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DRINKING AND DRIVING IN RURAL VICTORIA: A SURVEY OF HOTEL PATRONS

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Drinking and Driving in Rural Victoria: A Survey of Hotel Patrons

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Abstract:

The report presents the results of a survey of 250 hotel patrons in rural towns in Victoria, Australia. The data suggest that although enforcement is an important determinant of behaviour, the behaviour of respondents in relation to drink driving may also be accounted for (in part) in terms of social and lifestyle factors. Further analysis suggested that five clusters or groups of respondents could be identified. There was a relationship between cluster membership and drink-driving risk (and other variables) which suggests that a range of characteristics may be used to identify targetable groups of high-risk drivers for countermeasure development and targeting.

Key Words:

Enforcement, Police, Alcohol, Driver Behavior, Deterrence

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EXECUTIVE SUMMARY

This report is concerned with relationships between drink-driving behaviour and driver and situational characteristics amongst rural drivers. It arose from concerns that drink-driving enforcement programs had not been as successful in rural areas as they have been in the metropolitan area of Melbourne. The report extends earlier work performed by Harrison (1996).

Data from a survey of 250 hotel patrons in rural towns in Victoria, Australia, are presented and analysed in terms of the relationships between a range of variables and self-reported drink-driving behaviour. The survey was primarily concerned with the relationship between contact with drink-driving enforcement and attitudes and drink-driving behaviour.

The results of the survey suggest that the relationship between experiences of drink-driving enforcement and attitudes and behaviour is a complex one. The data suggest that the behaviour of respondents in relation to drink driving may be determined by social and lifestyle factors as well as their contact with enforcement activity.

The data were also used to investigate the possibility that there are subgroups of hotel patrons which could be defined in terms of their attitudes and behaviours in relation to avoiding detection for drink-driving. This analysis suggested that five clusters or groups of respondents could be identified. There was a relationship between cluster membership and drink-driving risk (and other variables) which underscores earlier evidence that a range of characteristics may be used to identify targetable groups of high-risk drivers for countermeasure development and targeting. The potential value of these results is discussed.

TABLE OF CONTENTS

<u>INTRODUCTION</u>	1
<u>METHOD</u>	3
PARTICIPANTS	3
QUESTIONNAIRE	3
PROCEDURE	4
CAUTIONARY COMMENTS	4
DATA ANALYSIS	4
<u>RESULTS</u>	5
SAMPLE	5
DESCRIPTIVE ANALYSES	5
EXPERIENCES OF ENFORCEMENT	5
BEHAVIOUR	8
RISK CLASSIFICATION AND ENFORCEMENT VARIABLES	11
RISK CLASSIFICATION AND BEHAVIOR	14
IDENTIFYING GROUPS OF RESPONDENTS	16
<u>DISCUSSION</u>	27
<u>REFERENCES</u>	31

INTRODUCTION

Victoria is a State of Australia with a population of about 4.5 million. About 80% of its population lives in the metropolitan area surrounding its capital city, Melbourne and nearby Geelong. The remaining 20% live in rural areas or regional urban centres serving the economic and social needs of the surrounding rural areas.

Road safety measures in Victoria have generally been characterised by an emphasis on enforcement and public education (media) programs. There has been a strong emphasis on enforcement of driving under the influence of alcohol for many years, and intensive, automated enforcement of speeding commenced in 1990. Both enforcement programs have been conducted by the Victoria Police which has responsibility for all aspects of moving-traffic enforcement. Accompanying public education campaigns since that time have been the responsibility of the Transport Accident Commission, the State's insurer for compulsory, no-fault transport injury.

The focus of this report is drink-drive enforcement, particularly in rural areas of Victoria. Enforcement of drink-driving in Victoria since 1990 has involved high levels of random breath testing by the Police. Random breath testing (RBT) involves road-side stopping of vehicles in the traffic stream and requiring the driver to undergo a preliminary breath test for alcohol. Where the preliminary breath test indicates a blood alcohol concentration over the legal maximum (.05g/100ml for fully licensed drivers and .00g/100ml for learner drivers and novice drivers in their first three years of driving) the driver is required to undertake an evidential breath test which is accepted by the courts as evidence of an offence. RBT can be conducted from individual Police vehicles or in larger, high visibility operations utilising large, purpose-built RBT vehicles. Various strategies have evolved over time using both methods to ensure coverage of main roads and surrounding minor roads. The Police are also empowered to require drivers to undergo a preliminary breath test at any time and often require a breath test when dealing with drivers on other traffic matters.

As was the case in New South Wales (Homel, 1988), the use of RBT at high levels has been shown to have had an impact on crashes in Victoria. Armour, Monk, South, & Chomiak (1985) showed in the early days of lower levels of RBT, for example, that RBT activities resulted in reductions in the number of hospitalisation crashes in metropolitan areas during times of the day known to be associated with alcohol-related crashes. More recently, Newstead, Cameron, Gantzer, & Vulcan (1995) presented evidence which indicates that the number of tests conducted at RBT stations is correlated with the number of "alcohol-time" crashes (defined as times of the day when crashes are known to be more likely to involve alcohol as a causal factor) in the Melbourne metropolitan area. Their results suggested that a 1% increase in the number of RBT tests was associated with an .02% reduction in the number of "alcohol-time" hospitalisation and fatality crashes in the period 1983-1993 in the Melbourne metropolitan area, and that this effect was independent of the effect of economic indicators and publicity which were also correlated with crash frequency. It needs to be emphasised, in spite of the independence of the effect of drink-drive enforcement, that this effect is found in the context of high levels of publicity and most likely depends, in part, on the level of publicity.

The situation in relation to rural areas in Victoria is less clear, however. Newstead et al. (1995) were unable to detect a significant relationship between RBT activity and crash frequencies in rural areas. More recently, an evaluation of increased levels of RBT activity in rural areas in Victoria indicated that some combinations of RBT strategies result

in a significant increase in the number of crashes (Cameron, Diamantopoulou, & Dyte, 1997). Cameron et al.'s analysis suggested that the increase in crashes under some enforcement conditions may have related to an increase in the number of drivers using roads other than main roads or highways.

Harrison (1996a) reported the results of a survey of a small sample of hotel patrons in four rural towns and noted that almost half of the respondents indicated that if they knew of the location of RBT activity they would drive home from the hotel by an alternative route. This supports Cameron et al.'s suggestion that increased use of back roads during enforcement activity may represent a significant problem in rural areas. It is of some interest to note, though, that the use of alternative routes may not only occur in rural areas. Frank (1986) noted that one consequence of the 1983 RBT blitz in Melbourne was an increase in the number of single-vehicle crashes in residential streets on weekends.

In his analysis of some of the psychological characteristics associated with drink-drivers, Harrison (1996b, 1998) noted some differences between convicted drink-drivers in metropolitan and rural areas which suggested underlying differences in attitudes that may have some role in the differences in behavioural responses to RBT activity.

Results such as these suggest that there are differences between metropolitan and rural drivers in relation to the effect of drink-drive enforcement on their attitudes and behaviour. The translation of the success of RBT programs in the metropolitan area into a rural program relies on an assumption that the effect of RBT and publicity in rural areas will mirror the effect of each in the metropolitan area. This project was conducted to investigate the relationships between drink-driving in rural areas and a number of driver and situational characteristics, with a specific focus on the enforcement experiences of respondents.

METHOD

Participants

Participants were 250 patrons of rural hotels in seven rural towns. The towns were selected for another study which also made use of the data collected with the questionnaire discussed below. Hotel patrons were chosen for the reasons outlined in Harrison (1996a). It was considered that this group represented a high-risk target group for drink-drive countermeasures. Previous research (e.g. Harrison, 1996b) has suggested that drink-drive offenders in rural areas often consume alcohol in hotels prior to their drink-drive offence.

Participants were recruited from the patrons of a sample of hotels in each town, and interviews were conducted on Thursday and Friday afternoons and nights. Thursday and Friday were used to ensure the maximum number of patrons were present.

Questionnaire

The questionnaire used in the survey was largely the same as the questionnaire used in Harrison (1996a). It is included in the Appendix. Items in the questionnaire were designed to obtain information from participants concerning their experiences with enforcement, their knowledge of the experiences of others with enforcement, their behaviour in relation to drinking and drink-driving, and their perceptions of the risk of detection for drink-driving.

The questionnaire took about ten minutes to complete.

The variables of particular interest included:

- **Contact with enforcement:** Measured here as the number of times the respondent had been breath tested (at RBT and at other times), the number of times the respondent had been a passenger in a car when the driver was breath tested (at RBT and at other times) and whether the respondent had ever been required to undertake an evidential breath test after initially being found to be over the legal maximum blood alcohol concentration.
- **Knowledge of others' contact with enforcement:** Measured here as the number of people known to the respondent to have been required to undergo breath testing (at RBT and at other times), the number of people known to the respondent to have been required to undertake an evidential breath test, and the number of others known to the respondent to have been detected over the legal maximum blood alcohol concentration who then avoided any punishment.
- **Recency of contact with enforcement:** Measured here as the last time a RBT bus was known to be in the area.
- **Perceptions of the behaviour of others:** Measured here as the responses to an item asking how other patrons would respond if RBT activity was known to be occurring.

