



Developing traffic safety interventions from conceptions of risks and accidents

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Abstract

By means of investigating the mental background to young male drivers' risky traffic behaviour, this explorative qualitative study outlines a framework for the construction of interventions that could mitigate risk-taking among young male drivers. Seven males, 20–23 years of age, demonstrating excessive speeding behaviour when driving, were interviewed in-depth. Five themes, “Self-image as a good driver brings self-esteem”, “Commanding high speed – a pleasurable sensation”, “High awareness of risks, but notions of serious outcomes are not salient”, “Imagined accident scenarios evoke outcome conceptions” and “Perceived cause of accident influences anticipated affective reactions”, had central positions in their conceptions about risk-taking and accidents. The results were analysed in relation to previous literature on the concepts of Anticipated Regret and Imagining as antecedents to attitude and behaviour change, and it was concluded that interventions based on imagining the emotional aftermath of being the perpetrator of a serious accident should be developed and tested.

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1. Problem description and introduction

We have all experienced it: A car appears in the rear mirror and overtakes us at high speed, way over the speed limit and right before a bend, then disappears ahead. Something like “What the hell is he thinking?” probably flashes through our minds. Statistically speaking, it is likely that our risk-taking driver was a young man. Injury due to traffic accidents is a leading cause of death for young drivers and passengers around the world, and this especially applies to young male drivers. Being a young male is considered to be predictive of crash involvement, as young men have higher rates of crash involvement than do young women, even when corrected for exposure factors (Peden et al., 2004).

This explorative qualitative study attempts to elucidate the mental background to young male drivers' risky traffic behaviour. More specifically, the present study has a threefold aim. (a) What kind of mental processes

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reinforce young males in taking risks when driving? Is this group of drivers mentally rewarded in some sense by driving in a way that other drivers might experience as terrifying? Or do they simply not experience that their driving can be risky? (b) Do these drivers have a potential for thinking and driving differently? Are there beliefs and emotions that, if aroused, would have the potential to make them drive more safely? Answers to these questions would be important for the third aim: (c) Constructing a framework for interventions that could make young risk-taking males change their driving behaviour. To achieve the aims of the study, we conducted explorative in-depth interviews with a group of young male risk-prone drivers.

To our knowledge, no previous studies have explored personal conceptions (including emotions as well as beliefs) regarding risks and accidents of young risk-taking drivers in-depth. However, there exist several lines of research that provide a background for the present study; some of this research is reviewed briefly below.

The nature of the phenomenon of young drivers' overrepresentation in traffic accidents has been explored in many studies. (For recent summaries of the literature on the driving behaviour of young drivers and measures used to influence their behaviour and attitudes, see e.g. Engström, Gregerson, Hernetkoski, Keskinen, & Nyberg, 2004; Panichi & Wagner, 2006.) Young drivers, particularly young males, tend to adopt a more risky driving style (Boyce & Geller, 2002; Deery, 1999; Elander, West, & French, 1993; Evans & Wasielewski, 1983; Harré, Field, & Kirkwood, 1996; Iversen & Rundmo, 2004; Laapotti, Keskinen, & Rajalin, 2003; Leung & Starmer, 2005) rate the risk of an accident in specific traffic situations as lower (Brown & Groeger, 1988; Sivak, Soler, Tränkle, & Spagnhol, 1989; Tränkle, Gelau, & Metker, 1989, 1990) and have more negative attitudes towards traffic laws (Yagil, 1998). A well replicated finding is that young male drivers perceive that, relative to the average driver, they themselves are more skilled and less likely to be involved in an accident (DeJoy, 1992; Finn & Bragg, 1986; McKenna, Stanier, & Lewis, 1991; Svenson, 1981). Age and lifestyle-related factors such as thrill-seeking, overconfidence in one's ability and peer pressure play a role in the development of young male drivers' risk-taking behaviour (Gregersen & Berg, 1994). In other words, they tend to show overconfidence in their ability as drivers, which in turn may lead to a biased perception of the potential hazards accompanying a risky driving style (Horswill, Waylen, & Tofield, 2004). This overconfidence also contains a potential problem in persuasive risk-avoidance communication directed at young drivers – if one considers oneself able to handle risk, the motivation to adhere to communication concerning how to avoid risks is likely to be low (McKenna, 1993; Sjöberg, 2003; Weinstein, 1989). In the present context, overconfidence is equivalent to an optimist bias with regard to one's driving skill. Weinstein and Lyon (1999) suggest that optimistic biases regarding personal risk constitute barriers for action in the direction of reducing risk-taking behaviour, and unrealistic optimism has also been shown to be difficult to alleviate by means of various persuasive manipulations (Weinstein & Klein, 1995). Some studies in the field of traffic psychology have indeed confirmed that it is difficult to influence traffic behaviour among young drivers through interventions aimed at changing their attitudes, especially concerning high-risk groups (Harré et al., 1996; Ulleberg, 2001).

Considering that the behaviour of the driver is a major cause in approximately 80% of car accidents (Rothengatter, 1997) developing psychological interventions that could reduce accidents among young male drivers seems a desirable enterprise. During the past decade, technical measures have raised the safety standards of cars as well as roads, which has led to a decrease in deaths and injuries due to traffic accidents (Elvik & Vaa, 2004; Peden et al., 2004). But when it comes to changing drivers' attitudes and behaviour towards risky driving, a statement from the report "Improving Road Safety by Attitude Modification" (OECD, 1994) still seems to hold true: "... the sizeable improvements that have been achieved in vehicle design and engineering over recent years appear not to have been matched by corresponding improvements to, for example, drivers' appreciation of road and traffic risk and their resulting behaviour."

