driving accidents and in 5 to 15.7% of all drivers who have been injured in crashes (Beirness & Porath-Waller, 2009). Studies of American, European, and Australian drivers have yielded comparable figures (Drummer et al., 2004; Laumon et al., 2005; Lenné et al., 2010). Converging with these historical findings are self-reported rises in driving after using cannabis. Although the total number of drivers who engage in DUIC is relatively low, DUIC is disproportionately prevalent among young drivers. Nearly a quarter (23%) of drivers between 18 and 19 years of age report having DUIC in the 12 months preceding their participation in surveys (Walsh & Mann, 1999). Even more striking is the finding of DUIC occurring among high school students (Asbridge, Poulin, & Donato, 2005). In fact, DUIC occurs more frequently than DUIA in young people; Beirness and Porath-Waller (2009) found that 19.7% of their respondents, nearly all of whom were male teenagers, reported using cannabis immediately prior to driving in the preceding year.

Young cannabis users may have an unrealistically positive view of the drug. A study undertaken in France in which 200 young adults were polled on their consumption habits revealed that while a number of these users acknowledged possible negative or unpleasant effects of marijuana use, the negative associations were tied only to health or scholastic achievement. Not a single participant drew links between marijuana use and elevated risk of road accidents (Chabrol, Roura, & Kallmeyer, 2004). Additionally, 56% of this sample of young adults had an overall positive opinion of cannabis (exemplified by the following statements: “marijuana is good, and more and more young people are smoking it”, “cannabis is natural; it's good for the body”, and “we must legalise hashish”, among other such sentiments). Only 25% of the sample had a negative opinion (a quote that typifies the attitude of this subgroup includes, “I think it's just plain idiotic to smoke marijuana”). Finally, 19% of the sample had a more reserved view (claiming that marijuana “should not be abused, but smoking a single joint never killed anyone”). Comparable findings have been observed in studies with adolescents and young adults showing that, as might be expected, positive intentions to use cannabis were more prevalent among people with a low risk perception of cannabis than among those with a high risk perception (Kilmer et al., 2007; Lopez-Quintero &

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