

Assessing and influencing driver attitudes in the United Kingdom

Charles Johnson
Jill Lewis
Rosemary Thew

Submission date: 31 July 2008

Word Count: 7476

Charles Johnson, Technical Director, Competence Assurance Solutions Ltd. 221 St John Street, Clerkenwell, London, United Kingdom, EC1V 4LY, tel: +44 2076882840, fax: +44 2076882829, email: charles.johnson@casolutions.co.uk

Jill Lewis, Director of Driver Education and Learning, Driving Standards Agency, The Axis Building, 112 Upper Parliament Street, Nottingham, United Kingdom, NG1 6LP, tel: +44 1159366666, email: jill.lewis@dsa.gov.uk

Rosemary Thew, Chief Executive, Driving Standards Agency, The Axis Building, 112 Upper Parliament Street, Nottingham, United Kingdom, NG1 6LP, tel: +44 1159366666, email: rosemary.thew@dsa.gov.uk

Corresponding Author - Charles Johnson

ABSTRACT

Accident and injury rates amongst car drivers have been consistently reducing in the United Kingdom since 1994. Indeed, the UK now has one of the lowest accident rates in the world. However, it is unclear to what extent this improvement is due to advances in car and road design and changes in legislation rather than improvements in driver behaviours. Indeed, while rates have been reducing overall, amongst young and novice drivers they have been increasing. Driver attitudes are thought to underlie this latter trend and to constrain further improvements in the overall accident rate.

Attitudes which affect driving performance have been explicitly included in the driver competency framework which now forms the basis of the UK's approach to driver training, assessment and licensing. As part of the development of these approaches, the Driving Standards Agency (DSA) commissioned CAS to develop and evaluate an attitude assessment questionnaire, the Attitude Advisor, primarily for use with trainee drivers but potentially with other groups of drivers as well.

The questionnaire's design is based on Ajzen's theory of planned behaviour and a taxonomy of driver attitudes related to safety. Findings from trials of the prototype questionnaire provide support for both the underlying theory and evidence for its criterion-related validity. In particular, scores on the questionnaire are related to age, gender, accident record and driving convictions. Finally, the paper outlines options for how the Attitude Advisor may be used in the future as part of driver training and continuing personal development in the UK.

INTRODUCTION

In the last fifteen years, significant improvements have been made in car accident and crash rates in the United Kingdom. The British Government set a target of a 40% reduction in road casualties by 2010 from its baseline years in the mid 1990's. The most recent figures released by the Department for Transport (1) show that road casualties have fallen by 35% from the baseline years and so are well on the way to meeting that target. As a result, the United Kingdom now has the fifth lowest road casualty rate in the world and only one-third that of the USA (2). This has been achieved against a backdrop of significantly increased car use, annual motor traffic mileage having increased from 274.2 billion miles (441.5 billion kilometres) to 316.4 billion miles (509.4 billion kilometres).

However, the Department for Transport consider that "*although the roads are safer, they are not yet as safe as they should be*" (3). There were still 247,780 road casualties in 2007. The chances of being injured in a car are twenty times greater than when travelling by rail (2). Motorcycle riding is sixteen times more dangerous again and even worse if you consider only fatalities. More importantly, although accident rates are falling for most types of car driver, rates have remained almost constant for young drivers (16 – 19 years old) and fatalities have risen by 16%. Driving experience plays a large part in these results. There is a 40% chance of a 17 year old driver having an accident in the first six months after they have qualified to hold a full driving licence (4). Accident liability falls but still remains high for new drivers of any age. For example, 30 year olds still have an accident rate of 25% in their first six months.

Much of the improvement achieved to date can be attributed to improvements in road and vehicle design and to the introduction of effective legislation and safety campaigns (3). Concerns have been expressed that, perhaps partly as a result of road and vehicle improvements, standards of driving behaviour are declining. For example, a survey undertaken by the Canadian Automobile Association revealed that 77% of people thought that drivers were less safe now than they were 20 years ago (5). Another Canadian study (6) reported that 95.5% of drivers believe they are more distracted while driving than they were five years ago.

The Driving Standards Agency has introduced a number of initiatives in the UK aimed at bringing about the next generation of improvements. The key one is the introduction, for the first time, of an explicit competency framework, for drivers of cars and light vans (7), which sets out the standards of performance and behaviour expected of someone who holds a driving licence. A fundamental part of this framework is the identification of driving attitudes which underpin good and poor driving. It is considered that "*learners often do not explore their own attitudes, or think about how they could make their behaviour safer*" and that they rely too much on subjective "*judgement of where their strengths and weaknesses lie*" (3). It is believed that introducing a more objective assessment of drivers' attitudes into the training process will be an important step in making further progress towards the Government's road safety targets.