We have found few published studies that have explored and tested persuasive measures that could lower accident rates in traffic. Most such endeavours have typically been based on a "Reasoned Action approach" (Ajzen & Fishbein, 2005), especially the Theory of Planned Behaviour (TPB), (e.g., Armitage & Conner, 2001; Parker, Stradling, & Manstead, 1996; Stead, Tagg, MacKintosh, & Eadie, 2005). In short, TPB posits that behaviour is best predicted by behavioural intentions, which are predicted by subjective norm, perceived behavioural control and attitude towards the behaviour. Attitude, in turn, is based on behavioural beliefs about performing the behaviour. However, many authors have criticized Reasoned Action approaches for focusing on instrumental/cognitive beliefs and not paying enough attention to the affective beliefs (emotions

and drives engendered by performing a certain behaviour) behind attitudes (e.g. Crites, Fabrigar, & Petty, 1994; van der Pligt, Zeelenberg, van Dijk, de Vries, & Richard, 1998).

Recently, it has thus been suggested to extend TPB in various ways. (For a review, see Conner & Armitage, 1998.) One of the suggested extensions is to incorporate affective beliefs, such as anticipated regret, into the TPB model. The concept of anticipated regret has been proposed, and has sometimes also been successfully applied, as a basis for interventions in various, mainly health-related, areas (Abraham & Sheeran, 2004; Abraham & Sheeran, 2003; Murgraff, McDermott, White, & Phillips, 1999; Parker et al., 1996; Richard, de Vries, & van der Pligt, 1998; Richard, van der Pligt, & de Vries, 1996; Richard, van der Pligt, & de Vries, 1995; Sherman, Crawford, & McConnell, 2004; van der Pligt, 1996). The idea is that if potential post-behavioural negative feelings like anxiety and guilt become salient in connection to a certain behaviour, this will influence action. It may be noted that the intervention studies involving activation of anticipated regret illustrate the potential of arousing “dormant” conceptions (beliefs and emotions) concerning aversive consequences of risky driving behaviour.

Weinstein (2003) discussed theories of health-protective behaviour, among them the Theory of Reasoned Action (of which TPB is an extension), which assume that the costs of abandoning the current risky behaviour are weighed against potential benefits from an alternative (i.e., less risky) behaviour. However, research on interventions based on the Reasoned Action approach tends to focus on beliefs regarding performing – or not performing – the desired behaviour (e.g. observing speed limits, Elliott, Armitage, & Baughan, 2005) but rarely touches upon the rewards that the current behaviour entails. The importance of paying attention not only to cognitive and behavioural components but also to affective components, such as how much pleasure and gratification people receive from engaging in high-risk activities, was stressed by Kelly and Kalichman (1998) who found that long-term frequency of unprotected sexual intercourse among gay men was predicted by two factors only: substance use before sex and the perceived reinforcement value of engaging in it, i.e. the pleasure derived from engaging in it. On the basis of their findings, the authors suggested that prevention approaches should aim at increasing the reinforcement values of safer sex, or at least at lessening the reinforcement value of high-risk sexual practices. The importance of understanding and including the individual's own, personal, conceptions of what is risky or safe as a basis for health-promoting persuasion methods has been pointed out by a number of authors (e.g., Crossley, 2001; Kouabenan, 2002). Thus, in targeting key beliefs when designing interventions aimed at reducing risk-taking in traffic, it could be that the psychological rewards the current risk-taking behaviour entails from the individual's point of view are just as important as their beliefs about potential positive and negative outcomes of the desirable behaviour (for example observing speed limits). Common steps involved in creating a TPB-based intervention (Sutton, 2002) are to first elicit salient beliefs on the issue at hand from a target population, then decide which TPB component to target, and then identify which beliefs best separate intenders from non-intenders and develop the intervention on this basis. Regarding speeding, Parker, Manstead, Stradling, Reason, and Baxter (1992) found that attitudinal beliefs concerning the likelihood of causing an accident, being stopped by the police and putting pedestrians at risk separated persons who intended to exceed the speed limit from non-intenders. Elliott et al. (2005) identified and suggested a number of behavioural beliefs significantly related to intentions of complying with the speed limit (“makes it difficult to keep up with the traffic”, “makes me feel relaxed”, “makes it easier to detect hazards”, “uses less fuel”, “reduces my chances of having an accident”) that could be used in road safety interventions. This, however, does not offer much guidance on how to target such beliefs in the design of interventions, i.e., how to model effective interventions. Nor does it give indications on how to overcome the barriers put up by overconfidence in the context of adhering to risk communication.

In line with the suggestions of Kelly and Kalichman (1998) and the strategies for persuasion suggested by Fishbein, Ajzen, and McArdle (1980) lessening the reinforcement value of risky driving and making conceptions about negative outcomes of risky driving more salient could be the basis for designing an intervention. Such conceptions could also consist of beliefs and emotions that are not currently salient.

