Alcohol and social interaction - a coercism relevant to driving?

Mark Vollrath

1. Risk of an accident and social interaction

In our evaluation of accident reports from the police in Mittelfranken, from the years 1984 to 1990, we investigated the influence of the number of passengers on traffic safety (Birkelbach, 1991). As compared to different exposure rates, one main effect was consistently found (see the left part of Figure 1): Driving is safer in the presence of one passenger than driving alone. This protective effect is somewhat reduced when more passengers are present in the car.

Most interestingly, this main effect is strongly moderated by the age of the drivers (see right part of Figure 1). The relative risk of an accident for a young driver (between 17 and 24 years of age) with more than one passenger is approximately the same as it is for driving alone.

To explain these results, two non-independently approaches are reasonable:

- The multitask approach with the problem of divided attention.

- The social approach which emphasizes primary social processes like social facilitation, sensitization and, as a consequence, a change in resource allocation.

Whereas most of the research has concentrated on the abilities and state of the driver in relationship to his vehicle, the influence of the social environment...
remains to be examined. This paper concentrates on the influence of social interaction on traffic safety.

2. Alcohol and social interaction

One of the reasons why this is such an important topic, is the substantial effect of alcohol on social interaction which, in turn, affects driving performance. To put it differently: perhaps the effect of social interaction on driving is especially important, when alcohol is involved. Kohnen (1992, in these proceedings) provided evidence that alcohol does alter social interaction substantially.

Obviously, social interaction in the car takes places at different levels, some of which may be difficult to observe. Speaking behavior, one of the most potent measures for quantity and quality of social interaction, can be recorded and analyzed relatively easily. In a review of the effects of alcohol on speaking, however, very few reports were found and the findings were not very consistent. Summarizing these, there was a marked influence of alcohol on speaking behavior, beginning at about 0.03%. The direction of the effects was inconsistent, which may be due to the different social situations, in which the behavior was observed. For example, in contrast with expectations, Keane & Lisman (1980) found no socially stimulating effects of alcohol, but a decrease in the amount of speech produced. However, the subjects had to talk to a female confederate of the investigator, presenting themselves as positively as possible, which may have created a very stressful situation.

Smith, Parker & Noble (1975) also did a study which examined social interaction. As in other studies, the amount of verbal output increased with rising BAC. At the same time, the amount of overlap in communication increased, too. When under the influence of alcohol, people spoke more, however, they were less considerate of their partners in dialogue.

3. Model of influence of alcohol on social processes

An approach to the understanding of the socio-emotional actions of alcohol gives the model of Krüger (1992), shown in Figure 2. The first effect of alcohol is "selection": alcohol directs the attention to social events (increased sensitivity to social cues: stimulus sensitization) and reinforces some emotions, for example feelings of pleasure, dominance and so on. In particular, processes of self-elation are increased (emotional facilitation). Thus, on one hand, attention is focussed on social stimuli, on the other, ego-orientation of behavior is increased.

These effects interact with the second effect of alcohol, namely sedation, which inhibits information processing. Thus, non-central stimuli are inhibited in cognition, as well as non-central inhibitors in emotional states. Moreover, sedation restricts the behavioral possibilities.

For example, fine-coordination is lost during a dialogue under the influence of alcohol due to the inhibition of motor and cognitive processes which enable this
coordination. A partner cannot be supported adequately by the so-called backchannels ("hm"), which require a very precise temporal control.

**Socioemotional actions of alcohol**

A model

![Diagram](image)

*Figure 2: A model of socio-emotional actions of alcohol. This model was taken from Krüger et al. (1992).*

Additionally, increased egocentrism diminishes the attention paid to the partner. Therefore, overlap is likely to increase (especially if the partner is under the influence of alcohol, too). Although this model is supported by many experimental results, the validation remains a task to be done.

4. Method for validation

The LOGOPORT, a portable device with a size approximately equal to that of a walkman, can record the temporal structure of speaking in the free field rather unobtrusively. Mundt, Kelleher & Perrine (1992, in these proceedings), give a more detailed description of this device and the method of analyzing speaking behavior developed by Krüger (1989). While they concentrate on monologous speaking behavior, the LOGOPORT also provides an elegant way to collect data on social interactions in natural situations. In a pre-test, 8 subjects wore LOGOPORTs during a party, where they drank as much beer and champagne as
they liked. BACs were measured using Alco-Tests. The subjects were divided into three subgroups based on the peak BAC they reached during the evening. Figure 3 gives the results for the amount of speech produced at a late hour during the evening compared to baseline at the beginning of the party. For means of comparison, the results from Smith, Parker & Noble (1975) are included.

While the subjects with low and medium BAC talked less (probably because they were tired), the subjects with the high BACs talked more. This is in accordance with the results of Smith, Parker & Noble (1975), who found an increase in the number of words produced up to a BAC of 0.06. An evaluation of different aspects of social interaction, which they did by counting the number of overlaps during interaction, can also be done with the LOGOPORT. However, with these data it was not possible because the partners changed frequently during the course of the evening.

Figure 3: Percentage of time spent speaking in the three alcohol groups as compared to baseline (left part of the figure). At the right part, the number of words (upper part) and interruptions (lower part) in the three alcohol groups of Smith, Parker & Noble (1975) are depicted.
5. Alcohol and social interaction during driving

A special emphasis should be put on investigations of social interaction during driving under the influence of alcohol. Figure 4 gives the distribution of the number of passengers in the car during accidents in which alcohol was involved. Especially in the group of the younger drivers, there is a higher percentage of accidents under the influence of alcohol with 2 or more passengers. As these young drivers are quite important from the perspective of traffic safety, these results emphasizes the importance of investigating this question.

![Drivers with BAC > 0](image)

*Figure 4: Percentage of cars with one, two or more passengers per age-group where alcohol was involved in the accident.*

References


