

AN EXPLORATION OF AUSTRALIAN DRIVING ANGER

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ABSTRACT

This paper reports the findings of two studies undertaken to explore the extent and nature of driving anger among a sample of Australian drivers. A qualitative study involving 25 drivers investigated the types of road incidents that evoked feelings of anger and frustration. The findings suggested that it is the effect of situation-specific factors, including the characteristics of the 'offending driver' which result in feelings of anger and the expression of aggression on the roads. Further to this finding, the full Driving Anger Scale (DAS) was administered to 166 participants in order to assess the applicability of this situation specific, general driving anger measure for Australian drivers. Factor analysis revealed a five-factor loading that resulted in the combining and renaming of two of the original DAS subscales. Also, the findings suggest that the DAS items may lack the situational, or contextual cues, sufficient to elicit meaningful measures of driving anger on Australian roads. Further analysis of the DAS, administered to a larger sample, is recommended.

INTRODUCTION

The term 'road rage' has been used extensively by the media to refer to a wide variety of behaviours on the road, many of them extreme in nature (Shinar, 1998). However, traffic researchers prefer to use the term 'aggressive driving', which accommodates many road behaviours which may be considered aberrant (NHTSA, 1999). Certainly, a review of the literature suggests there are a wide variety of definitions available that encompass a varying number of behaviours (NHTSA, 1999; Shinar, 1998).

To date, a substantial number of situational characteristics found to influence driver behaviour have been identified by traffic researchers (Lonerio & Clinton, 1998). Some of these characteristics have also been found to influence the amount of anger experienced by drivers in road incidents (Lajunen & Parker, 2001). Examples of these factors include, a sense of being pressed for time, the anonymity one may experience in a vehicle, and the gender and age of an 'offending driver' (Ellison, Govern, Herbert & Figler, 1995; Shinar, 1998; Yagil, 2001). Specific on-road behaviours that have been found to provoke feelings of anger on Australian roads, include: pulling out without looking; following closely – tailgating; competitive merging; changing lanes and cutting drivers off; driving too slowly in the passing lane; excessive honking of the horn or head light flashing; obscene language; and deliberate obstruction (Elliott & Shanahan, 1997). It also appears such characteristics are context dependent in their ability to generate feelings of anger and any subsequent aggressive driving behaviour (Lonerio & Clinton, 1998; Reason, Manstead, Stradling, Parker & Baxter, 1991).

In an Australian study conducted by Elliott and Shanahan (1997), Victorian police records between 1993 and 1997 were examined for all incidents of assault that occurred in or around a vehicle. Of the total of 518 assaults associated with motor vehicle use only 71 incidents were clearly identifiable as resulting from altercations in traffic. By examining the narrative associated with each recorded incident, instances that were excluded involved: speeding, missiles being thrown at passing cars or domestic situations (Elliott & Shanahan, 1997). However, as these behaviours could reasonably be considered precursor contributors to the on-road experience of anger, it is arguable that the contextual information in the police records may have been insufficient to ascertain a better indication of the rates of aggressive driving behaviour. Further to this suggestion, researchers have proposed that rarely would a single factor in isolation result in sufficient levels of anger to culminate in aggressive driving (Lajunen, Parker & Summala, 1999; Shinar, 1998). For example, delays caused by congestion may not necessarily result in feelings of anger and increase the likelihood of aggressive behaviour, as congestion at particular times and places may be anticipated (Lajunen, Parker & Summala, 1999; Underwood, Chapman, Wright & Crundall, 1999). Therefore, there appears to be a complex relationship between the situational characteristics of an anger provoking road situation and any resultant feelings of anger and subsequent road behaviour. Whilst the road safety implications of aggressive driving remain unclear, research in other countries would suggest it is becoming more prevalent (Deffenbacher, Oetting & Lynch, 1994; Gordhamer, Martinex, Petrilli, Lynch & Deffenbacher, 1996; Lajunen & Parker, 1998; Lajunen & Parker, 2001; VCCA, 1999).

