View metadata, citation and similar papers at core.ac.uk
brought to you by CORE
provided by University of Hertfordshire Research Archive

Social desirability and self-reported driving behaviours: Should we be worried?

Mark J. M. Sullman

School of Psychology, Hertfordshire University, UK

Joanne E. Taylor

School of Psychology, Massey University, New Zealand

Address for contact:

Dr Mark Sullman
School of Psychology
University of Hertfordshire
College Lane
Hatfield
AL10 9AB
UK.

Fax +44 1707285073
Email: M.Sullman@herts.ac.uk

Abstract

There is widespread use of self-report measures of driving behaviour in the traffic psychology literature, despite the frequent criticism that such measures are subject to social desirability bias. However, no research has yet investigated the more recently developed measures of driving anxiety and avoidance behaviour for socially desirable responding. Furthermore, relatively little research has investigated the issue of socially desirable responding on self-reported driver behaviour in general, and that which does exist has several shortcomings. The present study used a repeated measures design to assess the effect of social desirability on a measure of driving avoidance, the Driving and Riding Avoidance Scale (DRAS), and the Driving Behaviour Questionnaire (DBQ). A sample of 228 undergraduate students completed the DRAS, DBQ and a measure of socially desirable responding in class, which constituted a public place, and then again two months later in the privacy of their homes. None of the DBQ items were significantly different across the two locations. However, two of the DRAS general avoidance items were higher in the public setting, perhaps demonstrating the effect of socially desirable responding on driving avoidance due to environmental or practical concern. Nevertheless, overall it appears as though the DRAS and DBQ are not particularly vulnerable to socially desirable responding, although further well-designed research on the effects of such bias on these and other self-report measures of driving behaviour should be undertaken.

Keywords: driving behaviour, avoidance, social desirability, impression management, self-deception, bias, self-report, Driving and Riding Avoidance Scale, DBQ

1. Introduction

Self-report questionnaires and surveys are extensively used in research on driving behaviour (e.g. Lajunen, & Summala, 2003; Reason, Manstead, Stradling, Baxter, & Campbell, 1990; Şimşekoğlu, & Lajunen, 2008; Strahan, Watson, & Lennonb, 2008; Sullman, 2006; Sullman & Mann, 2009; Wallén Warner, & Åberg 2008). Over the last few decades, a number of self-report scales have been developed to measure aberrant driving behaviour, as well as drivers' attitudes, emotions, and personality styles. Additionally, self-report measures of driving anxiety and avoidance behaviour have been developed, following the increased awareness of these kinds of psychological effects following motor vehicle crashes (for a review, see Taylor, 2008). Self-report methodology has several advantages over other approaches, particularly in terms of low cost, efficiency of data collection, providing information about infrequent behaviour, and being able to investigate relationships between driving behaviour and factors such as attitude, emotion, and personality characteristics. However, some important criticisms have been levelled at self-report questionnaires as measures of driving behaviour, in terms of possible problems with reliability and external validity due to self-report being more vulnerable to social desirability than other methods such as behavioural observation (Paulhus, 1991).

A series of studies over the last decade by Timo Lajunen, Heikki Summala, and their colleagues has investigated the effect of social desirability on self-reported driving behaviour using the two types of socially desirable responding, impression management and self-deception (Paulhus, 1984, 1991). Impression management refers to the deliberate tendency to give favourable self-descriptions to others, while self-deception is a positively biased but subjectively honest self-description (Lajunen, Corry, Summala, & Hartley, 1997; Lajunen & Summala, 2003; Paulhus, 1984, 1991). Lajunen et al. (1997) found that impression

