

Contents lists available at [ScienceDirect](https://www.sciencedirect.com)

Transportation Research Part A

journal homepage: www.elsevier.com/locate/tra

Getting away with texting: Behavioural adaptation of drivers engaging in visual-manual tasks while driving



Oscar Oviedo-Trespalacios*

Queensland University of Technology (QUT), Centre for Accident Research and Road Safety – Queensland (CARRS-Q), Institute of Health and Biomedical Innovation (IHBI), Faculty of Health, Queensland, Australia

Queensland University of Technology (QUT), School of Civil Engineering and Built Environment, Science and Engineering Faculty, Queensland, Australia

Department of Industrial Engineering, Division of Engineering, Universidad del Norte, Barranquilla, Colombia

ARTICLE INFO

Keywords:

Mobile phone
Distraction
Human-systems integration
Self-regulation
Browsing
Distracted driving

ABSTRACT

Driver visual distraction due to the prevalence of mobile phone engagement has become a major safety concern for transport authorities worldwide. Despite long-term efforts to prevent engagement in mobile phone tasks, drivers continue to use their phones while driving. To develop better policy and prevention practices, gaining an understanding of the predictors and strategies utilised by drivers who use their mobile phone for distracting tasks is necessary. Visually intensive tasks are the main interest of this investigation, e.g., texting and browsing. In an online-questionnaire in Queensland (Australia), of the 484 drivers who participated, a 33.5% (n = 162) of respondents reported using a mobile phone for texting and browsing while driving on a typical day. Answers from these participants were analysed for this study. Negative binomial regression was used to model the effect of the independent variables (personal characteristics, perceived crash risk, beliefs, workload management strategies, and police avoidance strategies) over the rate of texting/browsing events per hour driving. The final statistical model confirmed that drivers who reported previous collisions; who believed that the effects of doing the texting/browsing task would last after it was finished; and who reported keeping their phone low to avoid police had an increased texting/browsing incidence rate. Comparably, drivers who held a valid driving license for longer; who perceived larger crash risk regarding texting/browsing behaviour; who avoided mobile phone use in demanding driving conditions; and who used workload management strategies such as reduced speed when engaged in mobile phone use had a reduced texting/browsing incidence rate. The results provide insights into the limitations of actual enforcement control and potential opportunities for countermeasures.

1. Introduction

Although car use has been in decline in Australian car-dependent cities (e.g. Brisbane metropolitan area (Li et al., 2015)), driving is still part of the daily lives of most Australians. Driving has a critical social and economic role but also constitutes large risks for quality of life, including potential injuries and fatalities. Rates for people seriously injured due to a road vehicle traffic crash increased an average of 0.9% from 2001 to 2010 in Australia (Henley and Harrison, 2016). Notable improvements in technologies such as cooperative intelligent transport systems and driving automation are expected to benefit road safety. Estimates suggest that

* Address: Centre for Accident Research and Road Safety – Queensland (CARRS-Q), Queensland University of Technology (QUT), Brisbane, QLD 4059, Australia.

E-mail address: oscar.oviedotrespalacios@qut.edu.au.

URL: <http://orcid.org/0000-0001-5916-3996>.

population-wide benefits are likely to be observed only in the long term (Dia, 2016). Numerous issues related to infrastructure investment (Clark et al., 2016), public perception (Kyriakidis et al., 2015), and policy design (Smith, 2016) need to be overcome before connected and automatic vehicles are widespread and accepted by drivers. Therefore, until active safety technologies are available to all drivers, it is necessary to investigate current road safety issues to prevent road trauma.

