



Nothing good ever happens after midnight: Observed exposure and alcohol use during weekend nights among young male drivers carrying passengers in a late licensing country



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ABSTRACT

Similar to other countries, also in the Netherlands young male drivers (ages between 18 and 24 years) are overrepresented in crashes during weekend nights, thereby fatally injuring one or more of their passengers. This overrepresentation may be due to two contributing factors: (a) a higher exposure-to-risk because of dangerous trip condition, and (b) a higher tendency to take risks. Studies on these factors, mostly carried out in jurisdictions where youngsters are licensed at an earlier age than in Europe, suggest a strong –often negative– influence from peer-aged passengers. Given that in adolescence susceptibility to peer pressure reduces with age, these findings may not be applicable to late licensing countries, such as in Europe. In the Netherlands –a late licensing country– youngsters are licensed after the age of 18 years, followed by a 5 year probation period with a legal alcohol limit of 0.2 g/L. Further, designated driver schemes are in place since 2001, alcohol limits are enforced by random breath testing schemes, and no passenger and night time restrictions are in force. Against this background, we examined the incidence of dangerous trip conditions and risk taking among young male drivers and compared those with a reference group with a low passenger fatality rate. To that end, data on trip conditions and risk behavior were obtained from a data base on 18,608 randomly selected drivers during weekend nights in 2010, between 22:00 and 06:00. This data base held information for each randomly selected on breath alcohol concentration (BAC), license status, driver characteristics (age and gender), number of passengers, time of night, and level of urbanization. Binary logistic regression analysis confirmed the overrepresentation of young male drivers in traffic, carrying more frequently passengers than the reference group, especially after midnight. Urbanization level was not a modifying factor, but ‘time of night’ was, with riskier conditions after midnight in terms of: (a) a higher young male driver presence, (b) young male drivers carrying more frequently multiple passengers and (c) a higher prevalence of illegal BACs. After midnight, no evidence was found for a protective effect of the presence of one passenger on alcohol use. Of the young male drivers, 5% were over the legal limit and 3 in 5 young males who were over the limit carried passengers. However, the indicative result that young male drivers with multiple passengers were less likely to have been drinking than solo drivers or drivers with just one passenger, is suggestive of a protective effect of multiple passengers. These results may guide preventive strategies, including police enforcement and designated driver programmes.

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1. Introduction

Road crashes involving young inexperienced male drivers pose great risk to themselves, other road users, but also to their own passengers (OECD-ECMT, 2006). Crashes, killing passengers with a young driver at the wheel, often occur during weekend nights. In the Netherlands for instance, weekend nights account for 20% of all passenger fatalities and in 42% of those cases an 18–24 years old

male was driving. This pattern is not unique to the Netherlands and has been reported for other jurisdictions as well (e.g., Williams et al., 2007). Studies conducted in jurisdictions such as the USA (Ouimet et al., 2010; Tefft et al., 2012; Williams et al., 2007, 2011) and New Zealand (Keall et al., 2004b) – where drivers are licensed at an early age – found elevated crash risks for young drivers with peer-aged passengers, but a lower crash risk when these passengers were adults. However, a review of the few studies conducted in European countries on passenger risks (Engström et al., 2008) – where drivers are generally licensed at a later age than in the USA and New Zealand – concluded that for 18–24 years

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old drivers the presence of passengers had a protective effect, irrespective of passenger age (Rueda-Domingo et al., 2004; Vollrath et al., 2002). A more recent study on crash severity from Italy was suggestive of higher crash risks with passengers. The odds of a driver being seriously injured in a crash were significantly higher for young drivers carrying passengers than for young drivers who drove solo. This was even more so when drivers and/or the passengers were male (Orsi et al., 2013). Further details about these crashes were not available, but the higher rates for serious injuries may be due to crashes occurring at higher speeds. This may be suggestive of risk taking. So far the findings on the influence of passengers on crash risk in relation to driver age are thus inconclusive. For a better understanding more insight is needed into the underlying contributing factors and causes.

Two factors have been postulated to contribute to a higher crash risk with passengers during weekend nights, namely: (a) a higher frequency of risk taking behaviors and (b) a higher exposure to risk, because of trip conditions being more dangerous (OECD-ECMT, 2006). The risk-taking-hypothesis has been confirmed in several studies, mostly studies in simulators. In simulator studies, the presence of a peer-aged passenger was shown to increase red light violations (Gardner and Steinberg, 2005) and the presence of sexually attractive passengers to increase look-but-failed-to-see errors (Caird and White, 2009). Also the perception of the passenger as risk-accepting (Simons-Morton et al., 2014), 'cool' or 'sexually attractive' (Caird and White, 2009) increases risk behavior in a simulator ride. In real traffic, higher speeds and closer following distances have been observed for young males when accompanied by a passenger (Simons-Morton et al., 2005).

