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TRAFFIC ACCIDENT RESEARCH UNIT

DRINK-DRIVING BACKGROUND MATERIAL

by

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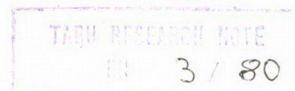
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1. The effect of alcohol on driving.

The driving task involves the processing of signals received by the sensory organs, the making of decisions based on those signals, and the performance of various physical tasks. The driving task has to be performed under conditions in which other drivers are competing for road space, and under the influence of a diverse range of social pressures involving, amongst other things, an accurate and fast assessment of risk-taking.

The main effect of alcohol appears to be its ability to depress the functions of the central nervous systems. It is in short like an anaesthetic. It reduces inhibitions that normally control social behaviour. It releases aggression. It increases risk-taking whilst reducing the driver's ability to judge risks and to perform the driving task. (See Starmer 1980)*.

The influence of blood alcohol on driving skills was examined by Lovibond and Bird (1971) of the University of N.S.W. They established in a battery of tests, the superiority when sober of 16 racing and rally drivers, over 26 ordinary drivers, thus validating the tests as measures of driving skill. The drivers were then tested, after three practice runs, at four levels of blood alcohol concentration (b.a.c.) namely 0.00, 0.05, 0.08 and 0.10 per cent.

By about 0.05 per cent b.a.c. the rally and racing drivers had lost their advantage over sober ordinary drivers, in tests of ability to corner, of track-ing, braking smoothness and lane control. At 0.08 per cent one competition driver lost control in a corner.

* See references on page 17.

Heavy drinkers showed as much impairment from alcohol as did light drinkers. In many tests there was a proportional decrease in performance, as b.a.c. was increased from zero.

As Birrell (1974) said of this study "the only aspect of driving improved by alcohol is confidence".

The influence of alcohol on judgement is well illustrated in a study by Cohen cited by Birrell. Bus drivers of great experience were given the task of driving between markers and showed skill in so doing. At blood alcohol concentrations of 0.06 per cent however, many experienced drivers attempted to drive between markers spaced less than the width of the bus.

The failure of coffee and fruit juices to counter the influence of alcohol on driving has been described by Teo (1975). The potentiating effect of some drugs on the alcohol affected driver, and the diverse effects of some prescribed drugs have been described by Starmer (1980).

A stimulating account of drink-driving, written for the layman, has been prepared by Birrell.

Figure 1 is based on a graph published by Birrell. It incorporates data from four famous studies of alcohol-related accidents usually termed the Evanston, Grand Rapids, Toronto and Manhattan studies.

Figure 1 illustrates that the risk of crashing at various levels of blood alcohol concentration is about:

3½ times the risk when sober, at 0.08 per cent b.a.c., and
26 times the risk when sober, at 0.15 per cent.

The significance of the 0.08 level is that it is the legal limit at and above which driving is illegal in New South Wales and in every other State of Australia except Victoria where the limit is 0.05.