management biased self-reported traffic violations, such as self-reported speeding, along with the number of accidents and infringement notices. On the Driver Skill Inventory, impression management correlated positively with self-reported safety skills (e.g., avoiding unnecessary risks, conforming to the speed limits, avoiding competition in traffic) and negatively with perceptual-motor skills (e.g., perceiving traffic hazards, prediction of traffic situations ahead, fast reactions), suggesting that impression management can distort self-reported driving skills related to safety (Lajunen, Corry, Summala, & Hartley, 1998). These results are consistent with the notion that social desirability bias tends to appear more as under-reporting undesirable behaviours rather than over-reporting desirable ones (Lindeman & Verkasalo, 1995). One important limitation of these two studies is that the self-report questionnaires were completed only in private settings, in the form of large groups of participants in which anonymity was emphasised. Lajunen and Summala (2003) argued that the effects of social desirability would be expected to be most apparent in public settings, but only for impression management scores (see also Paulhus, 1984). On this basis, they considered that a more accurate assessment of the effects of social desirability would be gleaned from a comparison of self-reports that were completed in public with those completed in private. In a subsequent study, constituting the public setting were 47 applicants for a driving instructor training course who completed the Driver Behaviour Questionnaire (DBQ; Reason et al., 1990) as part of the entrance examination (Lajunen & Summala, 2003). In order to maximise the effects of the “public” setting the applicants were also asked to write their names, addresses and social security numbers on the forms. In the private setting condition, 54 first-year students of the same driving instructor training course completed the DBQ anonymously during lecture time.

Using total mileage as a covariate in ANOVA analyses, the effects of social desirability on DBQ responses was relatively small (Lajunen & Summala, 2003). Results showed a significant difference between the two settings in only six of the 28 items, such that aberrant driving behaviours (such as forgetting where the car is parked, having no recollection of the road travelled, not noticing a pedestrian crossing, underestimating the speed of an oncoming vehicle, drinking and driving, and racing away from traffic lights) were reported less frequently in public than private settings. The strongest effect was for the drinking and driving item, which had a moderate effect size (η^2 = .11), while the remaining effects were small (η^2 = .05-.07; Cohen, 1988). There were no differences for any of the aggressive violations (i.e., showing hostility to other drivers, sounding the horn to indicate annoyance, giving chase) or for the four subscale scores (lapses, errors, ordinary violations, and aggressive violations). Lajunen and Summala concluded that there was little social desirability bias in self-reported driving behaviour.

Despite the improvement in study design with the comparison between public and private settings, one significant limitation of Lajunen and Summala's (2003) study was the use of a between-subjects design, where different groups of participants constituted the public and private settings. While some variables were controlled to a greater or lesser degree (e.g., total mileage was a covariate, and the two groups were similar in age and gender), other unmeasured variables that could have affected the results may have systematically varied between the groups, such as attitudes and personality characteristics. Furthermore, although this would have been acceptable with a large sample size and random allocation to groups, random allocation was not undertaken and both groups were relatively small. For these reasons a more stringent test of the effects of social desirability on self-reported driving

behaviour would be afforded by using a repeated measures design, with the same participants completing the questionnaire in both public and private settings.

Although there has been some research investigating the effect of socially desirable responding on the DBQ, there is currently no research which has examined any of the measures of driving anxiety and avoidance for socially desirable responding (Driving and Riding Avoidance Scale - DRAS; Stewart & St. Peter, 2004). Therefore, the present study aimed to investigate whether the DRAS is subject to socially desirable responding and to further examine the effect of socially desirable responding on the DBQ.

2. Method

2.1. Participants

Undergraduate university students were approached in class and briefly informed about the study. Those who agreed to participate were asked to complete two questionnaires, the first in class one week after the initial class visit (Time 1: public setting), and the second two months later in their own homes (Time 2: private setting). There were 307 students who completed the Time 1 questionnaire, and 228 who continued on in the study to complete the Time 2 questionnaire, representing a retention rate of 74%. Of the 228 students, nearly 65% were women (n = 147) and the average age was 24 years (SD = 8). Participants had held their driver's licence for an average of 7.2 years (SD = 7.6) and the average mileage over the last year was 12,747 km (SD = 8,035). Most (73.2%) of the sample held a full driver's licence, while 17.1% had a restricted and 8.8% a learner's licence (two participants had missing data for licence status).

