



Canadian drivers' attitudes regarding preventative responses to driving while impaired by alcohol



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ABSTRACT

Background: In many jurisdictions, a risk assessment following a first driving while impaired (DWI) offence is used to guide administrative decision making regarding driver relicensing. Decision error in this process has important consequences for public security on one hand, and the social and economic well being of drivers on the other. Decision theory posits that consideration of the costs and benefits of decision error is needed, and in the public health context, this should include community attitudes. The objective of the present study was to clarify whether Canadians prefer decision error that: i) better protects the public (i.e., false positives); or ii) better protects the offender (i.e., false negatives).

Methods: A random sample of male and female adult drivers (N = 1213) from the five most populated regions of Canada was surveyed on drivers' preference for a protection of the public approach versus a protection of DWI drivers approach in resolving assessment decision error, and the relative value (i.e., value ratio) they imparted to both approaches. The role of region, sex and age on drivers' value ratio were also appraised.

Results: Seventy percent of Canadian drivers preferred a protection of the public from DWI approach, with the overall relative ratio given to this preference, compared to the alternative protection of the driver approach, being 3:1. Females expressed a significantly higher value ratio (M = 3.4, SD = 3.5) than males (M = 3.0, SD = 3.4), $p < 0.05$. Regression analysis showed that both days of alcohol use in the past 30 days (CI for B: -0.07, -0.02) and frequency of driving over legal BAC limits in the past year (CI for B = -0.19, -0.01) were significantly but modestly related to lower value ratios, $R^2(\text{adj.}) = 0.014$, $p < 0.001$. Regional differences were also detected.

Conclusions: Canadian drivers strongly favour a protection of the public approach to dealing with uncertainty in assessment, even at the risk of false positives. Accounting for community attitudes concerning DWI prevention and the individual differences that influence them could contribute to more informed, coherent and effective regional policies and prevention program development.

1. Introduction

Road traffic crashes represent the 8th leading cause of disability-adjusted-life years lost globally (World Health Organization, 2013). In Canada, 35.4% of drivers who died in a fatal collision tested positive for alcohol in 2012 (Vanlaar et al., 2016). While fatalities involving a drinking driver have declined over time in many jurisdictions, they remain high. Hence, an arrest and conviction for DWI represents a strategic prevention opportunity (Fell et al., 2016). As some individuals

are more at risk for recidivism than others, in addition to minimum mandatory criminal code sanctions and sentences, Canadian provinces and US states also impose administrative countermeasures on drivers as a requisite for re-licensing. Their intensity and modality are frequently informed by an initial individual risk assessment (Ogborne et al., 2004; Rauch et al., 2010).

At the same time, accurate prediction of DWI recidivism is complex. This behaviour is the result of multifaceted interactions between psychological and neurobiological factors involved in individual risk

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taking propensity (e.g., alcohol misuse, personality and cognitive characteristics) as well as contextual and sociological factors (e.g., per se limits, enforcement practices, driving exposure, social norms) (Brown et al., 2013; Dugosh et al., 2013a, 2013b). A lack of risk assessment tools specifically validated for this offender population further complicates prediction of recidivism. Additionally, task demands inherent in the relicensing assessment process can motivate offenders to dissimulate in reporting their risky behaviour (Cavaiola et al., 2003; Dill and Wells-Parker, 2006). The pragmatic meaning of the interaction of these factors is that assessment of individual risk level is an imperfect science, which invariably leads to decision error in the orchestration of intervention strategies (Anderson et al., 2000; C'De Baca et al., 2001; Chang et al., 2002; Dill and Wells-Parker, 2006).

While the base rate for recidivism in first-time offenders may vary between jurisdictions, some estimates place it at approximately 25% (Voas and DeYoung, 2002). From efficiency and statistical standpoints, a recidivism prevention strategy would be justified to consider all offenders at low risk of recidivism and therefore in need of uniform minimal preventative measures (e.g., fines, short-term license suspensions and installation of alcohol ignition interlock, participation in brief DWI information courses). This strategy would reflect a reasonable overall 75% accuracy rate in responding to the threat of DWI recidivism. Nevertheless, by this approach's lack of sensitivity and high rate of false negatives, no high-risk offenders would be identified to receive the modalities and intensity of countermeasures shown to reduce DWI recidivism risk (Elder et al., 2011; Roth et al., 2007; Voas and DeYoung, 2002) (e.g., longer-term interlock installation, substance abuse counselling).

From a public security standpoint, signalling all offenders as high risk could also be justified. This would guarantee that all high-risk offenders receive the intensity of countermeasures shown to reduce DWI recidivism risk. This prevention approach, by its low specificity, would also result in a high rate of false positives (i.e., $\approx 75\%$) with consequences that, in aggregate, may outweigh the real benefits for public safety (Bogen, 1990). Specifically, a majority of DWI offenders seeking relicensing would be exposed to unwarranted penalties and costs (e.g., cost of interlock installation and maintenance), and possible stigma and desensitisation to interventions that could be required in future (C De Baca et al., 2001; C'De Baca et al., 2001). Greater stress would also be placed on already overburdened administrative DWI re-licensing systems (Robertson et al., 2009).