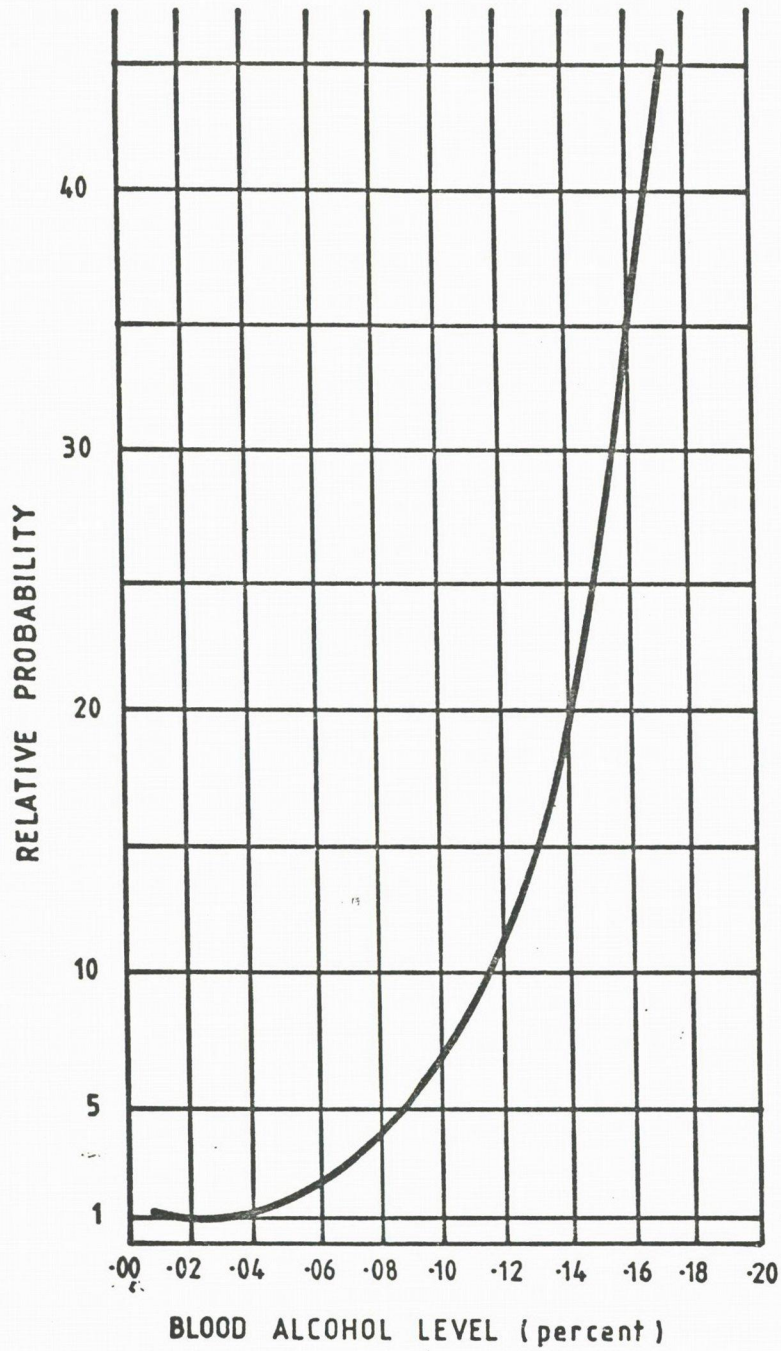


FIG. 1 RELATIVE PROBABILITY OF CRASHING
AT VARIOUS LEVELS OF B.A.C..

Starmer and Teo (1978) have published results of drinking Australian beer, in which male unfed medical students drank four "middies" (280 ml glasses) in one hour, bringing their b.a.c. above 0.08 per cent. In later work they showed that after a meal one more middy could be drunk before reaching 0.08 per cent and that the range was 4 to 6 middies in the first hour of drinking, for all conditions of men. They have also shown that further drinking at a rate of one middy per hour is sufficient to maintain a 0.08 per cent b.a.c.; this is because the body can only digest in one hour, the alcohol in about 280 ml of beer. Any rate of drinking above one middy per hour will result in an ever-increasing concentration of alcohol in the blood and brain.

It was this work by Starmer and Teo that provided the basis for the Unit's advice to the public as to allowable amounts of drink before driving.

The significance of the 0.15 per cent b.a.c. level is that half those convicted under N.S.W. Breathalyser legislation are over this figure. That is, half the convicted drink-drivers had at least 26 times the risk of crashing as when sober. (See Figure 2). Other information from the N.S.W. Bureau of Crime Statistics is shown in Table 1.

Year	Alcotests (i.e. roadside tests)		Breathalyser Analyses	
	Number of Tests	Percentage Positive	Number of Tests	Percentage Positive
1973	27,601	89.3	23,654	79.2
1974	25,861	82.4	21,882	78.2
1975	25,723	79.9	20,883	79.9
1976	25,823	79.6	21,194	79.0
1977	27,183	79.3	22,300	79.9
1978	29,059	82.6	24,837	79.9

TABLE 1: Alcotest and Breathalyser test results, N.S.W., 1973 to 1978.

