

The Impact of Driver Distraction on Young Drivers

McEvoy, S.P., Stevenson, M.R. & Woodward, M.
The George Institute for International Health

ABSTRACT

Background: Young drivers are over-represented in crash statistics. While the reasons are multifactorial, the role of driver distraction in crashes involving young drivers has been largely neglected.

Methods: A representative driver survey of 1347 drivers aged 18 to 65 years was conducted in New South Wales and Western Australia. Data were weighted to reflect the corresponding driving population and were analysed to determine the effect of driver age group on the reported frequency and types of distracting activities while driving, drivers' perceptions about the danger conferred by these activities, and crashes resulting from driver distraction.

Results: Young drivers (18-30 years) were significantly more likely to report distracting activities during the most recent driving trip including mobile phone use (18-30y: 11.5% v 50-65y: 4.1%, $P=0.004$), handling of in-vehicle equipment (18-30y: 80.8% v 50-65y: 54.9%, $P<0.001$), outside distractions (18-30y: 72.5% v 50-65y: 45.9%, $P<0.001$) and lack of concentration (18-30y: 75.8% v 50-65y: 61.5%, $P<0.001$). Young drivers rated most distracting activities as significantly less risky compared with older drivers. Young drivers were significantly more likely to report a crash resulting from a distraction during the last three years (18-30y: 7.7% v 50-65y: 2.3%, $P=0.01$).

Implications: Young drivers are more likely to engage in distracting activities while driving and are more likely to have crashed as a result. Education targeting young drivers, enforcement and engineering initiatives are needed to limit exposure and reduce injury.

INTRODUCTION

Young drivers are over-represented in crash statistics (Australian Transport Safety Bureau [ATSB], 2005, ATSB 2004). While the reasons are multifactorial, the role of driver distraction in crashes involving young drivers has been largely neglected and limited to the role of same-age passengers in crashes among newly licensed drivers (for example, Lin and Fearn, 2003). Moreover, little is known about young drivers' exposure to distracting activities while driving particularly in an Australian context. More information is needed about the effects of driver distraction on young drivers to inform appropriate countermeasures to improve road safety for this large and vulnerable road user group.

In order to explore the impact of driver distraction on young drivers, we conducted a representative survey of drivers aged between 18 and 65 years in New South Wales (NSW) and Western Australia (WA). We quantified the frequency, and types, of distracting activities drivers engaged in by age group (18-30 years, 31-49 years and 50-65 years) during their most recent driving trip. We also examined drivers' perceptions of the danger conferred by various distracting activities and other known risk-taking behaviours by age group. Finally, we determined the effect of driver age group on the occurrence of crashes resulting from driver distraction in the preceding three years. Accordingly, the survey provides, for the first time, Australian data on a full range of distractions that may occur while driving and the impact this has on young drivers, defined in this study, as drivers aged between 18 and 30 years.

METHODS

Study population

We undertook a cross-sectional survey of drivers aged 18 to 65 years in NSW and WA. Participants were also required to hold a driver's licence, have driven in the last month, and mainly drive a motorised vehicle, other than a motorcycle, on public roads. Based on data from the NSW Roads and Traffic Authority (RTA) and the WA Department of Planning and Infrastructure (DPI), this represented 4.9 million drivers in July 2003.

Sample selection

The sampling frame was the residential section of the Electronic White Pages in NSW and WA (Brylar's Australia on Disc Residential, May 2003). Households were stratified by state and area of residence as defined by postcodes. Four pools of phone numbers, comprising Sydney, regional NSW, Perth and regional WA, were randomly selected. Individuals were stratified further on the basis of age group (18-30, 31-49 and 50-65 years) and sex. Small groups (for example, regional residents) were oversampled and the overall sample size was calculated to take into account the stratification and statistical power required to detect distracting activities with a prevalence of at least 10% ($P=0.05$, precision=0.05).

Survey questionnaire

We collected information on the demographic and driving characteristics of respondents, the types of distracting activities during the most recent driving trip lasting 5 minutes or more, the perceived dangers of certain risk-taking behaviours including distracting activities, and crashes resulting from driver distraction in the last three years. Identifying data, such as name and date of birth, were not obtained. We collected information on numerous types of activities such as outside objects, people and events; talking to passengers; adjusting, or reaching for, in-vehicle equipment or objects; and daydreaming.