- **Beliefs about their own behaviour when choices are limited:** Measured here as the responses to an item asking how respondents would behave if they had to drive home when enforcement was present.
- **Self-reported avoidance behaviours:** Measured here as the responses to an item asking respondents to nominate what they have done to avoid being stopped in the preceding 12 months.
- **Concerns:** Measured here as the responses to items asking what respondents (and others as a separate item in the questionnaire) were concerned about in relation to driving after leaving the hotel.
- Regularity of hotel patronage and demographic variables such as age, sex, distance to home from the hotel and length of residency.

Procedure

Patrons were approached by one of three research assistants involved in the project in the hotel and were asked for their cooperation in the survey. The survey was conducted by the research assistant and answers recorded by her/him on the survey form. The survey was conducted in the hotel to reduce the inconvenience to the participants.

No information was collected which could identify participants, and about 30% of potential participants refused to participate.

Cautionary Comments

The survey represents the responses of hotel patrons sampled from the clientele of a small sample of hotels in a small sample of rural towns. As noted in Harrison (1996a), there is considerable potential for sample characteristics to have an impact on the outcome of the survey. It is not possible in the context of this project to control for this, although the present survey represents a substantial improvement over the earlier work where only four rural towns and a smaller number of respondents were surveyed.

Data Analysis

The data were analysed using a number of statistical techniques. Most of the analyses involved the use of contingency tables and a goodness of fit test, or the Kruskal-Wallis H test which was used by Harrison (1996a). This test is similar to a one-way analysis of variance but relies on the relative ranking of respondents on items rather than the variance of responses to items. It does not, therefore, make any assumptions about the distribution of the data. This characteristic of the H test was important in the present context where it was not considered appropriate to make the assumptions required to use a parametric statistical test. The H test statistic is distributed as a chi square statistic.

Additional analyses were conducted using factor analysis and cluster analysis techniques to identify groups of related or similar respondents. These statistical techniques are multivariate techniques which rely on the pattern of correlations between items (for the factor analysis) and the pattern of distances between participants (for the cluster analysis).

RESULTS

Sample

Respondents were 250 patrons of rural hotels. 23 patrons were not licensed to drive and were excluded from further analysis, leaving a sample of 227 licensed drivers – 45 females and 182 males.

Characteristics of the sample are summarised in Table 1.

Table 1: Characteristics of the Survey Sample

	Females	Males
Age Group		
18-21 years	5	13
22-30 years	14	42
31-50 years	20	86
51 years and older	6	41
Education Level		
Up to year 10	13	71
Years 11/12	27	55
TAFE/Tertiary	5	53
Occupation		
Unemployed/Retired	3	10
Home Duties	9	2
Self Employed	0	4
Management/Professional	11	30
Service/Sales/Clerical	16	24
Labourer/Trades	2	98
Other	2	14

The average age of respondents was 38.9 years. They lived an average of 30.4 km from the hotel and had lived in the area of the interview for an average of 18.8 years.

Descriptive Analyses

The analyses reported in this Section are primarily descriptive analyses of the survey data focusing on the enforcement experiences and knowledge of respondents and their behaviour.

Experiences of Enforcement

The survey included items relating both to the personal enforcement experiences of respondents and to their knowledge of the enforcement experiences of other people. The

experience of enforcement is summarised in Figures 1 and 2, which shows the number of different types of experiences (1) and the length of time since the most recent occurrence of each experience (2).

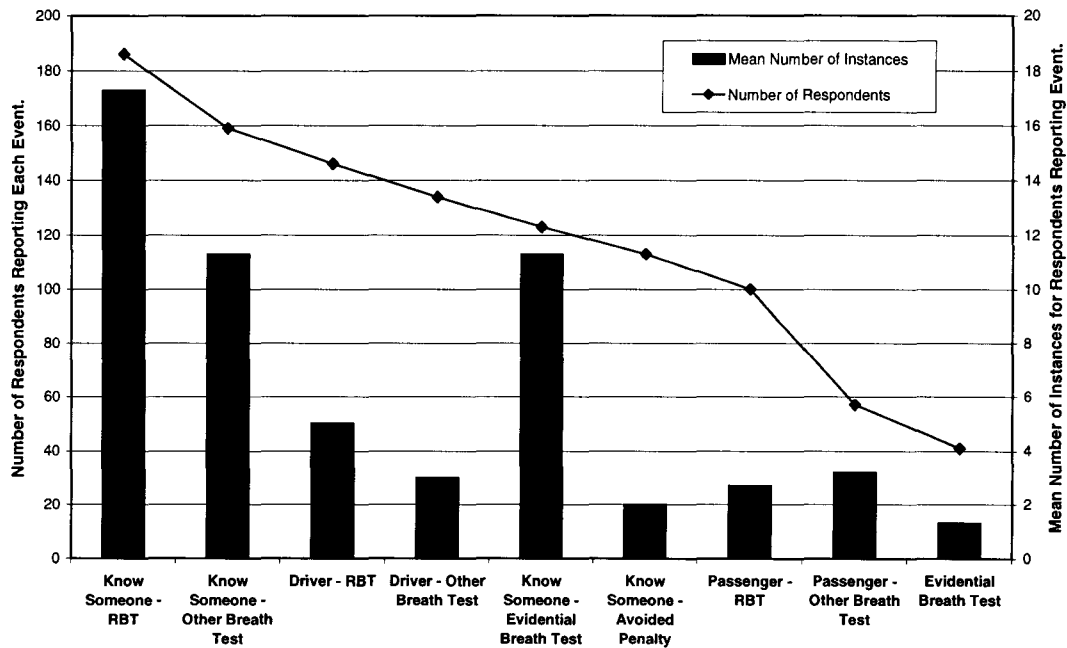


Figure 1: Number of Respondents Reporting Specific Enforcement Experiences and Number of Instances of Each Experience

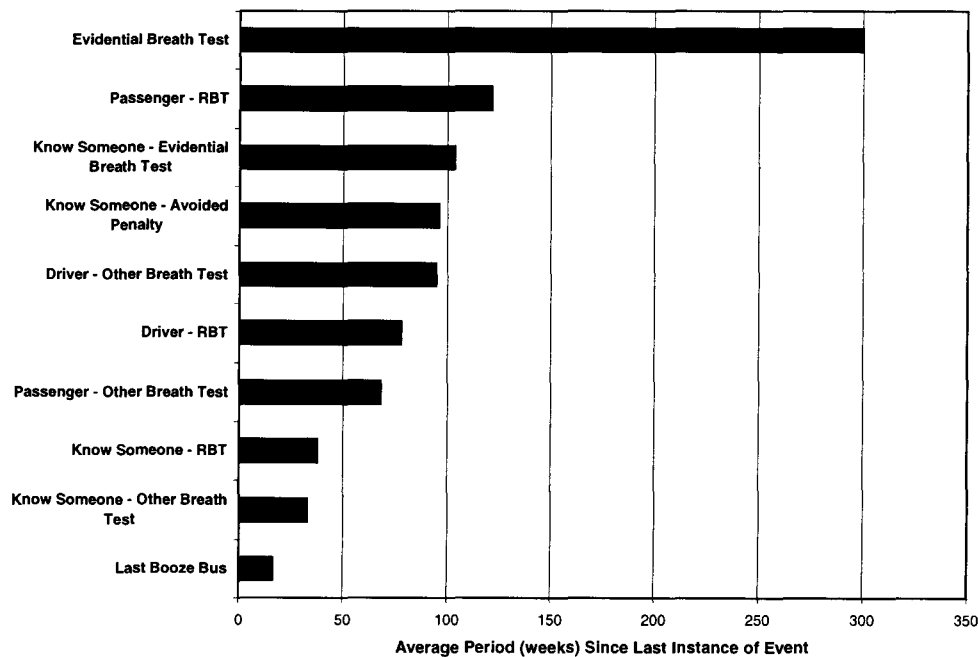


Figure 2: Average Period Since Most Recent Experiences of Enforcement for Respondents with Experiences of Each Type of Enforcement

Figures 1 and 2 suggest that knowledge of the experiences of other drivers with drink-driving enforcement was more common and more recent than personal experiences of drink-driving enforcement, underscoring the potential of the word-of-mouth effect discussed in Harrison (1996a). They also suggest that in general there is a relationship between the number of respondents who can recall particular events and the frequency of these events amongst respondents. The only substantial deviation from this was that the mean number of times respondents could recall someone else undergoing an evidential breath test was higher than might be expected given the number of people who could recall this occurrence. This also emphasises the importance of word-of-mouth effects in rural areas in relation to knowledge of people detected for drink-driving.