As a point of departure for constructing a framework for interventions, a deeper understanding of how young male risk-taking drivers themselves construe the meaning of risk-taking in traffic and how they perceive the potential consequences of such behaviour seems essential. Understanding this could help identify key conceptions to be targeted and may also reveal barriers to adhering to risk communication.

2. Method

2.1. Sample

For the purpose of this study, risk-taking behaviour was operationally defined as frequently, substantially and deliberately exceeding the speed limit when driving. Speeding is considered a key factor in the road injury problem, as high speed influences both crash risk and crash consequence (Peden et al., 2004). Also, attitudes towards speeding are very liberal in Sweden according to the SARTRE III survey (Dahlstedt, 2006) where drivers in 23 European countries were interviewed. Alcohol is another factor that contributes to crashes, but as attitudes to drinking and driving are very negative in the general Swedish population it was decided to focus on speeding. (For instance, 88.5% of the Swedes answered “Never” to the question “How many days per week do you drive after drinking even a small amount of alcohol?” which is by far the highest percentage of all countries participating in the SARTRE III survey.)

The participants were recruited by means of purposeful sampling (Patton, 1990) i.e. deliberately selecting participants assumed to be rich in information concerning issues central to the aim of the study. As the aim of the present study was to specifically explore the conceptions of young male speeding drivers, it was presumed that selecting and interviewing young males with a markedly risky driving style would give more relevant information than interviewing a random sample of drivers.

As a starting point for the fieldwork, names and telephone numbers of 20 young men between the ages of 19 and 23 were collected in two different ways. One way was by putting up notices and approaching young drivers at petrol stations. The other was through the first authors' personal network. It was explicitly stated that potential interviewees recruited this way should not be known by, or have had any previous contact with, the author. The pretext in both cases was that we wanted to get in touch with young men who “really enjoyed driving” and were willing to be interviewed about this. These men were then contacted by telephone for a short screening interview regarding their driving habits and driving style. The purpose of the study was initially presented as “understanding more about how young people think about car driving”, and questions assessing driving style were asked under the pretence of making sure that different driving styles were represented in the study. Respondents were not told that speeding behaviour was the focus of interest. During the screening interviews, those who admitted to frequent and substantial speeding were asked to participate in a face-to-face interview, whereas men who did not acknowledge substantial speeding were discarded.

Seven men between 20 and 23 years of age were selected for face-to-face interviews on the basis of the screening procedure. Four were full-time students at a large technical university, two were part time white-collar workers/part time students, and one was a full-time blue-collar worker. All were regular drivers who had had a driver's licence for at least a year and a half. Estimated yearly distance driven varied from around 4000 to 25,000 kilometres per year. Two of the men had personal experience of minor accidents as drivers, and three had some kind of (usually minor) accident experience as passengers.

A sample size of seven individuals may seem very small. Our initial intention was to interview 12–15 participants in a two-step procedure, but a preliminary analysis of the material from the first seven participants indicated that the contents of the interviews were very similar and that the same themes reoccurred over and over again, indicating redundancy (Patton, 1990) i.e. that additional interviews would not bring much new information. It was therefore decided to terminate the fieldwork.

The speeding behaviour described in the screening procedure was confirmed in the interviews. The seven participants all reported that they regularly exceeded the speed limit by up to 30 km/h – beyond this, they would risk losing their licence. On motorways and when the risk of being detected by the police was judged as minimal, speeds of 150–160 km/h, for some over 200 km/h, were reported. The speed limit on Swedish motorways is either 90 or 110 km/h.

2.2. Procedure

Data were collected by means of personal in-depth interviews, “the interview guide approach” (Patton, 1990), lasting from slightly over one hour to almost two hours. The interviews were conducted at a venue convenient to the participant: the office of the research institution, or the participant's workplace or home. All

interviews were audiotaped, with the consent of the participant. The first author, who has a great deal of experience conducting qualitative interviews, conducted all interviews. A brief topic guide provided the general framework for the interviews, giving the interviewer the opportunity to explore and probe into the conceptions of each individual participant. Exploring beliefs and emotions that were not actively accessible to the participants at the time of the interview was one purpose of the study, but asking direct questions on conceptions regarding risky driving and its potential outcomes would of course immediately make such conceptions salient and could also encourage answers that were socially desirable and superficial. In order to minimize such effects, conceptions regarding risk in traffic and outcomes of accidents were traced using three different angles of approach. After general questions on driving habits and motives for driving, the three approaches to eliciting conceptions were used, in the following order: First, the participant was asked to give free associations on the words “risks in traffic”; Second, a scenario technique, whereby the participant was stimulated to imagine, visualise and verbalise a serious accident and its aftermath, was used; Finally, traditional open-ended questions concerning beliefs about risk-taking were asked. The interview was rounded off by asking about the extent to which the participant had previously reflected over the issues brought up in the interview and whether he had ever thought of himself as a risky driver. After completion of the interview, participants were briefed about the actual purpose of the study and received two cinema tickets as thanks for their participation.