2.2. Measures

At Time 1, participants completed a six-page questionnaire which asked about demographic information (age, gender, kilometres driven in the last year, status of current car driver's licence, and years since obtained licence), driving accidents and incidents in the past year, and included the self-report scales described below. The five-page Time 2 questionnaire also included the measures described below, as well as asking about driving speed in various situations and the number of driving accidents and incidents in the past year.

Driving and Riding Avoidance Scale (DRAS). The DRAS (Stewart & St. Peter, 2004) assesses avoidance behaviour for various driving and riding situations and was included in both questionnaires. The DRAS consists of 20 situations which are rated for frequency of avoidance over the past week on a 4-point Likert scale from 0 (avoid rarely or none of the time) to 3 (avoid most or all of the time). The total score constitutes the sum of all 20 item ratings (range 0-60), with higher scores representing greater avoidance. There are subscale scores for general avoidance, avoidance of traffic and busy roads, avoidance of weather or darkness, and riding avoidance. The DRAS was developed in a series of studies using different samples of crash survivors. The scale has demonstrated internal consistency (α = .92) and test-retest reliability over four weeks (r = .83). A four-factor model (consistent with the subscales noted above) provided the best fit to the data from a sample of 386 crash survivors. The DRAS has demonstrated concurrent and discriminant validity, and has started to be used in subsequent research (e.g., Stewart, 2005).

The Driver Behaviour Questionnaire (DBQ; Reason et al., 1990) was included in both questionnaires and was used to measure aberrant driving behaviours. The DBQ is one of the most commonly used scales for investigating the relationship between driving behaviours and crash involvement. The scale consists of 28 items which measure four types of aberrant

driving behaviours (lapses, errors, violations, and aggressive violations) and is answered on a six point Likert scale.

Balanced Inventory of Desirable Responding (BIDR). The BIDR (Paulhus, 1991) was used to measure socially desirable responding. It consists of 40 items and includes subscales for impression management and self-deception (20 items each). The items are stated as propositions and respondents rate their agreement with each statement on a 7-point Likert scale from 1 (not true) to 7 (very true). Half of the items are reverse-scored and one point is added for each extreme response (a rating of 6 or 7). Total mean scores for impression management and self-deception range from 0 to 20, and an overall total score is represented by the sum of all 40 items. The BIDR has demonstrated internal consistency for the overall score (α = .83) as well as for the impression management (α = .75-.86) and self-deception scores (α = .68-.80). Test-retest reliability over five weeks was r = .65 and .69 for the impression management and self-deception subscales, respectively. The measure has demonstrated concurrent validity with other measures of social desirability in addition to discriminant validity.

2.3. Design and Procedure

The study used a repeated measures design in which the same participants completed the questionnaires in both the public and private settings. The Time 1 questionnaire was completed at the end of class by those who consented to participate, in close proximity to other students, their lecturer and a research assistant (one week after being provided with information about the study). The participants were also asked to write their name and contact address on a separate sheet attached to the front of the questionnaire, to enable the second questionnaire to be posted to them and to maximise the “public” effect.

The Time 2 questionnaire was mailed to students three months later for completion alone in their own home. Although the envelope was addressed to the participant, the letter was a general letter with no personalisation. In addition the questionnaire contained no name, but only a code to allow the questionnaires to be matched. As the participants were not required to add their names anywhere and were in the privacy of their own homes, this was deemed to represent a private setting. The Time 2 questionnaires were return mailed using a freepost envelope.

The true purpose of the study, as an investigation of social desirability, was not revealed to participants until the completion of data collection, at which point the mild deception necessary to ensure responses were not affected was explained. Until the deception was explained, participants were informed that the study was about different aspects of driving behaviour and whether they change over time. Participants who completed both questionnaires were reimbursed for the time taken to complete the questionnaires with a $10 gift voucher.

Some participants had missing data on the measures. Mean item replacement was used where there were one or two missing items on the DRAS (A. Stewart, personal communication, September 14, 2007) and the same criteria was used with the DBQ.

