

1. INTRODUCTION

1.1 The Candrive/Ozcandrive cohort study

The Candrive/Ozcandrive common cohort study is a multi-centre, international project which is tracking over 900 drivers aged 70 and over in Canada, as well as 300 older drivers in Melbourne, Australia and Wellington, NZ (Marshall, et al., submitted). Using a longitudinal study design, the project is tracking drivers for five years, assessing medical conditions, perceived and actual changes in their functional abilities, as well as actual driving exposure and patterns (using an in-vehicle device) and driving performance (at-fault crashes).

1.2 Older drivers and the low mileage bias

The widespread claim that older drivers are overly involved in crashes has apparent support from analyses of crash rates, particularly when using distance driven as the exposure measure (for example, OECD, 2001). However Janke (1991) recognized that drivers travelling more miles will typically have reduced crash rates per mile, compared to those driving fewer miles. The failure to take into account annual mileage when computing crash rates, has been termed the 'low mileage bias'. Janke's subsequent warning to licensing administrators not to become overly alarmed about older drivers' apparent high per-mileage crash rates, has been empirically demonstrated initially by Hakamies-Blomqvist, Raitanen & O'Neill (2002) and subsequently by Langford, Methorst & Hakamies-Blomqvist (2006) and Alvarez & Fierro (2008). All three studies used self-reported driving distances and self-reported crash frequencies to confirm that older drivers' apparent over-involvement in crashes calculated on a per-distance basis, disappeared after controlling for different annual driving distances.

The association between low mileage and heightened crash risk is usually attributed to location of driving: in the main, low mileage drivers do most if not all of their driving in urban areas, where the prevalence of complex traffic situations (and particularly intersections) results in increased crash risk (Janke, 1991; Langford and Koppel, 2005). However it may also be that at least some low mileage drivers have reduced their driving in response to perceived or actual declines in basic fitness to drive (Lyman, McGwin and Sims, 2001; Langford, Koppel, Charlton, Fildes and Newstead, 2006). This possibility is consistent with recent studies by Candrive researchers which have shown that older drivers who are less comfortable and have poorer perceptions of their driving abilities drive less overall and restrict their driving patterns (Blanchard & Myers, 2010; Myers et al., 2011).

1.3 Purposes of this paper

This paper uses Canadian and Australasian (i.e. Australian and New Zealand) data from the Candrive/Ozcandrive prospective study of older drivers to investigate associations between annual driving distances and:

- self-reported crash involvement per driver and per kilometer (km) driven;
- functional fitness to drive; and
- driving performance, reflected in a range of driving-related abilities and attitudes.

2. METHOD

All data used in this paper were taken from the Year 1 assessment protocols (Marshall et al., submitted).

Canadian and Australasian drivers in the Candrive/Ozcandrive older driver cohort study were allocated to one of three groups, according to their self-reported annual driving distances for the year previous to the Year 1 assessment. After excluding a small number of drivers for whom there were missing data, the group sizes were:

• low mileage (<5001 km)	180	14.7
• middle mileage (>5000 and <15000 km)	734	60.1
• high mileage (15000 km or greater)	<u>308</u>	<u>25.2</u>
	1222	100.0

(The sample of 1222 drivers used in the above analysis represents 98.9% of the total cohort, with thirteen drivers having been excluded due to lack of information about their estimated annual driving distances. However it needs to be that in later analyses presented in Tables 2-6, further small numbers of respondents have been omitted due to missing data.)

Previous studies (Hakamies-Blomqvist et al., 2002; Langford et al., 2006; and Alvarez & Fierro, 2008) used the following distance parameters: <3001 km for low mileage, >3000 and <14001 km for middle mileage and >14000 km for high mileage drivers. The parameters in the present study vary slightly, to ensure adequate numbers of respondents especially for the low mileage category.

Self-reported crash data covering the year previous to the Year 1 assessment were analysed to test the association between the different driving-distance categories and crash risk. The crash risk for each driving distance group was calculated by expressing the number of crash-involved drivers in each group as a ratio of the total distance for all drivers in each group, with the rate then standardised to represent one million kilometers of driving¹. Both distance and crash data were based on the twelve months preceding recruitment to the study.

Sample characteristics (gender and age), as well as scores on measures from the Candrive/Ozcandrive protocol, representing a range of physical, cognitive and psychological measures were selected for comparison across the three distance groups, to see whether driving-distance categories were associated with differences in fitness to drive and other driving-related factors.

