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Driving with pets and motor vehicle collision involvement among older drivers: a prospective population-based study

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Abstract

Objective—Distracted driving is a major cause of motor vehicle collision (MVC) involvement. Pets have been identified as potential distraction to drivers, particularly in the front. This type of distraction could be worse for those with impairment in the cognitive aspects of visual processing. The purpose of this study is to evaluate the association between driving with pets and rates of motor vehicle collision involvement in a cohort of older drivers.

Methods—A three-year prospective was conducted in a population-based sample of 2000 licensed drivers aged 70 years and older. At the baseline visit, a trained interviewer asked participants about pet ownership, whether they drive with pets, how frequently, and where the pet sits in the vehicle. Motor vehicle collision (MVC) involvement during the three-year study period was obtained from the Alabama Department of Public Safety. At-fault status was determined by the police officer who arrived on the scene. Participants were followed until the earliest of death, driving cessation, or end of the study period. Poisson regression was used to calculate crude and adjusted rate ratios (RR) examining the association between pet ownership, presence of a pet in a vehicle, frequency of driving with a pet, and location of the pet inside with vehicle with any and at-fault MVC involvement. We examined whether the associations differed by higher order visual processing impairment status, as measured by Useful Field Of View, Trails B, and Motor-free Visual Perception Test.

Results—Rates of crash involvement were similar for older adults who have ever driven with a pet compared to those who never drove with their pet (RR=1.15, 95% CI 0.76-1.75). Drivers who reported always or sometimes driving with their pet had higher MVC rates compared to pet owners who never drive with a pet, but this association was not statistically significant (RR=1.39, 95% CI 0.86-2.24). In terms of location, those reporting having a pet frequently ride in the front of the vehicle had similar rates of MVC involvement compared to those who did not drive with a pet in the front. A similar pattern of results was observed for at-fault MVCs. This association was not modified by visual processing impairment status.

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Conclusion—The current study demonstrates a positive but non-significant association between frequently driving with pets and MVC involvement. More research is needed, particularly on restraint use and whether the pet was in the car at the time of the crash, to help characterize the public safety benefit of regulations on driving with pets.

Keywords

Driver distraction; older drivers; pets; MVC

1. Introduction

One of the major causes of motor vehicle collisions (MVCs) among novice and experienced drivers in the United States is distracted driving.¹ This includes distractions that could potentially remove a driver's eyes from the road (visual), their hands from the steering wheel (manual), or their attention or concentration from tasks critical for safe driving (cognitive). According to the National Highway Traffic Safety Administration (NHTSA), nearly 10% of all fatal crashes and 18% of injury crashes involve some type of distraction.² In 2012, there were 3,328 deaths and an estimated 421,000 people injured as a result of distracted driving behavior.² Furthermore, the percentage of injured people in distracted-related crashes as a portion of all injured people has remained relatively constant in recent years, despite efforts to raise awareness about the dangers of distracted driving.^{2,3}

1.1. Within-vehicle distraction among older drivers

Most commonly, distractions to the driver occur inside the vehicle, rather than outside of it.⁴ While the majority of existing research on distracted driving has focused on specific activities such as texting and cell phone use, particularly among teenage drivers, other secondary activities can be equally or more distracting than cell phone use as measured by eye glances away from the road ahead and mirrors.⁵ This may be particularly relevant for older drivers. Research suggests that when confronted with an increased cognitive or physical workload while driving, older drivers have exhibited slowed cognitive performance and delayed response times in comparison to younger age groups which may in turn, lead to safety errors and increased risk of crash.^{6,7} Research suggests this is particularly true for older adults when the activity provides information that is not of direct relevance to the driving task.⁸ Therefore it is possible that those with slowed visual processing speed under divided attention conditions are more at risk for a MVC when driving with pets than those who do not have slowed visual processing speed. In addition, since older drivers are the fastest growing segment of the driving population, research about the effect of distraction on driving performance of older drivers is important.

