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Driver self-reported fleet safety characteristics: A study predicting organisational risk

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Background

- Estimates of the total cost of work related road crashes in Australia is in the vicinity of $1.5 billion (Wheatley, 1997)
- Average cost to the community of fatality in Australia is almost $2 million (Austroads, 2006)
- Average insurance costs to organisations in Australia is $28 500 (Davey & Banks, 2005) (PDO, WC, TP)

- Researchers and organisations are utilising tools such as DBQ, DAQ and SCQ to develop organisational profiles and identify at risk groups and trends
The study’s primary aims were to:

1. Explore the self-reported driving behaviours and attitudes of a large group of Australian fleet drivers
2. Examine the factors associated with crash involvement
Sample Mailout Survey or Online Survey

- Large National company
- 4,195 Drivers
- 89% Male
- Average age 43.7 yrs (range 18-66 yrs)
- Approx equal split between office and field workers
- 61% Sedans
- 42% City Driving, 40% City & Country Driving
Materials

1. **Driver Behaviour Questionnaire (DBQ)**
   - Scale (0 = never to 5 = nearly all the time)
   - Errors, Highway code violations & Aggressive violations

2. **Driver Attitude Questionnaire (DAQ)**
   - Scale (0 = strongly disagree to 5 = strongly agree)
   - Drinking driving, close-following, dangerous overtaking & speeding

3. **Safety Climate Questionnaire (SCQ)**
   - The SCQ contains 5 sub-factors that aim to measure perceptions towards fleet safety rules, communication and support, work pressures, adequacy of fleet safety procedure and management commitment
Crashes

588 participants reported being involved in a crash while driving for work in the last year.
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<tr>
<th>Measurement Scale</th>
<th>Alpha</th>
<th>M</th>
<th>SD</th>
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<tbody>
<tr>
<td>DBQ Errors</td>
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<td>1.36</td>
<td>.38</td>
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<td>Highway Code Violations</td>
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<td>1.50</td>
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<td>Aggressive Violations</td>
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<td>1.38</td>
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<td><strong>DAQ</strong></td>
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<td>Alcohol</td>
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<td>Close following</td>
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<td><strong>SCQ</strong></td>
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<td>Communication &amp; Support</td>
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<td>Adequacy of Procedures</td>
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<tr>
<td>Management Commitment</td>
<td>.93</td>
<td>4.18</td>
<td>.60</td>
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Results: Driving Behaviours

1. Firstly (DBQ), participants were most likely to engage in speeding offences at work
   • Significantly more likely compared to committing driving errors $F(1, 4195) = 70.73, p<.01$ or aggressive violations $F(1, 4195)$.

2. The mean scores for all three DBQ factors were relatively low, which indicates participants generally reported that they did not regularly engage in the specified aberrant driving.
Results: Driving Attitudes

1. Respondents were most concerned about close following.
   - Although, it was noted that the sample also believed it was generally unacceptable to drink and drive, speed, as well as engage in risky overtaking manoeuvres in some circumstances.

2. Participants generally reported the organisation promoted positive and adequate road safety rules, fostered a commitment to road safety, and were able to communicate and receive support regarding road safety issues.

3. It was also noted that participants reported some level of work pressure.
Results: Bivariate relationship

As expected, strong relationships appeared evident between the DAQ factors, with the highest correlations being between close following and risky overtaking \( (r = .69**) \)

Similar results were found between the DBQ factors, with the strongest bi-variate relationship identified between highway code and aggressive violations \( (r = .53**) \)

Weaker correlations were generally evident between the SCQ factors, although fleet safety rules and adequacy of procedures were highly correlated \( (r = .54**) \).
Results

1. In regards to bi-variate relationships between the questionnaires, significant negative correlations were evident between all the DBQ and DAQ subfactors (ie. Behaviours vs attitudes),
   1. Those who perceived aberrant driving behaviours such as speeding as serious were subsequently less likely to actually engage in such behaviours.

2. In regards to sample characteristics, a similar negative relationship was found between age and the DBQ factors, as older drivers were less likely to engage in aberrant driving behaviours and reported positive attitudes towards road safety, as measured by the DAQ.
1. A logistic regression analysis was performed to examine the contributions of the:
   - DAQ factors
   - DBQ factors
   - SCQ-MD factors
   - Driving exposure to (e.g., kilometres driven each year and hours driven per week)
   - to the prediction of self-reported crashes in the past 12 months.

2. Model not very efficient at identifying individuals involved in crashes e.g., <15%
Crashes

1. Participants who reported a higher level of driving exposure (i.e. kilometres per year) were most likely to indicate that they had been involved in a work-related crash in the past 12 months.

2. The model indicates that participants who reported a higher number of driving errors were most likely to be involved in a work-related crash ($p = .007$).

3. Furthermore, reporting a higher level of work pressure was also predictive of crash involvement ($p = .010$).

4. The inclusion of gender, age and years driving experience did not increase the predictive value of the model.
Discussion

1. Results suggested DBQ and SCQ are moderately robust
2. Participants generally reported positive behaviours and attitudes toward road safety
3. Results also provide preliminary indication of the impact that management have on driving behaviour
4. Work pressure appears to be an issue
Limitations

1. Sample size
2. Reliability of self-report data
3. Questions about representativeness of sample (sales-based environment)
4. Low frequency of self-reported crashes
Implications and Difficulties

- The measurement tools were not extremely efficient at predicting drivers who were involved in crashes.
- Problems associated with large scale administration of surveys.
- Scales need to be revised and incorporate other factors that are currently influencing driver behaviour attitudes and organisational safety climate.
- There is a need for survey tools to be user friendly.
- OHS are reluctant to address work related road safety.
- Over reliance on engineering solutions.
- Organisations now want a golden bullet.
Where to from here?: CARRS-Q

1. Development and implementation of a number of fleet safety interventions designed to increase awareness......

2. Strong need to develop brief, user-friendly yet psychometrically sound risk assessment tools to identify “at-risk” drivers and/or “at-risk” organisations.

3. Examine the feasibility of benchmarking across organisations

4. Look beyond traditional factors towards work pressure, multi-tasking, fatigue, etc
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