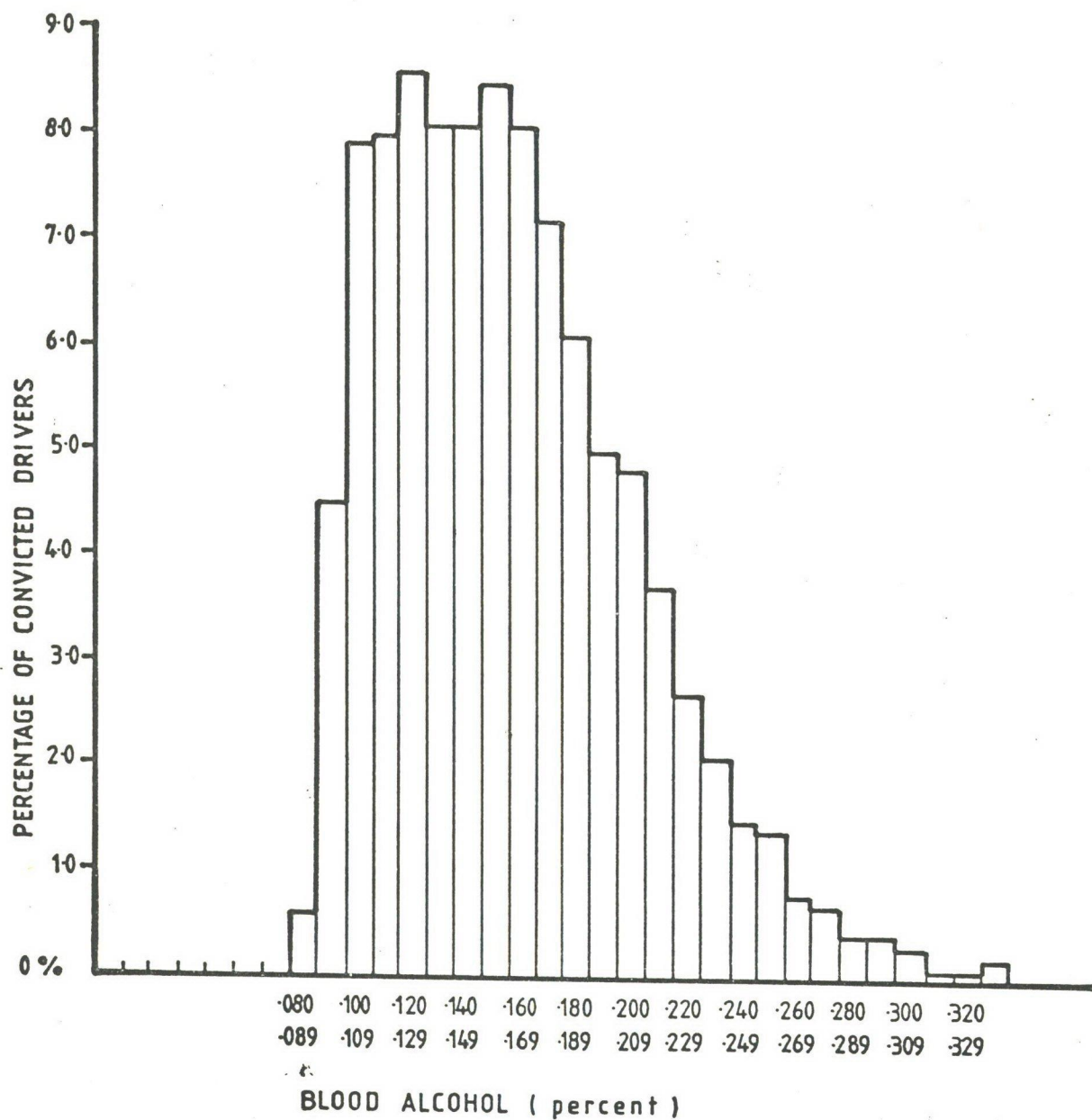


FIG. 2 DISTRIBUTION OF B.A.C. AMONG
CONVICTED DRINK DRIVERS, NSW, 1978.