1.2. Pets as a source of driver distraction

Pets may be a source of within-vehicle distraction, particularly when the pet is in the front seat of the vehicle. Pets in the back seat of a vehicle may be a visual or auditory distraction, whereas pets in the front may represent an additional physical distraction. In a report by AAA and Kurgo, nearly one-quarter of pet owners have used their hands or arms to hold the pet in place while applying brakes and 19% have used their hands or arms to keep their pet

from climbing into the front seat.⁹ These behaviors may require both hands being taken off the wheel which has been shown to result in variability in vehicle lane position and drifting into adjacent lanes.⁴

In a recent survey of drivers, interaction with pets was one of the top three most frequently reported distracting behaviors that participants admitted did result in an accident or near-miss.⁷ There have been several cases of fatal¹⁰ and nonfatal¹¹ MVCs caused by drivers who were distracted by pets in the vehicle and growing concern over safety of pets riding in vehicles.^{9,12,13} In some states, driving policies restrict drivers from having a pet in the lap while driving, whereas others restrict behaviors that could potentially distract a driver.¹⁴⁻¹⁶ Despite the increased attention and safety concern, there has been only one epidemiologic study examining the relationship between pets in vehicles and MVC involvement which reported that the rate of MVCs for older drivers who always drive with their pet was nearly double that of drivers who never drove with their pet.¹⁷ This study was based on retrospective data on collision involvement; at the time the study was conducted the MVCs had already occurred so is subject to certain methodological limitations, namely positive selection bias and whether the collision involvement changed their driving habits. The participants in the aforementioned study have now been followed-up for three subsequent years. Therefore, the current study aims to assess the relationship between driving with pets in the vehicle and rate of future MVC involvement among a population-based sample of older drivers.

2. Methods

2.1. Study Cohort

As described elsewhere, the study cohort consisted of a population-based sample of licensed drivers aged 70 years and older who resided in Jefferson County, Alabama or the bordering counties located in north-central Alabama.¹⁸ Participants were enrolled between October 2008 and August 2011. Persons who stated they had an Alabama license, had driven within the last three months, and spoke English were eligible to participate. The final sample consisted of 2,000 drivers. Participants completed a single in-person visit at the Clinical Research Unit at the University of Alabama at Birmingham (UAB) and were followed-up with telephone calls at one-year intervals for three subsequent years. The Institutional Review Board at UAB approved this study.

2.2. Data collection

Following written informed consent, a trained interviewer administered a demographic review (age, sex, race, education, and marital status), a general health questionnaire about the presence or absence of chronic medical conditions (i.e. "has a doctor ever told you that you have..."),¹⁹ questions about smoking and alcohol use, and the Mini-Mental State Examination (MMSE) to estimate cognitive status.²⁰ Reduced cognitive status was defined as a MMSE score ≤ 23 .

At the baseline visit only, participants were asked, "Do you have a dog and/or a cat as a pet?" Those with an affirmative response were asked about whether the pet rides in the car

(yes or no), how frequently the pet rides in the car (always, sometimes, rarely, or never), and where the pet frequently sits (rear cargo, rear seat, front passenger seat, front floor, in driver's lap, moves around, or front console). Participants could have reported more than one usual location where the pet sits. Those who reported having the pet in the front passenger seat, front floor, in driver's lap, moves around, or front console were defined as having a pet in the front. Those who reported a pet in the rear cargo area, rear seat, or pet-owners who never drive with a pet were defined as not having a pet in the front.

Tests for central vision and visual processing skills were administered at the baseline visit. Testing was done under habitual correction, so participants wore whatever spectacles or contact lenses normally worn when driving. All tests were administered under binocular viewing unless noted. Distance visual acuity was assessed using the Electronic Visual Acuity (EVA) system, and expressed as log minimum angle resolvable (logMAR).²¹ Contrast sensitivity was measured using the Pelli-Robson Contrast Sensitivity chart and scored using the letter-by-letter method and contrast sensitivity impairment was defined as <1.5 log sensitivity.^{22,23} The visual field sensitivity was assessed using a custom test designed for the Humphrey Field Analyzer (HFA) Model II-I (Carl Zeiss Meditec, Dublin, CA, USA) using a 20-point custom test design to include target locations that are relevant when a driver gazes toward the roadway environment through a vehicle's windshield or at the vehicle's dashboard (called the driving visual field).²⁴ A detailed description of the test rationale and procedure has been published.²⁵ Our prior research has shown that impairment in this region, defined as the average sensitivity in the lowest quartile, is associated with increased crash risk.²⁵ Visual processing speed under divided attention was examined by the Useful Field of View (UFOV) subtest 2 (Visual Awareness Research Group, Punta Gorda, FL).²⁶ Impaired UFOV performance was defined in terms of moderate impairment (scores 150-350 ms) and severe impairment (scores >350 ms). Visual processing speed under divided attention was assessed using the Trails B test, a paper and pencil test that also relies on problem solving, executive function, and working memory.²⁷ Impaired performance on Trails B was defined as scores greater than or equal to 2.47 minutes. Spatial ability was assessed by the Visual Closure Subtest of the Motor-free Visual Perception Test (MVPT).²⁸ Impaired MVPT performance was defined as less than eight cards correct.²⁹

Information regarding the participants' MVC involvement occurring during the study period was made available by the Alabama Department of Public Safety (ADPS). Accidents not requiring police accident report (e.g. minor accidents) were not included. Of relevance, the date of the collision and at-fault status according to the police officer at the scene was indicated on the report. For each participant, a count of any and at-fault collision involvement was determined.

