

Psychosocial function of driving as predictor of risk-taking behaviour

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Abstract

This study examined the relation between risk-taking behaviour while driving, the psychosocial function of driving, leisure time activities, car oriented peer group interaction and educational attainment. Two thousand four hundred seventeen drivers aged 18–25, randomly selected from the Danish Driving Licence Register, participated in the study. Data was collected through a mail survey. The response rate was 60.4%.

A positive significant effect on risk-taking behaviour based on the score on the psychosocial function of driving was found ($p < 0.001$). A positive significant effect on risk-taking behaviour was also found based on driving related interaction with friends. Low structure/high impulsivity leisure time activities such as playing PC-games, doing body building and partying with friends were found to be related to increased risk-taking behaviour ($p < 0.01$).

Although risk-taking behaviour is generally condemned by society results show that risk-taking behaviour while driving can also be functional in the lives of the young drivers. Consequently, other motives than safety motives are at stake when engaging in risk-taking behaviour. Implications for preventive efforts are discussed.

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1. Introduction

The problem of young drivers being over-represented in road traffic accidents has been well known for a long time. In a newly published OECD report, it is documented that 27% of the driver fatalities across the OECD countries involve a young driver (OECD, 2006). In Denmark a young driver is involved in 27% of all fatality and injury accidents (Møller, 2004).

Over the years, quite a few studies on the behaviour of young drivers have been done. Generally, results indicate two broad categories of influential factors. The first category has to do with the fact that young drivers are also new drivers facing a series of difficulties caused by a lack of driving skills and lack of experience (for an overview see for instance Gregersen, 1996). This study is related to the second category of influential factors, which has to do with the way the young driver chooses to drive.

A large number of individual factors influence the way the young driver chooses to drive. Examples of such individual fac-

tors are gender, personality and emotional state. Thus, men are shown to be less safety oriented than women (Laapotti et al., 2003), personality traits such as sensation seeking (Jonah, 1997), and being in an aggressive mood have been shown to be related to risk-taking behaviour while driving (Arnett et al., 1997).

While recognizing the importance of individual factors, awareness of the relevance of factors related to the lifestyle and general life situation of the young driver has increased. Two approaches should be mentioned, one of which focuses on problem behaviour across contexts, whereas the other focuses on lifestyle related behavioural patterns. In this study, the two approaches are combined. Therefore, the two approaches are described briefly below.

Studies using the problem behaviour approach have shown that problem behaviour in traffic is highly related to other problem behaviours such as cigarette smoking, alcohol misuse, marijuana use, social maladjustment and poor school performance (Bingham et al., 2006; Bingham and Shope, 2004a, b). These findings are in accordance with the Problem Behaviour Theory, which distinguishes between behaviour that is approved of by the general society and problem behaviour that is condemned. According to the theory, young people are typically involved in more than one kind of problem behaviour leading

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to a problem behaviour syndrome (Jessor, 1987). The syndrome has been shown to be stable over time (Shope et al., 2003). The problem behaviour approach has contributed to the understanding of problem behaviour in traffic and has among other things illuminated the necessity of early intervention. One core concept of the theory remains, however, largely unexplored in relation to problem behaviour in traffic. This concept is the concept of functionality, which implies that problem behaviour, although condemned by society, nevertheless is “functional, purposive and instrumental towards attainment of goals” in the life of the young person (Jessor, 1987). Assuming that the functionality of behaviour is an important element in the understanding of the behaviour, a first step towards illuminating this aspect in relation to driving behaviour is taken in this study.

Studies using the lifestyle approach have identified correlations between aspects of lifestyle and driving behaviour leading to different high- or low-risk lifestyle profiles (Berg, 1994; Gregersen and Berg, 1994; Chlioutakitis et al., 1999). Gregersen and Berg (1994) found that the lifestyle profile of young drivers with a high accident risk was characterised by elements such as infrequent participation in sport activities, frequent intoxication, and a generally hectic social life. In addition, driving with extra motives and interest in cars were shown to be characteristic aspects of the high-risk lifestyle profiles identified. Extra motives were motives such as sensation seeking, pleasure and showing off i.e. motives other than mere transportation. The studies on the relationship between lifestyle and driving behaviour have contributed to a broader understanding of subgroups of drivers but have only to a limited extent been able to explain how the relationships are established.

