

# A Comparison of Reported Driving Anger in Canada with USA, UK and Australia

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## Abstract

Driver anger and aggressive driving is a topic of continued interest and receives constant public attention, especially in the media. Although there are many situational and person-related factors contributing to aggressive driving behaviours, the most widely recognised among them is driver anger or frustration. Many studies in aggressive driving are thus devoted to measuring the anger aroused in a variety of anger provoking situations. Although the results obtained in the several previous studies were quite consistent in general, there are substantial variations across samples due to difference in the social, economic and political environment. This paper presents the results of a survey of a convenient sample of college students in a Canadian university on their driving anger using the Driver Anger Scale and compares the Canadian results with those from UK, USA and Australia.

## Introduction

Driver anger and aggressive driving is a topic of continued interest and receives constant public attention, especially in the media [1, 2, 3, 4, 5]. The media, however, prefer to use the term 'road rage' to refer to a wide variety of behaviours on the road but tended to focus its attention on the more extreme behaviours [5, 6, 7, 8]. Traffic researchers, however, prefer to use the term 'aggressive driving', which includes a much wider variety of road user behaviours that may be considered aberrant [9, 10].

Although there are many situational and person-related factors contributing to aggressive driving behaviours, the most widely recognised among them is driver anger or frustration [10, 11, 12, 13, 14, 15, 16, 17]. To date, a substantial number of characteristics have been found to influence the amount of anger experienced by drivers in road incidents including personality, congestion, type of vehicles involved, a sense of being pressed for time, the anonymity one may experience in a vehicle, and the gender and age of an 'offending driver' [11, 12, 13, 14, 18, 19, 20]. Therefore, there appears to be a complex relationship between the personal and situational characteristics of an anger provoking road situation and any resultant feelings of anger and subsequent aggressive driving behaviour.

Many studies in aggressive driving have therefore included some measures of the anger aroused in a variety of anger provoking situations. Although there are many instruments used to measure anger arousal [21], the most widely used instrument in road safety is the Driver Anger Scale (DAS) developed by Deffenbacher and colleagues [3]. This instrument has been applied to measure driver anger in many countries including America [3], the United Kingdom [14] and Australia [22], and has been found to exhibit a high degree of validity and reliability. In particular, the scores on the DAS have been found to be significantly correlated with trait aggression and self-reported aggressive driving in various studies [2]. It is interesting to note that although these three countries are very similar economically, socially and politically, there appears to be some differences in the level of anger aroused or at least reported by the drivers across these countries. Therefore, replication of these studies in similar countries such as Canada will still provide a useful comparison and valuable insights can be gained from such replication.

## Method

The participants in this study were mainly third and fourth year college students in a Canadian university. With the permission of the professors, the survey was administered by an undergraduate student to the participants during the lecture breaks in two transportation related courses. Of the 89 students who participated in the survey, 52 (58.4%) were male and 37 (41.6%) were female. The age distribution of the participants was as follows: 16-20 year old (40.4%), 21-25 years old (38.2%) and 26 years old and above (21.3%). It is worthwhile to note that 56 (62.9%) drivers reported that they had been issued at least one traffic violation ticket in the past three years while 13 (14.6%) had reported being involved in at least one crash in the past three years. Although quite high, these statistics are not unexpected since the sample consists of mainly young drivers. Also, 52 (58.4%) respondents reported that they drove a sedan, 12 (13.5%) reported driving a convertible or sport car, and 25 (28.1%) reported driving a van, utility vehicle or truck.

Consistent with the three previous studies, the Driver Anger Scale (DAS) was used to measure the level of frustration and anger reported by the Canadian sample. Twenty nine of the 33 items from the original DAS [3] were thus used to gauge anger arousal and these items included the hostile gestures, illegal driving, slow driving, traffic obstructions and discourtesy subscales. The four items on police presence were omitted in the survey for two reasons. First, Lajunen and colleagues found that the items in this subscale were insufficiently anger provoking and were dropped from further analysis [14]. Second, significant differences in traffic enforcement practices across countries make it difficult to compare the results which seem to vary substantially across countries.

The participants were required to record the amount of anger they would experience under each potentially anger provoking driving situations. The responses to each item were recorded using 5-point rating scale ranging from 1 = 'not at all angry' to 5 = 'very angry'. The measure of internal reliability for the DAS for this sample was very high with a Cronbach-Alpha of 0.92 and comparable with those obtained in the other studies that were used as comparisons; specifically, the Cronbach-Alphas obtained in an American study was 0.9 [3], 0.87 in a British study [14] and 0.94 in an Australian study [22].