Two issues then arise: how best to assess drivers' attitudes and how best to use the outputs of these assessments to modify or change driving behaviours. The remainder of this paper discusses the approaches which the Driving Standards Agency is pursuing. It describes the development and initial validation of a prototype attitude assessment questionnaire, the Attitude Advisor. The Attitude Advisor is intended for use primarily with learner drivers and pre-drivers but is also being considered for use with other groups, for example, in the rehabilitation of drivers convicted of offences such as speeding and drink driving. The paper also sets out some early thoughts on how the Attitude Advisor might be introduced and used in the UK.

ASSESSING ATTITUDES

A range of definitions of attitude are available in the literature. However, most psychologists agree that the key attribute of an attitude is its evaluative nature (i.e. liking/disliking an object). For the purposes of this work, the following definition of attitude was adopted (8):

'A complex mental state involving beliefs, feelings and values about an object which lead to a disposition to behave in a certain way.'

This definition highlights the difference between an attitude and other psychological constructs such as personality. Sherman & Fazio (9) note that attitudes cannot exist without reference to some specified object or set of objects (e.g. I think speeding is OK). Other related psychological constructs do not need a specified object for them to be meaningful (e.g. I am introverted).

There is also a long history of research into the relationship between expressed attitudes and behaviour. Mostly, the results of this research have been disappointing. Attitudes have rarely been found to be reliable predictors of behaviour (10, 11). The reason for this is that the assumed relationship has been much too simplistic. As a result, several models have been developed which consider a more complex interplay between attitudes and a range of other psychological and social factors in the prediction of behaviour. Among the more prominent are Fazio's MODE model (12) and Ajzen's Theory of Planned Behaviour (11). However, Fazio's model is more concerned with how attitudes develop whereas Ajzen's is concerned with their relationships to future behaviour. For this reason, Ajzen's model has been deployed in a wider range of experimental and practical research including examining the relationship between attitudes and driving behaviour. So, for example, Parker et al (13) report relationships between various aspects of Ajzen's model and driving violations while Haglund and Aberg (14) also find a relationship to speeding.

Since its development, a number of variations and additions to Ajzen's model have appeared. Figure 1, from Deighton and Luther (15), provides a synthesis of some of these variants:

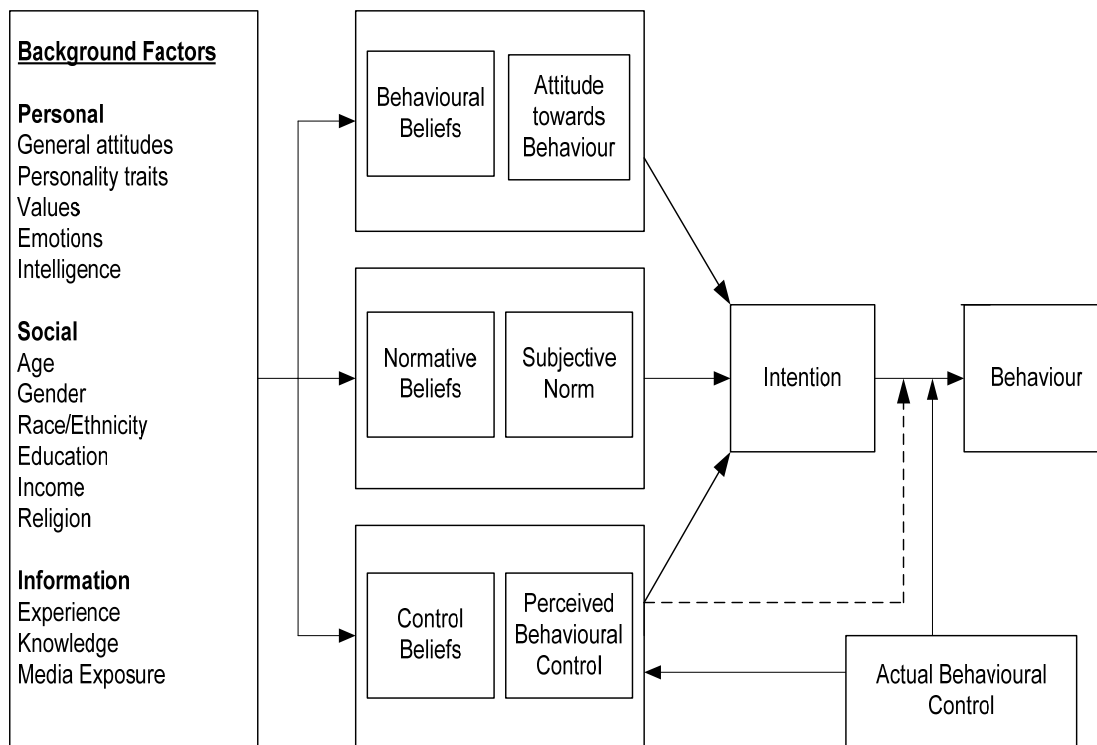


FIGURE 1 Theory of Planned Behaviour.

In the Theory of Planned Behaviour (TPB), the immediate antecedents of behaviour are intentions to behave in a particular way. Intentions develop out of the interplay of beliefs and attitudes about how to behave, subjective social norms concerning social pressures to behave in certain ways and individuals' perceptions of their own level of control over these behaviours. These factors, in turn, are influenced by and grow out of background factors which may include general attitudes, personality traits and experience amongst others.

The TPB model, therefore, provides a clear framework for developing the structure and content of any tool for measuring attitudes to driving. The main issue concerning its use is which aspects of the model to include and where to draw the line on content. For example, if you have good coverage of personal attitudes to behaviours, subjective social norms and perceived behavioural control, do you also need to have separate coverage of intentions or can they be predicted from the other factors? Likewise, if you have sufficient information on background factors, can you predict the more specific attitudes and beliefs with sufficient accuracy?

Certainly, a number of tests have been developed along the lines suggested by these two questions. Several deal only with intentions, either as self report questionnaires e.g. the Driver Behaviour Questionnaire (16) or the Driver Vengeance Questionnaire (17) or behaviour-based, e.g. the Vienna Risk-Taking Test (Traffic) (18) which use a Situational Judgement Test format to examine perceptions of the extent of risk in driving situations. Other tests deal only or mainly with background factors. For example, the Inventory of Driving-related Personality Traits (19) examines general traits thought to be associated with risky driving behaviours; the Safety Attitudes Questionnaire (20) assesses attitudes related to safety climate; the Sensation Seeking Scale (21) which examines general personality attributes related to risk taking; the Driver Risk Index (22) which attempts to relate general levels of stress to driving performance; and the Adolescents Health Attitude and Behaviour Survey (23) which assesses a range of socio-psychological support factors which might be related to driving behaviour.

However, the general trend is to contextualise such instruments to driving in order to get stronger predictive relationships. Furthermore, different predictors emerge in different situations and different research studies so that it is not clear that any combination of factors effectively predicts any higher order factor. Ajzen (11) suggests that peoples' attitudes are inconsistent, even irrational, in that they can hold contradictory attitudes about different objects and thus both appear to have contradictory intentions and to behave in different ways in different situations. In such circumstances, accurate prediction would depend on knowing what the predominant attitude or intention was. These arguments suggest that it is desirable to, at least, assess all four of the higher order factors in the TPB model if good prediction of driver behaviour is to be achieved.

It also follows from the above argument that attitudes, beliefs and intentions may vary across different aspects of driving. A number of different categorisations of risky behaviours have been put forward, for example in the Multidimensional Driving Style Inventory (24), but the approach adopted here was based on a content analysis of the attitudes identified as influencing behaviour in the Driving Standards Agency's driver competency framework (3). Figure 2 presents an overview of the categorisation system. The higher level categories (shaded in grey) were used to devise and structure the content of the Attitude Advisor questionnaire. The specific list of facets provided under each dimension (the white boxes in Figure 2) was used as the basis for determining the content of individual items in the questionnaire.