3. Results

Impression management and self-deception had low to moderate correlations at Time 1 (r = .29, p < .001) and Time 2 (r = .44, p < .001). Using paired t-tests, participants had higher impression management scores in the public setting (M = 4.13, SD = 0.61) than in the private

setting (M = 3.90, SD = 0.59), $t(202) = 4.47$, $p < .001$ (Cohen's d = 0.38). Self-deception scores were also higher in public (M = 3.97, SD = 0.63) than in private (M = 3.67, SD = 0.58), $t(197) = 6.07$, $p < .001$ (d = 0.50). Therefore, as expected, participants demonstrated higher levels of social desirability in the public setting than in the private setting.

The DRAS total, subscale, and item scores in public and private settings and paired *t*-test results are shown in Table 1. There were significant score differences across the two settings for five items, most of which were part of the general avoidance subscale. However, for these items, participants reported higher levels of driving avoidance in *public* settings rather than in private. This is the reverse of what would be anticipated, where ratings made in private would be expected to be higher than those made in public. Adjusting the alpha level for the number of tests conducted using a Bonferroni correction (.05/25 = .002), only the first two items remained statistically significant (*putting off a brief driving trip* and *choosing to walk or ride a bicycle to avoid driving*). There were no differences in the total DRAS score. The only difference across the four subscales was for the general avoidance subscale, although again the same trend of greater driving avoidance being reported in public was apparent. When differences between settings were found, effect sizes (Cohen's *d*) were in the small to medium range (0.21-0.36), while all other effect sizes were very small (0.00-0.17).

The DBQ subscales and item means in public and private settings are shown in Table 2, along with the results of paired *t*-tests. There were significant differences across the two settings for four items, two of which were in the Aggressive Violations subscale. However, again participants reported higher levels of these aberrant driving behaviours in the *public* setting, rather than in the private setting. This is the reverse of what would be anticipated, where ratings made in private would be expected to be higher than those made in public.

There were no differences on the four subscales. When differences between settings were found, effect sizes (Cohen's *d*) were all small (0.14-0.17). However, after adjusting the alpha level for the number of tests conducted using a Bonferroni correction (.05/32 = .002), none of the items remained statistically significant.

4. Discussion

The present study investigated whether the DRAS and DBQ, as self-report measures of driving behaviour, were vulnerable to socially desirable responding. The use of a repeated measures design where the same participants completed the measures in both public and private settings constituted a more rigorous test, improving on prior research where differences across settings could have been due to having different groups of participants in each setting (Lajunen & Summala, 2003). It was expected that the DRAS would be vulnerable to social desirability, given that it asks people to report undesirable behaviours rather than desirable ones (Lindeman & Verkasalo, 1995), and that this would be evident in lower scores when the questionnaire was completed in public as opposed to in a private setting.

Consistent with previous research on other types of driving behaviour (Lajunen et al., 1998), the present study broadly showed social desirability had little or no effect on the DRAS. However, in contrast to expectations, for the two items which were significantly different, participants reported higher levels of driving avoidance in the public rather than the private setting. Furthermore, if the bonferroni corrections are ignored, it was only the general avoidance subscale and mostly general avoidance items which were significantly higher in

the public condition. Considering the original assumption that driving avoidance is negative, this finding does not make sense, as there is no reason to report avoiding driving more often in the public setting. However, a closer examination of the individual items reveals that none of the items are explicitly related to anxiety or fear of driving. Furthermore, recent research has noted that the DRAS does not measure the reason(s) for avoidance behaviour, which may be something other than anxiety or fear (Taylor & Sullman, 2009). The instructions do not explicitly ask respondents to rate driving avoidance that is due to anxiety or fear. Therefore, the explanations for this type of avoidance could equally be due to practical issues such as petrol prices or concern for the environment. As the participants were all university students and the study was conducted at a time of historically high petrol prices, it would make sense for the participants to report a relatively high level of avoidance for practical reasons across both settings. However, environmental concerns could explain the varied endorsement of avoidance behaviour across the two settings, given that previous research has found socially desirable responding to have an effect on self-reported environmental attitudes and behaviours (e.g., Ewert & Galloway, 2009; Milfont, 2009). Therefore, it seems likely that these items from the DRAS are not measuring driving avoidance due to anxiety or fear, but avoidance in an attempt to portray concern for the environment in a public setting. Future research is needed to develop a more adequate measure of driving avoidance due to anxiety or fear.