General driving anger

Research into the phenomenon of aggressive driving has often utilised a measure of driving anger. These measures are commonly used to assess the factors that may influence a person to act aggressively on the road. In 1994, American researchers, Deffenbacher, Oetting and Lynch devised a 33 item measure of general 'driving anger', called the Driving Anger Scale (DAS) (Deffenbacher et al., 1994). Driving anger was conceptualised as a

personality trait related to an individual's underlying predisposition for anger, but specific to road situations (Deffenbacher et al., 1994). The measure consists of a series of statements representing road behaviours displayed by 'others', eg. 'someone is driving well above the speed limit' and specific driving related situations, eg. 'someone backs out in front of you without looking'. The items formed six subscales, which were named: hostile gestures, illegal driving, slow driving, traffic obstructions, discourtesy and police presence (Deffenbacher et al., 1994).

Utilising the DAS, traffic researchers then conducted a series of studies focusing on the individual (person-related) characteristics of high and low anger drivers (Gordhamer et al., 1996; Deffenbacher, Huff, Lynch, Oetting & Salvatores, 2000). Gordhamer and colleagues (1996) found that high anger drivers (those scoring > 53 on the trait DAS) not only reported greater levels of anger in 'rush hour' traffic, but also reported significantly more anger than low anger drivers (those scoring <42 on the trait DAS) under normal traffic conditions (Gordhamer et al., 1996). Further, the analysis of expressed 'driving anger', revealed high anger drivers participated in more extreme forms of aggression in both traffic conditions (Gordhamer et al., 1996).

In a 1998 study, Lajunen, Parker and Stradling, surveyed 280 British drivers and found that only three of the subscales were relevant to drivers in the United Kingdom (UK), renaming them accordingly: reckless driving; impeded progress and direct hostility. In addition, UK drivers reported lower levels of anger across all of the original subscales than their American counterparts. Items relating to police presence and the item 'you are driving behind a large truck and cannot see around it' evoked considerably low levels of anger and were omitted, resulting in the 28 item, UK version of the DAS [DAS (UK)] (Lajunen et al., 1998). By way of explanation, Lajunen and colleagues (1998), suggested that perhaps UK drivers have more positive attitudes to police enforcement than American drivers. However, they admitted that their findings may have been confounded by the effect of age, as their sample had a wider age range than the original American study (Lajunen & Parker, 1998).

The DAS and the DAS (UK) have subsequently been widely used in the study of 'driving anger' and aggressive driving. However, a recent study into the relationship between trait aggression, driver anger and aggressive driving suggested that although the anger-provoking situations in the DAS (UK) may evoke feelings of anger, they do not necessarily lead to the expression of aggression on the roads (Lajunen & Parker, 2001). Therefore, it should be considered that perhaps the DAS and DAS (UK) items may lack sufficient contextual information to elicit real-life feelings of anger experienced on the roads. For example, the item 'someone is weaving in and out of traffic', may be considered contextually ambiguous, as it fails to elaborate on: the personal characteristics of the 'offending driver' (Yagil, 2001); what constitutes 'weaving in and out of traffic'; and, whether this action had any direct impediment on your individual driving experience (Shinar, 1998).

Finally, acknowledging that the DAS only measures anger experienced and not expressed behaviour, Lajunen and Parker (2001) asked participants to report their most likely resultant behaviour from a list of seven possibilities, ranging from 'no reaction' to 'physical/verbal assault of person or property'. Participant responses revealed that higher levels of anger experienced are related to the severity of the expressed aggression, with situational factors (as portrayed by DAS items) affecting the amount of anger experienced (Lajunen & Parker, 2001).

The foregoing findings suggest that the DAS and shortened UK DAS may not automatically be applicable to Australian drivers. Therefore, before utilising the shortened UK DAS in Australian traffic research, it would appear prudent to investigate the applicability of the full 33 original DAS items to an Australian sample. Thus, the first aim of this study is to investigate general driving anger reported by Australian drivers as measured using the original Driving Anger Scale (DAS). Further, in order to explore the importance of contextual information in the generation of anger and subsequent behavioural responses, a small qualitative study was undertaken to explore the situational factors that affect feelings of anger among Australian drivers.

METHOD

Qualitative Study

The 25 participants (13 females and 12 males) comprised university students and associates of the researchers. Participants were aged 19 years and over and holders of a current drivers licence. A semi-structured questionnaire was administered by interview. This qualitative phase specifically aimed to investigate the types of road incidents which may evoke feelings of 'frustration and or anger' on the roads in Australia, and the characteristics of such situations. This was designed to explore the person-related and situational factors that can predispose a person, or contribute to, aggressive driving behaviour.

