Driver Inattention: More Risky than the Fatal Four?

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Abstract

Driver inattention is a very significant but often neglected road safety issue. In terms of its contribution to the social cost of road crashes, it far outweighs the contribution of drink driving, speeding, fatigue or non-use of seatbelt. This paper explores some of the common behaviours associated with driver inattention with respect to their perceived crash risks, rates of self-reported behaviours and whether drivers regulate such behaviours depending on the road and traffic environment.

Introduction

In an effort to reduce the road trauma, traffic authorities in Australia and New Zealand have implemented a series of countermeasures aimed primarily at reducing the road fatalities, with most states focusing their efforts on the four major contributing factors known as the "fatal four": speeding, drink-driving, fatigue and non-usage of seatbelts. Relatively little attention, however, has been devoted to several other factors, including driver inattention, that contributed more to the social cost of road crashes in Australia than the "fatal four". As evident from Table 1, the problem of drivers' inattention contributed to significantly more crashes and higher social cost than either alcohol or speed and the traditional focus on the fatal four is not likely to result in the optimal allocation of scarce road safety resources (Tay, in press). Since the under-reporting rates for non fatal crashes are likely to be much higher than fatal crashes, the relative contribution of driver inattention to the social cost of road crashes is expected to be much higher compared to drink driving or speeding.

Table 1: Major Contributors to Crashes - Queensland 2000

Factors	Fatal	Serious Injury	Minor Injury	Non-Injury	Cost (A$)
Inattention	38	933	2679	2559	495,237,018
Alcohol/Drug	94	475	491	666	359,808,830
Speed	48	239	257	402	182,728,570
Fatigue	28	295	347	479	174,203,186

Source: Crash statistics obtained from Web Crash 2 on 5/8/02; costs computed using per unit value provided by BTE(2000).

With the exception of a few recent papers investigating the impact of mobile telephone usage, little research has been conducted on the problems associated with other forms of drivers' inattention. Although important in increasing the relative risks compared to non-use, the use of mobile telephone was assessed to be a significant contributing factor in only a negligible proportion of all crashes. Violanti (1998) found that only 4.2% of fatal crashes had a phone present in the vehicle and of the fatalities with a phone present, only 7.7% were reported using the phone at the time of collision. Therefore, the use of cellular phone was considered a contributing factor in about a third of one percent of the fatal crashes. Inattention, therefore, is a more general problem than the usage of mobile telephone and more research should be conducted to better understand this important contributing factor to road crashes.

The purpose of this study is to explore drivers' perception of the risks involved in not paying attention while driving and their self-reported incidences of behaviours such as eating, drinking, using mobile phone, handling stereo system, reading, writing and looking at scenery and attractive pedestrians. Comparisons are made with the two widely researched and documented behaviours of speeding and drink driving to provide a better understanding of the drivers' attitudes and behaviours. This study also attempts to assess if risk compensation or self-regulation of such behaviour exists depending on the road and traffic environment.

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Survey

A self-administered questionnaire was designed to gather relevant information from the respondents regarding their perceptions of the risks involved in several common activities that will distract from the driving tasks. First, in order to gauge the respondents' overall perceptions of the relative risks associated with inattention as compared to some of the more highly publicised risky driving behaviour, the respondents were asked: "Please rank the following behaviours from 1 (most likely) to 4 (least likely) to contribute towards a serious crash?" The question is followed by these factors: drink driving, speeding, fatigue and inattention (see Table2). The same question and choices were repeated for minor crashes instead of serious crashes.

Second, in order to get more detail information on the respondents' perceptions of the risks involved in several common activities that will distract from the driving tasks, they were asked: "How likely do you think a crash will occur if a driver engages in the following behaviours while driving?" These activities include eating, drinking, using mobile phone, handling stereo system, reading, writing and looking at scenery and attractive pedestrians (see Table 3). The responses were recorded on a 5-point scale ranging from 1 = very likely to 5= very unlikely. Again, for the purpose of comparison, the survey gathered information on the respondents' perception of the risks associated with different speeding and drink driving behaviour using the same format.

Third, in order to collate the respondents' risks perceptions with their self-reported behaviours, respondents were asked: "How often do you engage in the following behaviours while driving?" The question was followed by the same list of activities described above and the responses were recorded on a 5-point scale ranging from 1 = never to 5 = regularly (see Table 4).

