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Accident Analysis and Prevention

journal homepage: www.elsevier.com/locate/aap



Alcohol consumption and cycling in contrast to driving

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ARTICLE INFO

Article history:

Received 15 December 2015
Received in revised form
22 December 2016
Accepted 2 January 2017
Available online xxx

Keywords:

Alcohol
Alcohol limit
Blood alcohol concentration
Drink cycling
Drink driving
Modal choice

ABSTRACT

In Germany, the legal blood alcohol limit for cyclists is much higher (0.16 percent) than the limit for drivers (0.05 percent) – as long as no crash has occurred. The proportion of police-recorded crashes with personal damage under the influence is higher for cyclists than drivers, and the blood alcohol concentrations are higher for cyclists than drivers. 63 women and 204 men who drive a car and use a bike and drink alcohol participated in the online study. In the sample, cycling under the influence (CUI) was more frequent and was observed more frequently among friends than driving under the influence (DUI). Persons who use a particular vehicle type more often in general and when they visit friends also use it more often after alcohol consumption. Persons who drink alcohol more often cycle more often after alcohol consumption. In all aspects covered, drink cycling was seen as more acceptable and less dangerous than drink driving. Persons who cycle more often under the influence observe drink cycling more often among their friends. They think they are less of a danger to themselves and others when cycling after alcohol consumption, and they agree less with the statement that one should leave one's bike parked after alcohol consumption. The attitudes that drinking is unsafe for one's own driving and that one should leave one's car parked are important predictors of (non-)drink driving. For cycling, the most important predictors are bike use frequency and observing drink cycling among friends.

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1. Introduction

Cycling under the influence increases the probability of a crash compared to cycling sober (e.g. [Andersson and Bunketorp, 2002](#); [Asbridge et al., 2014](#); [Hartung et al., 2015](#); [Hartung et al., in press](#)). In Germany, driving under the influence (DUI) has decreased markedly during the last two decades. In 1991, 30,458 drivers who were involved in a police-recorded crash with personal damage were found to be under the influence of alcohol. In 2104, the number of DUI drivers was 7775. Cycling under the influence (CUI) has only decreased very little: in 1991, 3625 cyclists under the influence were involved in a police-recorded crash with personal damage, compared to 3532 cyclists in 2014 ([Statistisches Bundesamt, 2015](#)). In Germany in all adult age groups the proportion of police-recorded crashes under the influence is higher for cycling than for driving; additionally, among those road users involved in a recorded crash, cyclists under the influence have a higher mean blood alcohol concentration than drivers under the influence ([Statistisches Bundesamt, 2015](#)).

In Germany, many adults can choose between bike and car. This raises the question which the study presented here aimed to answer: Do persons who use both means of transport differ in their habits and expectations regarding driving and cycling after alcohol consumption?

In Germany, at present cyclists are allowed to cycle with a blood alcohol concentration (BAC) of up to 0.16 percent. Above this limit, cycling is a criminal offence. If a cyclist who is apprehended with a BAC of 0.16 percent or higher holds a driving licence, this licence may be withdrawn if the cyclist does not pass a medical-psychological examination.

In Germany, the limit for absolute unfitness to drive a car is a BAC of 0.11 percent. Driving above a BAC of 0.05 percent is a regulatory offence. If the driver is caught with a BAC of above 0.05 percent more than once, or with a BAC of 0.16 percent once only, his or her driving licence is withdrawn.

Above a BAC of 0.03 percent, relative unfitness to cycle or to drive is indicated by typical deficits, cycling or driving errors, traffic behaviour that endangers others, and by being involved in a crash. Under these conditions, prosecution of drink-cycling or drink-driving is possible.

In Germany, DUI is most prominent for the age group from 18 to 21 years and CUI is most prominent for the age group 35–44 years ([Statistisches Bundesamt, 2015](#)). A hospital-based study on cyclist

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Table 1

Frequencies of the BACs considered as safe for cycling and driving after 3 h based on the maximum drink type (max.) and on the sum (sum) of drink types, mean, median, standard deviation, and maximum.

	cycling		driving	
	max.	sum	max.	sum
BAC (percent)				
N	265	265	266	266
0.00	119	65	240	184
>0.00–≤0.05	144	148	25	79
>0.05–≤0.10	2	44	1	2
>0.10–≤0.15	0	7	0	1
>0.15–≤0.20	0	1	0	0
Mean	0.009	0.029	0.001	0.005
Median	0.002	0.021	0.000	0.000
Standard deviation	0.012	0.032	0.004	0.013
Maximum	0.059	0.166	0.052	0.117

crashes shows a decrease in the proportion of alcohol-related cyclist crashes with age (von Below, 2016). We thus expected negative correlations between age and DUI and CUI (H1¹). The proportion of bike and car crashes under the influence of alcohol is higher for men than women (Statistisches Bundesamt, 2015; von Below, 2016). We thus expected male participants to report more cycling and driving after alcohol consumption than women (H2).