An Alcotest is given at the roadside by police when they suspect drink - driving. Most of those showing "positive" will be taken to be Breathalyser tested as will those refusing the Alcotest. The overall success of the system is seen to be about 64 per cent.

Vesey and Johnstone found in their study that 45 per cent of the 94 dead motorcycle riders who were analysed were over the legal limit of 0.08 per cent at autopsy. Since there were 119 riders in the study as a whole, the range of riders over the limit should more accurately (but less precisely) be stated as from 35 to 56 per cent of the 119 riders, since the unknown 25 riders might have been under or over the limit.

For dead riders and drivers, Lukin (1978) has estimated that 30 to 60 per cent were over 0.08. Steps have now been taken to improve the reporting of b.a.c. measurements made at autopsies, in the hope of narrowing this range.

2. The young drink-driver.

The reason why the Traffic Accident Research Unit studies drink-driving is of course to reduce the road toll. Since our best estimate is that nearly half the riders and drivers who die in crashes are over the legal limit, clearly these studies of drink-driving have a great significance to the community. They have particular significance for the young, since the road crash is the cause of as many deaths among teenagers as all the other causes of death added together.

The reason why teenagers are so heavily involved is probably that they think that they can compensate their lack of experience by acquiring great skill in driving. That this is untrue can be seen from Table 2. (Herbert 1980).

Age Range (years)	15/19	20/24	25/29	Under 30
Licensed as car driver	7.4	14.6	14.3	36.4
Injured while driving	16.8	21.7	14.2	52.8
Killed while driving	15.7	20.4	13.5	49.9
Driving in fatal crash	16.5	21.8	14.5	52.9
Driving in any crash	15.4	20.3	14.2	49.9

TABLE 2: Percentage distribution by age of drivers, average crash statistics 1976 to 1978; licences held 1978, N.S.W.

The importance of experience can be seen from Figure 3.

An aspect of the human involvement in crashes which is open to some sort of control is one's exposure to the risk of crashing. It is very interesting that the safest drivers, from the point of view of the number of serious crashes they have per 100 licence holders, are the elderly. In 1978, there were 11.9 serious crashes for each 100 licence holders aged 17 years. This decreased steadily with increasing age until it reached a minimum of 2.4 at age 75 years. So 17 year old drivers had 5 times the number of crashes that 75 year olds had.

