The Alabama VIP Driver Study: Studying Older Drivers Using Naturalistic Driving Techniques

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Background:
The objective of the UAB VIP Study is to identify how visual impairment impacts the safety and performance of older drivers. Previous research on vision and older driver safety and performance has focused on the study of police accident reports, brief on-road driving evaluations, or driving simulator studies. These techniques have serious scientific limitations, many of which are overcome by naturalistic driving methods.

Specific Aims of VIP:

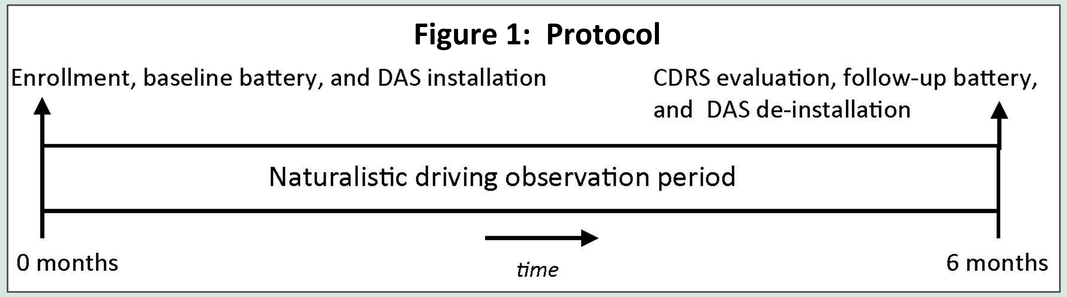
Aim 1: To examine relationships between vision and naturalistic driving in older drivers. Analyses focus on relationship between vision and safety critical events, lane-keeping, turning at intersections, driving performance under secondary task demands, and when a "co-pilot" is present.

Aim 2: To examine these relationships in light of potential effect modifiers, specifically, other driver characteristics, environmental factors, vehicle factors.

Aim 3: To examine relationships between driving performance as measured by naturalistic driving methods and the assessment provided by a certified driving rehabilitation specialist (CDRS), the clinical gold standard.

Instrumentation to Measure vehicle kinematics and driver behavior:
The VIP makes use of Data Acquisition Systems (DAS) as used in the SHRP2 study, as previously described. Five-channel video is recorded of the front view, driver's face, over the driver's shoulder, passenger, and rear view plus accelerometers, GPS, forward radar, and vehicle network.

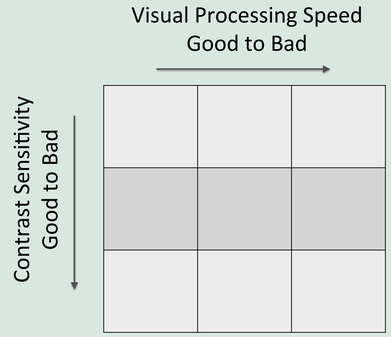
Figure 1: Protocol



Inclusion Criteria:
- Age ≥ 70 years old
- Provides proof of AL license
- Drives at least 4 days/week by self report
- Speaks English
- Owns a motor vehicle

Exclusion Criteria:
- Planned period preventing driving for more than 2 consecutive weeks
- Vehicle incompatible with DAS installation

Stratified sample based on contrast sensitivity and visual processing speed. Target N = 195.



Characteristic	Mean	Worst	Best
Visual acuity	20/25	20/250	20/15
Contrast sensitivity	1.68	1.05	2.00
Trails B, minutes	2.9	7.2	1.0
UFOV subtest 2, msec	262	500	23
MVPT, # correct of 11	9.5	6	11
MMSE, out of 30	27.6	22	30
Motion detection, minimum displacement threshold	0.21	0.53	0.04
Timed Up and Go, seconds[1]	11.7	21.6	7.4
Annual miles driven, self report	10,278	1,000	50,000
	n	%	
Gender			
Men	39	54.9	
Women	32	45.1	
Race			
African American	13	18.3	
White	58	81.7	

[1] 9 participants could not perform the task

Progress to Date:
Enrollment began late January 2015. As of August 1, 2016, there are 71 drivers who have completed the enrollment visit and DAS installation. We have completed 53 de-installations meaning the drivers completed the naturalistic driving observation period. 53 participants have completed the CDRS on-road evaluation. Participant age range is 70 – 95 years old (mean 80).

Other Domains Measured
Depression
Physical function
General health and medical use
Driving habits
Motor vehicle collisions from records
CDRS driving evaluation based on 45 minutes of driving

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