Based on the earlier findings of studies using the problem behaviour or lifestyle approach to the young driver problem, this study combines the two approaches in the hypothesis that risk-taking behaviour while driving is a functional element in the life of the young driver. The relevance of this hypothesis is documented in an earlier qualitative explorative study (Møller, 2004), in which four psychosocial functions of driving was identified (visibility, status, control and mobility). In addition, the lifestyle of the young driver and emotional involvement in driving was found to be related to the expression of these functions. Thus, it was found that a lifestyle characterised by low structure/high impulsivity leisure time activities and being with friends facilitated the use of the car in a way that enhanced risk-taking behaviour. Finally, it was suggested that risk-taking behaviour

was more common among young drivers attending basic vocational courses. With the purpose of finding out if selected aspects of these results can also be found in a larger scale quantitative study, this study focuses on the relationship between risk-taking behaviour, the psychosocial function of driving, leisure time activities, car oriented peer group activities and educational attainment.

2. Objectives

The purpose of this study was to examine the relation between risk-taking behaviour while driving, the psychosocial function of driving, leisure time activities, car oriented peer group interaction and educational attainment. The study is based on the assumption that a high score on psychosocial function of driving, car related peer group interaction with friends, engagement in low structure/high action leisure time activities and low educational attainment is associated with increased risk-taking behaviour.

3. Method

3.1. Data

A mailed questionnaire survey was carried out among 4004 young drivers aged 18–25. The sample was randomly drawn from the Danish driving licence register and stratified for gender. The response rate was 60.4% ($N=2417$). The nonresponse group consisted of 87 drivers, who for known reasons such as being ill, travelling abroad, having moved leaving no information about the new address etc. were unable to answer the questionnaire, and 1500 drivers who for unknown reasons did not respond. 56% of the respondents were women. The questionnaire used consisted of a combination of questions used in earlier studies (Quimby et al., 1999; Carstensen, 2002) and questions developed specifically for this study based on results of an earlier study (Møller, 2004b).

3.2. Measures

Risk-taking behaviour was measured based on nine questions that covered how often the young drivers performed different behaviours while driving (cf. Table 1). For each driver a total score was calculated based on his/her answer to each of the nine

Table 1
Frequency of behaviours used to measure risk-taking while driving

Behaviour	N	Never	Seldom	Occasionally	Often	Always
Racing against other drivers	2332	1465	563	242	33	29
Race out of the intersection on green	2317	954	650	514	140	59
Engage in risk-taking behaviour	2326	1030	1001	249	34	12
Drive close to the car in front	2333	795	950	468	98	22
Speed up on yellow	2331	479	778	754	257	63
Drive through a curve at high speed	2325	707	960	542	100	16
Drive at high speed for fun	2332	796	729	538	205	64
Drive at high speed to impress your friends	2332	1846	374	93	16	3
Take chances for fun while driving	2330	1919	318	61	23	9

Table 2
Proportions of answers to the questions used to measure the psychosocial function of driving

Psychosocial function of driving	N	Not at all (%)	To a limited extent (%)	To some extent (%)	Very much (%)
Practicability in daily life	2323	3.7	5.0	20.1	71.1
Independence	2306	8.3	14.0	37.7	40.0
Seeing friends easily	2315	4.7	11.8	32.7	50.8
Status	2289	52.8	29.8	15.2	2.2
Freedom	2321	3.3	6.0	32.0	58.7
Becoming an adult	2301	37.1	28.9	27.2	6.9
Adventure with friends	2309	7.4	17.1	44.0	31.5
Blowing off steam	2307	75.0	16.6	5.7	2.2
Get any place	2316	4.5	9.8	29.2	56.4

questions. For each question, the driver had to choose between the following five possibilities: ‘never’ (1), ‘seldom’ (2), ‘occasionally’ (3), ‘often’ (4), ‘very often’ (5). The numbers indicate the points given for each answer. The lowest possible score was 9 and the highest was 45. The reliability of the scale was 0.84 (Cronbach’s alpha). A high score indicated more risk-taking behaviour while driving than a low score.