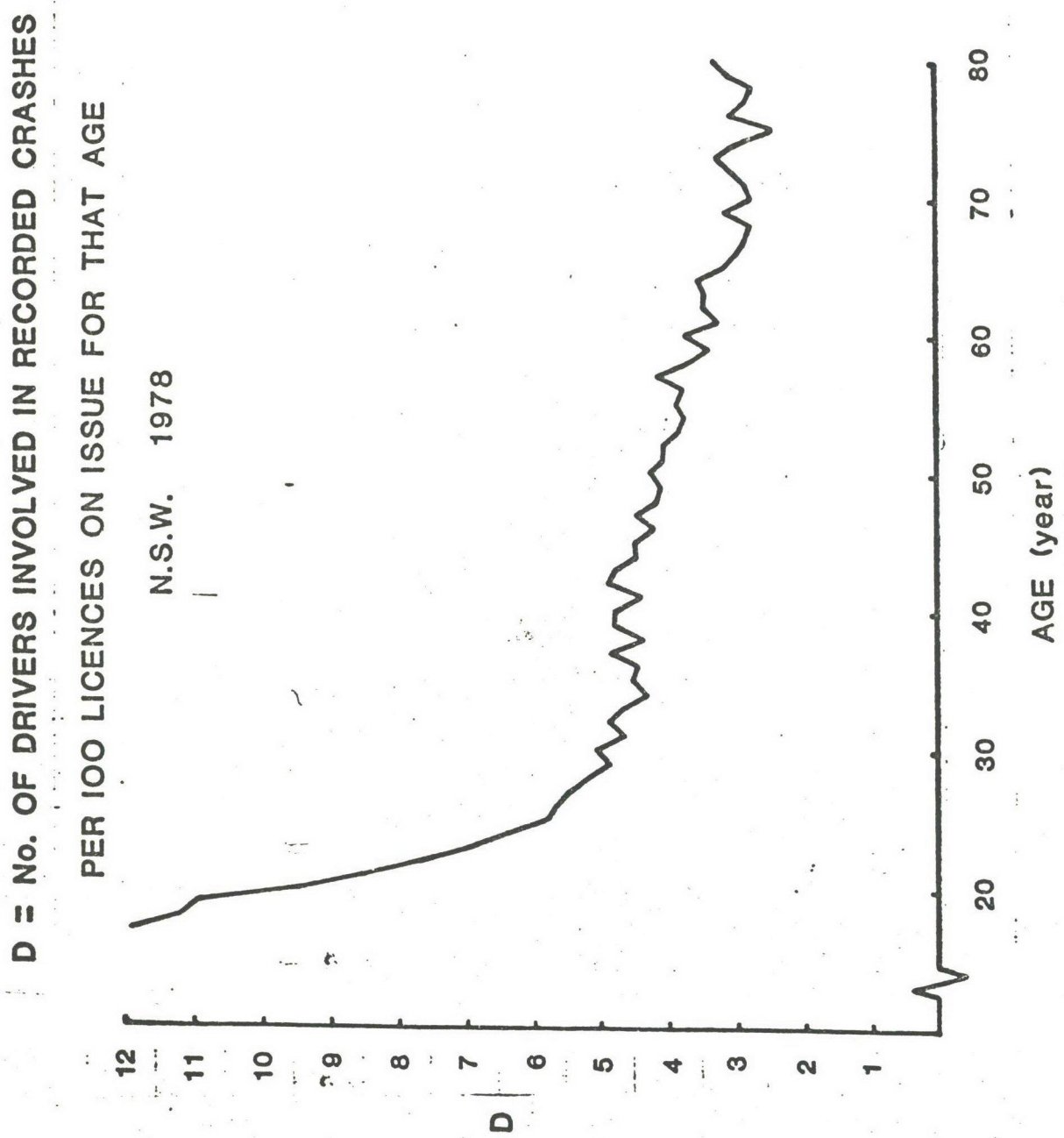
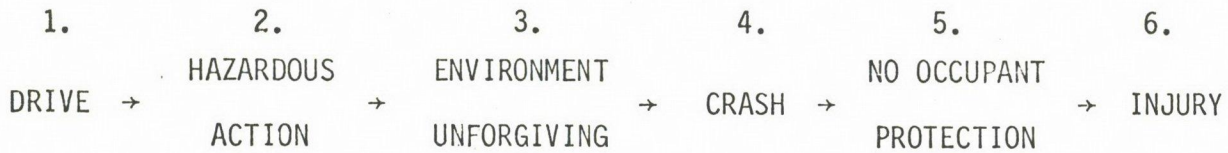


FIGURE 3: Drivers involved in crashes, per 100 licensed, N.S.W. 1978.

This amazes people. They feel that elderly drivers should be taken off the roads because they have more crashes. The truth probably is that elderly drivers are very clever at picking the times at which to drive, so as to minimise crashes. How they make their choices is not known, but one could speculate that they avoid wet weather, night driving and drink-driving, and do not drive when they are feeling unwell. In other words they minimise their exposure to difficult driving conditions. So they are much safer than young drivers because of the way they use their great experience and their maturity to select the conditions under which they drive.

3. Breaking the chain of events.

The chain of events that leads to a casualty in a car crash can be illustrated by a line diagram:



If we are to prevent the injury, we can do so by breaking any one link in this chain. Breaking several links improves our chances of surviving a journey.

1. We need not drive.
2. We could drive more defensively.
3. We could provide a safer driving environment (no roadside poles, all roads divided, no intersections).
4. Any of 1, 2 and 3 might allow us to avoid a crash (this is what generally allows us to drive to our destination).
5. We could provide and wear a seat belt.
6. Any of 1, 2, 3 and 5 might prevent the injury.

Drinking before driving adds a new dimension in that the possibility of (2) (Drive more defensively) is greatly reduced. It also reduces (5) (The likelihood of any seat belt provided, being worn). There are also problems in hospital treatment, brought about by drinking alcohol and affecting survival. These could be added to make a longer chain of events to SURVIVAL.