Finally, to examine if drivers self-regulate such behaviours according the perceived risks in different road and traffic environment, they were asked: "Will you be likely to participate in the above activities if you are in the following situations?" The question is followed by a list of road and traffic conditions ranging from stopping at traffic lights to driving on a freeway with heavy traffic (see Table 5) and the responses to each item were recorded on a three point scale with 1 = less likely, 2 = same and 3= more likely.

Sample

The survey was administered to a convenient sample of 140 participants. The respondents are predominantly male (75.5%) and the age distribution is as follows: under 25 (5.6%), 25-34 (15.4%), 35-44 (36.4%), 45-54 (26.6%), 55-64 (9.8%) and above 64 (6.3%). The respondents were drawn from a fairly even mix in terms of residential locality: city (40.6%), country town (43.4%) and rural (16.1 %).

Most of the participants have been recruited from Australian companies with a demonstrated interest in driver safety and driver training. The organisations involved cover a variety of industries but most do not have any drivers who would be considered as part of the transport industry, that is, very few of the respondents are professional or long haul drivers. The majority of the respondents drove to and from work (80%) and about a third have jobs that "require a lot of driving". Interestingly, only about one-quarter of the respondents drove for more than 15 hours per week which suggested that driving for more than two hours per day, on average, would be considered by many Australians as "a lot of driving". The majority of the respondents drove a car (69.1%) or 4WD (23.5%) most regularly, while the rest drove small trucks, buses, van and motorcycles most regularly.

Perceived Risks

As evident from the survey results shown in Table 2, most respondents considered driver inattention to be a minor contributor to serious crashes but a major contributor to minor crashes. Surprisingly, inattention was ranked lower than fatigue as a contributor to serious crashes even though it was assessed to be a more significant contributor of fatal crashes, as shown in Table 1. Part of this incorrect perception may be due to the lack of publicity and awareness on inattention as a major contributor to fatal crashes.

This result may also be due to drivers' ability to self-regulate according to the perceived risks when driving in different road and traffic environment. Unlike the more persistent effects of alcohol on the driver throughout the duration of the trip, driver inattention is more transient during the trip and drivers might be able to compensate for the higher risks involved in driving on more risky road and traffic conditions by paying more attention. The effects of self-regulation will be further discussed in the subsequent sections.

Having considered the potential for self-regulation, it should be noted that many drivers probably still have the incorrect notion that a crash is likely to involve another vehicle and not a pedestrian or cyclist. This misconception may also help to explain why the respondents would consider a crash in the car park or on a road with a lower speed limit and lighter traffic to be a minor crash. However, if they were to consider the event of hitting a pedestrian or a cyclist to be quite high, then they might reassess it as a serious crash resulting in death or injury.

Table 2: Ranking of Risks Associated with Inattention, Fatigue, Speeding and Drink Driving

Contributing Factors	First	Second	Third	Fourth	Mean
Serious Crashes					
Drink Driving	49.1	22.2	17.6	11.1	1.91
Fatigue	22.2	48.1	25.9	3.7	2.11
Speeding	15.7	23.1	27.8	33.3	2.79
Inattention	13.9	7.4	27.8	50.9	3.16
Minor Crashes					
Inattention	44.9	18.7	20.6	15.9	2.07
Drink Driving	34.9	26.4	21.7	17.0	2.21
Fatigue	7.5	34.0	33.0	25.5	2.76
Speeding	13.2	21.7	23.6	41.5	2.93

Note: Distribution (%) of the responses for each item is shown in the second column.
Mean calculated using first = 1, second = 2, third = 3, fourth = 4.

It is interesting to note that although the respondents' perceptions of the relative risks of being involved in a minor crash is consistent with the reported crashes shown in Table 1, their perception of the relative risks of being involved in a serious crash is not. This difference in their perceptions may be due to the fact that most drivers have direct experience of inattention resulting in either a near miss or minor crash. As serious crashes are relatively rare events, very few drivers have much direct experience of a serious crash but instead form their perceptions of these crashes from public awareness and education campaigns. However, these perceptions are clearly incorrect. For example, in the State of Queensland, fatigue was assessed to be the eighth most important contributing factor of fatal crashes, which was lower than the fifth placed inattention (Queensland Transport, 2000, pp 36), but was perceived by the respondents as a more significant contributing factor.