At each telephone survey, the interview included questions about driving status and cessation. Driving cessation was defined as a negative response to the question "Do you currently drive?" Participants who reported driving cessation were asked when they stopped driving. Five participants were excluded for inconsistent responses regarding driving cessation (i.e., they reported current driving at baseline, but during follow-up reported a date of driving cessation prior to study entry.) Therefore, baseline and telephone survey data from 1995 participants were included in this analysis. While it is possible for driving status

to switch multiple times (e.g. current driver, then former driver, then back to current driver) over the study period, participants were followed until the first report of driving cessation.

Date of death was confirmed by searching the Social Security Death Index or newspaper obituaries. Participants were considered at-risk for collision involvement until the earliest of driving cessation (n=164), death (n=100), or three years after the participants' enrolment date (n=1731).

An estimate of driving exposure (e.g. miles driven in a typical week) was generated through the administration of the Driving Habits Questionnaire (DHQ) at baseline and each telephone survey.³⁰ The DHQ is a valid and reliable instrument for estimating driving exposure. A structured interview that asks about the places driven to in a typical week as well as their distance from home was used to estimate the amount of driving done in a typical week. From each interview an estimate of total annual mileage was computed. To calculate total mileage during the study period, the mileage reported during each interview was summed while the participants were considered at-risk. If a participant was no longer at-risk due to driving cessation or death, the annual mileage was multiplied by the proportion of time they completed from the prior visit. For example, if a death occurred in July and the last visit occurred in January, the annual mileage reported in January was multiplied by 50%.

2.3. Statistical analysis

Descriptive statistics were generated for demographic, medical, visual, and driving characteristics at baseline. These variables were compared between groups based on location of the pet in the vehicle and were compared using chi-square and ANOVA for categorical and continuous variables, respectively. Poisson regression models were used to calculate crude and adjusted rate ratios (RRs) examining the association between pet ownership, driving with pets, frequency of driving with pets, and location of the pet in the vehicle with the number of any and at-fault MVC involvement. The models used a log link function and accounted for the natural log of the total miles driven during the study period as an offset. Finally, possible effect modification was assessed by adding an interaction term between the primary exposure and visual processing impairment status; separate models were used to assess UFOV, Trails B, and MVPT.

3. Results

Among participants who reported owning a pet, about one-third (n=212 of 690, 31%) reported driving with a pet in the front of the vehicle. Characteristics of the study sample are provided in Table 1 by pet-ownership status and where in the vehicle the pet would usually sit. At baseline, pet-owners tended to be younger, white, have higher education, and higher annual mileage. Compared to non-pet owners, those who owned a pet reported having more falls in the past year. Pet owners had a tendency to report having more medical conditions, but this was not statistically significant. There were no significant differences between groups with respect to sex. There were also no differences across strata in terms of visual acuity, contrast sensitivity, and visual field sensitivity. Participants who drove with pets in the front tended to have faster visual processing skills and higher MMSE scores.

Over the follow-up period, there were 249 MVCs in the overall cohort and 77 MVCs among pet owners. Table 2 presents the crude and age-adjusted rate ratios for any and at-fault MVC involvement among pet owners. There was no evidence of confounding when any of the demographic, health or vision characteristics from Table 1 were added to the model, thus only age-adjusted measures of association are presented. Those who had ever driven with pet were 15% more likely to have an MVC than pet owners who never drove with their pet after; however, this association was not statistically significant. Participants who reported always or sometimes driving with a pet were 39% more likely to have an MVC (age-adjusted RR=1.39, 95% CI 0.86-2.24) though this was not statistically significant and those who only rarely drove with a pet had a similar rate to those who never drove with their pet. Finally, pet owners who reported a common location somewhere in the front of the vehicle were 12% more likely to have an MVC; however, this association was not statistically significant. The pattern of results was similar for at-fault crashes with the exception of location; pet owners who reported driving with a pet in the front were 15% less likely to have an at-fault MVC. None of the associations were statistically significant.

