NAME: **Mackenzie Richards**

PARENTS' NAMES: **Matt and Sara Richards**

HOMETOWN: **Granger, Indiana**

CAREER OBJECTIVE: **I would like to work in supply chain or consulting after graduation.**

BIOGRAPHY: **I am a senior in Industrial Engineering. I have wanted to be an industrial engineer ever since I learned about what it was on my first college visit to Purdue as a junior in high school. I was on the robotics team at my high school, but I was never into the mechanical side of building the robot and instead focused on team organization, outreach programs, and doing presentations. That visit made me realize that engineering could be more than building robots. I discovered what I wanted to study and that I could be an engineer someday. It is hard work, but I love being a Purdue engineering student. Outside of class, I am a swimmer and have been swimming competitively for fifteen years. Being on the swim team in high school and having to practice both before and after each school day, as well as participating on the robotics team, taught me time management skills that I still use today. While I don't train as much as I did in high school, being in the college swim club has allowed me to keep racing and given me something to take my mind off of classes for a few hours a week. At home, I enjoy camping trips with my family. I have two younger sisters, and we like relaxing outside and walking our dog. I like spending time with my family and would not be where I am today without all their love and support.**

FACULTY LSAMP SPONSOR: **Dr. Brandon J. Pitts, Professor of Industrial Engineering, NHanCE Lab**

LSAMP GRADUATE STUDENT NAME: **Gaojian Huang**

GOAL OF THE WORK: **This research was a pilot study into research that has already been done on the correlation of older drivers actual and perceived driving ability.**

PERSONAL STATEMENT ABOUT THE LESSONS LEARNED FROM THIS EXPERIENCE: **This experience taught me about the research process, especially what to do when a project is being considered and how to do a literature review. As someone who had never done detailed research before, being in a lab in the beginning phases of a project was very fitting and allowed me to see exactly how much thought goes into each publication. I learned the importance of combing through published papers, articles, and conference proceedings to find gaps in the research that exists, in order to fill them later with new methods and ask questions no one has previously thought-of. I learned about presenting these findings to an audience that has no prior knowledge of the topic and how to put together a comprehensive poster and presentation. I now can more efficiently extract important and relevant data from academic papers and synthesize their findings in order to come to a new conclusion.**

Perception versus Reality: How Do Older Drivers Self-perceive Their Own Driving Abilities?

By Mackenzie Richards

Abstract

As the general population ages worldwide, the percentage of drivers aged 65 years and older continues to increase. By the year 2030, one quarter of drivers are projected to be represented in this age category. As a result, it is imperative to continue research efforts involving older adults. At the same time, leading car manufacturers are developing semi- and fully- autonomous vehicles at a rapid rate, which are expected to be available to the public in the next few years. Several research gaps exist regarding older adults' feelings towards this new technology. However, without a thorough understanding of how older adults self-perceive their own driving abilities, it will be challenging to develop vehicles that successfully support aging populations. Therefore, the goal of this project was to review and synthesize the existing literature regarding older drivers and their self-reported driving skills. In particular, this review sought to determine the correlation between self-perceived and actual driving abilities. In this project, the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) method was used to identify relevant articles. In total, the methods and results of 25 articles were thoroughly reviewed. Overall, a consistent trend was found such that older drivers who perceive themselves to drive "better" than they do in real-life are more likely to be involved in an accident. On the other hand, drivers who underestimate their driving abilities tend to be safer due to self-regulatory habits they employ, such as restricting nighttime driving. The implications of these findings support initiatives to help drivers become more aware of their actual driving performance as well as to develop calibration methods to improve overall road safety.

Keywords

age-related deterioration; driving ability; older populations; on-road safety; self-perception

Introduction

This paper summarizes the details of the author's experiences during a faculty-directed research program through a Louis Stokes Alliance for Minority Participation (LSAMP) project under the supervision of Dr. Brandon Pitts of Industrial Engineering in the Next-generation Human-systems and Cognitive Engineering (NHanCE) Lab to produce a literature review based meta-analysis of studies on older drivers' self-perceptions of their capabilities behind the wheel. With the continued aging of our population, the roads are becoming increasingly dominated by drivers aged 65 and over. As people age, their abilities to perform driving related tasks begin to deteriorate. Because of this, many older people "self-regulate" or limit their driving in order to avoid potentially dangerous situations. It is not uncommon for people 65 and older to limit their driving at night, in unfamiliar areas, or for long distances. The personal reasons behind self-regulation remain unclear, and there are also those who simply refuse to stop driving no matter how unsafe it may be for both them and others on the road around them. Finding what causes older drivers to self-regulate and the relationship between self-regulation and self-perceived driving abilities is the first step in helping drivers be more aware of their actual driving abilities. This pilot study aimed to be a first step in understanding the work done to date, and it focused on existing literature on the topic in order to synthesize these connections. Moving forward, the results and findings of this study could be used to help predict the factors that determine whether or not someone over the age of 65 will be inclined to switch to a fully automated vehicle.

