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Short communication

Self-rated driving and driving safety in older adults

Lesley A. Ross[a,*], Joan E. Dodson[a], Jerri D. Edwards[b], Michelle L. Ackerman[a], Karlene Ball[a]

[a] Department of Psychology, Edward R. Roybal Center for Research on Applied Gerontology, University of Alabama at Birmingham, CH 415, 1530 3rd Avenue South, Birmingham, AL 35294-1170, USA
[b] School of Aging Studies, University of South Florida, 13301 Bruce B. Downs Blvd., MHC 1326, Tampa, FL 33612, USA

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ABSTRACT

Many U.S. states rely on older adults to self-regulate their driving and determine when driving is no longer a safe option. However, the relationship of older adults' self-rated driving in terms of actual driving competency outcomes is unclear. The current study investigates self-rated driving in terms of (1) systematic differences between older adults with high (good/excellent) versus low (poor/fair/average) self-ratings, and (2) the predictive nature of self-rated driving to adverse driving outcomes in older adults ($n = 350$; mean age 73.9, SD = 5.25, range 65–91). Adverse driving outcomes included self-reported incidences of (1) being pulled over by the police, (2) receiving a citation, (3) receiving a recommendation to cease or limit driving, (4) crashes, and (5) state-reported crashes. Results found that older drivers with low self-ratings reported more medical conditions, less driving frequency, and had been given more suggestions to stop/limit their driving; there were no other significant differences between low and high self-raters. Logistic regression revealed older drivers were more likely to have a state-reported crash and receive a suggestion to stop or limit driving. Men were more likely to report all adverse driving outcomes except for receiving a suggestion to stop or limit driving. Regarding self-rated driving, older adults with high ratings were 66% less likely (OR = 0.34, 95% CI = 0.14–0.85) to have received suggestions to limit or stop driving after accounting for demographics, health and driving frequency. Self-ratings were not predictive of other driving outcomes (being pulled over by the police, receiving a citation, self-reported crashes, or state-reported crashes, $ps > 0.05$). Most older drivers (85.14%) rated themselves as either good or excellent drivers regardless of their actual previous citation or crash rates. Self-rated driving is likely not related to actual driving proficiency as indicated by previous crash involvement in older adults. Suggestions from other individuals to limit or cease driving may be more influential on self-ratings.

1. Introduction

Research on older drivers has shown that most consider the ability to maintain driving as key to personal mobility (Marottoli et al., 1997a,b). However, for some older adults, cognitive or physical impairments may begin to impact their ability to drive safely, especially as they approach their late 70s and early 80s, when crash rates begin to rise (Waller, 1991; Anstey et al., 2005; Ball et al., 2006). According to the Insurance Institute for Highway Safety (2010), only Illinois mandates older driver testing (road test for those drivers over the age of 75). Other states prohibit older drivers from renewing their licenses by mail (Alaska, California, Indiana, Louisiana, Massachusetts and Texas), or require older drivers to renew their licenses more frequently than other drivers, with renewal rates that vary from 2 to 8 years (Insurance Institute for Highway Safety, 2010). As such, it is commonly the responsibility of the older drivers or their physicians to judge their own driving competency.

There is increasing evidence that older adults have a tendency to overrate their driving abilities and driving safety (Goszczynska and Roslan, 1989). Marottoli and Richardson (1998) reported that objective evidence of driving ability did not impact a driver's confidence or self-rating of abilities. In fact, neither confidence nor self-rated ability was associated with past involvement in adverse driving situations. This was confirmed by Freund et al. (2005) who found that compared to drivers who believed they were the same or worse than other drivers their age, drivers who considered themselves better were actually four times more likely to be unsafe drivers as measured in a driving simulator. Gianutsos (1994) reported that older drivers did not perform as well as younger drivers on a driving simulator, yet gave themselves slightly higher ratings. Ackerman et al. (2011) found that older drivers' self-rated driving did not change over a three month period even after failing the Useful Field of View® Test (UFOV, a commonly used test for driving competency). Other research has found mixed results with

* Corresponding author. Tel.: +1 205 975 9424; fax: +1 205 975 6110.
E-mail addresses: lesleyaross@gmail.com, lesleyross@uab.edu (L.A. Ross), joan3d@uab.edu (J.E. Dodson), jedwards1@usf.edu (J.D. Edwards), mlynnack@uab.edu (M.L. Ackerman), kball@uab.edu (K. Ball).

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weak to no correlations between self-rated driving and on-road driving assessments in older adults without cognitive impairment (ages 65–85, $n = 85$) (Selander et al., 2011).

In contrast, other studies suggest that older adults' self-rating of driving may be more realistic as indicated by self-restrictions of driving. Lyman et al. (2001) reported that among drivers aged 65 or older ($n = 901$), participants who reported difficulty in three or more driving situations or drove less than 3 days per week were less likely to report the quality of their driving as excellent compared to participants who did not report any difficulty driving. The study concluded that an association existed between self-rated driving and self-regulation of actual driving. Baldock et al. (2006) reported moderate to large relationships between lower reported confidence (self-rated driving) and greater avoidance in difficult driving situations among drivers aged 60–90. Parker et al. (2001) reported an association between poor confidence in a range of driving situations and low self-rated driving ability. Self-rated driving has also been found to be predictive of restrictions in driving behavior among cognitively unimpaired older adults, and to a lesser degree for those with cognitive impairments (Dobbs, 1999).