The behaviours used to measure risk-taking behaviour were selected based on two criteria: firstly, the selected behaviours should reflect existing knowledge about the young driver problem in terms of accidents and driving style. Therefore, the behaviours selected capture issues such as driving at high speed, driving with extra motives and disregarding safety margins (see for instance Evans and Wasielewsky, 1983; Gregersen and Berg, 1994; Silcock et al., 1999; Webster and Wells, 2000; Begg and Langley, 2001; Parker et al., 2002; OECD, 2006). Secondly, the behaviours should reflect deliberate risk-taking rather than risk-taking caused by lack of experience (see for instance Gregersen and Bjurulf, 1996; Deery, 1999; McKnight and McKnight, 2003).

The *psychosocial function of driving* was measured based on nine questions covering different psychosocial functions such as status, freedom, adventure etc. (cf. Table 2). For each question the driver had to choose between the following four possibilities: ‘Not at all’ (1), ‘to a limited extent’ (2), ‘to some extent’ (3), ‘very much’ (4). In the analysis, the nine questions were included separately but also as a total score. Calculation of the total score followed the procedure described above regarding risk-taking behaviour. The reliability of the scale was 0.74 (Cronbach’s alpha). Besides indicating the psychosocial function of driving, the questions also indicated the degree of emotional involvement in driving. A high score indicated more emotional involvement in driving than a low score.

Leisure time activities were measured based on two categories of questions. The first category included 13 different leisure time activities such as sports and going to the movies. Each of the 13 activities represented one of the following two dimensions: (1) high structure/low impulsivity (i.e. having a leisure time job, doing team sport). (2) Low structure/high impulsivity (i.e. body building, computer games). For each of the 13 activities, the respondents indicated participation or nonparticipation. The two dimensions high structure/low impulsivity and low structure/high impulsivity were developed based on an earlier study (Møller, 2004b). The two dimensions were used to

make a distinction between leisure time activities that must be planned ahead and leisure time activities that can be initiated on very short notice and thus allow a high degree of impulsivity.

The second category of questions used to measure leisure time activities regarded driving related interaction with friends such as being chauffeur for friends and a shared interest in cars.

Educational attainment was measured on the basis of current or former participation in educational programs and categorised according to the academic skills/performance needed in the most recent educational program.

3.3. Analysis

Data analysis was generally conducted in two steps. First step included a number of single one-way analyses of variance (ANOVA). The purpose of this part of the analysis was to analyse the independent effect of each of the included factors. That is to see if the variation in risk-taking behaviour could be attributed a difference between the respondents based on differences in the psychosocial function of driving, leisure time activities, and educational attainment or to random variation between the respondents. At this step of the analysis, the questions regarding the psychosocial function of driving were included individually. The second step of the analysis involved simple and multiple linear regression with risk-taking behaviour as the dependent variable and psychosocial function of driving, leisure time activities, driving with friends and educational attainment as the explanatory variables. Assuming that some of the explanatory variables were inter-related, the purpose of this part of the analysis was to analyse the joint effect of the explanatory variables on risk-taking behaviour. Firstly, a simple linear regression was performed using the total score on the psychosocial function as the explanatory variable. Secondly, a multiple linear regression was performed. All variables were initially entered into the model. Nonsignificant variables were removed and the analysis was continued until only significant variables were included in the model. The variables used to measure the psychosocial function of driving were entered separately as opposed to as a total score. This procedure was chosen in order to get as detailed information about the psychosocial function of driving as possible.

For all analyses, significance level was set to 5%. Analyses were performed using SPSS version 13.