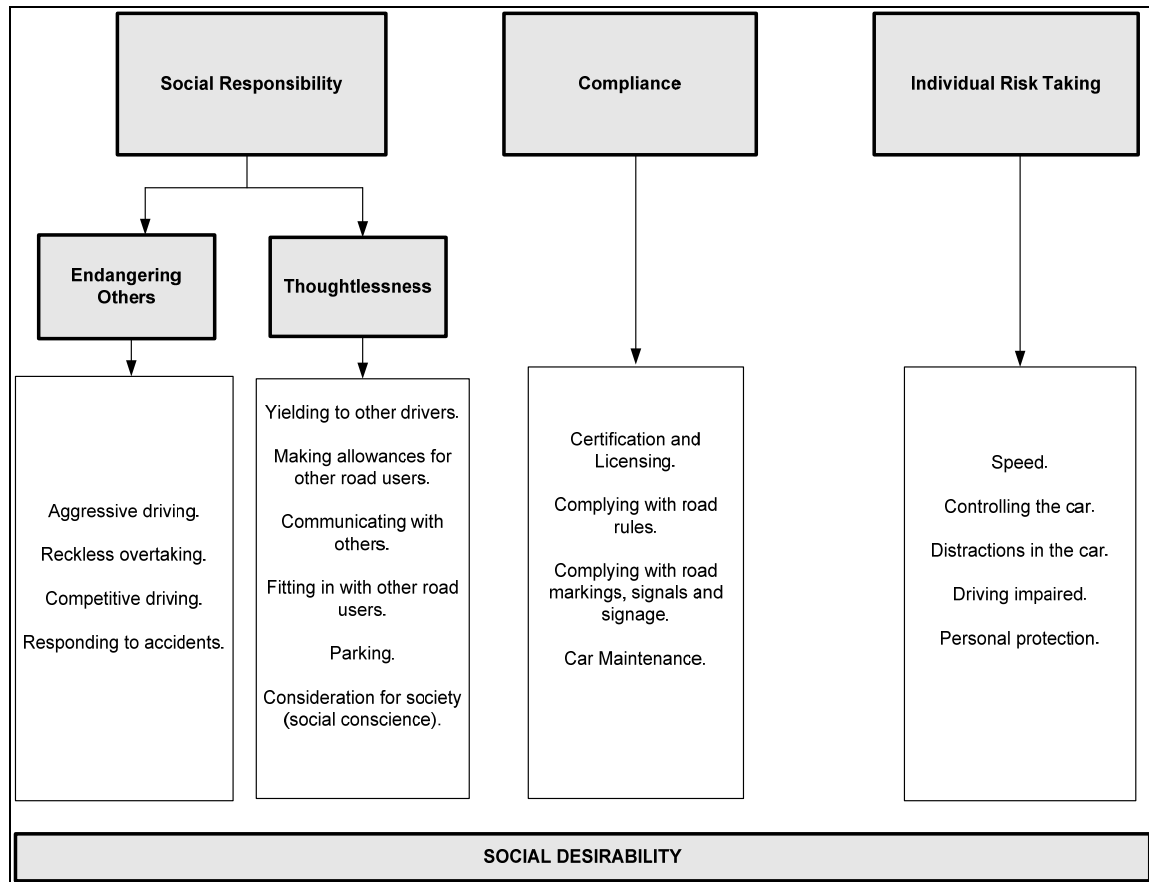


FIGURE 2 Test content categories

DESIGN OF THE PROTOTYPE ATTITUDE ADVISOR

The Attitude Advisor, therefore, is composed of a set of questions which score on the four main dimensions: Personal attitudes; Social norms; Behavioural control: Intentions. Within each dimension, the questions were written in such a way as to cover all the facets identified in the content analysis. This allows scores to be produced for the four main content dimensions as well as the TPB dimensions.

The prototype version is a self-report inventory built around nine different driving scenarios. Each scenario is introduced with a photograph depicting the scenario plus some text which further explains the context. In the initial version for trial, there were 13 questions per scenario, three concerned with personal attitudes to driving, three with social norms, three with perceived behavioural control and four with intentions. The content dimensions were evenly spread across the scenarios but the choice of which to cover was determined by the particular scenario. All questions are answered on a simple, Likert-type scale. There is a mix of positively-worded and negatively-worded items. Although social desirability was identified as a further, possible content dimension, it was considered that the mix of item types would sufficiently control this for all but those most determined to impression manage. This gave an initial questionnaire with 117 items. However, trial subjects, who mostly responded very favourably to the test, considered that it was slightly too long. Test item analysis also identified a number of weak items, particularly in the Social Norm scale. These were, therefore, dropped and a final version with 100 items constructed. All the analyses reported in this paper are based on the shorter version. Figure 3 shows an example of one of the

scenarios with two questions, one addressing attitudes to behaviour and the other intentions. Because the questionnaire is intended for use with a wide range of users and ages, it was important to keep the language as simple as possible. The instructions and content were designed, therefore, to be understood by those with a reading age of 12 years or above.