The present finding also supports Lajunen & Summala's (2003) conclusion that the DBQ is not greatly affected by socially desirable responding. Although the previous research has had some fairly obvious methodological shortcomings, the combined evidence of these studies (and the present) suggest that the DBQ is relatively immune to socially desirable responding (Lajunen et al., 1998; Lajunen & Summala, 2003). Perhaps this is because aberrant

behaviours are not viewed as being very undesirable behaviours. There is some support for this, as the only item Lajunen and Summala found a difference in was the drinking and driving item (which is not socially acceptable in Finland). However, the present study did not find any difference in this item and, although it would be possible to argue that the two Aggressive Violations which were significantly different (if you ignore the Bonferroni corrections) were amongst the most socially frowned-upon behaviours, it would be difficult to argue this with the error (fail to check mirror before a manoeuvre) and lapse (get into the wrong lane approaching an intersection). Future research should investigate this issue further.

It should, however, be noted that the present study also has a number of obvious methodological limitations. The first limitation of the study was in the operationalisation of the "private" setting. In an attempt to maximise the effect of the "public" setting the private-public manipulation consisted of two parts. Firstly, as was the case in previous research (e.g. Lajunen & Summala, 2003) the "public" setting was evoked by having the participants write their name and address on a sheet attached to the questionnaire. In the "private" setting the questionnaire had a code, but not the name of the participant. The second aspect of the "public" manipulation was having participants complete the questionnaires in a classroom environment in close proximity to other participants. In the private setting the questionnaires were posted to the individual and there were no controls over the environment in which the questionnaires were completed. Although the researchers specified that the participants complete the questionnaire alone and in private, it is possible that many of the participants may have completed the questionnaire in front of friends, family, flatmates (those sharing a house with them), or in other less private locations. However, there is no reason to believe that most of the participants did not complete the second questionnaire in private. Furthermore, it seems unlikely that the participants would take the second questionnaire to a

place where others would be able to note their answers and judge them. As the fundamental effect is a reduction in the reported frequency of socially undesirable behaviours due to concern about what others would think of them, it seems unlikely that, given the choice, an individual would complete a questionnaire measuring socially undesirable behaviour in the presence of others who may think badly of them. Therefore it seems much more plausible that the vast majority of the students followed the instructions to complete the questionnaire alone and in private. Finally, as their names were not included anywhere in the second questionnaire, this condition seems to constitute a private setting.

Confirmation of the effectiveness of the public-private manipulation can be shown by the scores on the BIDR, which were significantly higher in the public setting than in the private setting. This means that despite the lack of control over the private setting the appropriate effect was obtained. However, the fact remains that as the environments were different across the two conditions it is not possible to dismiss this as having had an effect on the results. A better approach would have been to have had participants complete the “public” and “private” questionnaires in the same classroom environment, thus removing the chance that the different environments influenced the findings.

There is also the possibility that order effects may have hidden the true impact of socially desirable responding. The values reported on the DRAS and DBQ could have been influenced by the order in which the “public” and “private” settings were tested. Research has found that the order in which questions, or sets of questions, are presented can have an impact on the results as well as who responds to questionnaires (e.g. Cowen & Stiller, 1959; Dietz & Jasinski, 2007; Roberson & Sundstrom, 1990). Unfortunately, because of the nature of the sample, it was only possible to access the students in class early on in the academic year, thus

excluding the possibility of counterbalancing. Therefore, as it is not possible to exclude the possibility that order effects (or practice effects) influenced the findings of this study, it is recommended that future research use counterbalancing in order to dismiss this potential explanation. A final limitation of the present study was that some of the comparisons that were not statistically significant had very small effect sizes, and the study had insufficient power to detect such small effects (less than 26%).

