

Psst – you know they’re not the same as us: A psychologist's view of motivation and behaviour change in relation to high risk road users

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Abstract

High risk road users present a difficult challenge for behaviour change programs. They continue to engage in risky behaviours despite the ongoing influence of community-wide programs that have often been shown to be broadly effective in reducing the frequency or severity of crashes.

There are two broad behaviour change options for high risk road users – increasing the intensity of already-operating programs, or developing and implementing new programs designed specifically to target them. The former approach is based on a belief that high risk road users will ultimately respond to the same behaviour change interventions, but that they are less responsive to current intensity levels. The second approach assumes that high risk road users are somehow immune to current interventions and will only respond to specifically targeted programs.

In either case, the challenge for road safety is how best to draw on psychological research and theory to foster the development and implementation of effective programs. Unfortunately, road safety programs are often based on theoretical notions about behaviour and behaviour change that are psychologically naïve. In particular, there is an implicit assumption in road safety research and program implementation that all road users have similar psychological characteristics and, more concerning, that they are similar in many respects to the people conducting research or developing and implementing road safety programs.

This paper introduces the concept of the road safety pyramid – a way of considering the potential value of behavioural research and theory in a road safety context. It is argued that theoretical development in road safety, behavioural research, and program development and implementation are all hindered by an implicit assumption that the vast mass of road users, and particularly the group engaging in high risk behaviours, has psychological characteristics that are similar in some way to the characteristics of researchers and practitioners. Examples of psychologically naïve approaches to behaviour change and behavioural research are used to demonstrate this argument, and the implications of the road safety pyramid for future research and program development targeting high risk road users are discussed.

Keywords

Driver behaviour, Psychology, Theory, Program development, Individual differences

Introduction

Harrison (1989) suggested there was a basic flaw in the development and implementation of road safety programs at that time, where interventions were proposed and ultimately implemented based on theoretical rationales rather than a well-researched understanding of the psychological mechanisms that might underlie the target unsafe behaviours. His argument was that the application of psychological methods in other areas of behaviour change started

with an analysis of the causal factors that contribute to the target behaviour, and that there had been little effort at that time to understand the psychological factors that underlie unsafe road use behaviours.

An observer of road safety research now might want to suggest that there has at least been some development in our understanding of the psychological processes that contribute to safe and unsafe road use. Some examples of this might include:

- The discussion of psychological factors in crash involvement by Elander et al (1993) – a broad review of psychological correlates of crash involvement.
- Research in the skill acquisition area being applied to novice driver problems – such as the research of Groeger and others (eg. Groeger & Brady, 2004).
- The application of naturalistic models of decision making to understanding offence behaviours in relation to speed and drink driving instigated by Harrison (eg Harrison, 2000a, 2000b, 2001).
- Investigations of the relationship between personality factors and unsafe driving behaviours (eg Harrison, 1998).
- Theoretical development and confirmatory research suggesting that basic psychological processes such as associative learning may play a role in the development of some safe and unsafe behaviours (eg Harrison, 2001b, 2005).

While these developments are positive and signal an interest in understanding the causal factors that contribute to our road safety problems, there are still some significant difficulties that challenge the value of work in this area. These include:

- The apparent failure of some researchers and practitioners to understand and apply a rigorous scientific method to the development, testing, and application of theory.
- An unwillingness on the part of many to give consideration to the role of basic psychological mechanisms and a preference for invoking complex mechanisms and processes, despite our shared appreciation, presumably, for Occam's razor.
- A reliance on what might be called armchair theories of behaviour in preference to theoretical notions derived from studies conducted in the real world, despite the success of the latter and the general failures of the former.
- An unwillingness to let go of cherished theoretical notions when they are clearly inconsistent with research evidence – with driver education and training remaining the leading example of this type of unscientific thinking.
- The involvement of broadly political processes in the development and implementation of behaviour change programs with one consequence being the dilution of scientific influence by populist notions about how to understand and change behaviour.

- The increasing dilution of expertise and declining recognition of expertise in behavioural sciences by a generalist view of road safety that assumes all opinions have equal value – an approach that, thankfully, is yet to take hold in surgery or aeronautical engineering.
- An increasing reliance on the “research” methods popular in marketing and advertising (eg. focus groups and surveys) and a declining reliance on sound, scientific methods with relevant outcome measures.
- An assumption implicit in research design and program development and implementation that program ideas developed by well-paid practitioners and tested against the type of people who attend focus groups will have an effect on the great mass of road users that constitute the real target group of road safety programs.