2.3. Data analysis

The analysis of the material from the interviews followed the principles of “framework analysis” (Ritchie & Spencer, 1994). This technique involves identifying recurring and important themes based on a combination of a priori issues, emergent themes and recurring attitudes or experiences. The analysis involved five key stages: (1) *Familiarization*. First, all interviews were transcribed from audiotape and were thoroughly read and re-read in order to list ideas and recurring themes. (2) *Identifying a thematic framework*. A thematic framework, by which the data could be examined and referenced, was constructed on the basis of the conceptualizations made during the previous stage. The thematic framework consisted of nine thematic areas; Background/Facts, Motives for driving, Risk in traffic, Perceived driving style, Own experiences, Knowledge/rules, Reflection/consequences, Scenario (with specific subcategories Description, Consequences, Emotions) and “Other”. (3) *Indexing*. The thematic framework was systematically applied to the data by assigning the transcripts codes that could cover a single sentence as well as a long statement. If the content of a particular amount of text could be assigned to different thematic areas, it was coded accordingly. (4) *Charting*. The coded data were rearranged according to thematic area by means of summaries, quotations or references to the raw data from the various participants. In this stage the broad thematic areas were divided into smaller subcategories, sometimes leading to a fusion between subcategories of two or three thematic areas. During this process the original transcripts were frequently revisited to make sure the contextual meaning was not misinterpreted. (5) *Mapping and interpretation*. Finally, superior or subordinate themes and overall patterns among them were defined and interpretations of the findings were made. This stage involves defining and structuring concepts, associations, patterns and phenomena, by logical as well as more implicit and intuitive processes.

3. Results

Five of the major themes that emerged from the analysis will be presented here. These themes appeared to have central positions in the conceptions of risk-taking and accidents among all participants, and were also considered to have particular relevance for the construction of interventions. Four other major themes that emerged were left out as they seemed only loosely connected to conceptions of risk-taking and accidents. Two of these themes; “Same driving style as most guys” and “Changes in driving style” were subordinate to the thematic area “Perceived driving style”, and two; “Functional motives” and “Social motives” were subordinate to “Motives for driving”.

The five themes presented are “Self-image as a good driver brings self-esteem”, “Commanding high speed – a pleasurable sensation”, “High awareness of risks, but notions of serious outcomes are not salient”, “Imagined accident scenarios evoke outcome conceptions” and “Perceived cause of accident influences anticipated affective reactions”. The quotations that illustrate the themes were selected because they were considered to be

representative of something that several of the participants gave expression to. The names accompanying the quotations are pseudonyms, in order to protect the identities of the participants.

3.1. *Self-image as a good driver brings self-esteem*

One very obvious aspect of the gratification obtained by fast driving is that it brings heightened self-esteem. All participants expressed high confidence in their competence as drivers and experienced themselves as skilled drivers with full control over their driving.

Carl: . . . a feeling of being in control, that I know how to do it. When I drive and notice someone else who is a bad driver, and I am a better one, I think to myself ‘Well, I’m rather good at this’. It is a bit like that, actually. Driving is something I feel I am good at, so it’s a nice thing to do. It gives me. . . Well, if you’re good at something, it gives you satisfaction when you do it. (*Interviewer:* Do you mean that it raises your self-esteem?) Yes, that’s exactly it!

The feeling of being superior to ones’ peers regarding various aspects of driving ability, including driving at high speed, was mentioned in most interviews and references to friends or acquaintances considered to be much less skilled drivers was found in all interviews.

Jan: I think I’m a better driver than most of the people I know. That is, not more law-abiding, but safer. And I get myself from point A to point B faster, without any trouble. I generally feel that my driving runs smoothly, that I drive more economically, yet more swiftly, than most others.

Competence and control were perceived to be attained by having good judgement, being able to decide what to do – and what not to do – in any specific situation. The participants also perceived themselves as responsible drivers, with sound judgement of potential dangers, in contrast to the “reckless driving” of some of their friends. All participants admitted to testing the limits of their driving skills by speeding, but this testing was claimed to take place only under what were considered safe circumstances: at night, on rural deserted roads, on roads with good visibility and smooth road verges. In contrast to this, they all claimed that they drive slowly in residential districts and on slippery roads, do not overtake when vision is blocked, etc. There was also a preference for speeding when driving a car that was considered safe and powerful. The ability to choose when speeding would be appropriate seems to add to their self-esteem.

Dan: On a 70 km/h road, for example, I can feel that here I can easily drive a hundred without any risk. Maybe it’s wrong to think like that, but I feel like I. . . I don’t drive too fast where one is not supposed to drive fast, so to say.

Practising driving skills, for example intentionally skidding in parking lots or on minor roads, was seen as an important way of attaining mastery in driving. There was a notion that a driver who has practiced driving this way is qualified for “tougher” driving than others are, as he has acquired the skill and competence required to avert and control dangerous incidents.

Peter: . . . like the driving instructor said, the guys who have been skidding around parking lots are better at correcting a skid when it does happen. This is really true. Those who strive to become better drivers can drive harder as well. There is a difference, they do have a readiness if something happens.

Despite the emphasis that participants placed on controlled and responsible driving, it was obvious that during their strive to attain mastery in driving many dangerous incidents had been encountered, and were at times even actively sought. All participants had been very near accidents, but such incidents did not seem to result in a more careful driving style. Instead, they seemed to increase self-confidence and preserve, sometimes extend, the limits of what was considered to be controlled and safe driving. That the experience of being able to avert a dangerous incident boosts self-esteem and increases confidence in one’s driving skill is clearly expressed in the quotation below.

Stefan: . . . it was just a quick, instinctive reaction on my part. It felt good, after that I knew I could trust myself. I can handle these kinds of situations.