	<p>You are coming up to this narrow section of road.</p>				
	<p>There is a red car coming the other way.</p>				
<p>47. It is OK to try to get through the junction before the red car.</p>	<p>Strongly Agree</p>	<p>Agree</p>	<p>Undecided</p>	<p>Disagree</p>	<p>Strongly Disagree</p>
	<p><input type="radio"/></p>	<p><input type="radio"/></p>	<p><input type="radio"/></p>	<p><input type="radio"/></p>	<p><input type="radio"/></p>
<p>59. I would ignore the sign if the person on the other side was driving very slowly.</p>	<p>Strongly Agree</p>	<p>Agree</p>	<p>Undecided</p>	<p>Disagree</p>	<p>Strongly Disagree</p>
	<p><input type="radio"/></p>	<p><input type="radio"/></p>	<p><input type="radio"/></p>	<p><input type="radio"/></p>	<p><input type="radio"/></p>

FIGURE 3 Test content examples

TRIAL METHODOLOGY

Although the main target group for the Attitude Advisor is trainee drivers, as noted there is interest in also using it with other groups. To establish the feasibility of this, the trial sample included participants with a wide range of driving experience, from pre-drivers to drivers with many years experience. In total, 331 individuals completed the trial. These were drawn from sixth form colleges, commercial companies, the Armed Forces and prisons. The breakdown of their driving experience was as follows:

- 94 Pre-Drivers - That is, individuals aged 14 years or over with a stated intention to learn to drive but no provisional license.
- 84 Learner Drivers - Individuals who were learning to drive and held a provisional driving license.
- 88 Novice Drivers - Individuals who have held their full driving licence less than 2 years.

- 60 Experienced Drivers - Individuals who have held their full driving licence for 2 years or more.
- 5 gave no information about their level of experience

Therefore, a sufficiently large number of participants were recruited in each key category to allow for basic statistical analyses to be carried out. The sample further comprised:

- 220 males and 91 females (20 undeclared)
- 45 aged under 16 years, 168 aged between 17 and 21, 76 aged between 22 and 35, 17 aged between 36 and 55, and 5 aged over 55
- 181 White , 57 Black British, 31 Asian British, and 21 from other ethnic groups
- 21 drivers (full driving licence) with driving convictions, 45 drivers with fines, 23 who had been at fault in an accident and 36 who had been involved in an accident which was not their fault.

Note that fifteen of the pre-drivers also had driving convictions, mostly for car theft, and that 13 of the learner drivers had already been involved in accidents.

Data collection

Trials were conducted in groups with 10-30 participants. Participants were given a short briefing by a CAS team member covering:

- The purpose of the trial
- The purpose of the Attitude Questionnaire
- Confidentiality issues
- Feedback of test scores
- How long the trial was likely to take and what to do when the trial was completed.

Information was collected after completion of the questionnaire on participants' reactions to the attitude questions, some demographic information and their personal driving history. Trial sessions lasted between 30 and 40 minutes. Following the trial, questionnaires were returned to CAS for processing. Summary reports were written for participants providing the following information:

- A short background on attitude and driving research
- A short description of the structure of the questionnaire
- An analysis of the particular group's results in comparison to the total sample
- Guidance on how to structure the results into a group discussion.

RESULTS AND DISCUSSION

A number of analyses were carried out to investigate the reliability, validity and acceptability of the questionnaire. Caution needs to be exercised when interpreting some of these analyses since sample sizes were sometimes small. For example, as noted, only 21 drivers with full licences in the sample had driving convictions. Only 9 of these had more than one conviction. However, the goals for this stage of development were limited to demonstrating that it was possible to develop a questionnaire with acceptable psychometric properties and sufficient evidence of its validity to justify further development and more extensive trialling and norming.

Technical Characteristics of the Scales

Table 1 presents the descriptive statistics for the total score and the eight scales based on the TPB model and the content categorisation. As described above, questionnaire responses were given on a 5-point scale from Strongly Agree to Strongly Disagree. These were scored as 1 indicating the lowest risk response and 5 the highest risk response. Therefore, across the whole questionnaire and within the sub-scales, higher scores indicate riskier attitudes.