This latter point – basically an assumption that they (the target) are the same as us (the researchers and practitioners) is the starting point for this paper. The central argument developed here is that despite the apparent development of interest in underlying psychological mechanisms noted above, there are significant challenges to the development and implementation of sound behaviour change programs targeting unsafe behaviours that relate to the professionals involved rather than any underlying problem with the application of psychology to road safety.

Them and Us

There are significant and well-understood psychological and cognitive differences between people that influence their behaviour in many contexts. These include differences in temperament that most likely have their source in genetic and other prenatal factors (eg. Schmidt & Fox, 2002), personality differences reflecting the interaction between temperament and early experiences (eg. Oslon et al., 1990), differences in responses to events and contexts that reflect the role of basic psychological processes in early and ongoing experiences (eg. McNally et al., 2006), and a broad range of cognitive differences that reflect genetic, biological, and experiential differences (eg. Rosenbaum, 2001). These all interact, in turn, with social and broader cultural influences resulting in complex differences between individuals and between groups of individuals in the community.

These differences between people are important. Road safety programs give some emphasis to them when attempts are made to tailor public education materials to a specific target audience, but there is little evidence that these attempts are successful. Indeed, this gathering of road safety experts to discuss behaviour change programs for high risk groups is evidence both that there is some interest in better tailoring of programs and that we have so far had only limited success.

One problem may be that road safety experts involved in the development and implementation of new programs are held hostage by their own temperament, personality, experiences, cognitive mechanisms, and social context. A greater concern is that the research used to underpin new programs and then to evaluate their outcomes is similarly held hostage without researchers and practitioners having a high level of awareness that their personal characteristics influence their work.

Research methods in common use give a sense of the magnitude of this problem. It is not unusual to rely on research methods that assume some minimum level of written or spoken language skill and some minimal level of comfort with written or spoken language on the part of research participants. Research methods such as discussion-group based methods and surveys using written or telephone-based instruments are examples of this type of research method. These methods assume something about the temperament, personality, experience, and cognitive skills of potential research participants that may not be true. Of equal importance, these methods rely on an assumption that all participants will be similar in the way they process and interpret the content and context of the research instrument or method. How often do road safety researchers attempt to ensure that each item of an instrument like the Driver Behaviour Questionnaire is interpreted in the same way by all participants?

The use of research methods that make untested assumptions about literacy, language-related abilities, or even comfort in a discussion environment cannot be viewed as scientifically sound. Despite this it is common practice for government road safety authorities to rely on discussion-group methods and surveys as the basis for identifying target groups and developing and evaluating road safety initiatives.

Perhaps more concerning – much of our research assumes that the characteristics of research samples in relation to temperament, personality, experience, and cognitive skills are representative of the same characteristics in the broader population to which the research is generalised. Apart from the occasional attempt to compare sample characteristics to broader demographic characteristics in the population measured in population census collections, there is rarely any attempt to ensure that the psychological and cognitive characteristics of a research sample are representative of the broader population.

It seems reasonable to assume that the characteristics that lead some people to take part in research studies, surveys, or discussion groups for market research companies (when most people do not) set them apart from the broader population. If this is so, and if these characteristics are in turn related to the response to road safety programs and road safety behaviour in general, then it is almost certainly unreasonable to assume that we can generalise our research outcomes to the broader road using population.

The results of studies using samples that are biased in relation to psychological and cognitive characteristics would be expected to lead to an understanding of safety-related behaviours as they relate to people with the particular characteristics of sample members rather than the population. Road safety initiatives developed using research involving samples of this type might be expected to have their greatest influence in that part of the population that shares the sample's psychological and cognitive characteristics. It may not be surprising, then, to find that evaluations of these programs (again using the same type of research sample and methods) produce positive outcomes while we continue to note challenging high risk behaviours from some members of the driving population.