Personal Experiences

Most respondents (146, 64.3%) reported that they had been required undertake a preliminary breath test at a random breath testing station. On average, these respondents reported being tested in this way 5.0 times with the average time that had elapsed since the last direct experience of random breath testing being 77.8 weeks or 1.5 years. Across all respondents (including those who had not been tested at RBT), the average number of experiences of undertaking a preliminary breath test at RBT was 3.2.

Fewer respondents (100, 44.1%) reported that they had been a passenger in a vehicle when the driver had been stopped for a preliminary breath test at a random breath testing station. This had occurred an average of 2.7 times, with the most recent instance occurring an average of 121.3 weeks (2.3 years) prior to the interview. For all respondents, this equated to an average of 1.2 experiences of being a passenger when the driver was breath tested at a RBT station.

134 respondents (59.0%) reported that they had been breath tested by the Police away from a RBT station. These respondents had been tested in this way an average of 3.0 times with the most recent instance being an average of 94.6 weeks (1.8 years) prior to the interview. For all respondents, this equated to an average of 1.8 experiences of being breath tested away from a RBT station.

Only 57 respondents (25.1%) had been a passenger in a vehicle when the driver was breath tested away from a RBT station. For these respondents, this had occurred an average of 3.2 times, with the most recent occurrence an average of 67.9 weeks (1.3 years) prior to the interview. For all respondents, this equated to an average of 0.8 experiences of being a passenger when the driver was breath tested away from a RBT station.

A total of 41 respondents (18.1%) reported being required to undergo an evidential breath test after a preliminary breath test. These respondents reported an average of 1.3 evidential breath tests with the most recent one being an average of 300.0 weeks (5.8 years) prior to the interview. For all respondents, this equated to an average of 0.2 experiences of being required to undertake an evidential breath test.

Respondents reported that the most recent booze bus based drink-drive enforcement they could recall in their area occurred an average of 16.4 weeks (0.3 years) prior to the interview.

Knowledge of the Experiences of Others

Most respondents (186, 81.9%) knew of one or more people who had been breath tested at a RBT station. These respondents reported that they knew an average of 17.3 people who had been tested in this way and that the most recent instance they were aware of another person being tested occurred 37.7 weeks (0.7 years) prior to the interview. For all respondents, this equated to knowing an average of 14.2 people with this experience.

Most (159, 70.0%) also knew of someone who had been tested away from RBT activity. These respondents reported knowing an average of 11.3 people tested in this way, with the most recent instance being 32.8 weeks (0.4 years) prior to the interview. For all respondents, this equated to an knowing an average of 7.9 people with this experience.

123 respondents (54.2%) knew of others who had been required to undertake an evidential breath test as a result of failing a preliminary breath test. These respondents knew an average of 2.8 people who had been required to undertake an evidential breath test, with the most recent instance occurring 103.5 weeks (2.0 years) prior to the interview. For all respondents, this equated to an knowing an average of 1.5 people with this experience.

Half of the respondents (113, 50.0%) knew of one or more people who had been detected over the legal maximum blood alcohol concentration and who had managed to avoid a penalty. These respondents knew an average of 2.0 people who had avoided punishment, with the most recent instance occurring an average of 95.9 weeks (1.8 years) prior to the interview. For all respondents, this equated to an knowing an average of 1 person with this experience.

Behaviour

The survey included items relating to the behaviour of respondents in relation to avoiding detection, and also included items which allowed a crude estimate of drink-driving behaviour to be made.

Avoidance Behaviours

Respondents were asked a number of questions about their behaviour and the behaviour of other people when trying to reduce the possibility of detection for drink-driving. Responses to these items are summarised in Table 2.

The data presented in Table 2 show that respondents perceived the most common general reactions to enforcement activity were using another route after leaving the hotel and getting someone else to drive. The use of alternative routes was also cited as the most common choice if confronted with a need to drive home after drinking and was reported more often than other behaviours as a behaviour which had been utilised to avoid detection in the 12 months prior to the interviews. Driving more carefully than usual and driving slowly were also common avoidance behaviours reported in the 12 months before the interview.

Table 2: Responses to Avoidance Behaviour Items

Item (multiple responses allowed on each item)	Number of Respondents (and percentage of sample)
How do people normally react if there is RBT activity in the area?	
Drink less	33 (15%)
Use another route	80 (35%)
Get someone else to drive	78 (34%)
Stay in the hotel/town	51 (22%)
Other behaviours	76 (33%)
If you had to drive home after drinking when there was enforcement activity, what could you do to avoid being stopped?	
Use a back road or alternative route	105 (46%)
Drive more carefully than usual	9 (4%)
Drive extra slowly	4 (2%)
Leave later/Stay at hotel longer	20 (9%)
Drive faster than normal	1 (0%)
Other avoidance techniques	71 (31%)
Which of the following techniques have you used in the last 12 months to avoid being stopped?	
Use back road or alternative route	108 (48%)
Drive more carefully than usual	89 (39%)
Drive extra slowly	32 (14%)
Eat food or drink coffee	32 (14%)
Leave later/Stay at hotel longer	54 (24%)
Drive faster than usual	15 (7%)
Drink less	76 (33%)
Other avoidance techniques	15 (7%)

Drink-Driving Behaviour

For both the current visit to the hotel and for the most recent visit, respondents were asked to estimate how much alcohol they had consumed, how long they had been at the hotel, and the method they would use to return home after leaving the hotel. This information allowed a crude judgement to be made about the drinking and driving behaviour of the respondent. It should be noted, however, that the estimate made here does not represent the likelihood that the respondent was driving with an illegal blood alcohol concentration, but rather that the respondent was driving having consumed a relatively large amount of alcohol in the amount of time they had spent at the hotel.

Respondents were judged to be relatively high-risk for purposes of the analyses here if:

- On the last visit to the hotel they consumed more than two alcoholic drinks per hour and drove home afterwards, or
- On the current visit to the hotel they had consumed more than two alcoholic drinks per hour and intended to drive home afterwards.

While this provides only a crude measure of drink-driving, it does reflect the likelihood that heavier drinkers who drive are more likely to drink-drive than other respondents.

Using these criteria, 72 respondents (32.1%) were classified as relatively high-risks.

The remaining respondents were classified as light drinkers if they had not (on either visit to the hotel) consumed an average of more than two alcoholic drinks per hour, or as heavy drinkers if they had consumed at least this amount of alcohol but did not drive or intend to drive. Using these criteria, 60 respondents (26.8%) were classified as light drinkers, and 92 (41.1%) as heavy drinkers.

Risk classification was associated with the education level of the respondents ($\chi^2_{(2)} = 10.3$, $p < .05$), and was associated with the sex of respondents ($\chi^2_{(2)} = 25.0$, $p < .05$). Males were more likely (36.8% of males) to be classified as relatively high-risks than were females (13.3%). 91.7% of the high risk respondents were males, compared to 58.3% of the light drinker respondents. The relationship between education level and classification was more complicated, and is shown in Figure 3.

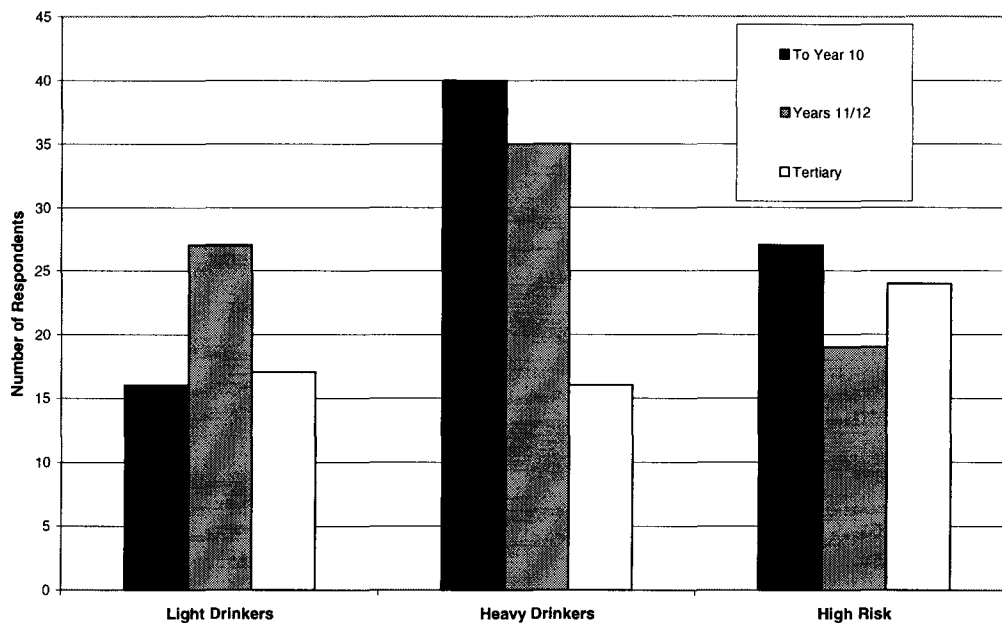


Figure 3: Risk Classification and Education Level

Respondents who were classified as relatively high-risks were older ($\xi = 43.2$ years of age) than heavy drinker and light drinker respondents ($\xi = 38.0$ & 35.0 years of age respectively) ($\chi^2_{(2)} = 12.4$, $p < .05$). They also reported having lived for a longer period of time in the area ($\xi = 24.5$ years) than other respondents ($\xi = 17.2$ & 14.2 years) ($\chi^2_{(2)} = 11.2$, $p < .05$), and living closer to the hotel ($\xi = 28.8$ km) than others ($\xi = 32.6$ km & 30.1 km for the heavy and light drinker respondents respectively).