4. Penalties and other deterrents for drink-driving.

I am indebted to my colleague Dr. Dawn Linklater for the following:

A deterrent is something that discourages action by creating fear or dislike of the trouble that is likely to eventuate if the action occurs. Some of the deterrents to unsafe behaviour in traffic may arise because the driver fears the known consequences to traffic crashes (car damage, journey interruption, painful injury and disrupted life style, or even death to car occupants or other road users). These deterrents may be called informal penalties and include such things as fear of the disapproval of one's peers and the desire to conform to the behaviour that is approved by society.

A social system or collection of people often disapprove of action that threaten the survival of that society. Some of this disapproval is formulated in legislation which prescribes formal penalties to be imposed on the person committing the prescribed action.

Most of the informal penalties are concerned with "attitudes". But it is these attitudes themselves which lead the society to draw up legislation aimed at ensuring the required behaviour by formally punishing recalcitrants.

Attempts to change behaviour by legislating for formal penalties alone (where society's attitudes are not favourable) will not be successful unless there is a high probability of the detection of the offence and imposition of the penalty. It is the informal penalties, particularly the attitudes of society, that provide the most effective deterrent. For this reason attempts to change behaviour should be made across a broad front which involves education (information dissemination and attempts to change attitudes) as well as the enforcement of any formal penalties enacted by the legislature.

5. The role of the mass media campaign in changing road user behaviour.

My colleague Mrs. Kathleen Freedman has contributed the following statement on the SLOB campaign:

Most mass media campaigns have no impact whatsoever on road user behaviour or attitudes. Yet they are one of the most commonly used countermeasures to crash loss. This need not be too much cause for alarm were it not for the fact that these campaigns are highly expensive and each year compete successfully for a large part of the traffic safety budget. Where countermeasures are competing for funds it becomes important to look to the effectiveness of a particular measure in achieving its objective. It is surprising and regrettable that the mass media campaign is so often allowed to escape this close scrutiny.

Each year hundreds of thousands of dollars are spent in Australia on mass media campaigns. Many of these are not evaluated at all. Many attract a great deal of public attention but are found to have no effect on road user behaviour.

The value of mass media campaigns in communicating information is well - established and is not in question here (Freedman et al. 1975, Schreiber et al. 1975). It is an important part of any traffic safety education programme and is often needed before attitudes and behaviour can be modified. However, providing information is rarely sufficient to bring about widespread behavioural change.

This obsession with the mass media campaign as a cure-all is not a peculiarly Australian problem, but a world-wide one. In the U.S.A. mass media campaigns continue to urge motorists to use seat belts despite the overwhelming evidence, demonstrated some 10 years ago, of the futility of this approach. In 1968-69 \$US 51 Million was spent on advertising to persuade adults to use seat belts. At the end of the 18 month campaign, a before-after study showed that seat belt usage was unchanged from its initial low level (Avery 1973).

This poor past record does not mean that we should abandon the use of the mass media campaign but rather that we should use it far more selectively. Under certain conditions it can be a highly valuable tool.

TARU has an ongoing programme of research into mass media communications. In 1974 we conducted the SLOB campaign as part of this programme. It was the first traffic safety campaign in Australia to be subjected to close scientific scrutiny.

This campaign is now regarded as a watershed in the use of the mass media to change drink-driving behaviour. It is an outstanding example of what can be achieved with a properly researched, creatively designed campaign. It also highlights the limitations of the mass media campaign in a situation where other key influences are operating against change. Because of its significance it is worth looking briefly at its development and effects.