Self-rated driving ability is frequently assessed by asking participants to compare their own driving to the average driver. For example, asking drivers to rate themselves compared to the average driver, or rating their driving on a scale where one option is 'average'. It has been noted that older drivers' self-ratings on this type of assessment may be more reflective of perceived self-efficacy rather than actual functional abilities (Ackerman et al., 2010).

The goal of this study was to investigate the association of older adults' self-rated driving with driving competency as indicated by: (1) being pulled over by the police, (2) receiving a citation, (3) receiving a suggestion to limit or stop driving, (4) self-reported crashes, and (5) state-reported crashes over the previous five years. The first aim of this study was to determine whether or not any systematic differences exist between older drivers who rate their driving as good/excellent versus older drivers who rate their driving as average/fair/poor. The second aim of this study was to investigate adverse driving outcomes as a function of self-ratings of driving ability.

2. Methods

2.1. Participants and procedure

The Maryland Motor Vehicle Administration project is an ongoing population-based prospective cohort study designed to investigate general mobility and driving competency/crashes among older adults (Ball et al., 2006; Ross et al., 2009). Between 1998 and 2000, 4203 older adults aged 55 and older were approached after renewing their driver's licenses at three Maryland Motor Vehicle Administration (MVA) locations or a retirement facility to participate in assessing a new test battery consisting of cognitive, physical and mobility assessments designed to predict crash risk. Of these, 49.5% ($n = 2121$) agreed to participate and signed the IRB-approved informed consent. In accordance with Maryland regulations, all drivers must have successfully passed a visual screening equitable to a corrected far visual acuity of 20/70 and a continuous field of vision of at least 140°. No other eligibility criteria were part of this study and the sample was representative of the Maryland older driver population. Study participation had no impact on driving privileges (please see Ball et al., 2006 for further details). Relevant to the current study, a random subsample of participants were also invited to take part in annual follow-up telephone interviews regarding their driving habits ($n = 787$). For the purposes of this project, only participants who reported driving at baseline, were aged 65 or older, and who completed five years of phone interviews were included in analyses ($n = 350$). Participants included 53.1% females and 94.6% Caucasians with a mean education of 14.09 years (SD = 3.07, range 5–20) and a mean age of 73.90 at baseline (SD = 5.25, range = 65–91). The first telephone interviews occurred an average of four months (SD = 1.5) after the MVA visit, and are included as part of the baseline data. Participants were then re-interviewed annually, thus providing driving outcome data for a total of five years. For more details on the study design and methods, see Ball et al. (2006) and Ross et al. (2009).

2.2. Measures

2.2.1. Self-rated driving at year five

Participants were asked to "rate the quality of your driving" on a scale of 1 ("poor"), 2 ("fair"), 3 ("average"), 4 ("good") or 5 ("excellent") during each annual interview. This variable at annual five was investigated as a grouping variable of poor/fair/average ($n = 52$) and good/excellent ($n = 298$).

2.2.2. Driving outcomes

At each annual telephone interview participants were asked about four driving outcomes for the previous year. These outcomes were: (1) the number of times they were *pulled over by the police* (regardless of whether or not they received a citation), (2) the number of *citations* (other than parking citations) received, (3) if anyone had *suggested that they should limit or stop driving*, and (4) the number of *self-reported crashes*, regardless of fault. Additionally, (5) *state-reported crashes* were also collected for each year. A dichotomous variable of no (0) or yes (1) was created for each of the five driving outcomes to indicate if the participant reported that one of the incidences occurred over the previous five year period. This resulted in 4 self-reported and 1 state-reported negative driving outcomes that indicated the presence or absence of the event across a five year period.

2.2.3. Driving frequency

Participants reported the number of days typically driven during a normal week. This item was included as a measure of driving frequency at year 5.

2.2.4. Demographic and health measures

Gender data was collected, and *age* was coded in years. *Total number of medical conditions:* participants were queried annually over a five-year period as to whether they had been diagnosed and/or treated by a physician over the prior year for a variety of medical conditions. Responses for Parkinson's disease, stroke, epilepsy, heart disease, depression, diabetes, cancer, Alzheimer's disease, or high blood pressure conditions were combined and summed across the previous five years (range 0–9). *Total number of eye conditions:* the same procedure above was repeated for visual diseases including glaucoma, cataracts, diabetic retinopathy, macular degeneration, optic neuritis, and retinal detachment (range 0–6).

3. Analyses

Older adults who reported driving at baseline and had complete data across the five years were included ($n = 350$). Descriptive analyses were conducted comparing older drivers with low and high self-rated driving. Chi-square (for categorical) and multivariate analysis of variance (MANOVA; for continuous) were conducted to investigate systematic differences between those with high and low self-rated driving. Five logistic regressions were conducted to assess predictors of negative driving outcomes (being pulled over, receiving a citation, receiving a suggestion to stop or limit driving, or self- or state-reported crashes), as well as whether self-rated