4. Results

The level of risk-taking behaviour was found to be significantly related to the psychosocial function of driving, leisure time activities inclusive driving related interaction with friends and educational attainment. Using one-way ANOVA, a positive significant effect on risk-taking behaviour of each of the nine questions used to measure the psychosocial function of driving was found. Most significant were 'status' ($F_{(3,2244)} = 64.626$, $p < .001$) and 'blowing off steam', ($F_{(3,2259)} = 174.843$, $p < .001$). Table 2 illustrates the answers to the questions regarding the psychosocial function of driving in the lives of the young drivers. In relation to six of the nine questions, the large majority of drivers (76–91%) found that driving 'to some extent' or 'very much' had that particular function in their life. The three questions regarding 'status', 'becoming an adult' and 'blowing off steam' deviated from that general tendency in that the majority of the young drivers found that those functions of driving 'not at all' or 'to a very limited extent' applied to them (82.6%, 66% and 92.1%, respectively).

As can be seen in Table 3 a significant relation between leisure time activities and risk-taking behaviour was found for 6 of the 13 leisure time activities included in the study. Three of the leisure time activities were related to an increase in risk-taking behaviour, and three of the activities were related to a decrease in risk-taking behaviour. Leisure time activities related to an increase in risk-taking behaviour were playing PC-games, doing body building and going to parties. Leisure time activities related to a decrease in risk-taking behaviour were doing homework, going to the movies and reading literature.

Using linear regression a positive significant effect on risk-taking behaviour based on the total score on psychosocial function of driving was found ($F_{1,2215} = 241.910$, $R^2 = 0.98$, $p < .001$). In addition educational attainment was found to be significantly related to risk-taking behaviour while driving ($F_{(4,2270)} = 20.649$, $p < .001$). Having only compulsory or basic vocational education was related to a higher score on risk-taking behaviour, compared to drivers with a more academic educational background. Educational attainment was also found to

Table 3
One-way ANOVA on leisure time activities and risk-taking behaviour

Leisure time activities	<i>N</i>	df	MS	<i>F</i>
Play in a band	2289	1	7.005	0.267
Leisure time job	2289	1	95.097	3.627
Seeing friends	2289	1	8.197	0.312
Homework	2289	1	1780.944	69.899***
TV	2289	1	0.013	0.000
PC-games	2289	1	1945.758	76.585***
Body building	2289	1	610.745	23.499***
Individual sport	2289	1	28.228	1.076
Team sport	2289	1	2.123	0.081
Political party	2289	1	27.720	1.056
Parties	2289	1	759.179	29.283***
Cinema	2289	1	177.189	6.768**
Literature	2289	1	1292.048	50.289***

** $p < 0.01$.

*** $p < 0.001$.

Table 4

Multiple linear regression on selected aspects of psychosocial function of driving, leisure time activities and educational attainment

Variable	Parameter estimate	95% CI	<i>t</i>
Constant	7.011***	6.097–7.926	15.032
Status	0.402**	0.151–0.653	3.142
Becoming an adult	–.213*	–0.408 to –0.018	–2.142
Blowing off steam	1.891***	1.596–2.186	12.564
PC-games	1.140***	0.725–1.555	5.391
Body building	0.579**	0.198–0.960	2.981
Parties	0.584**	0.189–0.979	2.896
Chauffeur for friends	0.541***	0.333–0.748	5.114
Interest in cars	1.055***	0.861–1.250	10.629
Driving with friends for fun	0.673***	0.489–0.859	7.199
Educational attainment	0.141	–0.12 to 0.295	1.806

$N = 2185$, $R^2 = 0.33$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

be significantly related to the psychosocial function of driving ($F_{(4,2237)} = 42.549$, $p < .001$). Parallel to the results regarding risk-taking behaviour compulsory or basic vocational education was related to a higher score with regard to the psychosocial function of driving.

Using linear regression a significant effect of driving related interaction with friends was found on risk-taking behaviour ($F_{(7,2236)} = 108.968$, $R^2 = 0.25$, $p < .001$) as well as on the psychosocial function of driving ($F_{(7,2206)} = 101.277$, $R^2 = 0.24$, $p < .001$). 'Being chauffeur for friends', 'interest in cars' and 'driving for fun with friends' were significantly related to both aspects. Thus a high score on 'being chauffeur for friends', 'interest in cars' and 'driving for fun with friends' increased the probability of having a high score on psychosocial function of driving as well as on risk-taking behaviour while driving.