Participants also expressed knowledge, learned during (for example) driver's education, of facts such as that of young male drivers being accident-prone and drivers in general often overestimating their abilities. But this knowledge seemed to be mostly on an intellectual level, and had not been personalized. No reflections as to whether such phenomena could apply to oneself were found in the interviews.

Dan: During theory lectures they nagged a hundred thousand times about drivers overestimating their own ability, and that that's why accidents happen. And I believe that's really true. (*Interviewer:* What about yourself – do you overestimate your ability?) No, I don't think so. (*Interviewer:* You don't think so?) No I don't. Not anymore.

3.2. *Commanding high speed – a pleasurable sensation*

Driving at high speed on the verge of one's capacity (but still with the feeling of being in control) often evokes intensely pleasurable feelings, according to the participants; Speeding was seen as a demanding task that requires full concentration as well as mastery. There seemed to be two different aspects of these feelings of pleasure, one being that focusing on driving can divert attention from other worries and that the mental occupation it takes seems to bring about a delightful sense of total alertness. The other aspect seems similar to the experiences sought by sensation seeking individuals (Zuckerman, 1979), containing strong arousal with emotions like exhilaration, fear, triumph and delight. These two aspects are well illustrated in the quotations below.

Dan: You're a hundred percent focused on what you're doing, there's no room for other thoughts. Because driving is not really a relaxing activity, but it is relaxing in the sense that you don't think about anything else while you're doing it. You have to focus completely, and that's quite pleasurable.

Jan: I usually drive very fast, because it is more fun to drive fast than to drive slowly. If one drives really fast, there's a lot of adrenalin, and that's fun. . . [Giggles] (*Interviewer:* OK, but what do you mean – adrenalin?) Well you know, if you stick to the speed limit on the motorway, that's no problem. But when you're reaching 200 on the motorway you really feel that now it's on the verge, that you really can't go much faster than this. You're really on tenterhooks, lots of adrenalin in your body – exciting! (*Interviewer:* How does it feel?) Hmmm. . . like jumping from a diving tower, stomach feels jittery, adrenalin flows, really on the edge, all senses really alert.

3.3. *High awareness of risks – but notions of serious outcomes are not salient*

When giving their spontaneous associations with “risk in traffic”, it became obvious that the participants were very aware that there are risks to be encountered in traffic, and that such risks could well result in an accident. A very large number of risky traffic situations were mentioned: slippery roads, tiredness, intoxicated fellow drivers, unforeseen obstacles on the road, animals and people turning up unexpectedly, etc. The possibility of being caught by the police while speeding was also frequently mentioned as a risk. Jonas, for example, gave the following answer when asked about his associations with “risk in traffic”:

(*Interviewer:* If I say “risk in traffic” – what comes to mind?) Wild animals. (*Interviewer:* Game, OK) And other people. That someone else mucks things up. (*Interviewer:* OK – for example?) By. . . well, lots of strange things happen, winos, people falling asleep, people changing lanes without looking in the rear-view mirror – those kinds of things. Guess that's it. (*Interviewer:* Anything else that comes up?) You mean like an accident or something? (*Interviewer:* Well, yes. . .) The police too. [Giggles] But they've been nice so far. I haven't been caught once during these four years. So if I do get caught I can take it. But I don't worry about the possibility of myself doing something. Of course there are risks, don't get me wrong. I've had crashes myself, crashed into a tree and such. But I worry more about what others could come up with.

That there are many situations that could easily cause an accident was thus readily acknowledged by all participants. Even though the possibility of hitting someone had been mentioned by a few, only two of them, Carl and Dan, spontaneously associated the possibility of injury or other serious outcomes of accidents with “risk in traffic”. Both had some type of personal experience of serious car accidents.

Carl: There are a lot of risks. You could die. I came to the scene of a serious accident right after the crash. And I've seen other accidents as well. There simply are a lot of risks in traffic.

At the end of the interview, participants were asked straightforwardly whether they had thought about the possibility of serious outcomes of accidents prior to the interview. None admitted to having actively thought in such terms, and this applied to the two participants mentioned above as well.

Dan: I don't think I've ever thought about what could really happen afterwards. . . Rather it is like: if I hit a moose, then the car will look like the car they showed us during driver education. They had a car there that had been in a collision with a moose.

Jonas: No, I guess I haven't thought about it that deeply. (*Interviewer*: Not that deeply?) No. Well, hardly at all really. No heavy stuff like that. But driving past a police check I tend to think 'Oh damn, lucky I wasn't driving too fast'. I do think about simple, minor things that could happen: 'What a drag it would be to lose my license' and such.

It is as if only the accident itself had a place in the conceptions of traffic accidents among these young drivers – potential serious outcomes of the accident did not seem to be salient in their minds. Their conceptions of traffic accidents seemed to “end” with the moment that the accident happens; notions of what could happen afterwards did not appear to be readily accessible in their minds. In their spontaneous associations to “risk in traffic”, conceptions regarding the possibility and occurrence of accidents as such turned up quickly, but none of them displayed any emotional reaction in relation to such conceptions neither any associations to potential ghastly consequences of an accident. The sub-theme concerning aftermaths and consequences of accidents emerged clearly only in a couple of interviews, where it was explored in more detail. This is illustrated here with an excerpt from the interview with Niklas:

(*Interviewer*: Is it like you thought 'Oh, wow, that was close?') Yes, but I've never thought deeper about what could have happened if. . . Well, if it had happened. (*Interviewer*: Or about what would have happened afterwards?) No. No I haven't. (*Interviewer*: Is it like it ends there: 'Moose on the road' – but one does not think further than that?) Yes exactly. I might have thought “Damn, that was lucky” and maybe I've seen a crashed car in my mind's eye. But I've never ever thought further than that. I mean, I have never reflected on the fact that people could have gotten hurt or something like that.