Figure 4 shows the significant relationship between hotel attendance in the preceding month and classification of respondents ($\chi^2_{(2)} = 14.5, p < .05$). It is clear in Figure 4 that hotel attendance is higher for those classified as more risky using the technique outlined above.

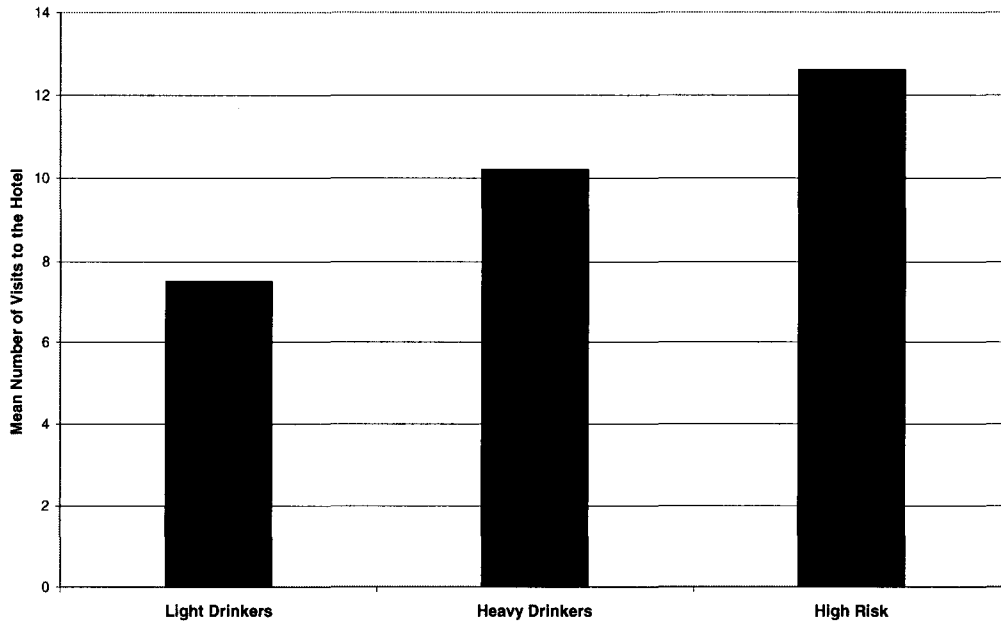


Figure 4: Risk Classification and Number of Visits to the Hotel in the Preceding Month

The relationship between risk classification and the enforcement items in the survey is discussed below.

Risk Classification and Enforcement Variables

The data were subjected to a series of analyses to determine the strength of any relationships between risk classification and other variables.

The relationships between riskiness and variables reflecting the direct, personal experience of enforcement activity are shown in Table 3.

In general, personal experiences of drink driving enforcement as a driver were not related to the risk classification assigned to respondents. The only exception to this was that the total number breath tests experienced by high risk respondents was significantly higher than the total for either light drinker or heavy drinker respondents.

Table 3: Risk Classification and Direct, Personal Experiences of Enforcement

	Mean Responses			Test Results
	Light drinkers	Heavy drinkers	High Risk	
Number of times tested at RBT	3.8	2.6	3.5	n.s.
Weeks since last time tested at RBT ¹	76.6	92.3	60.2	n.s.
Number of times tested away from RBT	1.3	1.9	2.0	n.s.
Weeks since last test away from RBT	61.0	111.5	100.3	n.s.
Number of evidential breath tests	0.2	0.3	0.2	n.s.
Weeks since last evidential breath test	286.0	329.6	253.8	n.s.
Total number of breath tests	4.8	4.7	5.8	p<.05
Weeks since most recent breath test	59.0	96.0	68.0	n.s.

The relationships between riskiness and variables reflecting indirect, personal experiences of enforcement activity are shown in Table 4.

Table 4: Risk Classification and Indirect, Personal Experiences of Enforcement

	Mean Responses			Test Results
	Light drinkers	Heavy drinkers	High Risk	
Number of times a passenger at RBT	1.3	1.6	0.6	p<.05
Weeks since last time a passenger at RBT	118.9	99.9	167.0	n.s.
Number of times a passenger at a breath test away from RBT	0.5	1.2	0.5	n.s.
Weeks since last time as a passenger at a breath test away from RBT	39.2	79.7	50.3	n.s.
Total number of times a passenger at a breath test	1.8	2.6	1.1	p<.05
Weeks since most recent time as a passenger at a breath test	86.0	102.8	127.4	n.s.

There was a significant relationship between risk classification and the number of times respondents had been a passenger when the driver was required to undertake a preliminary breath test at a RBT station. The means in Table 4 suggest that high-risk respondents reported less experiences of this type than did other respondents. There was also a significant relationship between the total number of indirect experiences of enforcement and risk classification which reflected the effect of the number of experiences as a passenger at RBT and the consistent (but insignificant) relationship between risk

¹ Means for responses involving estimates of the time since an experience are based only on those respondents who reported that experience.

classification and the number of times respondents had been passengers when the driver was required to undertake a preliminary breath test away from RBT.

The relationships between risk classification and variables reflecting the knowledge of other drivers' experiences of enforcement are shown in Table 5.

Table 5: Risk Classification and Knowledge of Others' Experiences of Enforcement

	Mean Responses			Test Results
	Light drinkers	Heavy drinkers	High Risk	
Number of people known to be tested at RBT	12.3	13.4	16.0	p=.05.
Weeks since last other person was known to be tested at RBT	51.7	47.5	17.1	n.s.
Number of times people known to be tested away from RBT	6.2	7.7	9.6	p<.05.
Weeks since last other person was known to be tested away from RBT	29.3	15.7	50.5	n.s.
Number of people known to have undertaken evidential breath tests	0.7	0.8	2.9	p<.05
Weeks since last other person was known to undertake an evidential breath test	149.0	99.0	82.2	n.s.
Number of people known to avoid punishment	0.5	1.5	0.8	p<.05
Weeks since last other person known to avoid punishment	98.7	100.8	85.6	n.s.
Total number of other people known to have contact with enforcement	19.6	26.1	29.5	p<.05
Weeks since most recent enforcement contact for another person	39.4	25.6	28.0	n.s.

The results in Table 5 indicate that risk classification and knowledge of the experiences of other drivers were related, but that the elapsed time since the most recent awareness of others' experiences of enforcement was not significantly related to risk classification. The significant results in Table 5 are shown in Figure 5. It is clear, in general, that higher levels of awareness of others' contact with drink-driving enforcement are associated with respondents classified as high-risk.

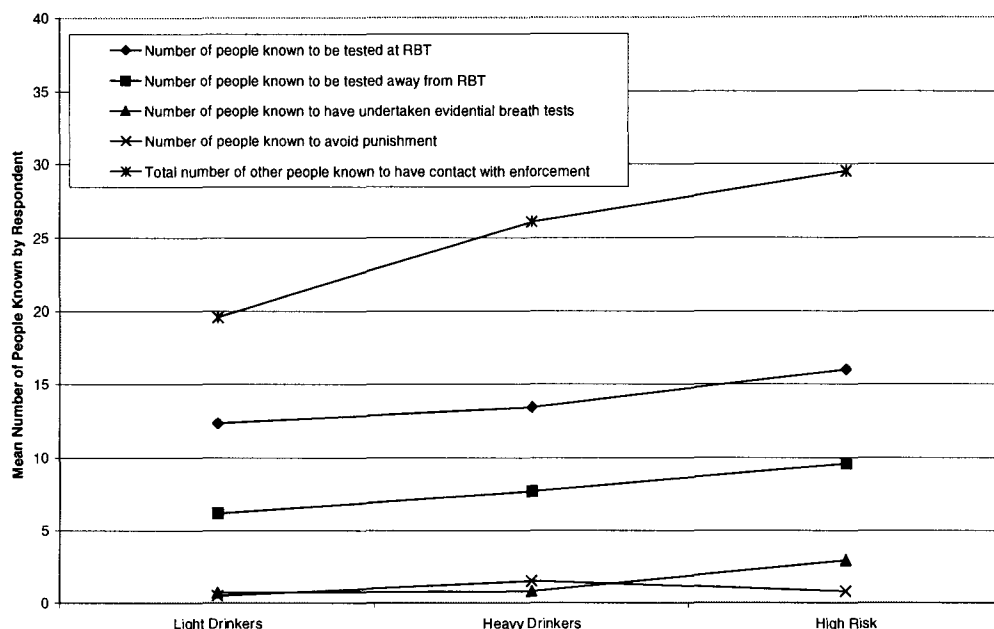


Figure 5: Risk Classification and Knowledge of Others' Experience of Enforcement

Risk Classification and Behavior

Respondents were asked a number of questions about their behaviour and the behaviour of others in the presence of local enforcement activity.