There is no shortage of older drivers, and society needs to adapt to the aging population sharing the road. One way of doing this is by introducing autonomous or self-driving vehicles. This industry, much like the 65 and up demographic, is continuing to grow. There are currently eleven major automobile manufacturers, ten of which have autonomous vehicles at some level of production. This is technology that is on the precipice of commercial use. Gaining insight into its potential user base and any barriers that may prevent adoption of these vehicles in everyday use is critical in the marketing of these vehicles. In this review, the literature was systematically examined, and articles were reviewed which pertained to older drivers and their perceptions of their own driving abilities. First, a comprehensive examination of the various measures utilized by researchers in each study was conducted. Second, these measures were synthesized and evaluated for their similarities and differences. Third, this information was compiled into a summary table and an infographic to highlight important findings. A discussion is included to present remaining research gaps in the knowledge base and, areas for future research exploration are suggested. Finally, a few brief policy

recommendations are provided to promote road safety.

Methodology

Using the PRISMA method process (Moher, 2009) shown in Figure 1, thousands of articles were narrowed down to 25 about older drivers and how their perceived driving capability compares with their actual driving ability. A total of 10 databases were searched: SCOPUS, TRID, PsycINFO, AgeLine, Web of Science, Abstracts in Social Gerontology, Engineering Village (including both Inspec and Compendex), PubMed, and edline. The initial search resulted in a total of 15,364 papers, of which 1,032 were duplicates. Two reviewers screened the remaining 14,332 papers to ensure all requirements were met. This screening was based on the abstracts and did not include reading the full articles. Papers were excluded if the study did not include older adults, if the focus was on age and driving self-regulation rather than self-perception, or if it sought to investigate interventional strategies regarding driving abilities. This selection process yielded a total of 66 articles to undergo a full text review. This eliminated an additional 41 articles for not meeting the inclusion criteria, by not discussing the self-perceived driving abilities of older drivers thoroughly enough to qualify for this project. In
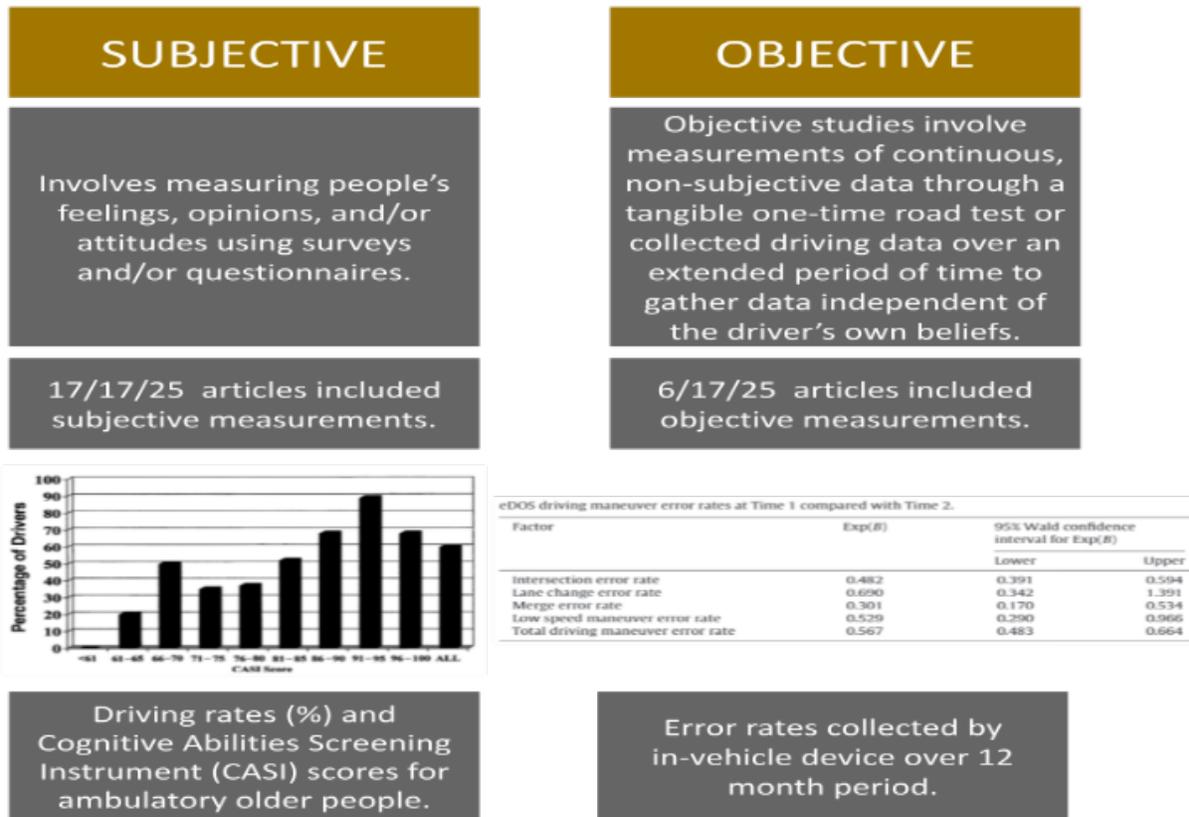

