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Self-report Survey of Student Driver Engagement with Distractions – the Role of Penalty Points and Experience

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Background

- 78% accidents due to driver distraction (Dingus et al., 2006), 70% classified as voluntary (Beanland et al., 2013) – scope for change
- Numerous driver distraction surveys[1] – variable in scope but approaching consensus for many behaviours, e.g.,
- Lansdown (2012) highlighted:
  - Writing and Reading texts, and Handheld Phone use rated most distracting
  - Penalty Points and Mileage as predictive of increased distractions

1. (Canadian Underwriter, 2016; Horrey et al., 2008; Lansdown, 2012; Lansdown et al., 2021; McEvoy et al., 2006; Privilege Insurance, 2006; RAC Motor Insurance, 2009; Royal, 2003; Schroeder et al., 2013; Speirs et al., 2008; StateFarm, 2017; Young & Lenn´e, 2010)

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Background

- Young drivers are well established as a high-risk driving group (RAC, 2009)
  - Exposure to smartphones throughout life
  - Smartphone use remorselessly negative to road safety

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Hypotheses

1. Higher penalty points will predict increased self- reported distracting behaviours.
2. Higher penalty points will predict greater accident involvement.
3. Greater driving experience will result in lower penalty points.
4. Greater driver experience will reduce accident involvements.

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Method

- Cross-sectional observational survey
- Instrument was a revision of the 2012 distraction survey, notably internet use included, external to vehicle distractions considered, and student respondents
- Data from 2012 – 2018 from undergraduate psychology for credit
- Demographic and personality data, ratings of and engagement with distractions within and outwith the vehicle; along with a self-rating of propensity to engage with distraction
- Work (with commuting) and non-work-related driving

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Method

- 530 respondents over seven years
- All fully licensed UK drivers
- First three years of their undergraduate degree
- Quota sampling within years to match student gender balance (except 2012/13, mean data was used)
- 20% males
- Average age was 20.6 (SD = 4.1)
- Average driving experience was 2.1 years (SD = 3.2)
- Average mileage was 5.7 thousand miles per year (SD = 5.4)

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Candidate Distractions

Distractions and (average) ratings (1: not distracting – 5: very distracting).

In-Vehicle		External to Vehicle	
Write text	4.16	Environmental conditions	3.84
Internet (use)	3.99	Events (unexpected behaviours)	3.58
Read text	3.58	Animals (unexpected behaviours)	3.56
Handheld (device use)	3.45	People (unexpected behaviours)	3.50
(Navigation) destination entry	3.22	Other events	3.29
Other behaviour	3.02	Roads (complex)	3.19
Daydreaming	2.88	Roads (busy)	2.99
(Interaction with) children	2.59	Roadworks	2.96
Media player	2.48	Advertisements (dynamic)	2.74
Pets	2.47	Advertisements (static official)	2.12
Handsfree (device use)	2.44	Advertisements (static unofficial)	2.06
Headphones	2.19	Signs (official)	1.91
Eating, drinking or smoking	2.10	Signs (unofficial)	1.86
(Interaction with) adults	1.92	Animals	1.77
		People	1.51

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Method

- For each individual, where…

$$Distraction\ Index = \sum (Yearly + Monthy + Weekly + Daily)$$

- Yearly = 1
- Monthly = 2
- Weekly = 3
- Daily = 4

…for each of the distracting behaviours noted above

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Results

- Summary results from 2021 Transportation Research Part F paper:
  - Internal to vehicle behaviours generally rated most distracting
    - Texting and Internet use
    - Limited evidence that internal distractions relatively worse
  - Limited evidence for variation over time
  - Support for 2012 TRF paper predictive models
    - Age, mileage and penalty points were predictive of greater engagement with distractions
  - Non-work-related driving found to have greater engagement with distractions
- Heteroscedasticity was found, therefore weighted-least-squares regressions used

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H1 - Higher penalty points will predict increased self-reported distracting behaviours

- IV = Penalty Points, DV = Distraction Index
- Null rejected
- Significant WLS regression models emerged for both:
  - Work-related driving (t (1,491) = 6.487, $p < 0.0001$)
    - R^2 = 28.1. A one Penalty Point increase was predicted to increase the Distraction Index by 2.086.
  - Non-work-related driving (t (1,514) = 8.912, $p < 0.0001$)
    - R^2 = 36.6. A one Penalty Point increase was predicted to increase the Distraction Index by 1.808.

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H2 - Higher penalty points will predict greater accident involvement

- IV = Penalty Points, DV = Accident Involvement
- Null accepted
- A significant linear regression model emerged. However, when controlling for heteroscedasticity, the WLS model was no longer significant (t (1,528) = 1.825, p = 0.069).

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H3 - Greater driving experience will result in lower penalty points

- IV = Driver Experience, DV = Penalty Points
- Null accepted
- A significant WLS regression model emerged (t (1,527) = 4.228, $p < 0.0001$).
- R^2 = 18.1. However, contrary to H3, a one-year increase in experience was predicted to increase Penalty Points by 0.069.

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H4 - Greater driver experience will reduce accident involvements

- IV = Driver Experience, DV = Accident Involvement (self reported)
- Null accepted
- A non-significant WLS regression model emerged (t (1,527) = 2.78, $p < 0.096$).

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Discussion

- Those with a history of poor road safety are significantly more willing to engage with distractions
- Good meta-analytic evidence (Castillo-Manzano & Castro-Nuño, 2012) supports penalty point systems to reduce accidents. Perhaps the sample just did not have sufficient power
- For our respondents, increased Experience led to increased Penalty Points. The relatively small range of experience could have been impacted by exposure
- The published literature supports increased experience reducing accidents. Our sample may have just not experienced enough driving to evidence potential reductions relative to others.

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Conclusions

- Positive predictive relationship between Penalty Points and engagement with Distractions
  - In both work and non-work-related driving
  - Supporting the previous 2012 survey findings
- Increasing Experience was found to predict increased Penalty Points
  Hopefully, this was a result of the sample's modest exposure and not ongoing trend.

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