Most of these studies on risk taking have been limited in terms of geographical area and type of risk behavior. Concerning geographical area most studies have been conducted in the USA where candidate drivers get licensed at a younger age than in Europe. As discussed by Twisk and Vlakveld (2010), this age difference is also associated with large differences in biological, psychological, and brain maturation (Casey et al., 2000; Giedd, 2004, 2008; Johnson et al., 2009). Age is relevant for the influence of the peer network (Horvath et al., 2012; Romer and Hennessy, 2007; Sumter et al., 2009), the ability to control impulses (Spear, 2013), and the development of cognitive skills such as planning and foresight (Blakemore and Choudhury, 2006). Also the ability to resist (perceived) peer pressure improves with age (Steinberg and Monahan, 2007; Sumter et al., 2009), which is especially relevant for understanding influences from passengers. Because of their older age, inexperienced drivers in Europe may therefore be less susceptible to peer-pressure and impulsivity than inexperienced drivers in the USA. To date such studies from Europe are scarce.

Concerning risk behavior in the presence of passengers, none of these European studies have considered illegal alcohol use as a factor. Alcohol has an even greater impact on the safety of young drivers safety (e.g., Keall et al., 2004b; Peck et al., 2008; Vollrath et al., 1997) than that of expert drivers (Blomberg et al., 2005; Borkenstein et al., 1974; Hels et al., 2011; Krüger and Vollrath, 2004; Mathijssen and Houwing, 2005). For these reasons, a large number of countries have introduced a lower alcohol limit for novice drivers than for experienced drivers (Twisk, 2006), and promoted designated driver (DD) programmes in which drivers 'pledge' to remain sober when carrying passengers. For instance the DD-programme BoB has been widely used in Europe. In the Netherlands, the BoB programme had a positive effect on self-reported behavior (Dienst publiek en communicatie and Ministerie van Algemene Zaken, 2013). However, so far no information is available of its effectiveness on actual drink driving while carrying passengers. Findings from a survey among adolescent passengers suggest however that drink driving among drivers with passengers may still be quite common, since 15–19% of these youngsters

reported to have ridden with a driver who had been drinking (Twisk and Vlakveld, 2011).

The higher-exposure- to-risk hypothesis is based on the fact that trip conditions are one of the most influential contributors to crash risk (Christie et al., 2007; Hakkert et al., 2002; Twisk, 2000). For instance, car trips during night hours and in darkness are more risky than those during daytime and in daylight, especially for novice drivers (e.g., McCartt et al., 1996; Sagberg, 1999). In the Netherlands, the crash risk of young novice drivers at night is on average 6.5 times higher than that during daytime. Also for experienced drivers (30–59 years of age) crash risks during night time are higher, but only by a factor of 2.9 (see Vlakveld, 2011 for an overview). Apart from low conspicuity and visibility in darkness affecting safety, fatigue may be one of the factors that specifically affect the safety of young drivers (Groeger, 2006). At night, young drivers more often get involved in fatigue-related crashes (Horne and Reyner, 1995) and also drive more frequently while fatigued (Barr et al., 2011) than older age groups. Moreover, their driving performance, especially the response to hazards, deteriorates more severely during night hours than for expert drivers. Thus for understanding crash risk during weekend nights, time of night is a relevant variable. Little is known about these trip conditions in late licensing countries.

To gain a better understanding of these factors in late-licensing countries, this study examines the risk-taking hypothesis in terms of alcohol use and the exposure-to-risk hypothesis in terms of night-time travel in the Netherlands. The Netherlands grants a license to young drivers from the age of 18 years, restricts alcohol use in the 5 year probationary license to 0.2 g/L (SWOV, 2009), and runs the designated driver campaign 'BoB' since 2001 (Dienst publiek en communicatie and Ministerie van Algemene Zaken, 2013). No restrictions are in place concerning night time driving or number and age of passengers. If exposure-to-risk would be a contributing factor, it is expected that during weekend nights a relatively large proportion of drivers will be in the age category 18–24 years and will be male. These young male drivers are also expected to carry more frequently passengers than a reference group (H1). This reference group includes driver groups with a low passenger fatality rate. On the risk-taking hypothesis it is expected that young drivers who carry passengers would be more frequently over the legal limit for alcohol than the low risk reference group of drivers with passengers (H2). If the BoB campaign were to have an effect, it is expected that illegal alcohol use among passenger carrying drivers would be lower than that among solo driving drivers (H3). For the three hypotheses, the study explores whether these patterns are influenced by level of urbanization and time of night.

2. Methods

2.1. Data collection

Data were obtained and analyzed from a convenience sample of drivers of passenger cars and small vans, who had been randomly tested for alcohol use in 59 test sessions during weekend nights from 22:00 to 04:00 in fall 2010, as part of the National Roadside Survey on alcohol use. In this survey, for each driver information was collected on their blood alcohol concentration (BAC), age and gender, the time period of the test, license category, and the urbanization level of the test-site. In the 2010 version of the survey, also the number of passengers was recorded. Unfortunately, no additional information was collected regarding the passengers, such as gender and age. Since the drivers were randomly selected from moving traffic for breath-testing, the records also provide a reliable estimate of the distribution of different driver groups in combination with passenger presence. A check of the driving

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