



Individual differences and propensity to engage with in-vehicle distractions – A self-report survey

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ABSTRACT

Ratings of severity and frequency of engagement with distracting driver behaviours are reported in this paper. Survey data were collected using an anonymous online questionnaire. Four hundred eighty-two respondents contributed to the survey during a 2 month data collection period. Results indicate that the three behaviours rated as most distracting when driving were (i) writing text messages (41%), (ii) reading text messages (62%), and (iii) using a cellular telephone hand-held (52%). The three most frequently reported distracting behaviours that resulted in accidents were (i) 'interaction with child passengers' 2.1% (near misses = 7.5%), (ii) both, route guidance destination entry with 2% (near misses = 2.8%) and use of an '... add-on media device, e.g., an iPod' with 2% (near misses = 3.9%), and (iii) the three items 'reading a text message', 'following advice from a route guidance system', and 'interaction with pets', all with 1.7% of respondents reporting an accident when undertaking the activity (with 6.5%, 3%, and 2.2% respectively for near misses). Two hierarchical regression models were explored. The first introducing personal factors, i.e., age, extraversion, agreeableness, conscientiousness, emotional stability and intellect ($R^2 = 0.131$, $p < 0.001$). The second controlled for variables in the first model and introduced driver-related variables, mileage, penalty points, and frequency of accidents with assumed responsibility ($R^2 = 0.253$, $p < 0.001$). This model identified age, extraversion, mileage, penalty points and accidents all to be significant predictors of engagement with unnecessary distractions. The data presents a picture of widespread awareness of, and engagement with, distracting behaviours by drivers in the United Kingdom. Findings from the hierarchical regressions suggest scope may exist to mediate the levels of distracting behaviours by exploring individual differences and driving styles.

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1. Introduction

A large proportion of the accidents on our roads have long been suspected by the driver distraction research community to have been caused by distractions and inattention. In recent years there have been several reviews of driver distractions (Basacik & Stevens, 2008; Kircher, 2007; Regan, Lee, & Young, 2008; Stutts, Reinfurt, Staplin, & Rodgman, 2001; Wallis, 2003; Young, Regan, & Hammer, 2003) and scientists have been working since the late sixties to understand the role of our attentional mechanisms in driving (e.g., Senders, Kristofferson, Levison, Dietrich, & Ward, 1967). The development of in-vehicle traffic, information and control technologies led to research in the 80s and 90s to evaluate of such systems (e.g., Wierwille, 1993; Zwahlen, Adams, & DeBald, 1988). During this period market penetration of these devices was relatively low, but progressively rising. In the last 20 years, the widespread use of cellular telephones and affordable route guidance systems, has led to an enormous increase in the potential for 'additional unnecessary' distractions in the vehicle. The 100-car study (Dingus et al., 2006) provided solid naturalistic data on the prevalence of distraction-related accidents.

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Findings suggest that some 78% of all vehicle crashes involve 'driver inattention to the roadway' (Neale, Dingus, Klauer, Sudweeks, & Goodman, 2005). However, the behaviours drivers consider distracting, or how these behaviours are rated by the drivers cannot be identified using naturalistic studies. Further, the relationship between the driver's characteristics, e.g., personality, and their likelihood to engage with distraction may also not be determined from observational work. Naturalistic studies do not lend themselves to the determination of insight or introspection regarding distractions or potentially questionable or illegal activities.

Several driver distraction surveys have elicited respondent's views (Royal, 2003). In the UK, the Highways Agency undertook a questionnaire survey as part of a project investigating driver distractions, e.g., roadside advertising. The results pertain mainly to distractions outside of the vehicle. Ninety-six percent of respondents indicated that their visual attention had been distracted by advertising when driving (Speirs, Winmill, & Kazi, 2008) and highlighted complex or changing images as the most distracting feature. Findings were comparable to a study by the Privilege Insurance Company who report 83% of drivers have been distracted by roadside advertising (Privilege Insurance, 2006).

Driver research in Australia reported the most common distracting activities (from the previous journey) as 'lack of concentration' (72%), adjusting in-vehicle equipment (69%), and other people, objects or events (68%). In discussing the self-report data the researchers state, for five percent of the respondents, one in five accidents were attributed to driver distraction (McEvoy, Stevenson, & Woodward, 2006). Other Australian survey work, by the RAC, identified the nine most dangerous driver-derived distractions and the nine distracting behaviours most frequently undertaken (RAC Motor Insurance, 2009). The three most distracting behaviours were (i) reading or sending text messages, (ii) attending to children, and (iii) reading maps; and for the most frequently undertaken distractions, (i) consuming food and drink, (ii) handling CDs, and (iii) adjusting car controls, respectively. One further survey, sampling drivers from the Australian state of Victoria, provides additional data. Excluding driving under the influence of alcohol, the respondents rated sending text messages, reading text messages and dialling a mobile telephone as the three most dangerous driving activities (Young & Lenné, 2010). This study is notable in the consideration of user-derived decisions regarding when distracting behaviours would be attempted. The three scenarios most reported were poor weather (91.7% of drivers), on winding or curved roads (83.8% of drivers) and in heavy traffic (74.7% of drivers).

Findings presented in this paper, report an assessment of contemporary activity, subjective ratings, personality, and the self-reported accident involvement, for United Kingdom drivers. It is novel in that it (i) provides UK baseline data, (ii) relates findings to the respondent's personality profiles (which has not been previously considered in driver distraction survey work), and (iii) models the propensity to engage in distracting activities. The data facilitates investigation of variables predictive of engagement with distraction, and through them, identification of opportunities to mediate such behaviours. It is hypothesised that, drivers with increased interest in technology, young drivers and extraverts will all be significantly more likely to engage in volitional distracting activities.

2. Method

A questionnaire survey was produced for this study. The instrument collected anonymous self-report data via the Internet. The data collected was: demographics, frequency and rated severity of engagement in distracting behaviours (described in more detail below), and personality scale information using the 50 item International Personality Item Pool (Goldberg et al., 2006).

2.1. Procedure

The survey was promoted on BBC Radio Scotland, in electronic media (Heriot-Watt University, School of Life Sciences web site and in a staff electronic newsletter), and on a professional driver's internet forum 'Trucknet.uk'. Respondents to the web site hosting the survey were initially presented with an informed consent. Subsequently, there were five sections to the survey, (i) demographics (age, gender, annual mileage, and years since qualifying for driving, accident history (frequency in the previous 3 years), and interest in technology (described in more detail below), (ii) rating and engagement with distracting behaviours (16 items, with 'I haven't done this while driving' and a Likert scale '1' – not distracting to '5' – very distracting) for each item, (iii) a frequency of distracting behaviours (16 items, with 'I haven't done this while driving' and an ordinal scale, with 'daily', 'weekly', 'monthly', and 'yearly' options for each item); (iv) associated accidents/near misses (16 items, 'Yes, I've had an accident', 'No, but I've had a near miss', 'No', and 'I don't know' for each item), (v) the 50 item version of the International Personality Item Pool (Goldberg et al., 2006) plus a field for any additional comments and feedback. The distracting behaviours explored in the study (Section 3) of the survey instrument, were derived from previous literature, accident statistics, and initial pilot testing. The 16 behaviours are listed in Fig. 1. The Heriot-Watt University, School of Life Sciences Ethics Committee, approved the study.

2.2. Respondents

Data was collected from 482 respondents during a 2-month collection period, between March and April 2009 using a purposive sampling strategy. Respondents who were non-drivers and/or non-UK drivers were excluded from the sample.

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