An example of the problem is found in Harrison (1998), who used occupation data and a psychological model of career choice (Holland, 1973) to assign personality characteristics to drink driving offenders detected by the Victoria Police, and compared these to normative data to assess the relationship between the personality characteristics of a group of high-risk road users to the broader population. The data were derived from Police records, and so were fully representative of the population of drink drivers detected by Police. This study identified two groups of male offenders defined in terms of their personality characteristics that together

accounted for fifty-eight percent of drink drivers in the sample – about five times the expected proportion of the population with these two personality “types”.

The key characteristics of the larger of the two groups (asocial, reserved, ordered, unimaginative, concrete) would be expected to lead them to avoid volunteering for research studies. The key characteristics of the smaller of the two groups (16 percent of the drink driving sample) (socially friendly, optimistic, adventurous) might lead them to volunteer to be part of a research sample if asked (and if motivated). It is likely that research focusing on drink drivers will recruit a sample biased towards the smaller of the two largest groups of drink drivers (defined in personality terms), and it would be unreasonable to assume that any result from this research could be generalised to all drink drivers. Indeed, program development research using discussion group formats to assess, for example, public education material may result in recommendations for new drink driving programs that are inappropriate for the largest group of male drink drivers simply because members of this group are unlikely to volunteer to take part in this type of research and are unlikely to contribute effectively as part of a group if they do volunteer.

The Road Safety Pyramid

The issue here is one of individual differences. These differences are likely to interfere in the effective development and evaluation of road safety initiatives that target high risk road users in particular. The study of personality characteristics of drink drivers noted above raises the possibility that the largest group of drink driving offenders may have personality characteristics that limit their involvement in research and, in turn, may reduce the relevance of drink driving countermeasures for them. It seems reasonable to assume that the same individual differences are likely to occur in relation to other high risk road use behaviours.

This issue is depicted in Figure 1. This Road Safety Pyramid that relies on some sweeping generalisations to show the potential problems with our current reliance on road safety knowledge held hostage by researchers and practitioners with particular characteristics who in turn make use of research samples drawn from relatively high-functioning members of the community to develop programs to influence target group members who are numerous but unlike the researchers or the research samples.