TABLE 1 Scale Descriptive Statistics

	Sample size	No. of Items	Min	Max	Mean	Standard Deviation	Reliability
Full Questionnaire	331	100	141	453	275.7	41.2	0.94
Endangering Others	331	20	31	95	58.8	10.4	0.80
Thoughtlessness	331	24	30	108	66.6	10.8	0.79
Compliance	331	28	37	122	73.9	12.2	0.77
Individual Risk Taking	331	28	35	128	76.2	12.6	0.82
Behavioural Intentions	331	31	36	144	86.3	17.8	0.91
Personal Attitudes	331	23	27	107	57.1	11.3	0.80
Social Norms	331	23	44	96	72.6	8.5	0.67
Perceived Behavioural control	331	23	32	109	56.7	11.7	0.82

There are relatively large score ranges for all sub-scales and the full questionnaire. This indicates a wide range of opinion amongst respondents. The variability of responses indicates that there should be good discrimination between respondents but also that either most have responded openly and honestly or that the “desirable” responses are not too obvious. An important point to note is that scores on the Social Norm scale are relatively high compared to the other scales. It seems to be usual for individuals to believe that other drivers have more risky attitudes than themselves.

Reliabilities were estimated using Cronbach’s co-efficient alpha (25), a measure of internal consistency. The full questionnaire and the individual scales all achieve acceptable levels of reliability with alphas above 0.75 except for the Social Norm scale where the value is slightly low at 0.67. Typically, a co-efficient alpha of 0.7 or above is considered a reliable scale (above 0.8 is considered good). It should be noted, however, that internal consistencies of 0.6 are not unusual for attitude test scales. Therefore, the Social Norm scale should not be discounted outright.

Construct Validity

Four sets of analyses were undertaken to evaluate the construct validity of the Attitude Advisor: factor analysis of individual items; factor analysis of sub-scale scores; analyses of the relationship of scale scores to relevant personal characteristics; and linear regression analysis examining the relationships between factors in the TPB model.

Although there was insufficient data for a reliable factor analysis to be undertaken on individual items (a sample size of about 2,400 would be preferable to adequately fill the data space) initial analyses were carried out to see if there was coherent structure in the data.

An exploratory principal components analysis on the questionnaire items indicated that there were 31 factors with eigenvalues greater than one. The eigenvalue greater than one rule is known to often overestimate the number of meaningful factors in a data set (26) and the Scree plot suggested that there may only be six factors (that is, the number of factors identified before you reach the “elbow” of the plot and enter the “scree”). However, six factors only accounted for 31% of the total variance and so did not adequately represent the data. The significance of these two findings is that the revised questionnaire was designed to have 32 blocks of questions. A block was defined as a set of questions addressing one aspect of the model within a single scenario. It appears that these scenario-related blocks are, to some extent, independent of each other. The implication is that responses on all the scales are, to some extent, scenario dependant. In other words, the attitudes and beliefs that people hold are, to some extent, specific to particular driving situations.

This interpretation is slightly misleading, however. There were clearly two or three factors which accounted for a large percentage of the variance. An analysis was, therefore, carried out on the 16 sub-scale scores in the questionnaire. The sub-scales are comprised of those items which belong to unique combinations of TRB model and content factors, e.g. Social Norms concerning Endangering Others, or Intentions concerning Thoughtlessness.

TABLE 2 Factor Loadings for Sub-scale Test Scores

Description	Factor 1	Factor 2	Factor 3
Personal Attitudes – Endangering Others	0.421	0.147	0.617
Personal Attitudes - Thoughtlessness	0.456	-0.048	0.611
Personal Attitudes - Compliance	0.263	0.090	0.793
Personal Attitudes – Individual Risk Taking	0.522	0.162	0.441
Social Norms – Endangering Others	0.169	0.641	0.194
Social Norms - Thoughtlessness	0.192	0.550	0.029
Social Norms - Compliance	-0.190	0.748	0.327
Social Norms – Individual Risk Taking	0.286	0.712	-0.106
Behavioural Control – Endangering Others	0.170	0.271	0.656
Behavioural Control - Thoughtlessness	0.552	0.059	0.479
Behavioural Control - Compliance	0.597	0.080	0.602
Behavioural Control – Individual Risk Taking	0.626	0.111	0.443
Behavioural Intentions – Endangering Others	0.712	0.357	0.294
Behavioural Intentions - Thoughtlessness	0.837	0.269	0.246
Behavioural Intentions - Compliance	0.862	0.108	0.253
Behavioural Intentions – Individual Risk Taking	0.844	0.206	0.282

Correlational analysis had suggested that, although there was a large general factor, there were some sub-scales which correlated only moderately with the others. A principal components analysis carried out on the sub-scale scores identified three factors. Table 2 shows the factor loadings for the sub-scale scores. Although the solution is not clean (that is, several sub-scales load significantly on more than one factor) the first factor is dominated by the Personal Intentions sub-scales, the second by the Social Norms sub-scales and the third by the Personal Attitudes and

Behavioural Control sub-scales. These results, therefore, provide some support for the Theory of Planned Behaviour which underpinned the questionnaire design.