Using multiple linear regression, a final model was developed. Results are shown in Table 4. The final model included aspects of the psychosocial function of driving, leisure time activities and car oriented peer group interaction. As can be seen in Table 4, educational attainment was no longer significant ($p = 0.71$).

5. Discussion

This study has three main results. The study shows that the psychosocial function of driving is an indicator of risk-taking behaviour while driving. Secondly, the study shows that young drivers engaged in low structure/high impulsivity leisure time activities including driving related peer group interaction are involved in more risk taking while driving, than young drivers engaged in high structure/low impulsivity leisure time activities. Finally, the study shows that low educational attainment is related to risk-taking behaviour while driving, but also that it correlates with other significant aspects of the lives of the young drivers. The results are discussed below.

The response rate of the study was 60.4%. It is well known that the response rate generally is relatively low in mail surveys (Abrahamson and Abrahamson, 1999). In addition, studies show that the response rate in mail surveys has been declining during the last years (Dillman et al., 2002; Leeuw and Heer,

2002). Keeping this in mind and compared with similar studies, the response rate of 60.4% in this study is not particularly low. Never the less nonresponse is generally a possible source of bias, and should therefore be considered. A respondent's decision not to respond may be a result of cognition as well as of motivation (Beatty and Herrmann, 2002). A cognitively based nonresponse may reflect cognitive inabilities, such as not being able to read and understand the questions or not having the information asked for available. A motivationally based nonresponse may be due to a lack of interest in the subject matter, or reluctance to admit certain behaviours or attitudes that they think are socially unacceptable. Unfortunately, it is not possible to determine the reasons behind the majority of nonresponse in this particular study. However, in order to limit nonresponse due to illiteracy and other related cognitive factors the questionnaire was tested among young drivers with low academic achievements. In order to limit nonresponse due to motivational factors a reminder letter was used and anonymity was guaranteed. A relevant concern is whether high-risk drivers would bother to participate in a mail survey on driving behaviour. As stated above it is not possible to determine if this group of drivers is underrepresented in the sample. However, the earlier described relationship between driving with extra motives and increased accident risk indicates a general interest in driving among high-risk drivers and thus a potential motivation in the subject of the study (Berg, 1994; Gregersen and Berg, 1994; Chlioutakitis et al., 1999). Untrue or biased answers constitute an issue related to nonresponse. Research into the reliability of self-reports of driving behaviour show that they are generally reliable (Hatakka et al., 1997; Lajunen and Summala, 2003), although Lajunen and Summala (2003) found that socially undesirable behaviours and attitudes are reported less frequently in social settings than in private settings. Bias due to social desirability will thus be limited in this study designed as an anonymous mail survey. Moreover, neutral phrasing of the questions used in the study, reduces possible effects of socially desirability, because it enables social desirability to be defined by the norms of the respondent rather than by the norms of the researcher (Hatakka et al., 1997).

The result that the psychosocial function of driving is related to risk-taking behaviour is supported by earlier studies that found that driving with extra motives such as sensation seeking, pleasure and showing off was related to increased accident risk (see for example Berg, 1994; Gregersen and Berg, 1994; Chlioutakitis et al., 1999). The fact that some young drivers use the car and risk-taking behaviour as a tool to gain status and let off steam shows that motives other than safety motives are at stake while driving. That such motives are related to the general life situation of the young driver is supported by the findings in this study that drivers who are interested in cars, act as chauffeur for their friends and drive with them for fun are more likely to be involved in risk-taking behaviour while driving than drivers who do not use the car in this way. This also indicates that risk-taking behaviour is functional in the life of the young driver. For preventing efforts this is an important result, because it contributes to an understanding of why it is so difficult to get through to young drivers with safety messages despite large efforts. From other studies, it is known, that young

drivers overestimate their skills and underestimate their risk (Finn and Bragg, 1986; Greening and Chandler, 1997). Combined with an immediate reward from risk-taking behaviour, such as increased status within the peer group, the motivation to refrain from such behaviours is likely to decrease accordingly. However, it is important to be aware that only a limited insight into the influence of the psychosocial function of driving is given in this study. Further studies are therefore needed to fully understand the implications of the psychosocial function of driving.