Survey conduct

Telephone interviews were conducted between 20 October 2003 and 7 November 2003 by trained professional interviewers in the Survey Research Centre at The University of Western Australia (UWA). Up to 8 calls were made to each residential number. Once contact was established, the interviewer provided an explanation for the call and determined the eligibility of household members for the survey. If multiple household members were eligible, the individual with the most recent birthday was interviewed. A computer-assisted telephone interview system was used. The Human Research Ethics Committees at UWA and the University of New South Wales approved the study.

Survey analysis

Data were weighted to reflect the corresponding driving population in order to calculate population estimates (pop est.; and their standard errors, SE). As there were no statistically significant differences between the states for the key measures, including the frequency and types of distracting activities reported during the most recent driving trip, the data were pooled and the study population was defined as the population of drivers aged between 18 and 65 years in the states of NSW and WA.

The data were analysed using STATA[®], Version 8. Percentages are presented as weighted percentages (SE), unless otherwise stated. Frequencies and proportions were calculated for categorical data and means, medians and interquartile ranges (IQR) for continuous data. Statistical significance testing using weighted chi-square analyses for trend were run to determine the effect of driver age group (18-30 years [young drivers], 31-49 years and 50-65 years) on the reported frequency and types of distracting activities while driving, drivers' perceptions of the danger conferred by these activities, and crashes resulting from driver distraction.

Where indicated, multiple logistic regression analyses were undertaken to determine if there were significant differences by age group, after adjusting for factors such as sex, area of residence (metropolitan or regional) and length of trip.

RESULTS

There were 1347 respondents across the two states and the response rate was 48.3%. The demographic and driving characteristics by age group are summarised in Table 1. The median time spent driving on a typical day was 60 min (IQR 40 – 120 min). This did not vary by age group. The majority of drivers had driven in the three days prior to interview (1309, weighted percentage [SE] 97.0% [0.5%]).

Distracting activities during the most recent driving trip

Young drivers (18-30 years) were significantly more likely to report many types of distracting activities during the most recent driving trip including mobile phone use ($P=0.004$), handling of in-vehicle equipment ($P<0.001$), reaching for objects ($P<0.001$), outside distractions ($P<0.001$) and lack of concentration ($P<0.001$; Table 2). The effect of age group remained significant after adjusting for the length of the trip. On average, a driver was engaged in some type of distracting activity once every 6 minutes while driving. Young drivers reported more distractions than older drivers (18-30 years: an average of 1 distraction every 5 minutes v 50-65 years: an average of 1 distraction every 8 minutes).

The perceived danger of distracting activities and other risk-taking behaviours

Young drivers rated most distracting activities as significantly less risky compared with older drivers. These included using mobile phones (hand-held and hands-free), writing text messages, reading maps, reaching for backseat objects and viewing scenery (all P -values <0.03). For example, in relation to writing text messages while driving, 37.3% of 18-30 year-old drivers, 55.9% of 31-49 year-old drivers and 69.0% of 50-65 year-old drivers felt that this was extremely risky ($P<0.001$), and in relation to reaching for backseat objects while driving, 67.2% of 18-30 year-old drivers, 79.4% of 31-49 year-old drivers and 85.7% of 50-65 year-old drivers felt that this represented a high or extreme increase in risk of crash ($P<0.001$).

By contrast, there were no significant differences in perceived risk of crash by age group for other, well-publicised risk-taking behaviours including driving with a blood alcohol concentration of 0.05g/dL, driving with a blood alcohol concentration of 0.08g/dL, driving 80 km/h in a 60km/h zone (speeding), and driving continuously for 2 hours (fatigue; all P -values not significant, NS).

For example, the majority of drivers (82.1%), irrespective of age, believed that driving with a blood alcohol concentration of 0.08g/dL represented a high or extreme increase in crash risk.

There was no significant difference in perceived risk of crash by age group for the following distracting activities: lack of concentration and talking to passengers while driving. Indeed, the majority of drivers (69.4%) felt that talking to passengers was not dangerous (no or small increase in risk of crash).