In summary, the present study indicates that self-reported driving avoidance on the DRAS and aberrant driving behaviour (as measured by the DBQ) do not appear to be particularly vulnerable to socially desirable responding. However, further research using a repeated measures design is needed to more clearly ascertain whether this conclusion applies to other measures of driving anxiety, avoidance, and driving behaviour in general. The future research should also ensure a better control over the operationalisation of the two settings and should also account for any possible order effects.

References

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd Ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.

Cowen, E.L., & Stiller, A. (1959). The social desirability of trait descriptive terms: Order and context effects. *Canadian Journal of Psychology/Revue canadienne de psychologie, 13*, 193-199.

Dietz, T.L., & Jasinski, J.L. (2007). The effect of item order on partner violence reporting: An examination of four versions of the revised Conflict Tactics Scales. *Social Science Research*, *36*, 353-373.

Ewert, A., & Galloway, G. (2009). Socially desirable responding in an environmental context: development of a domain specific scale. *Environmental Education Research*, *15*, 55-70.

Lajunen, T., Corry, A., Summala, H., & Hartley, L. (1997). Impression management and self-deception in traffic behaviour inventories. *Personality and Individual Differences*, *22*, 341-353.

Lajunen, T., Corry, A., Summala, H., & Hartley, L. (1998). Cross-cultural differences in drivers' self-assessments of their perceptual-motor and safety skills: Australians and Finns. *Personality and Individual Differences*, *24*, 539-550.

Lajunen, T., & Summala, H. (2003). Can we trust self-reports of driving? Effects of impression management on driver behaviour questionnaire responses. *Transportation Research Part F*, *6*, 97-107.

Lindeman, M., & Verkasalo, M. (1995). Personality, situation, and positive-negative asymmetry in socially desirable responding. *European Journal of Personality*, *9*, 125-134.

Milfont, T.L. (2009). The effects of social desirability on self-reported environmental attitudes and ecological behaviour. *Environmentalist, 29,* 263-269.

Paulhus, D. L. (1984). Two-component models of socially desirable responding. *Journal of Personality and Social Psychology*, *46*, 598-609.

Paulhus, D. L. (1991). Measurement and control of response bias. In J. P. Robinson, P. R. Shaver, & L. S.Wrightsman (Eds.), *Measures of personality and social psychological attitudes* (pp. 17-59). San Diego, CA: Academic Press.

Reason, J., Manstead, A., Stradling, S., Baxter, J., & Campbell, K. (1990). Errors and violations on the roads: A real distinction? *Ergonomics*, *33*, 1315-1332.

Roberson, M.T., & Sundstrom, E. (1990). Questionnaire design, return rates, and response favorableness in an employee attitude questionnaire. *Journal of Applied Psychology, 75*, 354-357.

Şimşekoğlu, Ö., & Lajunen, T. (2008). Social psychology of seat belt use: A comparison of theory of planned behavior and health belief model. *Transportation Research Part F*, *11*, 181-191.

Stewart, A. E. (2005). Attributions of responsibility for motor vehicle crashes. *Accident Analysis and Prevention*, *37*, 681-688.

Stewart, A. E., & St. Peter, C. C. (2004). Driving and riding avoidance following motor vehicle crashes in a non-clinical sample: Psychometric properties of a new measure. *Behaviour Research and Therapy*, *42*, 859-879.

Strahan, C., Watson, B., & Lennonb A. (2008). Can organisational safety climate and occupational stress predict work-related driver fatigue? *Transportation Research Part F*, *11*, 418-426.

Sullman, M.J.M. (2006). Anger amongst New Zealand drivers. *Transportation Research Part F, 9, 173-184.*

Sullman, M.J.M., & Mann, H.N. (2009). The road user behaviour of New Zealand adolescents. *Transportation Research Part F, 12,* 494-502.