Alternatively, a program that attempts to match preventative countermeasures to individual offenders' recidivism risk is posited to be more adapted, efficient and just (Beirness et al., 1997; Brown et al., 2013). This requires an assessment protocol that sets an "optimal" balance between the antipodes of sensitivity and specificity. In the context of uncertainty in the accuracy of assessment, however, decision theory posits that setting this balance requires explicit consideration of both the costs and benefits of decision error, and the attitudes and preferences of a given community (Leshowitz and Meyers, 1996). Lowering the threshold for designating DWI offenders as high risk for the benefit of greater protection of the public reflects a community's greater tolerance for application of unwarranted and burdensome countermeasures from more frequent false positives. Conversely, raising the threshold for designating DWI offenders for the benefit of some DWI drivers avoiding onerous countermeasures reflects a community's greater tolerance for the consequences for public security of more frequent false negatives. Incoherence between the thresholds set and drivers' perceptions concerning the judiciousness of re-licensing programs may influence compliance to them (Brown et al., 2008; Lapham and England-Kennedy, 2011) and their effectiveness in deterring DWI (Voas et al., 2010). Hence, optimal balance must reflect to some degree drivers' attitudes with respect to the costs and benefits of decision error (Miller et al., 2015), yet these attitudes are seldom made explicit.

The objective of the present study was to clarify, in the context of

uncertainty, whether Canadian drivers prefer erring on the side of false positives in DWI risk assessments (to better protect the public) or false negatives in assessments (to better protect the offender). As such, the present study extends previous examination of the attitudes held by DWI offenders concerning a similar question (Nadeau et al., 2016). Sex, age, and substance use have all been implicated in the perception, tolerance and engagement in risk taking (Fergusson and Horwood, 2001; Fergusson and Lynskey, 1996; Jones and Holmgren, 2009; Rhodes and Pivik, 2011; Steinberg et al., 2008). Hence, the influence of these factors on drivers' preferences and attitudes in this regard was also explored. Finally, regional differences in the attitudes to DWI across Canada have been posited (Solecki and Scrim, 2015), but little relevant data are available. Accordingly, Canadian drivers from five different major population regions were sampled randomly.

2. Methods

2.1. Recruitment

The Douglas Mental Health University Institutes Research Ethics Board approved all methods and materials for obtaining informed consent and conducting the survey (certificate #11/45). Nielsen Opinion Quest Inc., a public opinion survey research firm, carried out the random sampling and conducted the survey. A Canadian driver panel was recruited via mixed mode recruitment, including random web intercept and telephone Random Digit Dialing. A propensity score weighting technique was used to create representative general population frames from which to sample (see also: <http://www.opinionsearch.com/en/online-research/esomar-26>). Panel members were rewarded for their participation with either points, which can be exchanged for merchandise/gift cards/magazine subscriptions, or air miles, both with a value of approximately \$10.00 CDN. Previous studies by members of our research group have used and validated this recruitment approach and the representativeness of the resulting samples (Vanlaar et al., 2012; Vanlaar et al., 2008a; 2008b, 2008c; Robertson and Vanlaar 2008; Robertson et al., 2017).

2.2. Sample

Adult male and female Canadians who had driven in the past 30 days and held a valid driver's license were recruited in July 2013. Sampling was stratified by region, sex and age. The five most populous regions included the 10 provinces of Canada: Atlantic Canada (i.e., Nova Scotia, New Brunswick, Newfoundland and Prince Edward Island); Quebec; Ontario; the Prairies (i.e., Alberta, Saskatchewan and Manitoba); and British Columbia.

2.3. Instruments

2.3.1. Survey questionnaire

The online survey questionnaire, available in both English and French, was developed and utilized by our research group in previous studies. It consisted of 34 items and required an average of 12 min to complete. Data gathered from respondents regarding age and language, the region and environment where they lived, marital status, substance use, driving exposure, and frequency of driving when likely impaired possess convergent validity with data from other independent sources (e.g., crash data in individual years, and over time; see, Vanlaar et al., 2008a; Vanlaar et al., 2008b; Robertson and Vanlaar, 2008; Vanlaar et al., 2012; Robertson et al., 2017).

Respondents were asked to provide a dichotomous choice response to the following: "If you only had one choice and the risk of future impaired driving was uncertain, which would you choose: a) I would choose to restore a driver's license; or b) I would choose to maintain the suspension of a driver's license." Then, in order to examine how specific DWI events could influence respondent attitudes in light of the costs

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