An interaction term was added to the model to test whether the association between driving with a pet in the front and rate of crash involvement was modified by visual processing impairment status. There was no evidence of effect modification by any of the visual processing impairment measures for any or at-fault MVC involvement (p-value for interaction term >0.33 in all six models, data not shown).

4. Discussion

The current study aimed to evaluate the association between driving with pets and rates of crash involvement using a prospective design among a population-based sample of older drivers. The results indicate a positive association between ever driving with pets as well as frequency of driving with pets and MVC involvement after adjusting for age; however, these results were not statistically significant. With respect to at-fault MVCs, similar patterns were observed but at-fault crashes were relatively infrequent so these specific results may be unreliable. Although the results of the current study were not statistically significant, publishing non-significant results is important to provide a comprehensive understanding of the data regarding the safety of driving with pets.³¹

In a prior cross-sectional study of the same cohort,¹⁷ pet owners who reported always driving with a pet had a statistically elevated rate of retrospective MVCs compared to those who did not drive with a pet. The results of the current prospective study also demonstrated a positive association and the point estimate fell within the 95% CIs that the previous study reported; however, the magnitude of this association was weaker (1.39 vs. 1.89) and not statistically significant (Figure 1). Differences in the study results may be attributable to chance. As illustrated in Figure 1, the significant and non-significant point estimates from both studies can be compatible.^{31,32} Alternatively, there could be reasons for this discrepancy related to the prospective nature of the current study. If the pet died or was no longer cared for by the driver, then individuals who reported driving with a pet at baseline were no longer driving with a pet in the subsequent years of follow-up. This potential source of information bias may have obscured the relationship between frequency of driving with a

pet and MVC involvement. It may also be hypothesized that MVC involvement may influence habits of driving with a pet. For example, some drivers who were involved in a crash may have decided or been advised to stop driving with a pet. This pattern has been observed with other vehicle-safety behaviors, such as seat belt use where involvement in a MVC resulted in increased seat belt use.³³ However, whether or not people stopped driving with pets after getting into a collision was not assessed.

In this current analysis, pets in the front were not found to be a statistically significant risk factor for crash involvement. However, an important issue is that there was no information regarding whether the pets were restrained in any way, which may impact their potential for distracting the drivers, particularly in the front.

The results of this study must be interpreted in light of several strengths and limitations. The population-based nature of the sample increases the external validity of the observed results for the segment of the population who are licensed and actually driving the vehicle. An independent and impartial source (Alabama DPS) was used to obtain information on MVCs for study participants rather than driver self-report, which is known to be unreliable even in prospective studies.³⁴ It should be noted that minor collisions or those on private property were likely not captured; however, police-reported crashes are often more serious and involve public or personal property so are considered the most relevant crashes.

Study limitations must be acknowledged. The population was limited to one geographical area, so the results may not be generalizable to other regions. Annual mileage was based on self-report; however, other studies have demonstrated that there is excellent agreement between self-report and actual mileage, so any effect on the measure of association is likely to be negligible.^{35,36} Participants were asked to categorize the frequency with which they drove with their pets into categories of always, sometimes, rarely or never. These responses provided a survey of participant perceptions, but were not an audit of actual practice. This introduces the potential for misclassification bias and may obscure the relationships between frequency of driving with a pet and MVC, which may have biased the estimates toward the null. However, there is little reason to suspect differential bias by outcome status because the exposure was collected at the baseline visit and crashes that were included occurred after study enrolment. However, future studies should use more objective definitions. Because this is an observational study, we cannot rule out residual or unmeasured confounding for unmeasured covariates. For example, there was no information regarding whether the pet was in the vehicle at the time of the crash. That is, it is not known if those who experienced an MVC were actually driving with a pet at the time. Instead, this study was able to evaluate if habits of driving with a pet are associated with future crash involvement. Finally, this study did not collect information on type of pet or whether multiple pets were in the vehicle.

5. Conclusions

The results of this study suggest that pet-owners who drive with a pet do not have a statistically significantly higher rate of crash involvement compared to those who do not drive with a pet. There was a positive but non-significant association between frequently driving with pets and MVC involvement. The differing results between the current study and

a prior retrospective study may be due to a number of important methodological differences or to chance. The broader context of these results provides sufficient evidence to support future research on this topic. A better understanding of this association will likely emerge from studies using a naturalistic driving approach which would be well-suited in order to directly observe the role pets play as a potential source of distraction. In addition, more research is needed to examine use of restraints, type of pet, whether the pet was in the vehicle at the time of the collision, and how many person-miles the owner actually drives with the pet to help characteristics the public safety benefit of regulations on driving with pets.