Respondents were asked to indicate how they thought other hotel patrons would act if informed of the presence of drink-driving enforcement. Responses are presented in Table 6.

Table 6: Risk Classification and Beliefs About the Behaviour of Others

	Percentage of Respondents			Test Results
	Light drinkers	Heavy drinkers	High Risk	
Others would reduce drinking	17%	16%	11%	n.s.
Others would drive but use another route	28%	28%	51%	p<.05
Others would drink coffee or eat while drinking	0%	0%	0%	n.s.
Others would get another person to drive	32%	30%	44%	n.s.
Others would stay in town or walk home	25%	21%	21%	n.s.

The only significant relationship between risk classification and beliefs about the behaviour of other drivers was for the belief that others would drive after leaving the hotel but would use another driving route. The high risk respondents were more likely to

believe that others would take alternative routes (51%) than were heavy drinker or light drinker respondents (28% of each group).

Respondents were asked to indicate how they would act if informed of the presence of drink-driving enforcement and they had to drive. Responses are presented in Table 7.

Table 7: Risk Classification and Beliefs About the Behaviour of Others

	Percentage of Respondents			Test Results
	Light drinkers	Heavy drinkers	High Risk	
Respondent would use back road	45%	47%	54%	n.s.
Respondent would leave later	7%	3%	19%	p<.05
Respondent would drive more carefully	4%	3%	4%	n.s.

The only significant relationship between risk classification and the likely behaviour of the respondent if they had to drive when enforcement was present was for the intention to leave from the hotel later than planned. The high risk respondents were more likely to leave later (19%) than were heavy drinker or light drinker respondents (3% and 7% respectively).

Respondents were asked to indicate what they thought other hotel patrons worried about in relation to driving home after leaving the hotel. Responses are presented in Table 8.

Table 8: Risk Classification and Beliefs About the Others' Concerns About Driving Home

	Percentage of Respondents			Test Results
	Light drinkers	Heavy drinkers	High Risk	
Others worry about crashing	13%	19%	17%	n.s.
Others worry about hurting someone	18%	11%	7%	n.s.
Others worry about being stopped by Police	67%	54%	54%	n.s.
Others worry about being fined/punished	25%	38%	40%	n.s.

There were no significant relationships between risk classification and beliefs about the concerns of other patrons in relation to driving.

Respondents were asked to indicate what they worried about in relation to driving home after leaving the hotel. Responses are presented in Table 9.

Table 9: Risk Classification and Respondents' Concerns About Driving Home

	Percentage of Respondents			Test Results
	Light drinkers	Heavy drinkers	High Risk	
Worries about crashing	17%	12%	19%	n.s.
Worries about hurting someone	22%	10%	18%	n.s.
Worries about being stopped by Police	43%	39%	49%	n.s.
Worries about being fined/punished	18%	24%	18%	n.s.

There were no significant relationships between risk classification and the respondents' concerns about driving home after leaving the hotel.

Respondents were asked to indicate what methods they had used in the preceding twelve months to avoid being stopped by the Police. Responses are presented in Table 10.

Table 10: Risk Classification and Self-Reported Avoidance Behaviour in Previous Twelve Months

	Percentage of Respondents			Test Results
	Light drinkers	Heavy drinkers	High Risk	
Have used back roads/alternative routes	42%	55%	55%	n.s.
Have used extra care when driving	39%	54%	40%	n.s.
Have driven more slowly than usual	17%	20%	12%	n.s.
Have eaten food while drinking	20%	21%	10%	n.s.
Have left the hotel later	32%	22%	31%	n.s.
Have driven faster than usual	6%	9%	8%	n.s.
Have consumed less alcohol than usual	49%	36%	38%	n.s.

There were no significant relationships between risk classification and the respondents' self-reported behaviour in the preceding twelve months.

Identifying Groups of Respondents

It was apparent from the analysis presented above that personal, social, or lifestyle factors may have contributed substantially to the results. High-risk respondents tended to have more direct and indirect enforcement experiences, suggesting that their lifestyle may predispose them to greater contact with enforcement activity. The possibility that there may be identifiable groups of respondents with particular characteristics was addressed by conducting a number of analyses of the survey data to attempt to identify similar groups of respondents for further analysis.

A factor analysis of the items relating to the behaviour of respondents in the presence of enforcement and their perceptions of how others would behave in the same situation was conducted, including some demographic variables in the analysis as well. Most of the

items were dichotomous, so the factor analysis was based on Spearman (rank-based) correlation coefficients rather than Pearson coefficients.

The factor analysis resulted in the identification of five groups of correlated items which are summarised in Table 11.

Table 11: Factor Loadings After Oblique Rotation (Loadings less than .3 suppressed)

Item	I	II	III	IV	V
Would use backroad or alternative route to avoid being stopped	.65				
Have used backroad/alternative route to avoid being stopped	.61				
Age	-.57				
Have driven faster to avoid being stopped	.56				-.30
Have left later to avoid being stopped	.54				
Believe others would use alternative routes to avoid being stopped	.38		-.33		
Respondent worries about hurting others		.69			
Believes others worry about hurting others		.63			
Believes others worry about crashing		.59		.30	
Respondent worries about crashing		.54		.33	
Distance from hotel to home		.34			
Number of times at pub in preceding month		-.33			
Believes others worry about being stopped by the Police					
Have drunk less to avoid detection			.71		
Have driven slowly to avoid being stopped			.67		
Have driven more carefully to avoid being stopped			.63		
Have eaten food to avoid detection			.48		
Would use more care than usual to avoid being stopped					
Respondent worries about getting home late				.79	
Believes others worry about getting home late				.77	
Believes others stay in town or walk home to avoid detection				.46	
Believes others worry about being punished					.70
Respondent worries about being punished					.62
Would leave late to avoid detection					.55
Time lived in area			-.38		.40
Believes others drink less to avoid detection					.34
Believes others arrange for alternative drivers to avoid detection					.31
Respondent worries about being stopped by the Police					

Principal components extraction of the factors was used, followed by an oblique rotation of factors. The five factors presented in Table 11 accounted for 37.5% of the item variance and were generally uncorrelated with each other (no between-factor correlations exceeded 0.1).

Factor scores were calculated for each respondent on each factor by transforming responses on the relevant items in Table 11 into z-scores (mean of 0 and a standard deviation of 1) and summing scores for each item which loaded on each factor (taking the sign of the relevant factor loading into account). Thus, the factor score for respondents for the first factor was the sum of the transformed responses for the first six items in Table 11. Transformation into z-scores was undertaken to ensure that each variable contributed

equally to the factor scores. Each respondent therefore had one score for each of the five factors identified above.

The more-usual approach to calculating factor scores (using regression coefficients which reflect the relative importance of each item to each factor) was not available to the authors after using Spearman correlation coefficients in the factor analysis.

Table 12 describes the five factors in terms of the items which load on each factor.

Table 12: Descriptions of Factors

	Description	Suggested Label
I	High scores on this factor reflect the use of alternative routes, driving fast, and leaving the hotel late as methods to avoid being stopped by the Police. High scores are also associated with younger respondents.	Avoidance Behaviour While Driving
II	High scores in this factor reflect concerns about crashing and hurting other people. High scores were also associated with living further from the hotel and with less regular attendance at the hotel.	Concern for Others
III	High scores on this factor reflect a careful approach to drinking and driving. High scores were associated with driving slowly and carefully to avoid being stopped, and with the use of food and restrictions in alcohol consumption.	Care
IV	High scores on this factor were associated with concerns about getting home late and with the belief that others would walk home or stay in town to avoid detection.	Time Concerns
V	High scores on this factor reflect concerns about punishment. High scores were associated with concerns about fines, beliefs that others would drink less or arrange for alternative drivers to avoid detection, intentions to leave later than usual if necessary, and longer-term residency.	Punishment Concerns

The effect of classification of drink-driving risk (as detailed above) on factor scores is shown in Table 13.

The only significant effect in Table 13 was that relating to the effect of risk classification on scores on the “punishment concerns” factor. A post hoc analysis indicated that there was a significant linear trend ($F_{(1,221)} = 5.7, p < .05$), suggesting that higher risk classifications are associated with stronger concerns about punishment, longer residency in the area, and beliefs that others would drink less or use alternative drivers.