Inadequate interactions between drivers and vehicles play a significant role in road crashes (Petridou and Moustaki, 2000). Drivers alter their driving performance due to a wide range of factors such as sleepiness, distraction, alcohol, and other drugs. Mobile phone distracted driving is recognised as one of the most critical human factors issues in road safety (Haque et al., 2016). A study in Canada using a case-control design concluded that the odds of a culpable crash increase by 70% when the driver is using a mobile phone (Asbridge et al., 2013). Recent meta-analytic and systematic reviews of mobile phone distracted driving literature have concluded that (NHTSA, 2016, Simmons et al., 2016, Oviedo-Trespalacios et al., 2016, Fitch et al., 2017): (i) mobile phone visual-manual tasks (e.g. texting, browsing, or any other activity requiring using a keyboard interface and the screen) while driving increase crash risk and safety-critical events, and (ii) mobile phone non-visual-manual tasks (e.g. talking on a handheld or hands-free device) do not seem to be associated with a direct risk of crashes. Two main arguments have been offered as explanations for these findings. The workload management argument contends that drivers may increase their safety margin when conversing on a mobile device by slowing down and increasing their headway to the lead vehicle (Fitch et al., 2017). Compared with texting, mobile phone conversations are pervasive tasks which are difficult to interrupt, given the necessary time drivers need to adjust to the increased demands. The compatibility argument explains that visual-manual tasks are less compatible tasks with driving, which requires ongoing information procurement from the environment by the driver (Oviedo-Trespalacios et al., 2016). More research is necessary to support these arguments and explore how drivers integrate mobile phone tasks to driving.

Legislation and enforcement do not necessarily prevent mobile phone distracted driving. A recent U.S. literature review found that nearly none of the interventions targeting young distracted drivers sustainably prevented mobile phone use while driving (Ehsani et al., 2016). Studies in Washington DC, New York, and Connecticut have reported that handheld bans could have long term benefits if effective enforcement is available (McCartt et al., 2010, Jacobson et al., 2012). However, caution was advised regarding this finding as the results may have indicated that drivers switched to hands-free devices and therefore, they could still be cognitively distracted. Few comprehensive evaluations have been conducted to assess the effectiveness of mobile phone distracted driving legislation. In New South Wales (Australia), two consecutive observational studies in 2002 and 2006 confirmed an increasing trend of mobile phone use and, therefore, there is little evidence that the regulations in place during those years were successful in reducing this behaviour (Taylor et al., 2003, 2007). Indeed, recent studies have shown a large prevalence of mobile phone use among drivers across Australia (Oviedo-Trespalacios et al., 2017b; Waddell and Wiener, 2014).

The enforcement of mobile phone distraction rules is difficult and varies from one region to another. Few studies have been devoted to understanding the limitations and responses to enforcement of mobile phone distracted driving rules. Among the limited exceptions, Nevin et al. (2016) explored perceptions by police officers in the U.S. regarding barriers to enforcement. Five themes were found: (i) distracted driving law is task-specific (e.g. texting or conversing on handheld phone) and drivers could be using their phone for utilitarian activities such as GPS which are legally permitted, (ii) distracted driving usually has low prioritisation compared to other policing functions, (iii) many drivers challenge officers during traffic stops, (iv) some officers believe that drivers can safely multi-task, and (v) detection of distracted drivers is difficult. No similar studies have been conducted in Australia or comparable countries, however, it is reasonable to believe that these difficulties are paralleled in Australia. The interactions between mobile phone distracted drivers and police enforcement constitute a gap in the scientific literature. This information could be of immense importance in optimising legislation and policing.

The aim of this research is to identify predictors impacting the frequency of mobile phone use for texting/browsing among offending drivers in Queensland (Australia). In this Australian state, the use of handheld phones is not legally permitted. This research is principally motivated by the lack of information regarding the influence that workload management and police enforcement strategies have on texting behaviour while driving. Although these strategies seem to be reported in the literature, a clear link with mobile phone use while driving has not yet been established.

2. Method

This study protocol was approved by the Ethics Committee at Queensland University of Technology (Approval Number: 1500001038).

2.1. Participants and recruitment

A total of 484 volunteer participants completed an anonymous online questionnaire advertised through ads in Twitter, ads in Facebook, local press releases in major newspapers, and electronic mail through Queensland University of Technology (QUT) mailing lists. Participants were informed that they would not be penalized if they chose not to participate at any time (demographics of the total sample are shown in the Appendix A). While the participation was voluntary, participants were offered the opportunity to enter into a draw to win one of six \$50 gift vouchers. 33.5% ($n = 162$) of respondents reported using a mobile phone for texting and browsing while driving on a typical day and, therefore, they were included in this investigation. Table 1 describes the demographic profile of participants who reported texting/browsing on a mobile phone while driving.

Download English Version:

<https://daneshyari.com/en/article/6779690>

Download Persian Version:

<https://daneshyari.com/article/6779690>

[Daneshyari.com](https://daneshyari.com)