Ordinary least squares regression analysis provides further support for the model. The correlations between personal attitudes, social norms, behavioural control and intentions range from moderate (for those involving social norms) to large. Yet, Table 3 shows that personal attitudes, social norms and behavioural control all make unique and statistically significant contributions to the prediction of behavioural intentions, with behavioural control being the most predictive, and that the prediction from these variables is very accurate though not perfect (Multiple R = 0.81).

TABLE 3 Prediction of Behavioural Intentions by other TPB Variables

Effect	Coefficient	Standard Error	Std. Coefficient	Tolerance	t	p-value
Constant	0.442	5.321	0.000	.	0.083	0.934
Personal Attitudes	0.261	0.096	0.165	0.285	2.706	0.007
Social Norms	0.185	0.071	0.089	0.929	2.617	0.009
Behavioural Control	0.963	0.093	0.634	0.281	10.295	0.000
Multiple R = 0.81						
Squared Multiple R = 0.651						
Adjusted Squared Multiple R = 0.648						

Relationship of Scale Scores to Demographic Variables

A number of hypotheses can be developed based known relationships between demographic factors and known crash risk (2):

1. Males should have higher risk scores than females.
2. Younger drivers should have higher risk scores than older drivers.
3. Drivers who have held their drivers licence longer should have lower risk scores.

Results indicated that there was not a significant relationship between gender and total risk score on the full questionnaire. However, there was a significant relationship between gender and perceived behavioural control ($df=309$, $t=-2.88$, $p<.005$). This analysis showed that male respondents believed that they had more control in risky driving situations. In addition, there was also a significant relationship ($df=309$, $t=-2.47$, $p<.02$) between gender and individual risk taking. This analysis indicated that males were more likely to deliberately engage in behaviour that they recognise puts themselves at risk while believing they are not putting others at risk (e.g. driving fast on an empty road).

Analyses of Variance were undertaken to evaluate the relationship between driver age and risk score. Results showed a significant relationship, ($F(5,304) = 5.47$, $p<.001$) between age and the full questionnaire score. The results indicated that younger respondents generally had higher risk scores than older respondents. This result was replicated for all the scale scores except for social norms where there were no significant effects of age. Beliefs about the driving attitudes of other drivers seem to be shared by all age groups.

Analysis of variance was also undertaken to evaluate the relationship between the time a driving licence has been held and risk scores. Results showed a pattern of significant relationships very similar to that for age such that those who had held their licence for a shorter time had higher risks scores on all scores except for social norms. However, the length of time a licence has been held is strongly correlated with age and it is not clear at this stage which is the more relevant variable to assess or if, as has been suggested (4), they are additive.

As important as these results is the finding that none of the other demographic variables considered were significantly related to questionnaire scores. These included: ethnic origin; the stage trainee drivers were at in their training; how often respondents drove; how often they drove for work purposes; where respondents learned to drive; and the number of driving tests respondents had sat. However, significant differences were found between the different groups that participated in the trial. Most of the difference can be explained by the age and experience of the participants but one group, the older of the two prison groups, produced significantly lower risk scores on average than any other group. This group were considerably more suspicious of the purposes for undertaking the research and it is very likely that they were deliberately faking their responses. Nonetheless, there were a significant number of individual items where the prisoner group scored higher than average suggesting that not all of the items are amenable to impression management. It is also interesting to note that the young offenders group showed no evidence of impression management.

Criterion-Related Validity

A number of hypotheses were also considered concerning relationships between scale scores and criterion measures:

1. Drivers with driving convictions should have higher risk scores.
2. Drivers with driving fines should have higher risk scores.
3. Drivers involved in an accident who were at fault should have higher risk scores

In addition to the hypotheses listed above, it has been suggested that very risk averse drivers may be at risk of provoking accidents. Therefore, it was also predicted that:

4. Drivers involved in accidents for which they were not at fault should have lower risk scores.

The results of a series of analyses of variance supported some of these hypotheses but not all. Driving conviction rate was significantly related to score on the full questionnaire when age is controlled for as a co-variate, $F(2,215) = 7.13$, $p < 0.001$. Drivers with no convictions had an average score of 274.7; those with one conviction had an average score of 304.1; those with two or more convictions had an average score of 284.2. The finding that those with two or more convictions have lower risk scores than those with one conviction may indicate that being convicted has changed their attitudes. This conclusion is supported by the finding that the two groups produce equally risky scores on personal attitudes but those with two or more convictions score significantly lower on intentions. It is also worth noting that there are no significant differences related to conviction rate for social norms and only a weak, though significant, relationship with thoughtlessness. The implication of this is that conviction rate is most closely related to attitudes to personal risk and not to consideration of others.