Taylor, J. E. (2008). *Driving phobia consequent to motor vehicle collisions*. In M. P. Duckworth, T. Iezzi, & W. T. O'Donohue (Eds.), Motor vehicle collisions: Medical, psychosocial, and legal consequences. USA: Elsevier.

Taylor, J. E., & Sullman, M. J. M. (2009). What does the Driving and Riding Avoidance Scale (DRAS) measure? *Journal of Anxiety Research, 23,* 504-510.

Wallén Warner, H., & Åberg, L. (2008). Drivers' beliefs about exceeding the speed limits. *Transportation Research Part F, 11*, 376-389.

Author Note

We acknowledge the financial support of the Massey University Research Fund and would like to send a special thanks to those who participated in this study.

Table 1

DRAS total, subscale, and item mean scores in the public and private settings

	Public	Private		
	Mean (*SD*)	Mean (*SD*)	*t*	*d*
Total score	12.60 (9.16)	11.55 (9.73)	2.13*	0.11
General avoidance	5.79 (4.41)	4.75 (4.47)	4.01**	0.23
1. Put off brief driving trip	1.12 (1.01)	0.77 (0.92)	4.48**	0.36
2. Chose to walk or ride bicycle to avoid driving	1.17 (1.11)	0.94 (1.09)	3.33**	0.21
3. Avoided driving if possible	1.08 (1.13)	0.99 (1.03)	1.16	0.08
12. Avoided driving at night	0.37 (0.80)	0.45 (0.77)	0.25	0.10
18. Put off brief riding trip	0.54 (0.85)	0.41 (0.71)	2.13*	0.17
19. Chose to bus to avoid driving	0.98 (1.07)	0.82 (1.07)	2.35*	0.15
20. Avoided activities requiring driving	0.53 (0.75)	0.45 (0.75)	1.47	0.11
Traffic avoidance	5.27 (4.45)	5.05 (4.37)	0.85	0.05
5. Avoided residential streets	0.30 (0.69)	0.27 (0.64)	0.65	0.05
6. Avoided busy city streets	0.93 (1.05)	0.80 (0.95)	1.93	0.13
7. Avoided motorway	0.68 (1.04)	0.64 (1.05)	0.51	0.04
8. Avoided busy intersections	1.05 (1.05)	1.11 (1.05)	0.90	0.06
9. Travelled longer distance to avoid heavy traffic	1.05 (0.98)	1.05 (0.98)	0.06	0.00
10. Rescheduled drive to avoid traffic	0.89 (0.93)	0.76 (0.89)	2.24*	0.14
15. Avoided riding due to heavy traffic	0.44 (0.77)	0.44 (0.76)	0.10	0.00

Table 1 (continued)

	Public	Private		
	Mean (*SD*)	Mean (*SD*)	*t*	*d*
Weather avoidance	1.40 (2.58)	1.50 (2.59)	0.67	0.04
11. Avoided bad weather	0.36 (0.73)	0.42 (0.70)	1.38	0.08
12. Avoided driving at night	0.37 (0.80)	0.45 (0.77)	0.25	0.10
13. Avoided riding due to bad weather	0.23 (0.64)	0.24 (0.55)	0.33	0.02
14. Avoided riding at night	0.10 (0.43)	0.13 (0.49)	1.00	0.07
17. Rescheduled drive to avoid bad weather	0.35 (0.75)	0.36 (0.67)	0.19	0.01
Riding avoidance	1.44 (2.17)	1.50 (2.23)	0.42	0.03
4. Avoided riding if possible	0.47 (0.82)	0.37 (0.74)	1.44	0.13
13. Avoided riding due to bad weather	0.23 (0.64)	0.24 (0.55)	0.33	0.02
14. Avoided riding at night	0.10 (0.43)	0.13 (0.49)	1.00	0.07
15. Avoided riding due to heavy traffic	0.44 (0.77)	0.44 (0.76)	0.10	0.00
16. Avoided riding on motorway	0.28 (0.70)	0.33 (0.81)	0.93	0.07

Note. Total score range 0-60. Subscale score range 0-21 (general and traffic avoidance), 0-15 (weather and riding avoidance). Item range 0-3. In all cases, higher scores indicate more frequent avoidance. *N* ranges from 214-220 due to missing data.

