SELF-REPORTED SEATBELT USE AND RELATED ATTITUDES

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A total of 954 drivers were surveyed via telephone regarding general road safety and seatbelt-related attitudes and behaviours. Agreement ratings on a 0-10 scale were made for 19 items. From these, factor analysis extracted three factors: perceptions of personal seatbelt use and attitudes, perceptions of personal driving ability, and perceptions of other driving-related behaviours and attitudes. Cluster analysis identified three profiles of drivers based on these factors. Overall, two groups of drivers reported a strong commitment to seatbelt use and positive seatbelt-related attitudes. For one of these groups, perceptions of personal driving ability were very positive while for the other group they were only moderate. The third group of drivers reported less positive seatbelt-related attitudes and behaviours, however, scores were still quite high and suggested that this group of drivers quite often used seatbelts, but were likely to do so inconsistently. These drivers also had a moderate regard for their driving ability. Age and sex differences across the groups and implications for road safety will be discussed.

BACKGROUND

The Swedish National Road Administration (SNRA) commissioned MUARC to trial a method to assess the acceptability of seatbelt reminder systems. MUARC examined a two-stage method. For the first stage, a telephone survey was conducted in order to measure aspects of seatbelt use and general road safety, and to selectively recruit participants for the second stage. Participants were recruited if their responses indicated that they were less likely to wear a seatbelt than others surveyed. For the second stage a series of focus groups was held to examine reactions to the proposed seatbelt reminder system in-depth. The results of the second stage are discussed in an accompanying paper in the present conference proceedings (Harrison & Senserrick: *Seat Belt Use and Reminder Systems: Assessing the Acceptability of Intelligent Seat Belt Reminder Systems*).

This paper reports on the results of the telephone survey with two main aims:

- to identify any underlying patterns in participants' responses, and
- to identify groups of drivers who responded similarly to survey items.

While analyses were exploratory in nature, it was expected that drivers with safer driving behaviours and attitudes would be identified and would contrast with drivers reflecting poorer safety behaviours and attitudes. Of particular interest was whether seatbelt-related items would show variability among participants, given the aim to selectively recruit for the second stage.

METHOD

Participants

Participants took part in the study via a random-number telephone survey. Calls were made to households in the Melbourne metropolitan area on weeknights. In order to maximise the representativeness of the sample, when contact was made, the interviewer asked to speak with the driver in the household whose birthday was next. If the person was unavailable, details were recorded so that the relevant person could be called back at a convenient time, when possible. Whenever contact was made, age and sex of the respondent was requested, including after a refusal to participate in the survey.

Response rates

A pool of 3160 random telephone numbers was generated by a program developed by the second author. A total of 5,472 calls were made, of which 2,383 (43.5%) resulted in contact with a potential respondent. A total of 822 drivers completed the survey on first contact and a further 132 completed the survey after call backs, resulting in a total of 954 participants. Therefore, of calls for which contact was made, the response rate was 40.0%. There was a total of 1,072 refusals (45.0%), a further 357 calls were to houses with no drivers present (15.0%), and no direct contact was made for the remaining 3,089 calls.

Sex and age

Of the total 954 drivers who participated, 435 (45.6%) were male and 514 (53.9%) were females. In five cases, the sex of the respondent was unidentified. Age was not disclosed by six participants. The remaining participants ranged in age from 17 years to 90 years with a mean age of 44.9 years (SD = 15.6 years). There was no significant difference between the age of participant males (M = 45.8, SD = 16.3) and females (M = 44.0, SD = 14.9): $F_{(1,\ 942)} = 3.00$, $p = .08$. Of those that refused, 292 were male, 396 were female, and for 377 sex was unidentified. Too few recordings of age were made to compare differences.

Measures

The survey was comprised of two sections. In the first section, demographic information was obtained, including the respondent's age when getting first licence and driving exposure details. Respondents were asked to estimate the average number of hours spent driving each week, and the percentage of this time spent driving in daylight hours, in 60 km/h zones, and for work purposes.

In the second section, respondents' general and seatbelt-related road-safety beliefs and behaviours were measured according to 19 items. Respondents were asked to rate the extent to which they agreed with the 19 statements on an 11-point scale ranging from 0 to 10, where 0 = do not agree at all, 10 = agree very strongly, and 5 = agree somewhat. The majority of the items appear in Table 1. Two additional items were 'I sometimes take my seatbelt off before I get into my driveway' and 'One of the strongest reasons I have for wearing a seatbelt is that I might be fined'.

