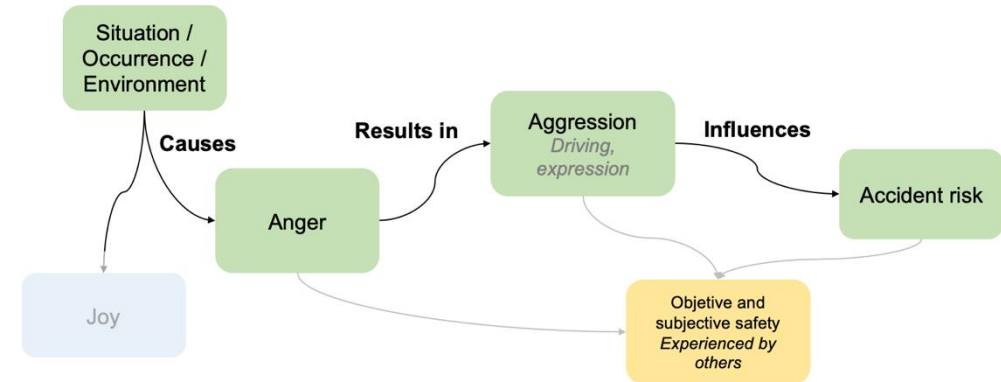


Anger, aggression and traffic safety

Inputs for ICSC workshop



The starting point

Aggressive drivers ↔ Aggressive driving

Instrumental aggression ↔ Affective aggression

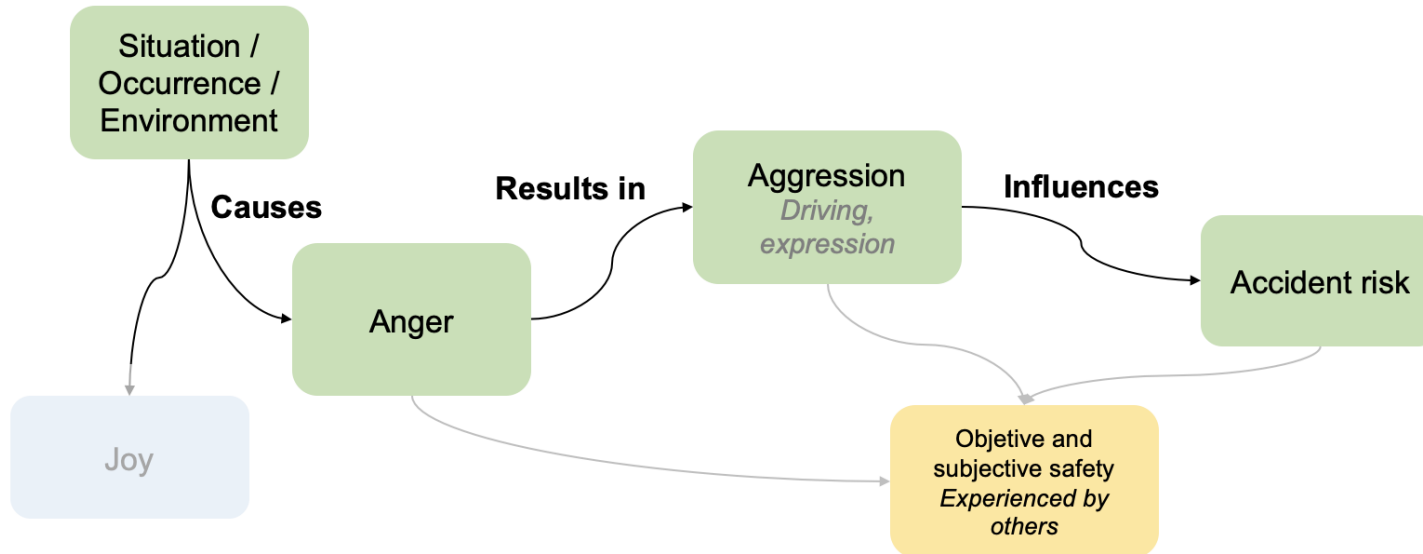
*Achieve a goal
e.g. speeding, running red lights
Anger not involved*

*Express or relieve anger
e.g. shouting*

Aggression → Accident risk



Anger, aggression and traffic safety



Various models link road events → anger → aggression (e.g. Shinar 1998)

Not every step occurs:

- A situation may not trigger anger
- Anger may not lead to aggression

Aggression outcomes:

- Short term: May target another driver / cyclist / pedestrian:
- Long-term: Escalate into a longer-term negative spiral of lower subjective and objective safety

Worst case: increased accident risk —

- Directly through risky maneuvers
- Indirectly through inattention/distraction

Aggressive driving and accident risk

Accidents / accident risk due to driving behaviour associated with aggressive driving:

- Derived from self-reported behaviour (Wickens et al., 2016; Brandstätter et al., 2017)
- Naturalistic driving studies (Dingus, 2016):
- Police reports give insight in the occurrence of aggressive driving (see Uhr, 2014, for an overview), but not whether it is related to a conflict.