$^{*}p < .05$. $^{**}p < .001$.

Table 2

DBQ subscales and item mean scores in the public and private settings

	Public	Private		
	Mean (*SD*)	Mean (*SD*)	*t*	*d*
Violations	1.10 (0.63)	1.08 (0.63)	0.65	0.03
3. Drive when you may be over the alcohol limit	0.39 (0.68)	0.39 (0.63)	0.00	0.00
11. Speed on residential road	1.63 (1.10)	1.55 (1.17)	1.13	0.06
20. Overtake on the inside	0.66 (0.92)	0.63 (0.83)	0.76	0.04
23. Close following	1.03 (0.89)	0.97 (0.95)	1.14	0.07
24. Cross intersection when light against you	1.19 (0.91)	1.21 (0.89)	-0.38	0.03
28. Speed on open road	1.68 (1.22)	1.71 (1.18)	-0.43	0.03
Aggressive Violations	0.85 (0.53)	0.80 (0.53)	1.84	0.10
7. Sound horn to indicate annoyance	1.11 (1.09)	1.18 (1.07)	-1.06	0.06
10. Pull out of intersection to force your way in	0.59 (0.75)	0.47 (0.64)	2.35*	0.17
17. Angered by another driver, give chase	0.30 (0.66)	0.29 (0.66)	0.24	0.02
18. Stay in lane about to close, force your way in	0.61 (0.77)	0.58 (0.73)	0.64	0.04
21. Race away from the lights to beat another	1.48 (1.19)	1.43 (1.15)	0.87	0.05
25. Become angry, indicate hostility	1.05 (1.00)	0.90 (0.95)	2.84**	0.16
Errors	0.66 (0.46)	0.64 (0.47)	1.08	0.05
5. Queuing to the left, nearly hit the car in front	0.70 (0.76)	0.72 (0.87)	-0.36	0.02
6. Fail to notice pedestrians crossing	0.87 (0.85)	0.82 (0.85)	0.80	0.06

Table 1 (continued)

	Public	Private		
	Mean (*SD*)	Mean (*SD*)	*t*	*d*
8. Fail to check mirror before a manoeuvre	0.96 (0.91)	0.83 (0.76)	2.29*	0.15
9. Brake too quickly on slippery road	0.67 (0.78)	0.58 (0.64)	1.79	0.13
13. Nearly hit a cyclist when turning left	0.42 (0.72)	0.48 (0.66)	-1.09	0.08
14. Miss give way signs	0.36 (0.53)	0.35 (0.60)	0.34	0.02
16. Attempt to overtake someone signalling right	0.40 (0.62)	0.41 (0.65)	-0.16	0.02
27. Underestimate speed of oncoming car	0.95 (0.87)	0.95 (0.84)	0.00	0.00
Lapses	1.10 (0.51)	1.07 (0.51)	1.12	0.06
1. Hit something when reversing	0.43 (0.63)	0.52 (0.62)	-1.94	0.15
2. Wake up to find yourself on a wrong route	1.05 (0.91)	1.15 (0.90)	-1.63	0.11
4. Get in the wrong lane approaching intersection	1.37 (0.78)	1.26 (0.80)	2.20*	0.14
12. Switch on the wrong thing	1.19 (0.99)	1.12 (0.90)	1.29	0.08
15. Attempt to drive off in 3rd gear	0.71 (0.87)	0.65 (0.81)	1.35	0.07
19. Forget where car parked	1.70 (1.13)	1.70 (1.07)	0.07	0.00
22. Exit a roundabout on wrong road	0.74 (0.76)	0.71 (0.76)	0.55	0.04
26. No recollection of the road just travelled	1.56 (1.09)	1.43 (1.07)	1.85	0.12

Note.

N = 219-222

$^{*}p < .05$. $^{**}p < .01$ $^{***}p < .001$.