Table 13: Factor Scores and Risk Classification

Factors	Mean Factor Scores			Significance Test Result
	Light drinkers	Heavy drinkers	High Risk	
Avoidance Behaviour	-0.13	-0.12	0.47	n.s.
Concern for Others	0.64	-0.11	-0.19	n.s.
Care	-0.23	0.21	-0.43	n.s.
Time Concerns	-0.13	-0.28	-0.21	n.s.
Punishment Concerns	-0.53	0.05	0.99	p<.05

The five factor scores were used as the input to a cluster analysis to try and identify groups of similar respondents. This technique has been used in a number of MUARC projects. The analysis indicated that five clusters of respondents could be identified using Ward's method of clustering and Mojena's method to specify the appropriate number of clusters (see Blashfield & Aldenderfer, 1988). The relationship between the clusters and the five factors is shown in Table 14.

Table 14: Clusters Membership and Factor Scores

Cluster	N ²	Mean Factor Scores				
		Avoidance Behaviour	Concern for Others	Care	Time Concerns	Punishment Concerns
A	67	-2.5	-1.5	-1.6	-0.2	-0.9
B	24	0.6	-0.5	5.2	0.2	0.4
C	12	-0.9	7.1	-0.8	-0.5	-0.5
D	27	1.9	-0.2	-1.3	-0.2	5.0
E	32	4.5	-0.6	-0.5	-0.6	-2.3
Sig. Test Results		p<.05	p<.05	p<.05	p<.05	p<.05

There were significant differences between clusters on all five factor scores. Post hoc analyses of all pairwise comparisons (using a Bonferroni correction for elevated Type I error rates) revealed the differences between clusters which are summarised in Table 15.

Table 15: Post Hoc Analysis of Differences Between Clusters

Factor	Relationship Between Clusters				
Avoidance Behaviour	E	>	D B	>	C A
Concern for Others	C	>	D E B	>	A
Care	B	>	E C D A		
Time Concerns	B A	>	C	>	D E
Punishment Concerns	D	>	B C A	>	E

² 62 respondents were not allocated to any cluster due to missing data in one or more of the factor scores used as the basis for the cluster analysis

Descriptions of each Cluster are presented in Table 16, based on the pattern of results shown in Tables 14 and 15 which reflect the behaviours and beliefs of respondents in relation to drinking and driving summarised in the factor analysis.

Table 16: Descriptions of the Five Clusters

	Description	Suggested Label
A	Members of this cluster were unconcerned about likely crash-related consequences after leaving the hotel and were unlikely to engage in avoidance behaviours to minimise the risk of driving after drinking.	Nonchalant
B	Members of this cluster were the most likely to take more care to avoid being stopped and were also the most concerned about time-related issues.	Careful
C	Members of this cluster were the most concerned about others and were the least likely to engage in avoidance behaviours. They were also relatively less likely to go to the hotel.	Empathic
D	Members of this cluster were the most concerned about punishment, believed that others would arrange for alternative drivers or would drink less to avoid detection, and were longer-term residents of the area.	Worried
E	Members of this cluster were the most likely to engage in avoidance behaviours to minimise the risks of driving after drinking. They were also the least likely to be concerned about fines or punishment and were the least likely to be worried about time-related issues.	Avoiders

There was only one significant difference between the enforcement experiences of the five clusters. Clusters differed in their experiences of having been a passenger when the driver was breath tested away from RBT ($\chi^2_{(2)} = 18.0, p < .05$). The difference between clusters is shown in Figure 6 (over the page). It is clear that the “Careful” drivers had experienced this more often than members of the other clusters, and that it was also a relatively common occurrence for the “Avoiders”.

The pattern of risk classification in each cluster is shown in Figure 7. It is apparent that respondents in the “Worried” cluster were more likely to be classified as high risk (44% were so classified) than were those in the “Careful” and “Empathic” clusters (20% and 17% respectively).

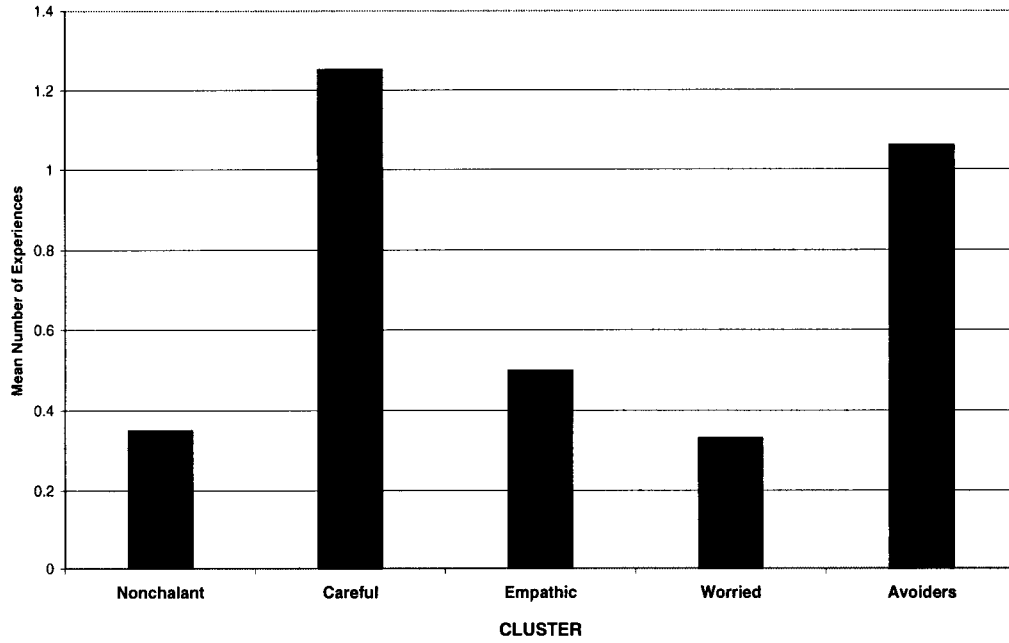


Figure 6: Cluster Membership and Mean Number of Experiences of Being a Passenger at a Non-RBT Breath Test

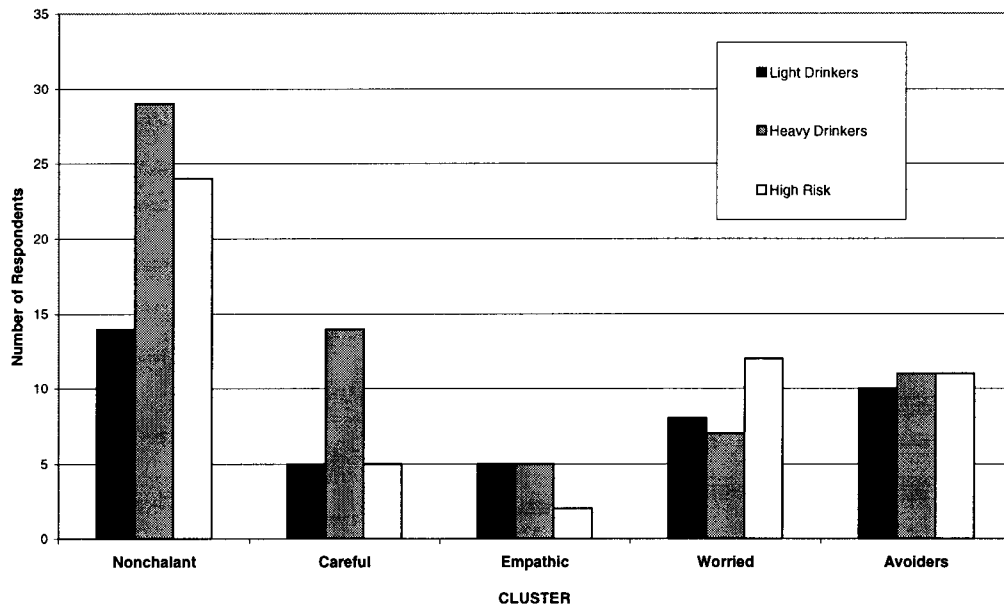


Figure 7: Cluster Membership and Risk Classification

It was considered worthwhile to investigate the effect of cluster membership on the relationship between risk classification and enforcement experience, reflecting the influence of lifestyle or other intra-personal characteristics on enforcement effects. Although the number of respondents in some clusters was relatively low (resulting in relatively low statistical power), the relationship between enforcement experience and risk classification was examined in each cluster using the Kruskal-Wallis method used earlier for the more-general examination of this relationship across the whole sample.

The results of these analyses are shown in Table 17.