Procedure

Several trained research assistants conducted the telephone surveys over 18 nights during a period of five weeks. Calls were made from Monday to Thursday evenings between 5:30 pm to 8:30 pm to maximise the chances of finding potential participants at home. The survey and file of random telephone numbers were linked together in a Microsoft Access database so that the research assistants could enter responses directly into the database. All assistants were issued with hands-free, telephone headsets for ease of data entry. Up to five call backs (only) were made to all numbers recorded in the database.

RESULTS

Underlying Response Patterns

In order to identify any underlying patterns in responses, a factor analysis was performed using the 19 items on general and seatbelt-related road-safety issues. While normality of variables need not be assumed for factor analysis, the procedure is sensitive to outliers, and therefore the data were screened with standard scores in excess of ±4 excluded.

Principal Components Analysis extracted six factors with eigenvalues greater than or equal to one. Examination of the scree plot indicated that a three-factor solution was also appropriate. After the two solutions were subject to oblique rotation, the pattern matrix for the three-factor solution produced a meaningful solution with superior alpha coefficients to the six-factor solution. Therefore, the three-factor solution was deemed the most appropriate representation of the data for the present analyses. The results of the three-factor solution appear in Table 1. The solution accounted for 41.1% of the variance in responses.

Table 1: Summary of three-factor solution after oblique rotation

		Factors		
	Items	I	II	III
Factor I	Wearing a seatbelt is automatic for me	.85		
(9 items)	I always wear a seatbelt when driving	.84		
	I always wear a seatbelt on short trips	.75		
	Sometimes I have to remind myself to put my seatbelt on	-.68		
	I always wear my seatbelt when driving in a carpark	.59		
	Wearing a seatbelt is sometimes a hassle	-.54		
	I always wear my seatbelt when reversing the car	.48		
	I sometimes forget to wear my seatbelt when I am a passenger	-.45		
	I feel very uncomfortable without a seatbelt on	.43		
Factor II	I am a more skilful driver than other drivers my age		.84	
(3 items)	I am safer than other drivers my age		.82	
	I am more careful than other drivers		.70	
Factor III	I tend to drive faster than most other drivers			.63
(5 items)	It's annoying seeing children in cars without their seatbelts on			-.60
	It's annoying seeing other adults driving without their seatbelts on			-.51
	Road safety is one of the most important issues in the community		.31	-.49
	I am generally a forgetful person			.33

Factor I: Personal seatbelt attitudes and behaviour (α = .70). The first factor grouped together all items concerning the respondents' pattern of seatbelt use and related attitudes. The strongest loadings on this factor were two items representing automatic seatbelt use on all driving occasions. Additional items focused more on specific circumstances of and attitudes towards regular seatbelt use, including comfort and convenience aspects. Therefore, high scores on this factor corresponded to regular seatbelt use and positive attitudes towards personal use of seatbelts.

Factor II: Perceptions of driving ability (α = .78). The items loading on the second factor all related to the respondents' perceptions of their driving ability in relation to other drivers, particularly drivers of the same age. High scores on this factor indicated favourable perceptions of one's driving skill, safety, and carefulness when driving.

Factor III: Other driving attitudes and behaviours (α = .39). The final factor appeared to represent other driving and road safety issues, including speed and others' use of seatbelts. Also included is a general forgetfulness characteristic. Low scores on this factor indicated more positive attitudes and behaviours in regard to road safety.

Two items (listed in the *Measures* section) did not load on any of the three factors and therefore were excluded from further analyses.

Types of respondents

Cluster descriptions

The next aim was to identify groups of individuals with similar responses, as represented by scores on the three factors. Some items (e.g. 'I tend to drive faster than most other drivers') were reverse-coded so that for all items a higher score corresponded to a more positive response in terms of safety. A hierarchical cluster analysis (Ward's method) was performed using standardised factor scores and squared Euclidean distance as the similarity-dissimilarity measure. The initial solution was then refined using a *k*-means relocation technique (quick cluster), again using squared Euclidean distance as the similarity-dissimilarity measure. The analyses suggested that a three-cluster solution was appropriate. A discriminant analysis confirmed the presence of three discriminant functions with a combined $\chi^2_{(38)} = 1661.25$, $p = .000$, for which 95.7% of cases were correctly classified. A MANOVA analysis confirmed that the general linear model was also significant: $F_{(38,\ 1638)} = 69.20$, $p = .000$.