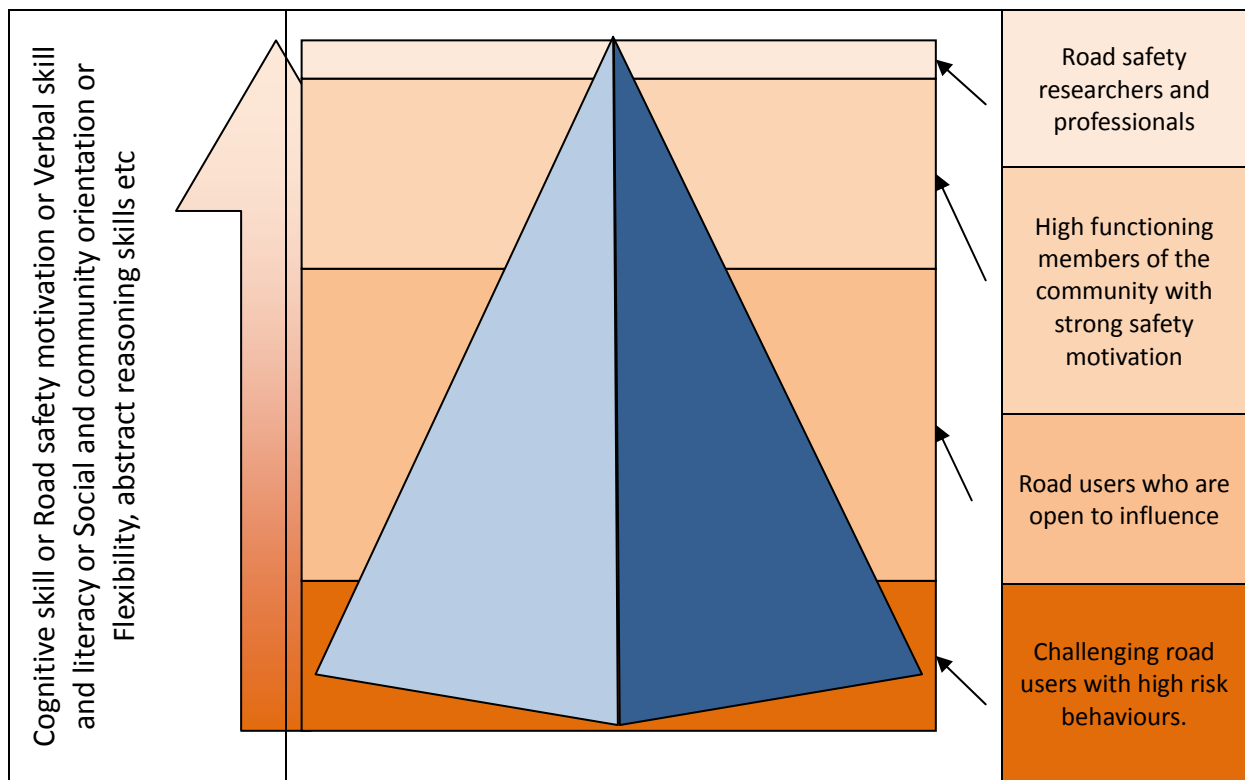


Figure 1: The Road Safety Pyramid

If the argument here is correct – that much road safety research cannot properly be generalised to high-risk road users – then there should be differences between the psychological and cognitive characteristics of high-risk drivers and low-risk drivers that are in turn likely to influence their involvement in road safety research studies. It was suggested earlier that this is true for drink-drivers – that almost half of male offenders have personality characteristics that would be expected to reduce their willingness to participate in research (and their ability to do so).

Elander et al. (1993) reviewed the association between a broad range of personal characteristics and crash involvement. They report some level of association between crash risk and factors such as psychological disturbance, personality disorder, interests characterised as non-intellectual and non-aesthetic, hostile or aggressive behaviours, conflict in family relationships, risk taking, low levels of maturity, impulsivity, emotional instability, unhappiness, and antisocial motivation and behaviours. More-recent research (eg. Dahlen et al., 2006; Fernandes et al., 2007; Ulleberg & Rundmo, 2003) has provided some support to the notion that personality characteristics play a role in crash risk, but perhaps in more-complex ways than anticipated in some of the research reviewed by Elander et al. (1993). There is also reasonably consistent evidence linking cognitive ability and crash risk – both at the extreme where disease processes or injury interfere with cognitive skill (eg. Borromei et al., 1999; Uc et al., 2004) and in relation to normal variation in cognitive skill (eg. Dunbar et al., 2001; Shinar, 1993).

There is at least some evidence that participation in research is also associated with personality characteristics. Pagan et al., (2006), for example, reported that people who did not participate in a study were judged by their peers to be more narcissistic and less assertive than those who did participate. Aviv et al. (2002) and Coye (1985) reported a relationship between personality characteristics and participation in a research project, and Norton et al. (1976) reported that continued involvement in a longitudinal survey study was related to academic performance and a measure of reasoning skill – with higher levels of cognitive ability predicting ongoing involvement. Romans-Clarkson et al. (1988) reported that refusal to participate in a study was more likely for older, never-married potential participants from lower socio-economic backgrounds. Finally, Waite et al. (1998) reported that participants in a research study requiring keeping a self-report diary were less likely to employ pathological defensive styles and were better adjusted than non-participants. Waite et al. concluded that poorly adjusted people may avoid participating in research where there is a risk of heightened anxiety or stress.

Wilson and Jonah (1988) lent empirical support to the notion that risky driving behaviours are part of a larger pattern of problem behaviours that co-occur in some individuals. These problem behaviours occur in the context of situational and personality factors that act to increase the likelihood that high-risk road users will also engage in high risk behaviours in other contexts. The personality factors that contribute to problem behaviours are similar to those associated with reduced participation rates in research – characteristics such as impulsivity and antisocial motivations along with patterns of alcohol misuse, and lower educational achievement (and presumably lower levels of cognitive skill).

We therefore have a situation in road safety research and program development where research studies devised by people at the top of the road safety pyramid in Figure 1 recruit participants who are likely to be in the middle of the pyramid, and who are likely to be dissimilar in many important ways to the potential target groups of high risk road users at the lower end of the pyramid, and seek to be generalisable to these targets.