'Fitness to drive' was functionally defined by the following measures:

- physical/sensory performance: One leg stance (left leg), time held; One leg stance (right leg), time held; Rapid pace walk, time taken; Ruler drop test (final trial), length grasped down ruler; and Snellen visual acuity in both eyes; and
- cognitive performance: Mini Mental State Exam; Montreal Cognitive Assessment; Motor-Free Visual Perception Test, time to complete all items; Trail Making test - Trails A, time to complete; Trail Making test - Trails B: time to complete; Months in Reverse Order number correct/incorrect; Digit Span – Forward, number correct; Digit Span – Backward, number correct.

¹ In order to calculate the combined driving distance for each group, it was assumed that the median annual distance for low mileage drivers was 4,000 kms, for middle mileage drivers 8,000 kms, and for high mileage drivers 16,000 kms. It was not possible to test this assumption within the confines of the study: however deliberately conservative estimates were made, with any likely errors serving to increase rather than reduce the differences in crash risk between the three groups.

Items from some of the psychological measures were also assessed:

- perceived driving abilities compared to 10 years ago (select items); and
- comfort with aspects of daytime driving (items from the Daytime Driving Comfort Scale²).

The fitness to drive and other driving-related variables used in this paper represent only a selection of the total range of appropriate variables available for analysis. As a general rule, only those variables which showed an adequate range of responses were included. As an example: only items from the Daytime Driving Comfort Scale (DCS-D) on which at least 20% of respondents rated their comfort level as being between 0-50% and at least 20% rated their comfort level as being greater than 50% were selected. The exact selection criteria varied across the variables.

In most instances, fitness to drive and other driving-related variables were measured on a continuous basis. However in keeping with the statistical techniques used in this paper, all continuous variables were changed to categorical variables. Wherever possible, for each physical/sensory or cognitive item, respondents were allocated to one of three equally sized groups (high, moderate, low) based on their performance on that item, with most analyses restricted to comparing the low and high distance groups. For other driving-related items, respondents were allocated to one of two groups (high, low) based on their performance on that item³.

Two research hypotheses were tested in regard to driving fitness and other driving-related items:

- low mileage drivers are more likely to perform or score at the lowest level, relative to high mileage drivers; and
- high mileage drivers are more likely to perform or score at the highest level, relative to low mileage drivers.

With the exception of Table 2 and consistent with the two research hypotheses, all tables compared only the low mileage and high mileage groups. Differences between the low mileage and high mileage groups have been tested for statistical significance using the Taylor Series 95% confidence limits for Relative Risks (Epi Info version 3.2).

3. RESULTS

3.1 Demographic analysis

Table 1 compares the gender and ages of low mileage and high mileage drivers.

There was an association between annual driving distance and gender, such that high mileage drivers were more likely to be male and conversely, low mileage drivers were more likely to be female. Both differences were statistically significant (Relative Risk=1.83, 95%CI 1.53-2.19 and RR=2.63, 95%CI 2.06-3.37, respectively).

² There is also a Nighttime Driving Comfort Scale (DCS-N). However as many older drivers tend to restrict or even stop nighttime driving, the daytime scale was considered to be more representative.

³ Binary outcome measures were used to maintain suitable cell sizes during analysis. So far as was possible, the mid-point on the measurement scale was used to define the two groups.

There was an association between annual driving distance and age, such that high mileage drivers were more likely to be younger (less than 80 years) and conversely, low mileage drivers were more likely to be older (80 years and older). Both differences were statistically significant (RR=1.49, 95%CI 1.30-1.70 and RR=3.02, 95%CI 2.18-4.19, respectively).

(Attachment 1 provides a more extensive demographic analysis of the combined Candrive/Ozdrive cohort of older drivers.)

3.2 Distance groups and per-distance crash rates

Table 2 compares the self-reported crash involvement of low mileage and high mileage drivers.

There was a slight tendency for the proportion of drivers in crashes to increase across the three distance groups, when considered relative to the proportions of crash-free and crash-involved drivers. When crash rates were considered relative to distance travelled, the indicative⁴ annual crash rates per million kms driven were:

- low mileage drivers 21.6
- middle mileage drivers 14.3
- high mileage drivers 8.3

3.3 Distance groups and physical/sensory performance

Table 3 compares the physical/sensory performance of low mileage and high mileage drivers and shows whether the research hypotheses were statistically supported.