## Results

The means and standard deviations of the 29 items from DAS used in this study are presented in Table 1. It is interesting to note that tailgating is considered by the majority of the respondents to be the most anger provoking incident, followed by someone cutting in and taking a parking lot that the respondent has been waiting for. These incidents were reported to provoke more anger than all the hostile gestures such as obscene gesturing and shouting. In fact, most of the situations involving discourtesy in driving were reported to provoke more anger than the three hostile scenarios. On the other hand, road construction and detours is rated as the least frustrating of the potentially anger provoking driving situations.

**Table 1****Canadian Driver Anger Scale**

Items	Mean	SD
<i>Discourtesy</i>		
Someone is driving very close to your rear bumper	4.17	1.01
Someone cuts in and takes the parking spot you have been waiting for	4.06	0.98
Someone speeds up when you try to pass	3.92	1.04
Someone backs out right in front of you without looking	3.85	0.98
At night someone is driving behind you with bright lights on	3.84	1.08
Someone cuts in right in front of you on the motorway	3.82	1.08
Someone coming towards you does not dim their headlights at night	3.53	1.12
A cyclist is riding in the middle of the lane and slowing traffic	3.40	1.40
Someone pulls out right in front of you when there is no-one behind you	3.16	1.27
<i>Hostile Gestures</i>		
Someone makes an obscene gesture towards you about your driving	3.45	1.35
Someone beeps at you about your driving	3.04	1.30
Someone shouts at you about your driving	2.99	1.34
<i>Illegal Driving</i>		
Someone runs a red light or a stop sign	3.33	1.37
Someone is weaving in and out of traffic	3.15	1.34
Someone is driving well above the speed limit	2.93	0.41
Someone is driving too fast for the road conditions	2.87	1.23
<i>Slow Driving</i>		
Someone is driving more slowly than is reasonable for the traffic flow	3.55	1.20
Someone is driving too slowly in the outside lane, and holding up traffic	3.49	1.24
A slow vehicle on a winding road will not pull over and let people pass	3.20	1.06
Someone in front of you does not move off straight away when the light turns green	2.85	1.11
Someone is slow in parking and holds up traffic	2.71	1.19
A pedestrian walks slowly across the middle of the street, slowing you down	2.52	1.32
<i>Traffic Obstruction</i>		
A truck kicks up sand or gravel on the car you are driving	3.45	1.18
You hit a deep pothole that was not marked	3.08	1.27
You are driving behind a vehicle that is smoking badly or giving off diesel fumes	3.06	1.23
You are driving behind a truck which has material flapping around in the back	3.01	1.27
You are stuck in a traffic jam	2.94	1.29
You are driving behind a large truck and cannot see around it	2.64	1.25
You encounter road construction and detours	2.45	1.22

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Note: Mean and standard deviations calculated using 'not at all angry' = 1 to 'very angry' = 5.

The mean scores for the five subscales included in this study are reported in Table 2 together with similar scores reported in previous studies for America [3], United Kingdom [14] and Australia [22]. In general, the Canadian sample reported a slightly lower overall average (3.23) in the driver anger scales than the American sample (3.26) but higher than the Australian (2.64) and British (2.26) samples. The only subscale in which the Canadian sample reported the most anger among the four countries reported is illegal driving, with a mean subscale score of 2.95 to means of 2.7, 2.6 and 2.3 for the

American, Australian and British samples respectively.

It is interesting to note that the Canadian sample reported discourteous driving as the most anger provoking driving situations, followed by hostile gesture, illegal driving, slow driving and obstructions. This relative ranking is similar to that obtained in the Australian sample but different from those obtained in the American and British samples. It also should be noted that the only subscale that has a consistent ranking (most anger provoking) across the four countries is discourteous driving.

**Table 2**

*Comparison of Mean Driver Anger in Four Countries*

Subscale	Canada	United States <sup>1</sup>	Australia <sup>2</sup>	Britain <sup>3</sup>
Discourtesy	3.75	3.9	3.1	2.7
Hostile Gestures	3.16	3.2	2.8	2.3
Slow Driving	3.05	3.2	2.4	2.0
Traffic Obstructions	2.95	3.3	2.3	2.0
Illegal Driving	2.95	2.7	2.6	2.3

Sources: 1. Deffenbacher et al (1991); 2. O'Brien et al (2002); 3. Lajunen et al (1998)

In addition, we also tested for differences in the reported driver anger scale between male and female respondents using the one-way analysis of variance procedure. The results for the different gender are reported in Table 3. In contrast to the samples from the other three countries, female respondents in this sample reported higher level of anger in all subscales relative to male respondents although these differences are not statistically significant at  $\alpha = 0.05$  or even at  $\alpha = 0.10$ .

