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# Drivers' illusions—no more risk

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**Abstract**

In this invited address to the International Congress of Applied Psychology, it is argued that traffic psychology has not had a major impact on accident prevention. The factors that have determined this are discussed. A review of the theories and models pertinent to drivers' risk taking and road user behaviour in general is presented. It is argued that both risk-homeostasis theories and task capability model are not sufficiently precise to be used as a basis for preventive measures. Attitude–behaviour models derived from social psychology have proved to be powerful in identifying motivational factors influencing road user behaviour, but the majority of empirical evidence is based on self-reported rather than observed behaviour. It is argued that individual differences can provide a basis for accident prevention, in particular driver training.


*Keywords:* Risk; Behaviour adaptation; Attitudes; Driver training

## 1. Introduction

Traffic psychology has expanded tremendously since the 1980s as is witnessed by its increased presence at the International Congresses of Applied Psychology. A major factor in this growth is the diminished return of engineering measures to increase road safety. Accident risk, be it expressed in terms of collision frequency, injury risk or fatality risk, measured either in terms of proportion to population or distance travelled, was at its peak at around 1972 in the US and Europe. By the time traffic psychology emerged, road accident risks were already abating.

The early gains in safety can be attributed to considerable engineering achievements and, to a lesser degree, to legislation. The introduction of divided highways and crash barriers reduced accident fatalities substantially. Equally impressive results were achieved in vehicle design and by

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the introduction of seatbelts and making wearing seatbelts compulsory. These measures primarily increased the likelihood of surviving a crash but did not necessarily make a crash less likely. The exception is, of course, the introduction of the drinking–driving laws, setting a specific, albeit arbitrary, limit to the amount of alcohol permissible in the blood while driving. This last point illustrates how psychology became relevant to accident prevention. While big gains had been made with reducing the consequence of accidents, in other words, reducing the severity of the consequences of what people do, eventually it was necessary to address what people do and attempt to modify their behaviour. The debate in Europe about what is a rational limit for the permitted blood alcohol concentration persists and it is noteworthy that that debate is not based on rationality alone. On the one hand, the Scandinavians take a moralistic stance, arguing that any alcohol is too much, going for a zero limit, on the other hand, the Mediterranean countries go for limits that do not put limitations to their life style, lunch and dinner included (e.g. Jayet, 1993). In the Netherlands, oversensitivity to equality prevails—hence questioning whether it is acceptable to set the limit on 2 promille for younger drivers and to 5 promille for adult drivers, as empirical evidence suggests is sensible (Vallet, 1991). Psychologists have produced interesting and relevant data about the deterioration of performance as a driver due to intoxication and have shown that this performance decrement nicely follows the Borkenstein curve depicting fatality risk (see e.g. Brookhuis, 1998), but political decision-making is not bound to data.

After the "easy" engineering measures were implemented to reduce the seriousness of the consequences of driver behaviour, not so easy measures to change driver behaviour were required. Traffic psychology has provided data on which such measures could have been based, but most of the measures were not based on these data, or at least, not on these data alone. Perhaps that is why behavioural interventions produce accident risk reductions that were far less dramatic than the earlier engineering measures. The remainder of the text will examine which theories and models pertinent to drivers' risk taking have been used in road safety research and which practical implications these can have for training and accident reduction.

## 2. Risk theories

The finding that the actual safety effects of engineering measures often were much less than the theoretical potential effects stimulated interest in drivers' reactions to these measures. A classic example of research that illustrates drivers' responses to changed driving conditions is Summala and Merisalo's (1980) study of driving on icy roads in which they demonstrated that drivers driving with studded tyres increased their speed such that their skid margin approached that of drivers driving with normal tyres. Another example is driving with vehicles equipped with ABS which produced driving behaviour not unlike that noted by Gibson and Crooks as early as 1938 who found that drivers delayed braking when driving with cars with improved brakes (in Summala, 2002). Similar results were found for improvements in road design (see for an overview: OECD, 1990).

Two theories emerged to explain these findings. Wilde's risk homeostasis theory (1982, 1988) was in origin a theory at an aggregate level, stating that on a societal level road accident risk remains constant. As this postulation proved difficult to maintain (see for example Heino, 1996), the theory was later adapted to describe individual road user behaviour and re-labeled "target risk