Mobile phone use and driving

Over 70% of young drivers (70.7%) had used a mobile phone while driving. In the study population, this means that over 900,000 young drivers have used a mobile phone while driving ($901,901 \pm 31,902$; total population of drivers aged 18-30 years: 1.275 million). Over one-quarter of young drivers (25.8%) reported using their phone frequently while driving (defined as phone use during 10% of driving trips or more). Over 30% of young drivers (31.4%) had ever written and sent text messages while driving.

In the study population, this means that over 400,000 young drivers have written and sent text messages while driving ($400,294 \pm 33,316$). Young drivers were significantly more likely to report having to take evasive action in the last 12 months to avoid a collision because of their mobile phone use (18-30 years: 27 incidents, 31-49 years: 10 incidents, 50-65 years: 1 incident, $P < 0.001$).

Crashes resulting from self-reported driver distraction

There were 313 crashes among 266 drivers ($20.1\% \pm 1.3\%$) during the preceding three years. Sixty-six drivers ($5.0\% \pm 0.7\%$) attributed one of their crashes to being distracted (21% of reported crashes; unweighted). Young drivers were significantly more likely to report a crash resulting from a distraction during the last three years (18-30y: 7.7%, 30-49 years: 4.7%, 50-65y: 2.3%, $P = 0.01$).

Of the 34 crashes resulting from driver distraction among young drivers, the main causes were lack of concentration (12 crashes), passenger and outside distractions (6 crashes each), and adjusting in-vehicle equipment (4 crashes). The main types of crashes that ensued were rear-end collisions in which the driver's vehicle hit the vehicle in front (13 crashes), collisions at intersections where the driver failed to stop (5 crashes), and crashes in which the driver's vehicle hit a fixed object or crashes while reversing (4 each).

DISCUSSION

This representative survey is one of very few worldwide to have examined the prevalence and effects of driver distraction with a focus on young drivers. We have made several important findings: young drivers are significantly more likely than older drivers to report many types of distracting activities and report a greater number of distractions during their most recent driving trip. Young drivers rank most distracting activities as significantly less risky compared with their older counterparts. However, they are also significantly more likely to report a crash resulting from a distraction during the last three years.

We estimate that over 900,000 young drivers in the study population have used a mobile phone while driving and over 400,000 young drivers have written and sent text messages while driving. We also found that young drivers are significantly more likely to report evasive action to avoid a collision in the last 12 months because of their mobile phone use. Given that there is strong epidemiological evidence to indicate that mobile phone use while driving is associated with an increased risk of having a crash (McEvoy et al., 2005; Redelmeier and Tibshirani, 1996), these figures are a cause for concern for road safety professionals.

The Victorian Government has recently announced that it will introduce a ban on all mobile phone use for novice drivers and, provided there is adequate education and enforcement, such action is likely to reap benefits (Victorian Government, 2006) and should be considered by other jurisdictions.

Interestingly, there were no significant differences by age group in the perceived risk of crash for well-publicised risk-taking behaviours, such as speeding, drink driving and driver fatigue (as opposed to many distracting activities). While we have no further information on this, it may be that media and education campaigns about other risk-taking behaviours have reached drivers across all age groups. Accordingly, efforts to increase driver awareness about the effects of distracting activities while driving (particularly targeting novice drivers) are also indicated. Moreover, as peer passenger restrictions for novice drivers are used with success in many jurisdictions overseas as part of graduated driver licensing programs (Langley et al., 1996), a similar initiative should be considered in Australia.

Unfortunately, to date, such restrictions have not been introduced except in the context of a previous license suspension (e.g. Victorian Government, 2006).

While a number of international surveys have also demonstrated that younger drivers were more likely to use a phone while driving and/or have higher levels of phone use (Beirness et al., 2002; Lambie et al., 2002; Sullman and Bass, 2004; Troglauer et al., 2006), few have studied other driver distractions. One American survey has also reported an association between driver age and crashes attributed to driver distraction (Royal, 2003). Importantly, we have been able to study the role of driver age group in greater depth and the sample size we used was specifically chosen to have sufficient power to examine the effect of driver age group on the reported frequency of distracting activities while driving.