3.4. Imagined accident scenarios evoke outcome conceptions

In order to illuminate conceptions of accidents from a different angle, the participants were asked to close their eyes and imagine a serious accident and its aftermath, simultaneously verbalising this scenario in as much detail as possible. The interviewer stimulated the participants' imaginations by asking questions like 'What happens next', 'What do you feel, smell, see, hear. . .' After some initial hesitance, most of the participants described scenarios that were very vivid. For some of them, imagining such a scenario was very emotionally upsetting, evoking strong feelings:

Stefan: He lies there, unconscious, bleeding. First I check if he is still alive, in that case I'll do whatever I can do. . . Call an ambulance, try to handle the situation the best I can. . . It's total panic; what have I done, why has this happened?

In contrast to this, two participants experienced great difficulty imagining an accident scenario at all – for one of them, evoking such a scenario took a long time and required many guiding questions from the interviewer. The other participant seemed to either actively defend himself against venturing into his imagination, or was simply not able to fantasise.

(*Interviewer*: But what do you think would happen if something like that (a crash) happened?) *Peter*: Anything could happen. Someone gets hurt. (*Interviewer*: Can you imagine a scenario like that?) No. It's impossible to know. (*Interviewer*: But if you try to fantasise about it. . .) There would be investigations, discussions with the police, prosecutor, insurance company – all of that. Of course one knows there will be problems!

Many of the participants who easily managed to evoke an accident scenario in their mind's eye, however, made spontaneous comments to the effect that the fantasised scenario was experienced as somewhat unreal, despite its vividness. This could naturally have been an effect of the interview situation, in which fantasising was produced in an artificial way, impelled by the interviewer, but it could also have been an effect of two other conceptions. The first was a strongly anchored belief that “nothing really bad will happen to me”, well illustrated in the quotation below.

Stefan: Well, it feels like the worst thing that could happen is that if I crashed, the car would get smashed and I'd get slightly wounded. But not... so very... grim and grave as when I described the worst thing that could happen. I don't think that the worst thing that could happen would happen to me.

The second conception that turned up is a feeling of being protected by the car, that it will absorb the impact and thus protect the persons in it. This conception can also be distinguished in the quotation above. The notion of consequences in the form of damage to the car and minor injuries to oneself was thus clearly present in the participants' conceptions of traffic accidents, while notions of grim, far-reaching personal consequences and suffering seemed relatively non-existent. In the scenarios, the notion of someone else being hurt or killed turned up quickly and spontaneously. All the fantasised scenarios contained accidents in which another human was seriously wounded or even dead. Such scenarios definitely stirred the participants emotionally, and would constitute the worst possible happening. The idea of surviving, but having to live forever with the knowledge of having caused others so much pain, was very frightening to them. Fear, guilt, apathy, depression, anxiety, shame, remorse and anger were some of the anticipated emotions expressed in this context. The idea of oneself being hurt or killed appeared to be a much less frightening scenario. Fantasies around this were naturally also very unpleasant, but did not stir the same strong emotions by far. This in turn seems based on the conception that if one deliberately engages in a risky behaviour, one also has to accept the personal risk involved. That the same risky behaviour would bring consequences for an innocent bystander is, on the contrary, not acceptable and would bring great remorse.

(Interviewer: What is the worst that could happen to you while driving?) Peter: That would have to be driving with a passenger and having an accident where they're hurt and I'm not. Or if they were really hurt, if somebody died, but I survived. THAT would be the worst, having that on my conscience. Always knowing that I've driven so bloody bad that somebody else has died. Or been hurt, gotten paralysed and stuff. That would be the worst. Same thing if I'd been driving and done something stupid and somebody in another car was hurt because of me. That is, if I'd caused somebody else's accident. That would be the worst. *(Interviewer: If you yourself are injured?)* If I hurt myself I only have myself to blame, but of course it would be dreadful, but I'm not going to be... then it's I myself who's caused it, done it to myself, so I get to take the hit. But if someone else should suffer because of my driving... That... that would be difficult to live with.

Jan: Well... what is really scary is if in a crash everybody is killed except oneself. That's what one is most afraid of... A crashed car and such, I don't give a damn. What matters is hurting others, and oneself of course. But it would be worse if others get hurt because of something I did, than if I hurt myself.

3.5. Perceived cause of accident influences anticipated affective reactions

Another theme that emerged in relation to this issue was that all participants soon ventured into speculating on who, or what, actually caused the fantasised accident. As this phenomenon did not become evident to the interviewer until the end of fieldwork, it was explored in-depth only in the last three interviews. Here, however, it became clear that responsibility for an accident seemed to be attributed to three main causes; “Others”, “Fate” and “Self”. Where the responsibility for a serious accident was perceived to be clearly influenced how participants anticipated the affective consequences of it. Attribution to “Others” involved for example another driver making an unforeseeable manoeuvre like changing lanes without checking the blind spot or ignoring stop signs, or a child who suddenly runs out on a motorway. Such situations were perceived as being beyond ones' control as “the other” created a situation that would be impossible to handle for any driver, regardless of skill.