Given that the overall model for the three-factor solution was significant, oneway ANOVAs were performed using Scheffé comparisons for each factor in order to identify the sources of differences between the clusters. Results are displayed in Table 2. Cluster profiles are represented by column scores and are contrasted by comparison of row scores.

Table 2: Means and ANOVA results of factor scores by cluster membership

	Total ($N = 858$)	Cluster 1 ($n = 397$)	Cluster 2 ($n = 329$)	Cluster 3 ($n = 132$)	F statistic
Factor I Personal seatbelt attitudes and behaviour	9.33	9.63[a]	9.65[a]	7.63[b]	$F_{(2, 855)} = 570.50$, $p < .000$
Factor II Perceptions of driving ability	7.29	8.54[a]	6.13[c]	6.44[b]	$F_{(2, 854)} = 455.89$, $p < .000$
Factor III Other driving attitudes and behaviours	8.34	9.06[a]	8.03[b]	6.92[c]	$F_{(2, 855)} = 275.80$, $p < .000$

Cluster 1: Committed seatbelt users with strong positive driving attitudes and behaviours, and high perceptions of personal driving ability. The first cluster profile scored above average on all three factors and highest on the factors representing perceptions of driving ability and other driving attitudes and behaviours. This profile reflects a strong commitment to seatbelt use and road safety, both in attitudes and behaviours, and a strong positive perception of personal driving ability in relation to others. This was the largest group with 397 drivers (159 male, 236 female, 2 unknown).

Cluster 2: Committed seatbelt users with good driving attitudes and behaviours, but lower-than-average perceptions of personal driving ability. This group of respondents scored equally high with those of Cluster 1 on the factor representing positive seatbelt attitudes and behaviours. They also scored reasonably high, although somewhat below average, for other driving attitudes and behaviours. However, this group scored the lowest on perceptions of their driving ability. Overall, this profile represents a strong commitment to seatbelt use, general support for other road safety issues, together with a mild regard only for their driving ability. This was also a large group comprising 329 drivers (140 male, 189 female).

Cluster 3: Less-committed seatbelt wearing and driving attitudes and behaviours with lower-than-average perceptions of personal driving ability. These drivers scored well below average on Factors I and III, therefore showing the lowest regard for seatbelt and other road safety issues of the present sample of drivers. Respondents in this group perceived their driving ability at a below average level, although somewhat higher than drivers in Cluster 2. Therefore, this group reflected the least committed approach to seatbelt use and other road safety issues, and a mild regard for their driving ability. There were 132 drivers (82 male, 49 female, 1 unknown) in this group – therefore a much smaller group with less than half the number of drivers of the first two groups.

Profiles of the three groups of drivers

For ease of comparison, the three clusters were described as those with *good, intermediate*, and *poorer road-safety profiles*, respectively. Final analyses (oneway ANOVAs with Scheffé comparisons) explored differences between the groups on demographic details, as displayed in Table 3. As shown, significant findings were that drivers with a good road-safety profile were on average somewhat older than the other two groups, and that drivers with good and intermediate road-safety profiles spent a greater percentage of time driving in daylight hours than drivers with a poorer profile. Further differences were found for sex and licence type.

Table 3: Means and ANOVA results of demographic variables by cluster membership

	Total (N = 858)	Good (n = 397)	Intermediate (n = 329)	Poorer (n = 132)	F statistic
Age	44.70	47.68[a]	42.48[b]	41.29[b]	$F_{(2, 850)} = 14.33$, $p < .000$
Age first got licence	20.67	21.03	20.54	19.92	$F_{(2, 855)} = 2.17$, $p > .05$
Driving hours per week	12.58	13.02	11.66	13.54	$F_{(2, 855)} = 1.86$, $p > .05$
Driving in daylight (%)	80.20	82.04[a]	80.35[a]	74.30[b]	$F_{(2, 855)} = 7.52$, $p = .001$
Driving in 60 km zones (%)	65.15	66.69	64.66	61.71	$F_{(2, 854)} = 2.05$, $p > .05$
Driving for work (%)	11.45	11.80	9.74	14.70	$F_{(2, 848)} = 2.00$, $p > .05$

Chi-squared analyses revealed that sex differences between clusters (as reported in the cluster descriptions), were significant: $\chi^2_{(2)} = 20.75$, $p < .000$. To identify which differences contributed to the significant finding, standardised adjusted residuals (*Res*) were examined. The analysis confirmed that drivers with a good road-safety profile were statistically more likely to be female (*Res* = 2.3) and that drivers with a poorer road-safety profile were far more likely to be male (*Res* = 4.5).