Taking this view of the current situation in road safety research has some interesting consequences, including the following:

- It is almost certainly unreasonable to generalise research using survey methods and discussion groups to high risk road users unless there is clear evidence that the research has drawn a representative sample of participants from the target group.
- If commonplace research methods that rely on broad sampling methods do not provide evidence that the research sample is indeed representative of the target group, it seems unwise to use the research as the basis for policy or program development or evaluation.
- More-challenging research methods that do not rely on potentially-biased sampling methods need to be used to further our understanding of problem behaviours amongst high-risk groups. Sampling methods that draw directly from the population of interest should be used, and research methods that are less influenced by sampling biases (such as observational methods) or methods that make use of other data sources (such as crash data and enforcement data) should be used in preference to research methods that are inappropriate for the target group.

- Researchers have an obligation to demonstrate that their sampling methods result in a research sample that is relevant to the specific target group and target behaviours of interest. This will be a significant challenge for those researchers who rely on samples derived from the broader population or who use methods that are less appropriate for the target group.

Theories and Programs – the Pyramid’s Final Consequence

There is no doubt that the most obvious problem highlighted by the Road Safety Pyramid is a research problem – there are good reasons to believe that road safety research as it is often conducted is not generalisable to the target group of high risk road users. While the onus is on researchers to remedy this situation, there is a more-subtle problem that needs to be considered.

One reason for being concerned about the use of samples drawn from the middle of the road safety pyramid to address problems relating to people at the bottom of the pyramid is that research methods that rely on understanding attitudes and perceptions of road users (collected from survey responses or in a group format) are collecting information that is informed by the temperament, personality, cognitive skills, and experiences of the research participants. Generalising this understanding to high-risk road users who are unlikely to participate in research is difficult because their temperament, personality, cognitive skills, and experiences will differ – so their responses to road safety issues, messages, and interventions are unlikely to be the same.

This concern can be extended into the areas of theory development and program development. In both areas, the researchers and practitioners at the very top of the road safety pyramid are as much hostage to their own temperament, personality, cognitive skills, and expertise as are research participants drawn from the middle of the pyramid. Their understanding of the psychological and cognitive mechanisms that underlie behaviour, and their understanding of factors that might influence high risk behaviours, are based on their own psychological and cognitive characteristics. Without some emphasis on “grounding” the theoretical and program development process in real data drawn from the high-risk target groups, the work of those at the top of the pyramid is likely to be ineffective.

This has been apparent in relation to the development and application of theoretical notions about driver behaviour. The early (and unfortunately ongoing) reliance on the so-called deterrence model is a good example of this failure to “ground” research and theory in relevant data. This model’s reliance on subjective expected utility models of “rational” decision making as the basis for understanding decision making behaviour fails to take into account the large amount of research now available concerning bounded rationality and naturalistic decision making (see Harrison, 2000a, b, 2001a) and as a result has little relevance for the development of sound enforcement strategies targeting risk taking behaviours. Certainly the Victoria Police is now making use of enforcement planning methods that rely on a more-grounded understanding of how real people (lower in the pyramid) make behavioural decisions (Harrison, 2004).

Similarly, ongoing reliance on theoretical notions of behaviour that concern behavioural “intentions” rather than actual behaviour assumes that the focus on intention is reasonable when there is at least some evidence that behavioural intentions are not necessarily good predictors of actual behaviour and, perhaps more importantly in this context, when the

behavioural intention research does not generally involve the use of research participants drawn from high-risk target groups. Indeed, the reliance of behavioural intention research on questionnaire instruments for data collection suggests that generalising the results to high risk drivers lower down the Road Safety Pyramid may be unreasonable.

Concluding Comments

In some respects the problems discussed here in relation to road safety research and program development are similar to those encountered when discussing the development of early psychological theories about human behaviour. Early theoretical developments arose from an attempt to generalise from small clinical samples to the broader population – as if the psychological and cognitive processes of the small clinical sample were assumed to be representative. Freud and Jung developed their theoretical accounts of human psychology in this way – they drew their samples from a small section of what we might call the Psychopathology Pyramid (mostly middle class women) and then generalised to the rest of the pyramid.

Road safety research appears to be in danger of using the same (now-discredited) approach to science and there is a need to consider how best to “ground” our research and program development and evaluation so our work has relevance to high risk groups of road users. This challenge was raised some time ago (Harrison, 1989), and is more relevant today as we attempt to address high-risk road users who so far have been resilient in the face of a broad range of road safety interventions.

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