(Interviewer: But you can't really see that you could hurt someone else? It simply can't happen, or...?)

Peter: Well... I guess I could hurt someone. If they do something wrong. (Interviewer: Now, what do you mean?) Well, if I am passing somebody and he swerves when I do so – then it is his fault. I am passing him, that's the difference. Then I might hurt him, but it wouldn't be my fault but his – he is hurting himself, right? /.../ Or if someone gets in my way because he ignores a give way sign or something. Then it is his fault. But it is still I who may hurt him and myself. But then it is not my fault, and that makes a big difference I think.

Attributing an accident to “Fate” is done when external causes that do not directly involve the actions of a person are seen as responsible. Accidents attributed to “Fate” are also perceived as being beyond ones' control and skill as a driver. This type of attribution is clearly expressed in the quotation below.

Jonas: ...driving on the motorway and suddenly we had a punctured tyre. So we went off the road, straight into a signpost. The car was completely ruined, but we wore belts and got away with some bruises and cuts from broken glass. (...) She avoids driving after the accident. But it hasn't really affected my driving because I felt that it was not her fault. She couldn't... She had a flat – that just happens and there's no way to prepare oneself for it.

Accidents attributed to “Fate” or “Others” were not believed to have the same detrimental effect on future mental well being as an accident solely attributable to “Self” would. If the responsibility for an accident was attributed solely to oneself, the emotional consequences were anticipated as much more terrifying than if the accident was attributed wholly or partly to “Others” or “Fate”.

Niklas: It would be horrible to hit and kill a kid, even if it wasn't my fault. It would be simply awful, but it would be much worse to hit some old man at a pedestrian crossing and it'd be entirely my fault. YOU did this.

4. Discussion

The aim of the present study was to explore the mental background of young male drivers' risky traffic behaviour, and on this basis outline a framework for the development of an intervention that could make young male drivers less risk-prone. Judging from the results, reducing risk-taking behaviour in the form of excessive speeding will be no easy task. As mentioned in Section 1, according to Weinstein (2003) various theories on health-protective behaviour, including the Theory of Reasoned Action, build on the assumption that the health benefits of discarding the present behaviour is weighed against the costs that giving it up entails. The present study indicates that giving up speeding would involve giving up a wide range of pleasure and profit gained from speeding by our participants. In addition to increased self-esteem due to experiencing oneself as a competent driver, they also derived a great deal of sheer pleasure – some almost bodily sensations of well being were reported to occur when driving at high speed. Such pleasurable feelings of being in command are in line with the concept of “flow”, which is defined as “a psychological state in which the person feels cognitively efficient, motivated and happy” (Csikszentmihalyi & LeFevre, 1989). The dark side of the flow experience – in the context of driving – is that it can be an almost addictive sensation, which the person strives to achieve over and over again. Taken together, this means that speeding was experienced as a highly rewarding activity. Our participants' conceptions regarding their own speeding behaviour also seemed to contain no truly negative elements, and they certainly did not perceive themselves as risk-takers. It is also worth noting that night-time and rural deserted roads were seen as appropriate for speeding. Tränkle et al. (1989, 1990) suggest that young men rate traffic situations that do not display clear danger signals as low-risk situations, and the results from the present study point in the same direction. Thus, subjective low-risk situations gave our participants a go-ahead for speeding. This could be an explanation as to why night-time and rural roads are circumstances where young drivers are particularly over-represented in accidents (Assailly, 2005; Engström et al., 2004). Deficiencies in awareness of the risks inherent in speeding are also reflected in the fact that not one of our respondents reported having actively and spontaneously thought about the possibility of very negative outcomes of his speeding behaviour, in the form of the consequences that a serious accident could bring, prior to the interview.

Perceived vulnerability to a threat has been shown to correlate positively with self-protective action (Weinstein, Sandman, & Roberts, 1991) and our participants did not seem to perceive that speeding involves a real threat, and much less that they might be vulnerable to it.

So, what possible interventions could the findings of the present study actually point to? Methods aimed at increasing awareness of risks in traffic do not seem promising. The participants already had a thorough intellectual knowledge of many risks: Exterior risks such as the sudden appearance of a moose, mistakes and unexpected manoeuvres by others, slippery road conditions and so forth, as well as risks of a more psychological nature such as the tendency to overestimate one's own ability as a driver were already present in their minds.

As we see it, the most interesting findings are that our participants' conceptions of "risks in traffic" do not seem to include any salient notions of potential ghastly consequences of accidents but that strong anticipatory negative feelings were evoked when notions of the possibility of hurting another human by risky driving were activated. Imagining being responsible for the injury or death of another person especially seemed to make potential negative behavioural outcomes salient to the participants. This finding opens up for a hypothesis on intervention strategies, well in line with the suggestions of Fishbein et al. (1980); that one strategy for changing beliefs underpinning a certain behaviour is to introduce new, salient beliefs. Also, according to Kelly and Kalichman (1998) lessening the reinforcement value of high-risk practices can be an important part of prevention approaches. Is it likely that introduction of salient beliefs and emotions regarding potential negative outcomes could lead to a re-structuring of young risk-taking drivers' emotional and cognitive conceptions of what speeding entails?