On four of the five performance measures (One Leg Stance right leg, Rapid Pace Walk, Ruler Drop and Snellen Visual Acuity), low mileage drivers were more likely to perform at the lowest level, relative to high mileage drivers – and conversely and for all five measures, high mileage drivers were more likely to perform at the highest level, relative to low mileage drivers.

For three measures, (the Rapid Pace Walk, Ruler Drop and Snellen Visual Acuity), both the low mileage driver hypothesis (RR=1.30, 95%CI 1.08-1.55, RR=1.50, 95%CI 1.21-1.85 and RR=1.38, 95%CI 1.04-1.82, respectively) and the high mileage driver hypothesis (RR=1.43, 95%CI 1.09-1.88, RR=1.62, 95%CI 1.21-2.16 and RR=1.27, 95%CI 1.01-1.60, respectively) were statistically supported.

3.4 Distance groups and cognitive performance

Table 4 compares the cognitive performance of low mileage and high mileage drivers and shows whether the research hypotheses were statistically supported.

For six of the eight cognitive measures (Motor-Free Visual Perception, Trails A, Trails B, Digit Span – Forward, Digit Span – Backward and Months in Reverse Order), low mileage drivers were more likely to perform at the lowest level, relative to high mileage drivers (the low mileage driver hypothesis) – and

⁴ 'Indicative' because the mid-point driving distances used to calculate the rates were estimates only and need to be confirmed by actual driving distances before they can be confidently accepted.

conversely, for these measures and the Montreal Cognitive Assessment, high mileage drivers were more likely to perform at the highest level, relative to low mileage drivers (the high mileage driver hypothesis).

The differences were statistically significant for four of the eight cognitive measures, (Motor-Free Visual Perception, Trails A, Trails B, and Months in Reverse Order) for both the low mileage driver hypothesis, (RR=1.30, 95%CI 1.07-1.58, RR=1.37, 95%CI 1.12-1.67, RR=1.35, 95%CI 1.10-1.64 and RR=1.77, 95%CI 1.12-2.80, respectively) and the high mileage driver hypothesis (RR=1.39, 95%CI 1.06-1.82, RR=1.44, 95%CI 1.12-1.85, RR=1.44, 95%CI 1.10-1.88 and RR=1.09, 95%CI 1.01-1.18, respectively).

3.5 Distance groups and driver perceptions

Table 5 compares the self-rated driving-related abilities of low mileage and high mileage drivers and shows whether the research hypotheses were statistically supported.

For all six items, both the low mileage driver hypothesis (RR=1.47, 95%CI 1.10-1.98, RR=1.44, 95%CI 1.19-1.75, RR=1.73, 95%CI 1.21-2.47, RR=1.36, 95%CI 1.09-1.68, RR=1.65, 95%CI 1.29-2.12 and RR=1.47, 95%CI 1.05-2.07, respectively) and the high mileage driver hypothesis were statistically supported (RR=1.16, 95%CI 1.03-1.31, RR=1.38, 95%CI 1.14-1.67, RR=1.16, 95%CI 1.04-1.28, RR=1.25, 95%CI 1.06-1.48, RR=1.32, 95%CI 1.13-1.53 and RR=1.12, 95%CI 1.01-1.24, respectively).

Table 6 compares daytime driving comfort of low mileage and high mileage drivers and shows whether the research hypotheses were statistically supported. In the absence of any direct measure of driving capacity, comfort in various driving situations has been taken as a proxy of the capacity to manage each situation. It is recognized that this step needs to be treated with caution

For all nine items, low mileage drivers were more likely to score at or below the scale midpoint (50%) relative to high mileage drivers (the low mileage driver hypothesis) – and conversely, high mileage drivers were more likely to score above the scale midpoint, relative to low mileage drivers (the high mileage driver hypothesis). In other words, more low mileage drivers felt less than ‘moderately comfortable’ (the label for the midpoint position on the scale) with the specified situations, whereas more high mileage drivers felt at least ‘moderately comfortable’ with the specified situations.