We expected persons who use their bike or car more often to also cycle or drive more often after alcohol consumption. Such a correlation may be caused by mere habit: persons who “always” use a means of transport to go “anywhere” are also more likely to use it when they go to a pub or a party or to meet friends and also to go back home again. For car drivers, driving frequency had a correlation of Pearson $r = 0.10$ with drink driving in the past 6 months and Pearson $r = 0.11$ with drink driving in the following 6 months covered by the study (Castanier et al., 2013). We expected positive correlations between cycling frequency and CUI and between driving frequency and DUI (H3). We also expected positive correlations with using a means of transport for leisure purposes and to see friends, i.e. opportunities where alcohol may be consumed (H4).

Descriptive norms, the behaviour of other persons, are relevant for DUI (Moan and Rise, 2011). We expected persons who see their friends more often cycle or drive under the influence to also report this behaviour more often (H5). Persons who consume alcohol more often are more likely to drink drive (Chang et al., 2013). We expected that persons who drink alcohol more often are more likely to drive and to cycle under the influence (H6).

Personal norms and drink driving are correlated (Gehlert and Genz, 2011). We expected persons who report more CUI/DUI driving to have more positive attitudes towards this behaviour, see it as more acceptable and think less about it (H7).

Enforcement of drink driving and publicity campaigns against it reduce its frequency (Tay, 2005). Increasing not only the objective but also the subjective probability of apprehension is a measure to reduce driving under the influence of alcohol (Koch and Halbleib, 1995). We thus expected a negative correlation between driving or cycling after drinking alcohol and the expected probability of a police check (H8). Police checks may also deter people from CUI or DUI. For this reason we expected negative correlations between experienced police checks and drink driving and cycling (H9).

For persons who have to drive or cycle in their job, licence suspension or prohibition from cycling may result in their dismissal. For this reason we expected them to cycle or drive less under the influence than persons who do not have to drive or cycle in their job (H10).

¹ The hypotheses are numbered. These numbers are also used in the following sections.

Other potential risks aside from police checks and enforcement are crashes and the consequences for the cyclist or driver themselves and for other road users involved. For drivers avoiding a crash is a more important argument against DUI than avoiding sanctions (Alonso et al., 2015; Freeman and Watson, 2009). A review showed that persons who report DUI consider it as safer than do persons who do not drive under the influence (Kelly et al., 2004). We expected persons who think that they are endangering themselves or others when cycling or driving under the influence to report less DUI or CUI (H11).

The legal limit for road users could play several roles. It is a legal regulation and must be observed for this reason alone. Besides this, a legal limit could communicate an idea of what is “safe”: if driving or cycling below a certain limit is allowed, it might be considered as safe. Driving or cycling below the legal limit could become acceptable. Road users are not always well-informed about traffic rules (Ellinghaus and Steinbrecher, 1993). Accordingly, the assumed legal limit is more important for individual decisions than the real one. Both for cycling and driving, we expected that the higher a person assumes the legal BAC to be, the higher the BAC they consider as safe and the more often they drink cycle or drink drive (H12). Not only legal questions may be important for the individual decision to cycle or drive after consuming more or less alcohol but also personal considerations regarding which limit is still safe. We expected persons who consider higher BACs for their own cycling as safe to cycle or drive more often under the influence (H13).

Since cycling under the influence has a more tolerant legal limit and is less likely to result in harm for others than driving under the influence, we expected attitudes towards drink driving to be more negative than towards drink cycling and the “safe” BAC to be lower (H14), and also more intense enforcement to be experienced and expected for DUI than for CUI (H15).

2. Methods

2.1. Participants

The survey was made public, mainly by the second author, to many institutions which deal with road safety, to bike forums, to friends, and via Facebook. As the legal conditions differ between countries, only persons living in Germany were addressed.

404 persons filled in the survey at least up to the page where they could write a final comment. As we intended to compare the same persons regarding bike and car use after alcohol consumption, we selected those persons who drove a car and rode a bike and drank alcohol (all three items with answers more often than “never”). This reduced sample consisted of 267 adults who drank alcohol and rode a bike and drove a car and thus had the opportunity to use either means of transport after having consumed alcohol. These road users were 18–77 years old (mean 36.3 years, standard deviation 13.9 years, median 34 years), 23.6% women and 76.4% men. 1.9% had finished school after grade 8 or 9, 8.6% after grade 10, 11.3% held an advanced technical college entrance qualification, 24.4% held a general qualification for university entrance, 12.8% held a bachelor degree or an exam from a university of applied sciences, 34.6% a master degree or an exam from a university, 6.4% had a PhD. This means that, in relation to the general population, our sample was younger and better educated than average and more of the participants were male.

31.1% of the participants lived in Saxony, 13.5% in Berlin, smaller shares in other parts of Germany. 20.6% lived in a city with more than 1,000,000 inhabitants, 27.3% in a city with 500,000 to 1,000,000 inhabitants, 21.7% in a city with 100,000 to 500,000 inhabitants, the others in smaller cities or towns.

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