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Highlights

- Rates of any and at-fault crash involvement were not found to be significantly higher for pet owners who had ever driven with a pet compared to those who never drove with their pet, regardless of where the pet frequently sits in the vehicle.
- Frequently or sometimes driving with a pet was associated with a higher rate of MVC involvement; however, this association was not statistically significant.
- This association was not modified by impaired higher order visual processing skills, as defined by UFOV, Trails B, or MVPT.

Figure 1. Comparing adjusted odds ratio and 95% CI for frequency of driving with a pet and any crash involvement between retrospective and prospective analyses

Table 1

Demographic, medical, functional, and driving characteristics at baseline among older drivers by location of pet in the vehicle

	Drives with pet, in the front (N=212)	Drives with pet, not in the front (N=188)	Never drives with pet (N=290)	Non-pet owner (N=1305)	p-value
Age, years, mean (SD)	76.2 (4.3)	76.4 (4.2)	76.7 (4.7)	77.6 (5.2)	<0.0001
Gender					
Female	93 (43.9%)	84 (44.7%)	109 (37.6%)	584 (44.8%)	
Male	119 (56.1%)	104 (55.3%)	181 (62.4%)	721 (55.3%)	
Race					
non-White	17 (8.0%)	15 (8.0%)	31 (10.7%)	297 (22.8%)	
White	195 (92.0%)	173 (92.0%)	259 (89.3%)	1008 (77.3%)	
Education					
Less than high school	61 (28.8%)	45 (23.9%)	105 (36.2%)	419 (32.1%)	
High school or GED	4 (1.9%)	7 (3.7%)	11 (3.8%)	29 (2.2%)	
1-4 years of college	123 (58.0%)	105 (55.9%)	141 (48.6%)	649 (49.5%)	
Postgraduate degree	24 (11.3%)	31 (16.5%)	33 (11.4%)	210 (16.1%)	
No. medical conditions					
0-2	49 (23.1%)	48 (25.5%)	78 (26.9%)	361 (27.7%)	
3-4	84 (39.6%)	77 (41.0%)	116 (40.0%)	546 (41.8%)	0.56
5	79 (37.3%)	63 (33.5%)	96 (33.1%)	398 (30.5%)	
Falls in past year					
0	150 (70.8%)	130 (69.2%)	221 (76.2%)	1031 (79.0%)	
1	34 (16.0%)	26 (13.8%)	41 (14.1%)	189 (14.5%)	<0.0001
2	28 (13.2%)	32 (17.0%)	28 (9.7%)	85 (6.5%)	
MMSE score					
<24 (impaired)	2 (0.9%)	1 (0.5%)	7 (2.4%)	36 (2.8%)	
24-30 (not impaired)	210 (99.1%)	187 (99.5%)	283 (97.6%)	1269 (97.2%)	
Annual miles driven, mean (SD)	10751.7 (15674.3)	10431.5 (9252.3)	10169.0 (10239.3)	9065.8 (7749.6)	0.021
Visual acuity, logMAR					
20/40 or better (better)	201 (94.8%)	169 (89.9%)	260 (90.0%)	1202 (92.2%)	
Worse than 20/40 (worse)	11 (5.2%)	19 (10.1%)	29 (10.0%)	102 (7.8%)	
Contrast sensitivity					
<1.5 (impaired)	12 (5.7%)	11 (5.9%)	19 (6.6%)	88 (6.7%)	
1.5 (not impaired)	200 (94.3%)	177 (94.2%)	270 (93.4%)	1217 (93.3%)	
Visual field sensitivity, dB					
22.5 (worse)	49 (23.1%)	35 (18.6%)	69 (23.8%)	340 (26.1%)	0.14
>22.5 (better)	163 (76.9%)	153 (81.4%)	221 (76.2%)	965 (74.0%)	
Useful Field of View Subtest 2, ms					
<150 (better)	139 (65.6%)	113 (60.1%)	158 (54.5%)	715 (54.8%)	
150-350	59 (27.8%)	58 (30.9%)	106 (36.6%)	429 (32.9%)	0.021
>350 (worse)	14 (6.6%)	17 (9.0%)	26 (9.0%)	160 (12.3%)	