For seven of the nine items, both the low mileage driver hypothesis (RR=1.58, 95%CI 1.09-2.29, RR=1.58, 95%CI 1.18-2.12, RR=1.55 95%CI 1.07-2.23, RR=1.56, 95%CI 1.22-1.99, RR=1.71, 95%CI 1.20-2.43, RR=2.06, 95%CI 1.47-2.90 and RR=1.21, 95%CI 1.01-1.45, respectively) and the high mileage driver hypothesis were statistically supported (RR=1.12, 95%CI 1.01-1.23, RR=1.19, 95%CI 1.06-1.35, RR=1.12, 95%CI 1.01-1.23, RR=1.29, 95%CI 1.11-1.50, RR=1.15, 95%CI 1.04-1.28, RR=1.24, 95%CI 1.11-1.39 and RR=1.22, 95%CI 1.00-1.49, respectively).

The two items (or situations) where the hypotheses were not supported were ‘Tailgated by other drivers’ and ‘Passed in non-passing lane’.

4. DISCUSSION

The present study used slightly different distance parameters from previous studies to define the three driver groups – and particularly, used a higher parameter for the low mileage group. Despite this difference, the findings reported in Tables 3 to 6 provide early support for the two research hypotheses: that low

mileage drivers were more likely to perform at the lowest levels across a range of physical/sensory and cognitive areas and to have lower perceptions of aspects of driving, relative to high mileage drivers; and conversely, that high mileage drivers were more likely to perform at the highest levels, relative to low mileage drivers. These findings are consistent with the notion that the association between low mileage drivers and heightened crash risk may be due at least partly to declines in some low mileage drivers' basic fitness to drive.

However at least two factors need to be taken into account before this conclusion can be confidently accepted.

First, as shown in Table 1, there was a strong association between age and annual driving distances – such that the low mileage group had proportionally more older drivers and conversely, the high mileage group had more younger drivers. It might be that the findings relating driving mileage to performance were at least partly the result of an association between driver age and performance. Indeed when the analyses in Tables 3 to 6 were repeated to compare the youngest-old drivers (70-71 years) and oldest-old drivers (79 years and older), a strong association between driver age and performance was confirmed. At the same time however, when driver age was controlled by restricting analyses to all drivers aged 70-74 years, the two research hypotheses were again supported.

Secondly, as with the other studies in this area (Hakamies-Blomqvist et al., 2002; Langford et al., 2006; and Alvarez & Fierro, 2007), driving and crash data were self-reported. Other studies (Staplin, Gish & Joyce, 2008; Blanchard et al., 2010; Huebner et al., 2006; Crizzle, Myers & Almeida, 2012) have shown that older drivers self-estimates of driving distance may be inaccurate relative to more objective measures obtained from in-vehicle devices. Before the low mileage bias can be accepted as a definite phenomenon, it needs to be demonstrated using more objective, empirical data than has currently been the case. The Candrive/Ozcandrive study is in a position to provide these data once the full set of Year 1 data, including vehicle recordings of mileage as well as licensing authority data on crashes, is available for analysis.

It also needs to be noted that in most instances, only simple bivariate analyses have been conducted for this paper. While the subsequent findings are considered to represent a valuable further step in our understanding of the low mileage bias, it is also recognized that more sophisticated statistical modeling is required to better understand the interactions between the full array of variables in play. It is intended to pursue these further, extended analyses once more objective, empirical data have been obtained. As part of this planned modeling, continuous measures of fitness to drive and other driving-related aspects will be used.

5. CONCLUSIONS

The paper has added to the growing body of research which suggests that the so-called 'older driver problem' is most pertinent to a small sub-group of low mileage drivers with reduced fitness to drive. For this sample, the low mileage group represented 15 percent of the total sample.