Quantitative Study

Participants

A sample of convenience was recruited comprising 166 participants (61 male and 105 female) including associates of the researcher and University students. Of the participants, 33.7% were aged 17-21 years of age and an almost equal proportion (31.9%) were aged 36 years and over. The only selection criteria applied was that participants hold a current licence to drive.

Driving Anger Scale

The 33 item, original DAS (Deffenbacher et al, 1994) was administered to all participants. The sub-scales were: hostile gestures, illegal driving, slow driving, traffic obstructions, discourtesy and police presence. The participants were required to record the amount of anger they would experience in response to each item (1=not at all angry, 2=a little angry, 3=some anger, 4=much anger, 5=very much angry).

Table 1 is a list of all items, their means and standard deviations. In keeping with Lajunen et al. (1998) it was decided to exclude items with a mean <1.5 as they indicate little or 'less than a little' anger. On this premise, only one item was deleted, item 23 'a police car is driving in traffic close to you'. This item was also excluded from calculation of the mean score. The measure of internal reliability for the DAS was very high with a Cronbach's alpha of .94.

Table 1. Means and Standard Deviations for DAS (33 Items) in Order Presented to Participants

Item	<i>M</i>	<i>SD</i>
1. Someone in front of you does not move off straight away when the light turns green	1.92	.78
2. Someone is driving too fast for the road conditions	2.68	1.08
3. A pedestrian walks slowly across the middle of the street, slowing you down	2.10	.79
4. Someone is driving too slowly in the outside lane, and holding up traffic	2.87	1.02
5. Someone is driving very close to your rear bumper	3.38	1.07
6. Someone is weaving in and out of traffic	2.53	1.09
7. Someone cuts in right in front of you on the motorway	3.15	1.01
8. Someone cuts in and takes the parking spot you have been waiting for	3.77	1.02
9. Someone is driving more slowly than is reasonable for the traffic flow	2.66	.93
10. A slow vehicle on a winding road will not pull over and let people pass	2.79	1.07
11. You see a police car watching traffic from a hidden position.	2.09	1.22
12. Someone backs out right in front of you without looking	3.19	.97
13. Someone runs a red light or a stop sign	2.83	1.24
14. Someone coming towards you does not dim their headlights at night	2.99	1.14
15. At night someone is driving behind you with bright lights on	3.11	1.08
16. You pass a radar speed trap	1.84	1.10
17. Someone speeds up when you try to pass them	2.98	1.09
18. Someone is slow in parking and holds up traffic	1.95	.91
19. You are stuck in a traffic jam	2.34	1.04
20. Someone pulls out right in front of you when there is no-one behind you	2.90	1.03
21. Someone makes an obscene gesture towards you about your driving	2.91	1.17
22. You hit a deep pothole that was not marked	2.26	1.08
23. A police car is driving in traffic close to you	1.48*	.83
24. Someone beeps at you about your driving	2.53	.98
25. Someone is driving well above the speed limit	2.41	1.15
26. You are driving behind a truck which has material flapping around in the back	2.10	1.07
27. Someone shouts at you about your driving	2.85	1.12
28. A cyclist is riding in the middle of the lane and slowing traffic	2.61	1.06
29. A police officer pulls you over	2.02	1.07
30. You are driving behind a vehicle that is smoking badly or giving off diesel fumes	2.72	1.15
31. A truck kicks up sand or gravel on the car you are driving	2.68	1.03
32. You are driving behind a large truck and cannot see around it	1.86	.87
33. You encounter road construction and detours	1.79	.82

*Item deleted from calculation of participant's mean scores

RESULTS

Qualitative Study

Participants were able to cite up to three separate incidents in which they experienced frustration/anger on the roads. Of 75 potential responses, participants reported 56 incidents that elicited feelings of frustration, and or anger. The findings are presented as percentages of the 56 reported incidents.

Almost half of the incidents (48%) occurred in heavy traffic, with the remaining occurring in light or medium traffic density conditions (42%). The majority of reported incidents (64%) were found to have occurred during daylight hours. Exploration of the 'offending driver' characteristics revealed that 71% were male and 9% were female. Approximately 20% of participants did not, or were unable to, accurately recall the characteristics of the driver.