	Drives with pet, in the front (N=212)	Drives with pet, not in the front (N=188)	Never drives with pet (N=290)	Non-pet owner (N=1305)	p-value
Trails B, minutes					
<2.47 (not impaired)	144 (68.3%)	133 (70.7%)	170 (58.6%)	794 (61.0%)	
2.47 (impaired)	67 (31.8%)	55 (29.3%)	120 (41.4%)	507 (39.0%)	
Motor-Free Visual Perception Test, # correct					
<8 (impaired)	23 (10.9%)	21 (11.2%)	43 (14.8%)	211 (16.2%)	
8 (not impaired)	189 (89.2%)	167 (88.8%)	247 (85.2%)	1094 (83.8%)	

Note: Values are n (%) unless otherwise noted. Chi-square tests and ANOVA used to calculate p-values for categorical and continuous variables, respectively. Abbreviations: dB, decibels; logMAR, log minimum angle resolvable; MMSE, mini-mental state examination; ms, milliseconds; SD, standard deviation.

Table 2

Crude and adjusted rate ratios and 95% CI for any and at-fault MVC involvement among study participants (N=1995)

	No. of drivers	Any MVC				p-value	At-fault MVC			
		No. of collision s	Crude RR	Adjusted RR ^I (95% CI)	No. of collision s		Crude RR	Adjusted RR ^I (95% CI)	p-value	
Ever Drive with Pet										
Ever	400	47	1.12	1.14 (0.75-1.72)	0.55	26	1.12	1.15 (0.65-2.05)	0.63	
Never (ref)	290	30	--	--		17	--	--		
Non-pet owners	1305	172	1.23	1.15 (0.80-1.65)	0.44	86	1.13	1.02 (0.62-1.67)	0.65	
Frequency of Driving with Pet										
Always/Sometimes	184	23	1.38	1.39 (0.86-2.24)	0.18	13	1.44	1.44 (0.75-2.77)	0.27	
Rarely	216	24	0.92	0.95 (0.58-1.58)	0.79	13	0.87	0.91 (0.45-1.84)	0.79	
Never (ref)	290	30	--	--		17	--	--		
Non-pet owners	1305	172	1.23	1.15 (0.80-1.65)	0.44	86	1.13	1.02 (0.62-1.67)	0.65	
Location of Pet in Vehicle										
Pets in the front	212	27	1.13	1.12 (0.73-1.73)	0.59	11	0.86	0.85 (0.46-1.60)	0.64	
Pets not the front ² (ref)	478	50	--	--		32	--	--		
Non-pet owners	1305	172	1.19	1.11 (0.83-1.48)	0.49	86	1.01	0.90 (0.60-1.33)	0.59	

Note: Poisson regression used to calculate estimates and p-value. Log miles used as an offset.

¹ Adjusted for age.

² Includes pet owners who drive with a pet but not in the front and pet owners who never drive with a pet.

Table 3

(Supplementary). Crude and adjusted rate ratios and 95% CI for any and at-fault MVC involvement among pet owners (N=690)

	No. of drivers	Any MVC				p-value	At-fault MVC			
		No. of collisions	Crude RR	Adjusted RR ^I (95% CI)	No. of collisions		Crude RR	Adjusted RR ^I (95% CI)	p-value	
Ever Drive with Pet										
Ever	400	47	1.12	1.15 (0.76-1.75)	0.51	26	1.12	1.15 (0.65-2.05)	0.63	
Never (ref)	290	30	--	--		17	--	--		
Frequency of Driving with Pet										
Always/Sometimes	184	23	1.38	1.39 (0.86-2.24)	0.18	13	1.44	1.44 (0.75-2.77)	0.27	
Rarely	216	24	0.92	0.95 (0.58-1.58)	0.85	13	0.87	0.91 (0.45-1.84)	0.79	
Never (ref)	290	30	--	--		17	--	--		
Location of Pet in Vehicle										
Pets in the front	212	27	1.13	1.12 (0.73-1.71)	0.61	11	0.86	0.85 (0.46-1.58)	0.60	
Pets not the front ² (ref)	478	50	--	--		32	--	--		

Note: Poisson regression used to calculate estimates and p-value. Log miles used as an offset. Among those who reported owning a pet.

¹ Adjusted for age.

² Includes pet owners who drive with a pet but not in the front and pet owners who never drive with a pet.