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7. REFERENCES

- Alvarez, F. & Fierro, I., (2008). Older drivers, medical conditions, medical impairment and crash risk. *Accident Analysis & Prevention*, 40 (1), 55-60.
- Blanchard, R. & Myers, A., (2010). Examination of Driving Comfort and Self-Regulatory Practices in Older Adults using in-Vehicle Devices to Assess Natural Driving Patterns. *Accident Analysis & Prevention*, 42(4), 1213-1219.
- Blanchard, R, Myers, A. & Porter, M., (2010). Correspondence between self-reported and objective measures of driving exposure and patterns in older drivers. *Accident Analysis & Prevention*, 42(2), 523-529.
- Crizzle, A.M., Myers, A.M. & Almeida, Q.J. (2012). Self-regulatory practices of drivers with Parkinson's disease: Accuracy of patient reports. *Parkinsonism & Related Disorders*. In press. <http://doi.org/10.1016/j.parkreldis.2012.09.003>
- Hakamies-Blomqvist, L., Raitanen, T. & O'Neill, D., (2002). Driver ageing does not cause higher accident rates per km. *Transportation Research Part F*, 5, 271-274.
- Huebner, K., Porter, M. & Marshall, S., (2006). Validation of an electronic device for measuring driving exposure. *Traffic. Injury Prevention*, 7, 76-8.
- Janke, M., (1991). Accidents, mileage and the exaggeration of risk. *Accident Analysis & Prevention*, 23(2-3), 183-188.
- Langford, J. & Koppel, S., (2005). A tale of two surveys: Explaining older drivers' low mileage bias. Paper presented to the Australasian Road Safety Research, Policing and Education Conference, 13-16 November 2005, Wellington, New Zealand.
- Langford, J., Koppel, S., Charlton, J., Fildes, B. & Newstead, S. (2006). A re-assessment of older drivers as a road safety risk. *Special Issue of International Association of Traffic and Safety Sciences (IATSS)*, 30 (1), 1-11.
- Langford, J., Methorst, R. & Hakamies-Blomqvist, L., (2006). Older drivers do not have a high crash risk--a replication of low mileage bias. *Accident Analysis & Prevention*, 38(3), 574-578.
- Lyman, J., McGwin, G. & Sims, R., (2001). Factors related to driving difficulty and habits in older drivers. *Accident Analysis & Prevention*, 33, 413-421.
- MacDonald, L., Myers, A. & Blanchard, R., (2008). Correspondence among older drivers' perceptions, abilities and driving behaviours. *Topics in Geriatric Rehab*, 24, 239-252.
- Marshall, S., Man-Son-Hing, M., Charlton, J.L., Koppel, S., Langford, J., Tuokko, H., Porter, M., Bédard, M., Vrkljan, B., Naglie, G., Rapoport, M., Korner-Bitensky, N., Gélinas, I., Mazer, B., Myers, A., Gagnon, S., & Polgar, J. (Submitted). A five year longitudinal study of older Canadian, Australian and

New Zealand drivers: Methodology for the Candrive/ Ozcandrive Study. *Accident Analysis & Prevention: Special Issue*.

Myers, A., Paradis, J., & Blanchard, R., (2008). Conceptualizing and measuring confidence in older drivers: Development of the Day and Night Driving Comfort Scales. *Arch Phys Med Rehab*, 89, 630-640.

Myers, A., Trang, A., & Crizzle, A., (2011). Naturalistic study of winter driving practices by older men and women: Examination of weather, road conditions, trip purposes and comfort. *Can J Aging*, 30 (4): 577-589.

OECD, (2001). *Ageing and Transport. Mobility Needs and Safety Issues*, Paris.

Staplin, L., Gish, K., Joyce, J., (2008). 'Low mileage bias' and related policy implications—a cautionary note. *Accident Analysis and Prevention*, 40, 1249–1252.

Table 1: Gender and age analyses for low mileage and high mileage drivers.

			Low mileage (<5001k)	High mileage (>=15000k)
Gender	Male	No.	77	241
		%	42.8%	78.2%
	Female	No.	103	67
		%	57.2%	21.8%
Age	Age 70-74	No.	45	151
		%	25.0%	49.0%
	Age 75-79	No.	59	114
		%	32.8%	37.0%
	80-84	No.	51	33
%		28.3%	10.7%	
85-90	No.	24	9	
	%	13.3%	2.9%	
90+	No.	1	1	
	%	0.6%	0.3%	
Total all respondents		No.	180	308
		%	100.0%	100.0%

Table 2: Self-reported crash involvement for low mileage, middle mileage and high mileage drivers.

			Low mileage drivers (<5001k)	Middle mileage drivers (5001- <15000k)	High mileage drivers (>=15000k)	Total
Crash involvement in previous year	No crashes	No. %	159 91.4%	648 88.5%	261 86.7%	1068 88.5%
	1 or more crashes	No. %	15 8.6%	84 11.5%	40 13.3%	139 11.5%
Total all respondents		No. %	174 100.0%	732 100.0%	301 100.0%	1207 100.0%

Table 3: Physical/sensory performance for low mileage and high mileage drivers.