There was no support for the second and third hypotheses. Although several of the relationships involving fines closely approached significance, there were no significant relationships between either number of fines or number of accidents caused and any of the scale scores.

However, there was support for the fourth hypothesis. Risk averse drivers do appear to be involved in more accidents for which they were not judged to be at fault but significant differences do not appear for all the scales. Scores for personal attitudes, $F(3,214) = 2.72$, $p < 0.05$, behavioural control, $F(3,214) = 3.127$, $p < 0.05$, and compliance, $F(3,214) = 2.60$, $p < 0.05$, are all significantly related to accident rates but none of the others reach significance although several show similar trends.

CONCLUSIONS AND NEXT STEPS

These results provide some support for both the TPB model and for the value of the Attitude Advisor. Although not all the hypotheses were supported and it is not clear from the results that there

is a straightforward causal chain linking personal attitudes, social norms and behavioural control to intentions and through intentions to behaviour, there is sufficient evidence of the reliability, construct validity and criterion related validity of the questionnaire to justify progressing the questionnaire to the next stage of its development.

However, since the Attitude Advisor is one of the planks in the UK's Learning to Drive campaign, launched by the Secretary of State for Transport, it is necessary to develop a high degree of confidence in its technical quality before it is implemented nationally. In the next stage, three issues need to be addressed: what changes to the content and its delivery might be advantageous; how to conduct more extensive trials; and how best to make use of the Attitude Advisor.

Changes to the content and its delivery

The prototype version used still photographs to introduce the scenarios. As has been noted, the questionnaire items are similar to those used in Situation Judgement Tests. In such tests there is some evidence that, although photographs offer advantages over simple text, the use of video can significantly enhance their validity (26). Furthermore, interactive video is already used in the Hazard Perception Test which forms part of the current UK driving test and more extensive use of video, perhaps in driving simulations, is being considered. Using video in the Attitude Advisor would clearly fit with this trend.

Further trials

Although the results for the prototype questionnaire are encouraging, there are a number of hypotheses which have not been supported. This may, of course, reflect weaknesses in the materials or the model but it may also be a result of the relatively small sample of drivers and the limited nature of the information concerning their driving histories. In the next stage it will be necessary to run trials on a much larger and properly structured sample, not only to increase confidence in the validation findings but also to allow for the development of fully representative norms.

Future Use of the Attitude Advisor

In its consultation paper (3), the UK Department for Transport have clearly stated that the Attitude Advisor is not expected to form part of the driving test. Nor is it expected to form part of any pass / fail decision. Indeed, since there is evidence that the Attitude Advisor is fakeable, at least to some extent, it would be difficult to justify any such use in a national scheme.

Instead, it is envisaged that the Attitude Advisor will form part of the learning to drive process. One of the key changes in the Driving Standards Agency's approach to learning to drive is to emphasise that driving should be considered a life long learning activity. As such, it is important to address attitudes to driving very early in the process of learning to drive. Research (27) indicates that many of the attitudes found in experienced drivers are already in place well before formal driver training begins. For this reason, the Driving Standards Agency consider that work to develop the right attitudes to driving should begin in school education and, as such, are pursuing the development of driving awards (3). Using attitude assessment as a way to help individuals develop safe and responsible attitudes to driving is seen as an important part of the education process. Therefore a key target group for the Attitude Advisor will be pupils aged 14 to 16.

However, driver education is unlikely to be compulsory, so many individuals learning to drive will not have had their attitudes assessed. For this reason there are a number of other possibilities being considered. For example, it is possible that learner drivers will be encouraged to complete the attitude advisor with approved driving instructors taking responsibility for helping them interpret and use the results. Alternatively, attitude assessment might be used as an adjunct to group discussions. Group discussions are already used in Switzerland and Norway as part of the learning to drive process. As well as learner drivers, group discussions based on attitude assessment are being

considered as part of the driver rehabilitation process. Driver rehabilitation training is already in place in the UK for such behaviours as drink driving and speeding.

All of this implies that there will be individuals available skilled in using the Attitude Advisor and providing feedback to learner drivers. A vital part of the next stage of development, therefore, will be to trial the Attitude Advisor with such individuals and ensure that reports based on it are comprehensible, easy to use and seen as a valuable part of learning to drive.

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