Finally, the means and standard deviations of the driver anger scores for the three different age groups were also computed and reported in Table 4. It is evident that whereas the overall mean level of reported anger decreases with age, the same can not be said of some of the subscales. However, none of these differences were statistically significant at  $\alpha = 0.5$  or 0.10 when tested using the one-way analysis of variance procedure.

**Table 3**

*Gender Differences in Canadian Driver Anger*

Subscale	Canada	United States <sup>1</sup>	Australia <sup>2</sup>	Britain <sup>3</sup>
Discourtesy	3.75	3.9	3.1	2.7
Hostile Gestures	3.16	3.2	2.8	2.3
Slow Driving	3.05	3.2	2.4	2.0
Traffic Obstructions	2.95	3.3	2.3	2.0
Illegal Driving	2.95	2.7	2.6	2.3

Sources: 1. Deffenbacher et al (1991); 2. O'Brien et al (2002); 3. Lajunen et al (1998)

**Table 4***Age Differences in Canadian Driver Anger*  
16-20 yrs old

Subscale	16-20 yrs old		21-25 yrs old		26 yrs old & above	
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Discourtesy	3.94	0.69	3.64	0.75	3.59	0.77
Hostile Gestures	3.15	1.23	3.39	1.14	2.27	1.10
Slow Driving	3.19	0.91	3.07	0.88	2.77	0.87
Traffic Obstructions	3.13	0.82	2.82	0.93	2.83	0.85
Illegal Driving	2.96	1.06	2.84	0.90	3.04	1.07
Overall Anger	3.37	0.61	3.19	0.68	3.24	0.67

*Note: One-way Anova found no difference in the means at  $\alpha = 0.10$  for all subscale*

## Discussion

On average, the Canadian drivers sampled reported more anger in response to discourteous driving behaviours exhibited by the other drivers than hostile gestures, illegal driving, slowing driving and traffic obstructions. Among all the 28 potentially anger provoking driving situations, it is not surprising that "someone driving very close to your rear bumper" or tailgating is considered by the majority of the respondents to be the most anger provoking driving situation. Tailgating is considered by most drivers not only as a discourtesy but also a very intrusive and highly unsafe driving behaviour.

It is interesting to note that road construction and detours is rated as the least frustrating of all the twenty eight potentially anger provoking driving situations. This result is somewhat surprising given the high media coverage about the effect of construction delays and road rage in the city surveyed. One possible explanation is the relatively more frequent occurrences of road construction versus other potentially anger provoking situations because the City of Calgary is booming and there are many road construction projects on-going during the time of the survey. However, the likelihood of this scenario is not very high because there are many other relatively common potentially anger provoking driving situations, such as discourtesy and slow driving, that are included in the survey. Another possible explanation is that construction delays provoke relatively less anger because there is no specific person to blame, unlike most of the other scenarios included in the DAS.

In general, the Canadian sample reported a slightly lower overall average in the driver anger scales than the American sample [2] but higher than the Australian [22] and British [14] samples. It should be noted that the British sample consists of a broader and larger sample of drivers whereas the Canadian, Australian and American samples consist of a smaller sample of younger drivers. It is not surprising therefore that the British respondents reported relatively lower mean scores on all the anger subscales measured.

As expected, the mean anger scores for the Canadian sample is much closer to the corresponding mean scores for the

American sample because their proximity and similarity in driving culture. This inference is further supported by the finding that the relatively ranking of the means of the subscales for the Canadian drivers are the same as the corresponding mean scores for the American drivers but they are different from those of the Australian and British samples.

## Limitations of Study

Although the sample contains a very important segment of the target population (young drivers), it consists of a relatively higher portion of the more educated segment of the population. Since the effects of education level on the perceptions of anger provoking situations and the reported level of anger aroused have not been well researched and documented, we are unable to judge if any systematic bias exists due to our sampling framework. This study should thus be regarded as a useful comparative study that provides some valuable insights to understand driver anger and aggressive driving behaviours in Canada relative to three other major Anglo-Saxon countries. It should be noted that two of the three previous studies used as a comparison for this study also used a convenient sample of college students. Since the main purpose of the survey is to compare driver anger measured in a Canadian sample with those obtained from comparable countries, this targeted sample is thus deemed to be appropriate.

The moderate sample size (89) used also limited the extent of the analysis that could be done in this study. Even though the sample could be considered as sufficiently large for simple statistical tests like the one-way analysis of variance, it was too small for other methods such as factor analysis which would be useful to explore the underlying factor structure of the items used instead of assuming the same subscales used in previous studies. However, this limitation did not significantly affect the main aim of this study, which is to compare the reported driving anger in Canada with those obtained in USA, UK and Australia. Nevertheless, the sample is drawn only from one city in Canada and may be representative of drivers from other parts of the country.

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