The limitations of the study should be noted. First, phone numbers were randomly selected from the residential Electronic White Pages, thus respondents were sampled from households with a landline and a phone book listing. There is evidence to suggest that using the Electronic White Pages as the sampling frame for health surveys does not introduce significant bias into estimates (Wilson et al., 1999). Second, the survey's response rate approached 50% and the possibility of selection bias (including by age group) needs consideration. However, as almost all drivers have engaged in distracting activities while driving, it is unlikely that differential bias between respondents and non-respondents would have had an appreciable effect. Third, self-reported data is subject to recall and social desirability bias. As our study population was aged between 18 and 65 years, we believe the likelihood of differential recall by age group to be low. This may not have been the case if we had included drivers over 65 years. Social desirability has not been shown to significantly influence self-reported driver behaviour in an anonymous setting such as the one we used (Lajunen and Summala, 2003).

IMPLICATIONS

Young drivers are significantly more likely to engage in distracting activities while driving, less likely to perceive them as risky, and yet more likely to have crashed as a result. Increasing young driver awareness of the adverse consequences of distracted driving through the media and driver licensing handbooks, increased enforcement of existing laws (e.g. hand-held phones) and extension of those laws to include all phone use among novice drivers (as in Victoria), and engineering initiatives to ensure the safety of in-vehicle equipment and the development of collision warning systems are needed to minimise the exposure to distraction and/or reduce consequent injury in this vulnerable road user group.

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Table 1. Demographic profile and driving characteristics

Characteristic	Age group (#, weighted %*)		
	18-30 years	31-49 years	50-65 years
Sex			
Male	220 (51.0)	244 (51.1)	222 (53.9)
Female	220 (49.0)	221 (48.9)	220 (46.2)
State			
NSW	220 (77.1)	235 (75.8)	221 (75.7)
WA	220 (22.9)	230 (24.2)	221 (24.3)
Area			
Metropolitan	220 (63.8)	230 (61.5)	222 (56.5)
Regional	220 (36.2)	235 (38.5)	220 (43.6)
Employment			
Full time	223 (49.0)	280 (60.7)	189 (44.5)
Part time	74 (17.3)	93 (20.6)	75 (15.7)
Retired	0 (0)	10 (2.3)	108 (25.3)
Student	80 (21.5)	9 (1.8)	1 (0.3)
Homemaker	39 (7.6)	46 (9.5)	42 (7.9)
Other	24 (4.5)	27 (5.1)	27 (6.2)
Distance driven (km/y)			
<2000	31 (8.4)	22 (5.2)	22 (5.0)
2000-4999	93 (21.6)	39 (10.1)	58 (14.0)
5000-9999	55 (13.0)	82 (18.5)	76 (16.0)
10,000-19,999	112 (25.3)	125 (28.4)	126 (28.7)
≥20,000	149 (31.7)	197 (37.8)	160 (36.3)
Passenger carriage			
Rarely or never	89 (19.4)	86 (18.4)	133 (30.7)
About 25% of trips	107 (25.8)	109 (24.1)	134 (29.5)
About 50% of trips	81 (19.1)	93 (19.3)	59 (15.5)
About 75% of trips	48 (11.0)	42 (8.9)	41 (8.5)
All or most trips	115 (24.8)	135 (29.4)	75 (15.7)
Routine driving	309 (69.3)	349 (77.7)	278 (63.6)

* Percentages may not add to 100% due to rounding

Table 2. Types of distracting activities reported by age group during the most recent driving trip of 5 minutes' or more duration

Distracting activity	Age group (#, weighted %)			P*
	18-30 years	31-49 years	50-65 years	
Lack of concentration	333 (75.8)	349 (75.6)	271 (61.5)	<0.001
Outside factor	304 (72.5)	271 (62.1)	189 (45.9)	<0.001
Talking to passengers	184 (39.9)	194 (43.4)	144 (33.8)	0.03
Adjusting in-vehicle equipment	353 (80.8)	323 (70.0)	234 (54.9)	<0.001
Reaching for objects	131 (33.0)	104 (22.8)	60 (14.5)	<0.001
Drinking	74 (16.7)	55 (10.5)	33 (7.7)	0.003
Eating	31 (7.2)	24 (5.2)	24 (6.3)	NS†
Smoking	49 (11.5)	57 (12.6)	31 (6.4)	0.02
Personal grooming	25 (6.8)	13 (2.8)	5 (1.5)	0.003
Mobile phone use	40 (11.5)	44 (10.5)	14 (4.1)	0.004

* P-value from chi-square test for linear trend

† NS Not significant