Table 17: The Relationship Between Risk Classification and Enforcement Experiences for Each Cluster³

	Non-chalant	Careful	Empathic	Worried	Avoiders
Number of times tested at RBT	***			*	**
Weeks since last time tested at RBT					
Number of times tested away from RBT			*	**	
Weeks since last test away from RBT					
Number of evidential breath tests				**	
Weeks since last evidential breath test					
Number of times a passenger at RBT			**		*
Weeks since last time a passenger at RBT					
Number of times a passenger at a breath test away from RBT					
Weeks since last time as a passenger at a breath test away from RBT					
Number of people known tested at RBT					
Weeks since last other person was known to be tested at RBT					
Number of times people known to be tested away from RBT			*		
Weeks since last other person was known to be tested away from RBT					
Number of people known to have undertaken evidential breath tests					
Weeks since last other person was known to undertake an evidential breath test					
Number of people known to avoid punishment	**			*	
Weeks since last other person known to avoid punishment					
Total number of breath tests	***			*	**
Weeks since most recent breath test					
Total number of times a passenger at a breath test					*
Weeks since most recent time as a passenger at a breath test					
Total number of other people known to have contact with enforcement			*		
Weeks since most recent enforcement contact for another person					

Risk classification in the “Nonchalant” cluster was associated with the total number of breath tests recalled by the respondent, the number of times the respondent had been breath tested at a RBT station, and with the number of people known by the respondent to have avoided punishment. Figure 8 shows these relationships. In each case, the high risk and light drinker respondents were similar, with the heavy drinker respondents reporting relatively fewer experiences of RBT, fewer instances of being breath tested, and knowing relatively more people who had avoided punishment after detection.

³ The table presents the significance of Kruskal-Wallis test statistic.

* p < .10 ** p < .05 *** p < .01

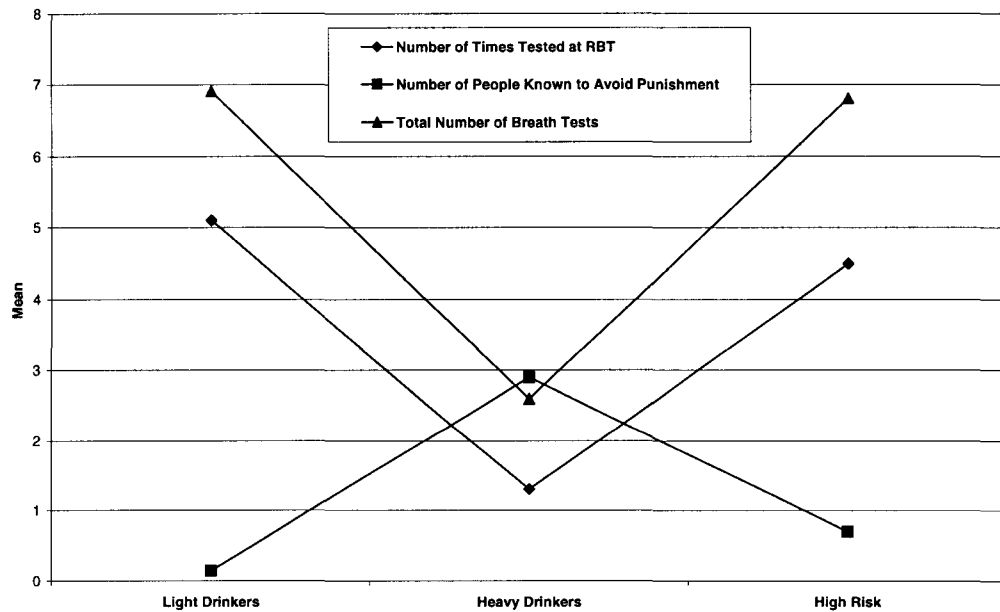


Figure 8: Risk Classification and Enforcement Experience for the "Nonchalant" Cluster

Risk classification in the "Careful" cluster was not significantly associated with any enforcement-related variables.

Risk classification in the "Empathic" cluster was related to the number of times the respondent had been tested away from RBT, the number of times the respondent had been a passenger at RBT, the number of people known to be tested away from RBT, and the total number of people known to have had contact with RBT. This is shown in Figure 9 (over the page). For each variable, the responses of high risk respondents suggested greater contact with and awareness of enforcement activity compared to those of the low and heavy drinkers respondents.

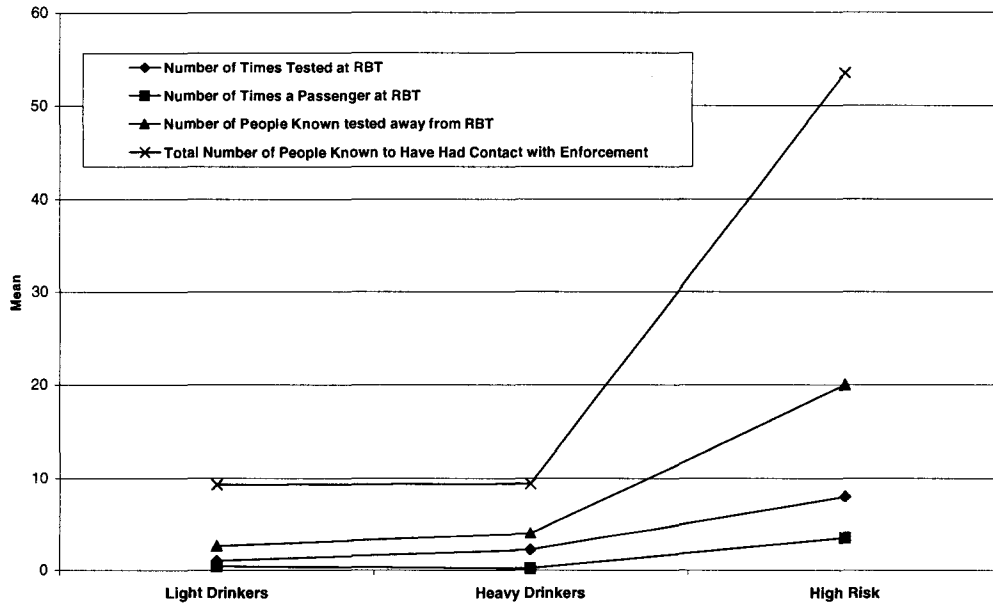


Figure 9: Risk Classification and Knowledge of Others Experiences of Enforcement for the "Empathic" Cluster

Risk classification in the "Worried" cluster was associated with the number of times the respondent had been breath tested at and away from RBT, the number of times they had been subjected to an evidential breath test, the number of people known to avoid punishment, and the total number of people known to have had contact with enforcement. These results are shown in Figure 10.

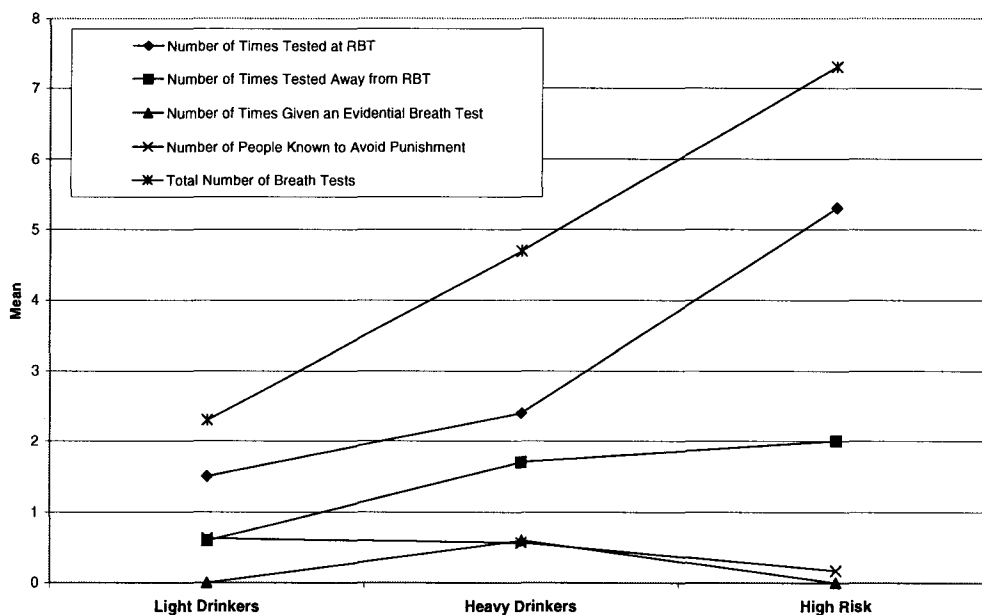


Figure 10: Risk Classification and Enforcement Experience for the "Worried" Cluster

Higher levels of risk classification in the “worried” cluster were associated with more experiences of being breath tested at and away from RBT stations, and more breath tests in general. Classification as a high risk was also associated with knowing fewer people who had avoided punishment. Experience with evidential breath tests was confined to those respondents classified as heavy drinkers.

Risk classification in the “Avoiders” cluster was associated with the total number of breath tests reported by respondents, the number of tests at RBT, the number of times the respondent had been a passenger at RBT, and the total number of times the respondent had been a passenger during any type of breath test. Figure 11 shows these relationships.