Performance area and category parameters			Low mileage drivers (<5001k)	High mileage drivers (>=15000k)	Statistical support for hypotheses
1 One Leg Stance (left leg): time held	Low <7 secs	No. %	50 32.5%	111 37.8%	No support for low mileage, high mileage hypotheses
	High >21 secs	No. %	46 29.9%	102 34.7%	
Total all respondents			154	294	
2 One Leg Stance (right leg): time held	Low <7 secs	No. %	62 39.2%	88 30.3%	No support for low mileage, high mileage hypotheses
	High >22 secs	No. %	45 28.5%	92 31.7%	
Total all respondents			158	290	
3 Rapid Pace Walk: time taken time	Low >6 secs	No. %	87 48.9%	108 35.2%	Support for low mileage, high mileage hypotheses
	High <6 secs	No. %	46 25.8%	106 34.5%	
Total all respondents			178	307	
4 Ruler Drop (final trial): length grasped down ruler	Low >6 cms	No. %	67 43.2%	89 31.0%	Support for low mileage, high mileage hypotheses
	High <11 cms	No. %	36 23.2%	116 40.4%	
Total all respondents			155	287	
5 Snellen Visual Acuity in both eyes	Low >19.9	No. %	49 27.4%	60 19.6%	Support for low mileage, high mileage hypotheses
	High <10.1	No. %	49 27.4%	105 34.3%	
Total all respondents			179	306	

Note: the numbers of respondents in the middle performance category for each of the five measures have not been shown in the table. However 'total all respondents' frequencies and all '%s are based on all respondents in each mileage sub-group. Performance measurements per protocol were not available for small numbers of respondents.

Table 4: Cognitive performance for low mileage and high mileage drivers.

Performance protocol and category parameters			Low mileage drivers (<5001k)	High mileage drivers (>=15000k)	Statistical support for hypotheses
1 Mini Mental State Exam	Low <28	No. %	31 17.4%	74 24.0%	No support for low mileage, high mileage hypotheses
	High >29	No. %	45 25.3%	65 21.1%	
Total all respondents			178	308	
2 Montreal Cognitive Assessment	Low <26	No. %	70 38.9%	120 39.2%	No support for low mileage, high mileage hypotheses
	High >27	No. %	43 23.9%	89 29.1%	
Total all respondents			180	306	
3 Motor-Free Visual Perception Test: time to complete all items	Low >152 secs	No. %	75 41.9%	102 33.9%	Support for low mileage, high mileage hypotheses
	High <117 secs	No. %	44 24.6%	108 35.9%	
Total all respondents			179	301	
4 Trail Making - Trails A: time to complete	Low >40secs	No. %	80 44.4%	96 31.2%	Support for low mileage, high mileage hypotheses
	High <33 secs	No. %	49 27.2%	116 37.7%	
Total all respondents			180	308	
5 Trail Making - Trails B: time to complete	Low >102 secs	No. %	73 41.2%	101 32.9%	Support for low mileage, high mileage hypotheses
	High <75 secs	No. %	43 24.3%	115 37.5%	
Total all respondents			177	307	
6 Digit Span – Forward: No. correct	Low <10	No. %	59 32.8%	84 27.5%	No support for low mileage, high mileage hypotheses
	High >12	No. %	41 22.8%	95 31.0%	
Total all respondents			180	306	

7 Digit Span – Backward: No. correct	Low <6	No.	67	107	No support for low mileage, high mileage hypotheses
		%	37.2%	35.0%	
	High >7	No.	47	101	
		%	26.1%	33.0%	
Total all respondents			180	306	
8 Months in Reverse Order	At least one incorrect	No.	32	31	Support for low mileage, high mileage hypotheses
		%	17.9%	10.1%	
	All correct	No.	147	276	
		%	82.1%	89.9%	
Total all respondents			179	307	

Note: the numbers of respondents in the middle performance category for each of the eight measures have not been shown in the table. However 'total all respondents' frequencies and all '%s are based on all respondents in each mileage sub-group. Performance measurements per protocol were not available for small numbers of respondents.

Table 5: Self-rated driving-related abilities compared to 10 years ago, for low mileage and high mileage drivers.