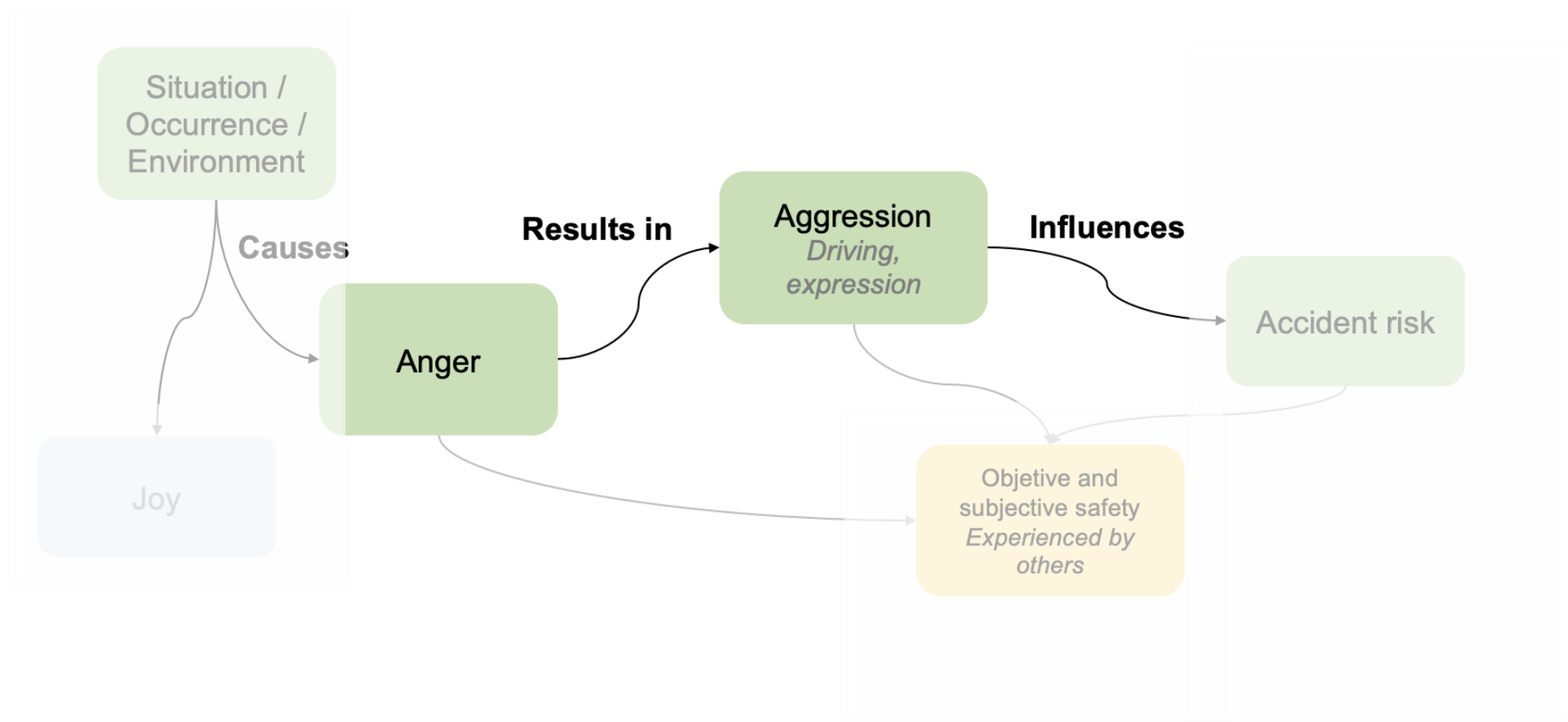
Other limitations

Mainly limited towards aggressive driving in general – not specifically aggressive driving towards cyclists or pedestrians.