Table 3: Perceptions of Crash Risks Associated with Inattention, Speeding and Drink Driving

Behaviours	Very Likely	Likely	Neutral	Unlikely	Very Unlikely	Mean
Making written notes, appointments, etc	62.0	32.1	2.9	2.2	0.7	1.47
Reading maps, newspaper, notes, etc	59.4	33.3	5.1	1.4	0.7	1.51
Talking on your hand-held mobile phone	39.9	43.5	12.3	4.3	0.0	1.81
Eating (fast food, sandwiches, fruits, etc)	14.5	51.4	23.9	10.1	0.0	2.30
Drinking (coffee, tea, soda, etc)	16.7	50.7	18.8	13.0	0.7	2.30
Looking at attractive pedestrians by the side of the road	17.4	44.2	30.4	7.2	0.7	2.30
Looking at scenery, advertisements, etc	14.6	35.8	38.0	11.7	0.0	2.47
Changing channel/volume or cassette/CD on your stereo	12.5	39.0	33.1	14.7	0.7	2.52
Talking on your hands free mobile phone	8.7	37.0	28.3	23.9	2.2	2.74
Exceeding the speed limit by < 10 km/h on a 50km/h rd	6.5	29.0	33.3	22.5	8.7	2.98
Exceeding the speed limit by 10-20 km/h on a 50 km/h rd	28.3	48.6	13.0	8.7	1.4	2.07
Exceeding the speed limit by > 20 km/h on a 50 km/h rd	54.0	35.3	7.9	2.2	0.7	1.60
Exceeding the speed limit by < 10 km/h on a 100km/h rd	8.0	18.1	37.7	23.9	12.3	3.14
Exceeding the speed limit by 10-20 km/h on a 100km/h rd	25.9	36.0	23.0	12.9	2.2	2.29
Exceeding the speed limit by > 20 km/h on a 100 km/h rd	37.4	46.0	10.8	4.3	1.4	1.86
Driving after having an alcoholic drink or two	20.1	31.7	33.8	12.2	2.2	2.45
Driving with a BAC level of 0.05-0.08	51.4	36.2	8.0	4.3	0.0	1.65
Driving with a BAC level of 0.08-0.10	74.6	21.7	2.2	0.7	0.7	1.31
Driving with a BAC level of more than 0.10	91.2	7.3	0.7	0.0	0.7	1.12

Note: Distribution (%) of the responses for each item is shown in the second column.
Mean calculated using very likely = 1, likely = 2, neutral = 3, unlikely = 4 and very unlikely = 5.

As discussed earlier, driver inattention comprises many common behaviours that have different perceived crash risks. As shown in Table 3, the behaviours that were perceived as most likely to cause a crash were writing, reading and talking on a hand-held mobile phone. These behaviours were perceived to be more likely to cause a crash than all of the common speeding behaviours, including driving more than 20 km/h above the speed limit on a 50 km/h road. In addition, reading and/or writing while driving were also perceived to be more risky than driving with a moderately high (0.05-0.08) blood alcohol concentration level.

Interestingly, the acts of eating and drinking while driving were considered to be about as risky as driving 10-20 km/h over the speed limit on a 100 km/h road. More importantly, all the inattentive behaviours listed were perceived to be more risky than driving less than 10 km/h over the speed limit. Given the strong emphasis on speeding by transport authorities and the relative lack of emphasis by most government agencies to address the problem associated with driver inattention, these results suggest that compared to most policy makers, drivers have either overestimated the dangers associated with driver inattention or underestimated the dangers associated with speeding. These differences in the perceived risks between policy makers and drivers, coupled with the different emphasis on enforcement, may result in the wrong perception among some drivers that some of the countermeasures directed at reducing speeding may not be a measure designed mainly to reduce crashes and improve road safety.

Self-Reported Inattentive Behaviours While Driving

As shown in Table 4, most drivers reported that they never or rarely read or write while driving. This result is consistent with the perception of most respondents that it is very risky to participate in these behviours. Reading, however, appeared to be done by a fairly substantial share of the drivers albeit not often or regularly. Also, as expected, a large proportion of the respondents reported that they often handled their car stereo system while driving since these activities were not perceived to be very risky.