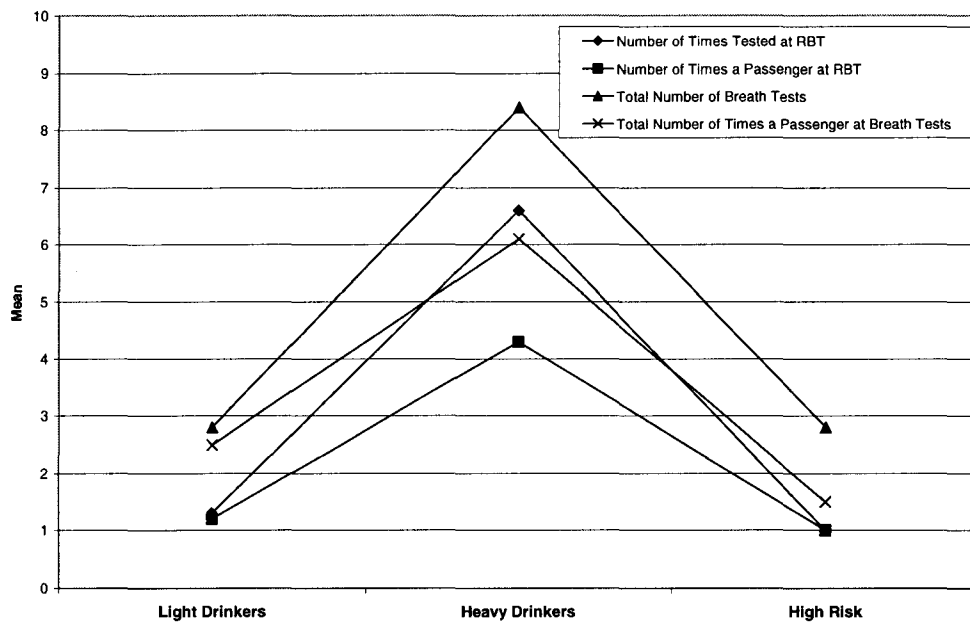


Figure 11: Risk Classification and Enforcement Experience for the "Avoiders" Cluster

For each variable in Figure 11, heavy drinkers respondents reported more enforcement experience than either the light drinkers or high risk respondents.

DISCUSSION

This study represents an extension of an earlier one reported by Harrison (1996a) based on a smaller sample of hotel patrons from a smaller number of rural towns in Victoria. Its main aim was to examine the self-reported behaviours and attitudes of rural hotel patrons to explore the factors associated with drink-driving and the effect of enforcement activity.

Analysis of the data involved dividing respondents into groups with higher, moderate, and lower-risks of drink-driving based on self-reports about their most recent visit to the hotel and the current visit. It needs to be reiterated that the risk classification provides information about both the relative consumption of alcohol and the likelihood of driving after consuming alcohol. The light drinker respondents, on the two occasions used to classify them, consumed relatively little alcohol on a drinks per hour basis. The heavy drinkers group had consumed relatively larger quantities of alcohol but did not intend to drive from the hotel (based on their stated intention). Some in this group may have driven in spite of their response to the survey items, but it is not possible to estimate the number of respondents in the heavy drinkers group who should be in the high risk group. The high risk respondents were those who had consumed similar amounts of alcohol to those in the heavy drinkers group but who intended to drive from the hotel. Differences between the light drinker respondents and other respondents would reflect differences relating to the consumption of alcohol, while differences between the moderate and high risk groups would specifically reflect factors associated with driving after relatively high levels of alcohol consumption.

Compared to the results reported in Harrison (1996a), the method used here to classify respondents as high-risks was relatively liberal. Only 10% of Harrison's (1996a) sample were classified as drink-drivers, while the high-risk classification was applied to 32% of the current sample. The liberal definition was interpreted here as a reflection of the likelihood of patrons driving after consuming larger amounts of alcohol rather than as a clear definition of illegal drink driving. The greatest benefit of this approach was that the number included in the higher risk category was greater than in the earlier study, allowing a more powerful statistical analysis of the factors associated with this behaviour.

Classification as a relatively high-risk was more common for males than females. This is consistent with the literature and reflects the ongoing importance of targeting countermeasures at males in rural areas. Harrison (1996b, 1998) supports this in noting that the percentage of drink drivers who are males is marginally higher in rural areas (91.8%) than in the metropolitan area (86.7%). In considering the use of demographic information as an aid to targeting countermeasures, it is also important to note that those classified as relatively high-risks in the present study were older and had lived for a longer period in the local area compared to other respondents.

The results concerning the experiences of respondents with enforcement suggested that knowing about the experiences of others in relation to drink-driving enforcement was more common than having direct or personal experience of enforcement. This is consistent with Harrison's (1996a) discussion of the likely importance of word-of-mouth reports of enforcement activity in small communities with a high level of social cohesion such as is characteristic of Australian rural communities (Amato, 1981, 1983).

The results of the surveys were similar to those reported by Harrison (1996a) in relation to the enforcement experiences of respondents. The 64% of respondents in the current

involvement of lifestyle and social factors in the action of the word-of-mouth effect

⁴ Determining the nature of causal relationships between variables proved difficult in the present study. In general, the author has chosen to emphasise the use of the simplest or most pragmatic interpretation of the results.

regarding enforcement discussed in Harrison (1996a). High risk respondents, who spend more time at the hotel than other respondents and who would be expected to have similarly inclined social contacts and friends might be expected to know of more people who have had contact with drink-drive enforcement.

Thus the results of the survey partly represent the effect of social and lifestyle factors on the experience of drink-driving enforcement. The results also underscore the resilience of drink-driving behaviours in the face of drink-driving enforcement activity. The high-risk respondents tended to have relatively high levels of experience of drink-driving enforcement and, like other respondents, were generally concerned about detection and punishment but they continued to drive after consuming relatively large amounts of alcohol. This is consistent with Harrison's (1998) argument that some offenders may be less influenced by enforcement and publicity than others. This result adds emphasis to the importance of targeting enforcement and public education material more directly at high risk drivers in rural areas.

The factor analysis conducted as part of the present study suggested that the items relating to attitudes, beliefs, and self-reported behaviours of respondents could be reduced to five factors which would reflect the underlying variability of the responses to these items. The five factors accounted for 37.5% of the variance in these survey items. In general, scores on the five factors were unrelated to the risk classification of respondents, with the exception of scores on the "punishment concerns" factor where high risk respondents scored higher than other respondents, suggesting that high risk respondents were more concerned about punishment and that they were more likely to believe that others used specific techniques to avoid detection.

The cluster analysis conducted on the derived factor scores suggested that there were five groups of respondents with similar beliefs and self-reported behaviours. The percentage of respondents in each cluster classified as high risk suggested that the likelihood of respondents drink-driving may have been related to cluster membership. Respondents with beliefs and behaviours suggesting that they were concerned about others (the "empathic" cluster) were the least likely to be classified as high risk (17%), while those who were most concerned about the punishment-related consequences of their behaviour (the "worried" cluster) were the most likely to be classified as high risk (44%). This suggests that worrying about the risk of detection may not be enough to stop drink-driving behaviour for some offenders. Recent theoretical development similarly suggests that contextual and lifestyle factors may be as important in the decision to drive after drinking as concerns about detection.

With one exception, risk classification in each cluster was either unrelated to enforcement experience or was related in such a way that it was clear that high risk respondents were more likely to have contact with enforcement activity. The exception to this pattern was in the "avoiders" cluster, where high risk respondents reported significantly less contact with RBT enforcement activity than heavy drinkers respondents and the same amount of contact with enforcement as the light drinkers respondents.

The result for the "avoiders" cluster suggests that the strategies used by high risk members of this cluster to avoid detection are successful. In spite of their behaviour – which suggests a greater likelihood of driving after drinking at the hotel – these respondents report less contact with drink drive enforcement activity (either as a passenger or as a driver) than respondents who drink at the hotel but are less likely to drive afterwards. Respondents in this cluster were more likely to report using alternative routes or back-roads, driving faster, and leaving the hotel later to avoid being stopped. For the high risk

respondents, these avoidance behaviours have apparently resulted in less contact with enforcement activity, reinforcing the need to develop enforcement techniques and strategies to target this behaviour in rural areas. It may be useful to conduct further research in this area to further identify the characteristics of the “avoiders” cluster to help in the targeting of public education programs.

The more general association between high risk levels and higher levels of contact with enforcement activity in the other clusters underscores the importance of social and lifestyle factors in the relationship between drink driving behaviour and contact with enforcement. These data are consistent with a view that high-risk behaviour and contact with enforcement activity are together associated with these factors.

The consequences of these results for the role of enforcement are unclear. While it might be argued that the higher levels of contact with enforcement reported by the high risk respondents may have a general effect on the likelihood of offending such that without enforcement activity there might be more people in the high risk category, the results reported here are also consistent with a view that stresses the importance of factors other than contact with enforcement on the likelihood of drink driving. It is argued here, therefore, that the data presented above are supportive of an approach to drink-driving which emphasises the role of causal factors such as lifestyle and social factors in addition to the current emphasis on enforcement, which given its success should continue to be the centre of focus of drink-driving programs.

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