Drivers who are more aggressive, tend to have more accidents – but not a direct link to anger

e.g. behaviours associated with aggressive driving tailgating (driving too closely behind another vehicle), dangerous overtaking increase the odds of accidents

What makes road users angry? Does this result in aggressive driving?



Influences on anger in German urban cyclists

Target group:

Urban cyclists in Germany (Study 1: 73 cyclists in focus groups; Study 2: 129 cyclists in a 10-day diary study).

What is being researched:

Anger among cyclists:

- Identifying *which events provoke anger* while cycling
- How these events cluster thematically,
- Which situations elicit the strongest anger (especially comparing interactions with car drivers vs. pedestrians).

Huemer, A. K., Oehl, M., & Brandenburg, S. (2018). Influences on anger in German urban cyclists. *Transportation Research Part F: Traffic Psychology and Behaviour*, 58, 969–979.
<https://doi.org/10.1016/j.trf.2018.07.026>



Influences on anger in German urban cyclists

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ABSTRACT

Previous research shows that anger and aggression among road users lead to maladjusted driving and a higher risk of accidents. Especially cyclists as vulnerable road users have a high risk of being injured if they are involved in accidents. This paper examines reasons for cycling anger in two studies. The first study aimed at identifying anger provoking events. Seventy-three cyclists were invited to discuss anger provoking events in a focus group setting. These events were rated regarding their anger intensity, clustered within focus groups, and aggregated across all groups. The first study revealed 208 unique cycling anger provoking events of varying anger intensity that were summarized in six clusters. The second study aimed at validating these anger provoking events, the ratings, and the clusters. Here, 129 participants were asked to complete a four-time point diary study (over the course of ten days), in which they registered all anger provoking events that they experienced while cycling. The results of this study validated most of the anger provoking events of the first study. Both studies show that most anger provoking events are related to conflicts between cyclists with other road users like car drivers and pedestrians. Moreover, conflicts with car drivers seem to cause stronger anger among cyclists than conflicts with other cyclists or pedestrians. Implications for further research and the planning of road infrastructure are discussed.

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1. Introduction

1.1. Anger in road traffic

Anger is understood as a personal tendency that biases people to blame others for blocked goals in uncertain situations. The cognitive mechanisms of how anger influences information processing and the relationship of anger and aggressive behaviour have been examined extensively in emotion research. In the appraisal tendencies framework (e.g., Lerner & Keltner, 2000), six central appraisal themes (certainty, pleasantness, attentional activity, anticipated effort, control, and responsibility) differentiate between emotions. Anger is appraised as “[...] predictable, under human control and brought about by others (Lerner & Keltner, 2000; p. 497)”. Studies have shown that experiencing anger while driving a car is predicted by other peoples’ goal-blocking behaviours. This relationship is strongest if drivers (a) perceive the other person to be responsible for his or her behaviour, (b) think that others are in control of their behaviour, and (c) believe that the others act with aggressive intention (Beisswingert, Zhang, Goetz, Fang, & Fischbacher, 2015; Mesken, Hagenzieker, Rothengatter, &

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Influences on anger in German urban cyclists

Key Findings

Six clusters of cycling anger events:

- **C1. Interaction with car drivers:** Inappropriate vehicle movements (e.g., close passing, sudden braking, door opening), perceived hostility (e.g., honking, blocking paths), disregarding traffic rules (e.g., turning without looking, taking right of way).
- **C3. Interaction with pedestrians:** Inattention, stepping onto bike lanes, pedestrians waiting or walking on cycle paths, groups blocking paths, hostility, children/seniors.

Other clusters:

- **C2. Interaction with other cyclists; C4. Rules and laws; C5. Infrastructure; C6. Environment and cycling conditions**

Highest anger intensity: Interactions with car drivers

Moderate anger intensity: Interactions with pedestrians

Most frequently nominated events:

- Pedestrians on cycling paths (35 mentions)
- Missing or bad infrastructure (31 mentions)
- Slow cyclists blocking overtaking opportunities
- Car driver overtaking too closely
- Car driver taking right of way from cyclist

Other clusters (infrastructure, rules, environment, cyclists) did not differ significantly from “medium” anger.

Influences on anger in drivers because of other road users

Research has examined the relationship between drivers' attitudes toward cyclists and their self-reported aggressive behaviors toward them (e.g., Fruhen & Flin, 2017).