Self-rated driving-related abilities compared to 10 years ago			Low mileage drivers (<5001k)	High mileage drivers (>=15000k)	Statistical support for hypotheses
1 See road signs at distance	Better or same	No. %	115 66.5%	231 77.5%	Support for low mileage, high mileage hypotheses
	Worse or a lot worse	No. %	58 33.5%	68 22.8%	
2 See road signs at distance at night	Better or same	No. %	77 44.5%	184 61.7%	Support for low mileage, high mileage hypotheses
	Worse or a lot worse	No. %	96 55.5%	115 38.6%	
3 See road lines at night	Better or same	No. %	126 72.8%	252 84.6%	Support for low mileage, high mileage hypotheses
	Worse or a lot worse	No. %	47 27.2%	47 15.8%	
4 See objects on road at night with glare or on wet roads	Better or same	No. %	89 51.4%	192 64.4%	Support for low mileage, high mileage hypotheses
	Worse or a lot worse	No. %	84 48.6%	107 35.9%	
5 Quickly find street or exit in unfamiliar area & heavy traffic	Better or same	No. %	96 55.5%	217 72.8%	Support for low mileage, high mileage hypotheses
	Worse or a lot worse	No. %	77 44.5%	80 26.8%	
6 Get in and out of car	Better or same	No. %	126 72.8%	243 81.5%	Support for low mileage, high mileage hypotheses
	Worse or a lot worse	No. %	47 27.2%	55 18.5%	
Total for all respondents for all measures			173	298	

Note: Performance measurements per protocol were not available for small numbers of respondents.

Table 6: Comfort in daytime driving situations for low mileage and high mileage drivers.

Comfort with various aspects of daytime driving			Low mileage drivers (<5001k)	High mileage drivers (>=15000k)	Statistical support for hypotheses
1 In light rain	0-50% confident	No. %	42 24.3%	47 15.4%	Support for low mileage, high mileage hypotheses
	>50% confident	No. %	131 75.7%	258 84.6%	
2 In heavy rain	0-50% confident	No. %	60 34.7%	67 22.0%	Support for low mileage, high mileage hypotheses
	>50% confident	No. %	113 65.3%	238 78.0%	
3 Parking in tight spots	0-50% confident	No. %	43 24.9%	49 16.1%	Support for low mileage, high mileage hypotheses
	>50% confident	No. %	130 75.1%	256 83.9%	
4 In unexpected storm	0-50% confident	No. %	77 44.5%	87 28.5%	Support for low mileage, high mileage hypotheses
	>50% confident	No. %	96 55.5%	218 71.5%	
5 Seeing street or exit signs with little warnings	0-50% confident	No. %	47 27.2%	49 16.1%	Support for low mileage, high mileage hypotheses
	>50% confident	No. %	126 72.8%	259 84.9%	
6 Surrounded by multiple transport trucks	0-50% confident	No. %	55 31.8%	47 15.1%	Support for low mileage, high mileage hypotheses
	>50% confident	No. %	118 68.2%	258 84.6%	
7 Tailgated by other drivers	0-50% confident	No. %	82 47.4%	117 38.4%	No support for low mileage, high mileage hypotheses
	>50% confident	No. %	91 52.6%	186 61.0%	

8 Passed by other drivers in non-passing lane	0-50% confident	No. %	85 49.1%	126 41.3%	No support for low mileage, high mileage hypotheses
	>50% confident	No. %	88 50.9%	179 58.7%	
9 Other drivers do not signal or seem distracted	0-50% confident	No. %	97 56.1%	141 46.2%	Support for low mileage, high mileage hypotheses
	>50% confident	No. %	76 43.9%	164 53.8%	
Total all respondents for all measures			173	305	

Note: Performance measurements per protocol were not available for small numbers of respondents.

ATTACHMENT: Demographic analyses for the combined Candrive/Ozdrive cohort.

Gender	Male	No.	795
		%	64.4%
	Female	No.	440
		%	35.6%
Age	Age 70-74	No.	405
		%	32.8%
	Age 75-79	No.	464
		%	37.6%
80-84	No.	267	
	%	21.6%	
85 and above	No.	99	
	%	8.0%	
Highest education completed	Post-graduate	No.	222
		%	18.0%
	Graduate	No.	273
		%	22.1%
	Diploma	No.	184
		%	14.9%
	Trade/technical	No.	112
		%	9.1%
High school	No.	283	
	%	22.9%	
Grade school	No.	158	
	%	12.8%	
Other/unknown	No.	3	
	%	0.2%	

Area of residence	Rural	No.	96
		%	7.8%
	Urban	No.	1123
		%	90.9%
	Other/unknown	No.	16
		%	1.3%
Total all respondents		No.	1235
		%	100.0%