The SLOB campaign grew out of a large scale survey of community drink - driving habits and attitudes conducted by TARU in 1971 (Freedman et al. 1973). It was clear from the results of this research that permissive social attitudes were the major cause of irresponsible drinking and driving in the community and until they could be changed, this behaviour, and its serious consequences, would persist. Any attempt to influence behaviour directly, either by coercion (e.g. Breathalyser legislation) or persuasion (e.g. urging people to "take a cab") would be likely to fail because of the strong influence of social pressures that were encouraging the problem behaviour. It was decided to mount a mass media campaign to try to change social attitudes. Behaviour would start to change only with the growth of social pressures against drinking and driving as attitudes became less permissive. The SLOB campaign was aimed therefore not at road user behaviour directly but at the attitudes supporting this behaviour. Significant behavioural change was seen as the long-term result of a continuous attack on social attitudes. This campaign may be seen as the first step in this attack.

For the SLOB campaign, an extensive programme of concept development was undertaken over a 6 month period to develop the communications approach likely to be most effective. Psychologists from TARU worked closely with creative personnel from the selected advertising agency on this research. (Freedman et al. 1979).

The group discussions highlighted the difficulties in changing drink - driving behaviour. The young male driver is in a real predicament. He is aware of the dangers, but social attitudes have created a situation for him where the benefits for irresponsible drinking and driving far outweigh the costs. Driving after drinking is frequently rewarded. It means convenience. But more importantly it means social acceptance at a time when this need is strongest. Most young men actually arrive home without incident after drinking. The unpleasant consequences such as physical injury or being caught are seen as unlikely and so have minimal influence on behaviour. On the other hand, more responsible behaviour such as limiting drinks, or refusing to drive home after drinking too much is in fact likely to incur a heavy penalty in the form of social ridicule and ostracism. When "ability to hold your alcohol" is taken as a sign of manhood, when a car is the key to social and sexual success, a symbol of maturity and a means of achieving privacy, it is little wonder that advice to "limit your drinks" or "take a cab" falls on deaf ears. There is far too much at stake. A campaign with these simplistic messages would be sure to fall.

In the course of the concept research it became apparent that many young men felt trapped by the system. They resented being subjected to such social pressure and were often looking for an "out" to the drinking treadmill which would not reflect negatively on their masculinity. It became clear that a campaign which helped provide this "out" could strike a chord, and would be unlikely to provoke defensive reactions.

Thus the concept of the SLOB emerged. This campaign was designed to help those young men who wanted to go against group pressure but were afraid to. It had two objectives, to communicate information about drinking and driving and to change social attitudes. A reversal of the drink-driving social climate was needed so that irresponsible behaviour came to be viewed as anti-social.

The Australian Bureau of Statistics was engaged to carry out before - after surveys to evaluate the SLOB campaign. (Scott). These surveys showed that it achieved both its communication objectives. It resulted in a dramatic increase in knowledge about alcohol and traffic crashes. There was a small but statistically significant change in attitude in the desired direction. After the campaign, young people were more likely to express disapproval of both the man who "drives after drinking 6 middies of beer" and the man who pressured his friend to do so. (Henderson). The SLOB campaign demonstrated that a well-researched, creatively designed mass media campaign can succeed in both informing the public and in changing attitudes to drinking and driving. However it also raised some important questions.

Given that mass media campaigns can be effective in changing drink-driving attitudes, are they cost-effective? Such campaigns are run at very heavy costs. The SLOB campaign cost \$150,000 with the bulk of this spent on media placement. To have long-term effects such that behaviour can be influenced as social attitudes change, such a campaign needs to be ongoing. And it is here that drink-driving campaigns are at a particular disadvantage. The "drink and drive responsibly" message must compete with the heavily funded alcohol advertising campaigns which are continually reinforcing existing permissive attitudes.

The SLOB campaign taught us that in the area of drinking and driving, mass media advertising is of considerable value in communicating information. However it would appear to be of limited value in changing attitudes or behaviour in the present social climate. When a relatively small change in attitude occurs at high cost and when a continuing educational effort is required to build on this change it becomes important to look to alternatives to the mass media campaign.

One such alternative now being explored is a drink-driving educational programme for secondary schools. It may be the case that in the long-term, it would be possible to bring about more substantial changes in public attitudes by concentrating on teenagers and children at school who within a few years will in fact be the young drivers most at risk. Once less permissive attitudes become more common among young people as a result of school programmes, mass media campaigns may then serve to reinforce these attitudes and spread them throughout the community.

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