Findings show that drivers with more negative attitudes toward cyclists also report higher levels of aggression toward them (example items by Rissel et al, 2002)

These attitudes are not tied to specific on-road situations, they may predispose drivers to react aggressively when such situations arise — for example, when cyclists are perceived as obstructing or violating traffic norms.

Fruhen, L. S., & Flin, R. (2015). Car driver attitudes, perceptions of social norms and aggressive driving behaviour towards cyclists. *Accident Analysis & Prevention*, 83, 162–170.

<https://doi.org/10.1016/j.aap.2015.07.003>

Rissel, C., Campbell, F., Ashley, B., & Jackson, L. (2002). Driver Road Rule Knowledge and Attitudes towards Cyclists. *Australian Journal of Primary Health*, 8(2), 66. <https://doi.org/10.1071/PY02029>

Chris Rissel, Fiona Campbell, Bruce Ashley and Lisa Jackson

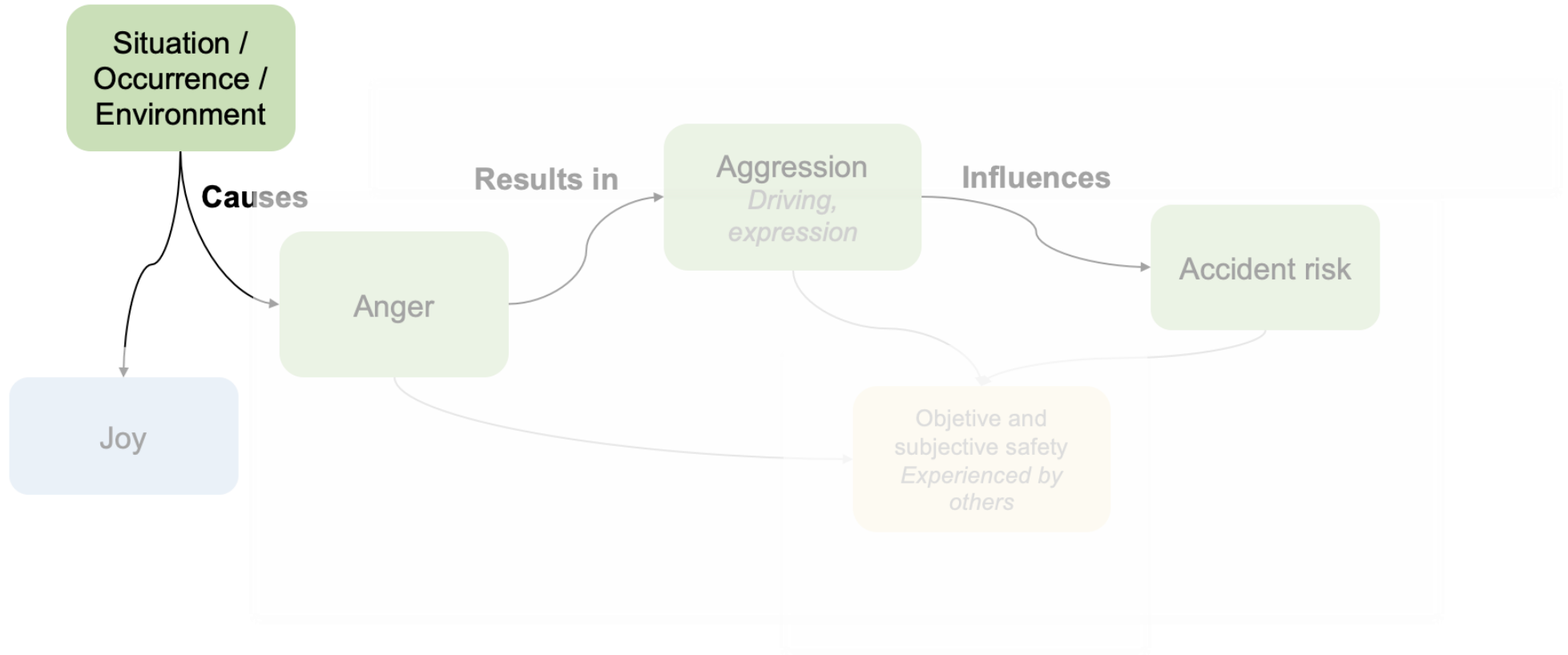
Table 2: Per cent of respondents who agree or strongly agree with statements *