Table 4: Self-Reported Inattentive Behaviours

Inattentive Behaviours	Never	Rarely	Sometimes	Often	Regularly	Mean
Changing channel/volume or cassette/CD on your stereo	4.9	27.3	36.4	20.3	11.2	3.06
Looking at scenery, advertisements, etc	16.8	32.9	32.9	10.5	7.0	3.00
Looking at attractive pedestrians by the side of the road	7.0	22.4	69.9	0.0	0.7	2.58
Eating (fast food, sandwiches, fruits, etc)	23.1	40.6	30.1	5.6	0.7	2.20
Drinking (coffee, tea, soda, etc)	34.3	30.1	23.8	9.1	2.8	2.16
Talking on your hands free mobile phone	62.0	7.7	15.5	7.7	7.0	1.90
Reading maps, newspaper, notes, etc	58.5	33.8	6.3	1.4	0.0	1.51
Talking on your hand-held mobile phone	72.0	21.0	5.6	0.7	0.7	1.37
Making written notes, appointments, etc	83.1	12.0	3.5	1.4	0.0	1.23

Note: Distribution (%) of the responses for each item is shown in the second column.
Mean calculated using very likely = 1, likely = 2, neutral = 3, unlikely = 4 and very unlikely = 5.

In contrast, relative to expectations or conventional wisdom, mobile phone usage rates appeared to be under-reported. This lower rate of usage may partly be due to the higher levels of debate and publicity on the dangers associated with mobile phone usage, particularly hand-held phones, while driving. On the other hand, part of the lower usage rates may simply be due to the fact that our sample comprises a relatively large proportion of respondents from rural and country towns that are not well served by such services.

It is interesting to note that only about 23% and 34.3% of the respondents reported that they never drank or ate while driving, whereas the majority of the respondents reported that they had done these activities occasionally. These activities were perceived to be as risky as driving 10-20 km/h above the speed limit on a 100 km/h road. These results suggest that respondents view such activities as socially acceptable and not very risky.

Finally, looking at scenery, advertisements and attractive pedestrians while driving were also done more frequently by drivers in the sample, probably because they are perceived to be less risky than some of the common behaviours such as eating, drinking or driving 10-20 km/h above the speed limit on a 100 km/h road.

Risk Compensation and Self-Regulation

Economic theory posits that a consumer will choose the level of risks to optimise his/her utility or maximise the difference between expected benefits and costs. It is important to note that like speeding but unlike drink driving, inattention is much more transient in nature and rivers are better able adjust the level of risky behaviours to undertake

as the expected costs and benefits of such activities vary according to the road and traffic environment. Therefore, it is hypothesised that drivers are more likely to participate in inattentive behaviours in road and traffic environment that they deem to be safer and less likely to undertake such activities under more adverse conditions.

Table 5: Self-Regulation of Inattention According to Road and Traffic Environment

Road and Traffic Environment	Less Likely	Same	More Likely	Mean
Stopped at traffic lights	7.0	22.4	69.9	2.65
Driving in familiar environment	11.3	54.2	33.8	2.25
Driving on straight road	15.4	66.4	17.5	2.04
Driving on urban road with light traffic	21.7	64.3	14.0	1.92
Driving on a freeway with light traffic	35.7	55.2	9.1	1.73
Driving in a car park	58.7	35.7	4.9	1.48
Seeing a police car behind you	73.4	24.5	2.1	1.29
Driving on urban with heavy traffic	72.5	26.1	1.4	1.29
Driving on a freeway with heavy traffic	73.2	26.8	0.0	1.27
Driving around a bend	78.2	21.1	0.7	1.23

Note: Distribution (%) of the responses for each item is shown in the second column.
Mean calculated using Less Likely = 1, Same = 2, More Likely = 3.

As shown in Table 5, drivers reported that they were more likely to participate in inattentive behaviours when they were stopped at traffic lights, driving in familiar environment or driving on a straight road. The balance appeared to be driving on urban roads with light traffic and as the traffic increases, drivers tended to pay more attention to their driving and were less likely to engage in distracting or inattentive behaviours. These results provided some support for the economic theory of consumer choice under uncertainty, in particular, with respect to risk compensation and self-selection.

Conclusion

Despite contributing more to the social costs of road crashes than drink driving, speeding or fatigue, the problem of driver inattention has received little attention in the road safety arena. This paper explored drivers' perceptions of the risks associated with inattention and found that most drivers considered it as a more significant contributor to minor crashes but a less significant contributor to serious crashes than drink driving, speeding and fatigue. In addition, several types of driver inattention, such as handling the car stereo, looking at scenery, advertisements and attractive pedestrians, eating and drinking were found to be fairly widespread. However, drivers also self-regulated these activities according to the road and traffic environment: increasing the likelihood of participating in such activities when they felt safer and vice-versa.

References

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