Participants most frequently reported feeling frustration and or anger about the behaviour of 'other drivers', as opposed to situations that involved impediment of progress such as congestion or delays. The survey revealed the following sources of frustration/anger in order of frequency: 'other drivers' cutting-in; tailgating by 'other drivers'; general reckless driving such as speeding and weaving in and out of traffic by other's; a perceived lack of the 'others' driving ability, demonstrated by non-use of indicators; acts of open hostility, such as objects being thrown at their vehicles; and other vehicles slowing their progress. Interestingly, three of the frustrating/anger provoking situations cited by participants involved the presence of police. Consistent with the literature review, this study's findings about various sources of frustration/anger on Australian roads, including 'presence of police', suggests that the suitability of the full 33 item DAS for future Australian traffic research warrants further investigation.

The participants reported experiencing a range of emotions in the situations recalled including feelings of annoyance, frustration, anger and intimidation. While 96% of participants reported responding in some way to the situation, it was not always in an overtly aggressive manner. This is consistent with previous research (Lajunen & Parker, 2001).

Despite the small sample size, this survey provided valuable insight to the experience of driving anger and the experience of aggression on Australian roads. The emotions identified appear to be affected by the multiple characteristics presented in any given situation. As such, this would appear to suggest that it is the effect of the situation-specific factors, including the characteristics of the 'offending driver', which influence anger experienced and the likely expression of aggression on the roads.

Quantitative Study

The composite mean DAS score ($M=84.28$, $SD=20.55$) indicated moderate levels of general driving anger for the sample. However, the standard deviation is quite large indicating that there was considerable variance in the levels of anger reported. Table 2 displays the original six subscale means for participants compared to American (Deffenbacher et al., 1994) and British drivers (Lajunen et al., 1998).

Table 2. Subscale Means of Australian Drivers compared to UK and US Drivers (Lajunen et al., 1998; Deffenbacher et al., 1994)

Subscale	No. of Items	Australian <i>M</i>	US <i>M</i>	UK <i>M</i>
Discourtesy	9	3.1	3.9	2.7
Traffic Obstructions	7	2.3	3.3	2.0
Hostile Gestures	3	2.8	3.2	2.3
Slow Driving	6	2.4	3.2	2.0
Police Presence	4	1.9	3.0	1.4
Illegal Driving	4	2.6	2.7	2.3

Table 2 indicated that Australian drivers, tended to report levels of anger somewhere between US and UK drivers. Further, the means suggest that Australian drivers are more closely aligned with UK drivers in the levels of anger experienced by road behaviours due to 'discourtesy', 'traffic obstructions', 'slow driving' and 'police presence'.

Table 3. DAS 33 Item Loadings and Percentage of Variance Explained by the Factors

Items in Original DAS Subscales	Factors					
	1 (18%)	2 (9%)	3 (9%)	4 (8%)	5 (7%)	6 (3%)
Slow Driving						
9. Someone is driving more slowly than is reasonable for the traffic flow	.743					
4. Someone is driving too slowly in the outside lane, and holding up traffic	.676					
10. A slow vehicle on a winding road will not pull over and let people pass	.623					
18. Someone is slow in parking and holds up traffic	.615					
3. A pedestrian walks slowly across the middle of the street, slowing you down	.412					
1. Someone in front of you does not move off straight away when the light turns green	.469					
Discourteous Driving						
15. At night someone is driving behind you with bright lights on	.676					
14. Someone coming towards you does not dim their headlights at night	.660					
20. Someone pulls out right in front of you when there is no-one behind you	.607					
17. Someone speeds up when you try to pass them	.606					
12. Someone backs out right in front of you without looking	.579					
28. A cyclist is riding in the middle of the lane and slowing traffic	.461					
8. Someone cuts in and takes the parking spot you have been waiting for	.445					
7. Someone cuts in right in front of you on the motorway	.429					
5. Someone is driving very close to your rear bumper*						.560*
Illegal Driving						
13. Someone runs a red light or a stop sign		.742				
25. Someone is driving well above the speed limit		.732				
6. Someone is weaving in and out of traffic		.658				
2. Someone is driving too fast for the road conditions		.645				
Police Presence						
29. A police officer pulls you over			.602			
23. A police car is driving in traffic close to you			.596			
11. You see a police car watching traffic from a hidden position			.568			
16. You pass a radar speed trap			.553			
Traffic Obstructions						
19. You are stuck in a traffic jam*			.475*			
31. A truck kicks up sand or gravel on the car you are driving				.800		
32. You are driving behind a large truck and cannot see around it				.546		
26. You are driving behind a truck which has material flapping around in the back				.493		
30. You are driving behind a vehicle that is smoking badly or giving off diesel fumes				.488		
33. You encounter road construction and detours				.444		
22. You hit a deep pothole that was not marked				.435		
Hostile Gestures						
27. Someone shouts at you about your driving					.821	
21. Someone makes an obscene gesture towards you about your driving					.652	
24. Someone beeps at you about your driving					.630	