Chi-squared analyses also revealed significant differences between the clusters according to the type of licence they held: $\chi^2_{(4)} = 17.29$, $p < .01$. Licence types were divided into probationary, full, and other types. (Only one other type of licence was reported by a respondent in the first cluster.) The breakdown of probationary and full licences for clusters by both number and percentage is presented in Table 4.

Table 4: Type of licence held by drivers in the three groups

Licence Type	Total (N = 855)	Good (n = 397)	Intermediate (n = 329)	Poorer (n = 132)
Full	810	386	307	117
	(94.4%)	(97.5%)	(93.3%)	(89.3%)
Probationary	45	9	22	14
	(5.2%)	(2.3%)	(6.7%)	(10.7%)

From Table 4 it can be seen that the majority of drivers' held a full licence. The pattern of results for clusters indicates that while this was true within each group, compared to the total percentages, percentage distributions for the first group were balanced somewhat more towards full licences (significantly: *Res* = 3.4), while for the third group percentages were balanced somewhat more towards probationary licences (significant: *Res* = 3.0).

Given these differences in licence type, it was decided to examine age differences in closer detail. Age was broken down into three age groups as shown in Table 5 below. Chi-squared analyses indicated significant differences between the clusters according to age group: $\chi^2_{(4)} = 25.49$, $p = .000$. Drivers with a good road-safety profile represented more drivers in the oldest age group than expected by chance (*Res* = 3.1) and less in the youngest age group (*Res* = -4.0). In contrast, drivers with a poorer road-safety profile represented more drivers in the youngest age group than expected by chance (*Res* = 3.3) and less in the oldest age group (*Res* = -2.6).

Table 5: Age by groups for the three groups of drivers

Age	Total (*N* = 853)	Good (*n* = 394)	Intermediate (*n* = 327)	Poorer (*n* = 132)
17-25 years	91	24	42	25
	(10.7%)	(6.1%)	(12.8%)	(18.9%)
26-50 years	470	214	181	75
	(55.1%)	(54.3%)	(55.4%)	(56.8%)
51-90 years	292	156	104	32
	(34.2%)	(39.6%)	(31.8%)	(24.2%)

DISCUSSION

As expected, better and poorer road-safety attitudes and behaviours were identified, with an intermediate profile also determined. The role of seatbelts was found to vary among the groups. Responses were based on three underlying patterns or perceptions – perceptions of personal seatbelt use and attitudes, perceptions of personal driving ability, and perceptions of other driving-related behaviours and attitudes. Analyses based on these response patterns portrayed one group of drivers reporting a commitment to regular seatbelt use and very positive road-safety-related attitudes and behaviours, together with a high regard for their driving ability. A second group was also committed to regular seatbelt use, with quite positive road-safety-related attitudes and behaviours, however with only a mild regard for their driving ability. The final smaller group of drivers reported the least favourable seatbelt and road-safety-related attitudes and behaviours and a somewhat mild regard for their driving ability. For simplicity and ease of comparison, these three groups were described as those with good, intermediate, and poorer road-safety profiles, respectively.

Comparison of demographics details particularly contrasted two of the groups of drivers. Drivers with a good road-safety profile were somewhat older on average and were more likely to represent drivers in the 51-90 year-old age range compared to the other groups. They spent more time driving in daylight hours, were more likely to be female and to hold a full licence. These drivers contrasted with those reporting a poorer road-safety profile, who were somewhat younger on average and were more likely to represent 17-25 year-olds within the group compared to other groups. They spent less time driving in daylight hours compared to the drivers with a good road-safety profile, and were more likely to be male and to hold a probationary licence compared to other groups. Given that the average number of hours spent driving did not differ for the groups overall, it can be extrapolated that this group drove more during non-daylight hours than the other groups. This is particularly important, given that drivers in the younger age group are more likely to be involved in injury crashes during these hours than are drivers of the other two age groups (based on Victoria Police crash data). Therefore, the younger drivers in this group are particularly compromising their safety if driving during non-daylight hours without a seatbelt. It is important to note however, that while this group of drivers, showed a less positive score on the seatbelt-related factor compared to the other two groups, the score was still well above the moderate response range (7.63 from a possible 0-10). Therefore, it is likely that this group of drivers quite often use their seatbelts, but do so inconsistently. The relation between seatbelt use and time of day for young drivers in particular, should be further explored.