Statement	Bell Dignam (1995)	Present study (2001)
	% Agree or Strongly Agree	
It is very frustrating sharing the road with cyclists.	59	57
Cyclists should not be able to ride on main roads (without cycle tracks) during peak hours	61	51
Many cyclists take no notice of road rules	59	62
Cyclists have just as much right to use the road as motorists	77	75
Most cyclists are aware of other road users and keep out of their way	72	61 *
It is safer for cyclists to keep to the left of the lane	89	83
Drivers are not trained to look out for cyclists	71	63
Cyclists are courteous on the road to motorists	52	34 *
Many cyclists on the road have not learned to ride properly	60	46 *
Motorists need to be educated to give cyclists a fair go on the road	85	81
If cyclists want equal rights on the road, they should pay registration fees or road taxes	46	38
Drivers should change lanes when overtaking cyclists rather than veering around them	76	69

* Significantly different at $p < 0.05$

What makes road users angry?

Does this result in aggressive driving?



Anger and aggression among drivers in three European countries

What is being researched:

Focuses on anger between **car drivers**: how often do drivers experience anger in traffic and how it translates into aggressive driving behaviour.

Findings:

Behaviour that elicited the strongest anger reaction was when an oncoming driver failed to dip their headlights

In contrast, more than 80% said they would not react if a slow driver held up traffic while parking.

Impatient driving (e.g., tailgating, pressure from behind) was the most anger-provoking category across all three countries.

Parker, D., Lajunen, T., & Summala, H. (2002). Anger and aggression among drivers in three European countries. *Accident Analysis & Prevention*, 34(2), 229–235. [https://doi.org/10.1016/S0001-4575\(01\)00018-5](https://doi.org/10.1016/S0001-4575(01)00018-5)



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Anger and aggression among drivers in three European countries

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Abstract

Recent reports of 'road rage' in the British media give the impression that driver aggression is escalating. In order to understand this phenomenon we need to know what it is about driving that provokes motorists to feel anger and then to go on to express that anger in the form of aggression. A postal questionnaire survey of more than 2500 drivers was carried out in three European countries: Britain, Finland and the Netherlands. The study had three main aims: (a) to discover how angry, if at all, a range of situations on the road make drivers, (b) to find out how many drivers are likely to react aggressively to those situations, and (c) to investigate individual and/or cultural differences in terms of anger and/or aggressive responses among motorists. Results indicate that the same types of behaviour provoke anger and aggression in all three countries, and that traffic density may play a role. © 2002 Elsevier Science Ltd. All rights reserved.

Keywords: Driver anger; Driver aggression

1. Introduction

The media, at least in the UK, have become preoccupied in recent years with incidents of aggressive behaviour occurring between ordinarily peaceful members of the public. There have been reports of, and speculation as to the causes of, a phenomenon that has been labelled 'trolley rage', and which involves aggression between supermarket shoppers. We have even been told about 'gym rage' and 'office rage' incidents in which people are prepared to use force against others to exact revenge or express their anger. However, by far the greatest level of attention has been paid to so-called 'road rage' incidents in which drivers become so enraged by the behaviour of another road user that they explode with 'rage' and an ugly scene ensues. Sensationalist reports of this phenomenon occur with alarming regularity in the British media, and some surveys have reported worryingly high levels of aggressive driving (Lex Report on Motoring, 1996; Sample Surveys Limited, 1996). In some quarters the problem of highly

aggressive drivers is taken for granted and the focus is on ways in which the behaviour of such individuals might be managed or remediated (Lowenstein, 1997; Deffenbacher et al., 2000). However, others have questioned whether 'road rage' actually exists as a distinctive phenomenon, and believe the term should be dropped in favour of something less emotive, e.g. driver aggression (Ward et al., 1998).

One interesting question is what sort of behaviour on the part of a driver is taken to be aggressive by others. One survey asked exactly this and reported that the manoeuvre most commonly felt to be aggressive was close following/tailgating, which 62% of the 529 motorists sampled reported having experienced in the previous year (Joint, 1995). Headlight flashing and the use of obscene gestures were also seen as aggressive by most, and had been experienced recently by 59% and 48% of those sampled, respectively. It seems then, at least on the roads of the UK, that drivers are regularly interpreting the behaviour of others as aggressive. Indeed, 60% admitted that they themselves had lost their temper while driving at least on occasion (Joint, 1995). Driver anger emerged as even more prevalent in a diary study reported by Underwood et al. (1999), with 85% of the 100 drivers taking part reporting having experienced anger while driving during a 2-week period.

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Does aggressive driving due to conflicts result in accidents?