* deleted from new factor structure as the item failed to load to appropriate subscales

In order to examine the utility of the DAS in the Australian context, a principal components analysis (PCA) was conducted. Analysis revealed 6 factors with eigenvalues >1 , representing 54% of the total variance explained by these factors. Subsequent, principle axis factoring, using varimax rotation, excluding items loading $<.3$, revealed the item loadings and variance explained by each factor at Table 3.

Inspection of the loadings on Factor 1 show that all the 'slow driving' items loaded well ranging from .41 to .74. However, all but one 'discourteous driving' items also loaded well on Factor 1 ranging from .42 to .67. 'Discourteous driving' item 5, 'someone is driving very close to your rear bumper' loaded .56 on Factor 6. With reference to the loadings, the 'discourteous' and 'slow driving' items proved difficult to differentiate from each other. Therefore, in the Australian context it would be appropriate to combine these two subscales resulting in an instrument with five subscales. Item 5 'someone is driving very close to your rear bumper' could be omitted without a great loss to the measure. Item 19, 'you are stuck in a traffic jam', also failed to load with other 'traffic obstruction' items. Therefore, this item could also be omitted without impacting greatly on the DAS as a measure of general driving anger in an Australian population.

DISCUSSION

The results of this research suggest that the DAS requires further investigation, before either the full US or UK version is used with Australian drivers. For example, this study highlighted the relevance of certain situational characteristics that were excluded from the shorter DAS (UK) measure, eg. 'police presence' (Lajunen et al., 1998). In keeping with this finding, the smaller qualitative study would suggest a 'police presence' may lead to feelings of frustration/anger in some Australian drivers. Further, this finding suggests that there may be cultural differences between Australian and American drivers that influence responses to the DAS. Perhaps Australian drivers are more similar to British drivers in general driving culture, in that they may be more tolerant of police enforcement practices than American drivers. In contrast, the differing factor loadings of the UK study may also suggest differences in driving culture. For instance, it should be considered that as UK roads are possibly becoming increasingly congested as population density increases, perhaps British drivers are slightly more tolerant and accommodating of traffic obstructions and aberrant driving behaviours in general than Australian drivers. Alternatively, the difference between Australian and overseas loadings may have been due to the characteristics of the sample in this study. In particular, the sample was relatively homogenous being predominantly drawn from a University student population. Although the sample featured a wide cross-section of ages, it is possible that there was a bias toward reporting less anger due to social desirability factors. This highlights the need to replicate this study with a larger more representative sample of Australian drivers.

Interestingly, the two items that failed to load appropriately onto relevant factors, 'someone is driving very close to your rear bumper' and 'you are stuck in a traffic jam', perhaps did so due to a lack of real-time situational context. In support of this proposal, previous research suggests that 'following too closely' (tailgating) is one of the more frequently reported anger-provoking road behaviours in Australia (Elliott & Shanahan, 1997). This suggestion is in keeping with the literature review findings that rarely would a single factor in isolation result in sufficient levels of anger to culminate in aggressive road behaviour (Lajunen, Parker & Summala, 1999; Shinar, 1998).

The full DAS administered to this current sample revealed a five-factor model: 'lack of driving etiquette' (encompassing the original subscales 'slow driving' and 'discourteous driving'), 'illegal driving', 'police presence', 'traffic obstructions' and 'hostile gestures'. As a result of these findings, it is recommended that further investigation of the original DAS (Deffenbacher et al., 1994) on a larger population is warranted before being used as a meaningful measure of general driving anger on Australian drivers, particularly when inferring a possible relationship with aggressive driving outcomes. In broader terms, these findings suggest that the use of situation-specific scenarios in traffic research may represent a somewhat artificial means of manipulating a frustrating/angering road situation, lacking contextual cues which elicit meaningful measures of anger and subsequent road behaviours (Lajunen & Parker, 2001; Shinar, 1998). Further work is required to develop valid and reliable instruments to assist in the study of driving anger and aggressive driving.

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