The results that certain types of leisure time activities are related to increased risk are also supported by earlier studies (see for example Berg, 1994; Gregersen and Berg, 1994; Chlioutakitis et al., 1999). The additional and new contribution from this study comes from the categorization of leisure time activities according to a high/low structure dimension. The use of this dimension was done with the purpose to illuminate, whether the relation between leisure time activities and driving behaviour was a result of the specific activities, or rather a reflection of a more general way of dealing with the challenges of youth life. The above results regarding the psychosocial function of driving indicate that risk-taking behaviour is reflecting the general life situation of the young driver. This is further supported by the findings regarding leisure time activities. The results show that risk-taking behaviour while driving is related to a leisure time characterised by low structure activities such as body building, partying and playing PC-games, activities that demand only limited planning ahead. Together with the above results the study thus shows that driving and risk-taking while driving is part of and facilitates a low structure lifestyle thereby becoming functional in the life of the young driver. However, results also indicate that the relation between driving behaviour and leisure time activities is complex and that the high/low structure dimension profitably could be further refined. The result that reading literature, a low structure leisure time activity, is related to less risk-taking while driving is an example of the need of further refinement and that a dimension capturing interaction with friends should be considered.

This study does not enable conclusions about risk-taking behaviour in other aspects of life. Therefore a relevant next step would be to find out, if engagement in low structure leisure time activities is related to other forms of problem behaviour. Results from this and an earlier study (Møller, 2004) indicate, that a low structure leisure time may reflect social maladjustment. Such a finding would be in accordance with Problem Behaviour Theory (Jessor, 1987). However, additional studies are needed to clarify this.

In this study low educational attainment was found to be related to increased risk-taking behaviour in the univariate analysis. This result was expected based on results from earlier studies that found educational attainment to be related to accident involvement (Murray, 1998; Hasselberg, 2003). Considering the importance of education in the western societies today it is reasonable, to some extent, to consider educational attainment as a result of the general competences of the young person in handling the challenges of modern youth life (Mørch, 2003). Thus, the finding that low educational achievement is

related to increased risk-taking behaviour may support the suggestion, that risk-taking behaviour is related to a more general maladjustment in society. However, in this study educational attainment was no longer significantly related to risk-taking behaviour when using multiple regression analyses. This may be due to covariance with other more significant aspects or caused by a lack of relevance. Further studies are needed to clarify this.

The results of this study show that the driving behaviour of the young driver is influenced by motives related to the general life situation of the young driver. This implies that the young driver not only needs skills for handling the car, reading the traffic etc. In order to drive safely the young driver also needs skills to handle the influences from motives stemming from his/her general life situation. Based on the results of this study, examples of some of the skills need are controlling the impulse to let off steam through driving behaviour or the motivation to gain status among friends through risk-taking behaviour while driving. In addition to the existing preventive efforts additional preventive efforts designed to increase the young drivers' awareness of the existence and influence of such motives should be created. The relation between driving related interaction with friends and increased risk-taking behaviour indicate the relevance of interventions focusing on and including the peer group. The relevance of peer group based interventions is supported by earlier studies (Studsholt, 1990; Mørch, 1998). Finally, in accordance with a number of studies dealing with the young driver problem from a lifestyle perspective (Berg, 2001; Bina et al., 2006; Chlioutakitis et al., 1999; Chlioutakitis et al., 2005) the results of this study confirms the need of a differentiated approach based on knowledge of different subgroups of young drivers.

This study was conducted in Denmark a small Scandinavian country. Therefore, it is relevant to consider the extent to which the results are also applicable to other countries. The overrepresentation of young drivers in accidents is a well-known problem in most countries. The accident pattern of young Danish drivers is very similar to the accident patterns of young drivers in other countries (OECD, 2006). This indicates that at least part of the young driver problem is of a more general nature not related to specific national characteristics. However, studies also show that "each country has its own problems in traffic culture" (Özkan et al., 2006). It is not possible to estimate to what extent local characteristics related to the Danish traffic culture, the Danish youth life etc. influence the results of this study. Further studies are needed to clarify this. However, the results are generally in accordance with results from other studies conducted in other countries.

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