It seems reasonable that involvement in a traffic accident would arouse behavioural beliefs about negative outcomes. At least two studies (McKenna & Albery, 2001; Rajalin & Summala, 1997) within traffic psychology have examined the effects of being involved in a serious accident. Both indicate that long-term behaviour change is not a general effect, but that accident experience under some circumstances can give rise to a different, more cautious, driving style. McKenna and Albery (2001) found that persons who had been taken to hospital due to an accident estimated their driving skills and safety in driving less positively (i.e. indicating less optimism bias) than others. These drivers also manifested less intention to speed in the future. Rajalin and Summala (1997) found that drivers in general returned to their "normal" driving patterns a few months after the accident, but more detailed interviews revealed that drivers who placed the blame for the accident on their own mistakes reported a permanent change in driving behaviour as an effect of the accident. How drivers attribute the responsibility for an accident has been studied according to attribution theory (e.g. Stewart, 2005), but we have not found any studies that explicitly relate attribution of accidents to future traffic behaviour. This should merit further research, especially regarding the impact of accidents where an "innocent" human being was injured. In our study the emotional consequences of an accident were apprehended as much more terrifying if the accident involved hurting someone else and was attributed to oneself rather than to some external factor. McKenna and Albery (2001) suggest that if there is a causal link between negative experience and protective behaviour, ways to convey such experiences "second hand" – as a substitute for living through it – should be explored further.

Some studies within social psychology have indeed touched upon this very issue. Significant changes in the beliefs and attitudes of subjects have been accomplished after unprompted reflection on an issue, that is, simply asking participants to explain, imagine or think about an event. (For a review, see Koehler, 1991. See also the APA award address of Aronsson (1999) for a reconcilable reflection.) Some examples of studies in this vein will be given here. Persons who were asked to think about what it would be like to have a certain disease, and for whom it was easy to imagine that it actually had befallen them, later estimated the probability of actually contracting that disease as significantly higher than did a control group (Sherman, Cialdini, Schwartzman, & Reynolds, 1985). Simply imagining an incident can thus increase the subjective probability that it will occur, which in turn should influence attitudes by means of modified behavioural beliefs about performing the behaviour. Similarly, asking Dutch students to think about how they would feel after having unprotected sex with a stranger had significant effects on both attitudes and behaviour during a five-month period after the intervention (Richard et al., 1996). The authors concluded that the effects obtained were probably due to a heightened awareness of negative emotional consequences of having unprotected sex, that is, potential negative post-behavioural feelings were made salient, which in turn led to less risk-taking. Highly accessible attitudes have

indeed been shown to exert a stronger influence on behaviour. (For an overview of this research, see Erber, Hodges, & Wilson, 1995.)

In conclusion: If imagining an accident and its consequences could, at least to some extent, serve as a substitute for real experience this might lead to a heightened awareness of potential negative outcomes of accidents. The findings from the present study, when set in relation to the literature presented above, open up for the hypothesis that heightened cognitive and emotional awareness of consequences of traffic accidents could introduce new salient beliefs, and possibly reduce unrealistic optimism about the risk and severity of accidents. Another possible effect of raising awareness of potential negative outcomes is a decrease in the reinforcement value of speeding. An intervention built on imagining the personal emotional aftermath of being the perpetrator of a serious accident should thus be developed and tested as a method of increasing traffic safety among young men. This conclusion is also supported by Weinstein (1989) who in a literature review on the relation of personal experience with precautionary action, suggests that "... programs emphasizing concrete, personalized information about likelihood, severity, and precautions; programs attacking unrealistic optimism; and programs finding ways to increase hazard salience will be more successful than will traditional attempts to disseminate general hazard information to the public." (p. 48)

On account of the explorative nature of the present study and the small number of participants, there are a number of aspects to be handled before an intervention of this type can be launched and applied in a real-life setting. First, a straightforward intervention that can be applied to a broad socio-economic sample of young men has to be developed. It must also be decided whether the intervention should be modelled for use with single individuals or in a group setting. The findings regarding the differences in anticipated consequences depending on how an accident is attributed, as well as some participants' refusal to imagine an accident scenario, should also be considered in the development of the intervention. Second, a formal pre-test–post-test experimental approach with a control group has to be used for establishing the short- and long-term effects of the intervention. Third, if effects on driving behaviour and/or attitudes can be substantiated, relevant contexts for applying the intervention have to be carefully considered. Here we refer to a recent review and discussion (Assailly, 2005) of preventive educational strategies. Also, the appropriateness in targeting specific subgroups should be investigated. For example, it may turn out that drivers with certain personality characteristics (e.g. sensation seekers, Jonah, 1997) are especially likely to benefit from the intervention whereas for others the effect could be nil or even negative.

Finally, on the basis of the present study there is no way to know whether our findings are specific for young male drivers or if the same themes would appear among other categories of drivers. Our main aim was trying to venture into the personal mental representations of some young male risk-taking drivers, without any specific hypothesis on how the representations would be shaped or if they differed from those of other drivers. It could, however, be interesting to study the conceptions of young men who do not speed, using the same method, to explore similarities and differences in the themes that emerge.

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