Figure 1 - Subjective vs Objective Review Characteristics.

total, 25 papers were included in the final review.

The approaches for assessing the self-perception of driving abilities in older drivers vary across the studies, but there were some commonalities. It is important to note that the self-perception of driving abilities can only be reported subjectively by a participant, and thus to collect this information, all studies at minimum utilized a questionnaire, an in-depth interview, and/or focus groups. Some studies developed their own questionnaires that often consisted of a series of questions, while others adapted previously used questionnaires. In either case, participants were asked to rate their perceived driving ability using an evaluative scale. For objective data

collection methods, driving performance using a real-world, or naturalistic, road condition was used as an assessment tool. This was conducted either by assigning an unbiased observer to objectively score the driving performance of an older driver or by installing devices into the on-board diagnostic port or onto the dashboard of the participant's vehicle to record natural driving patterns. Finally, driving simulations were also used as a means of collecting objective driving performance data. These driving-based objective measures were used in combination with the participant's subjective reports and expert evaluations. Figure 2 shows a breakdown of the screening process for the subjective and objective data measures used in the various studies reviewed for this meta-analysis.
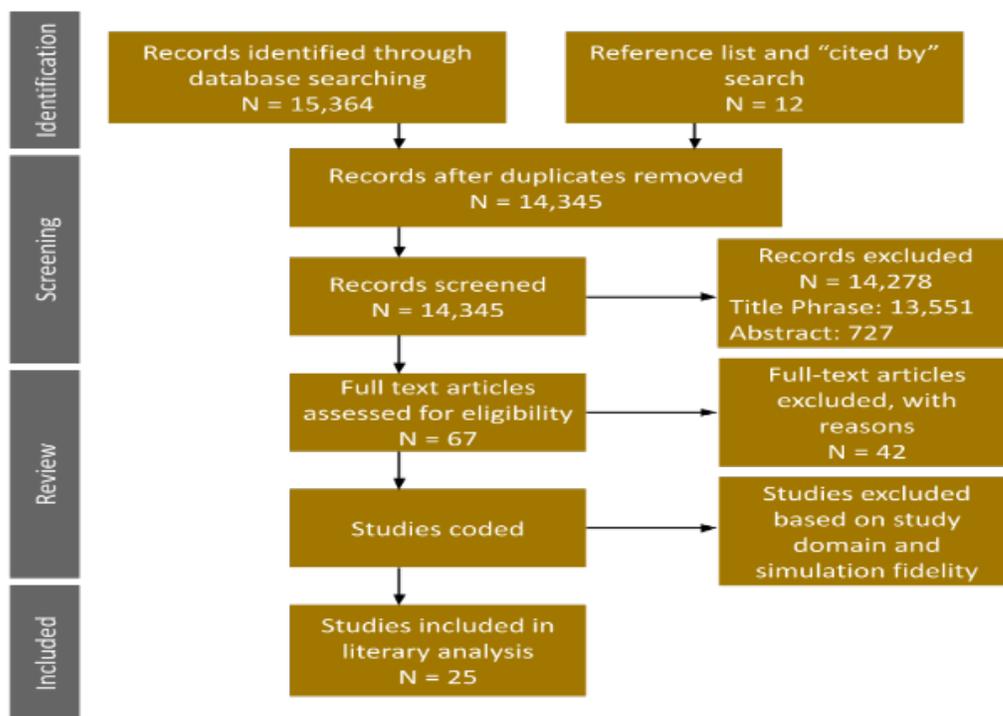

Figure 2 - Number of Articles and the study's screening results at each level of the process.

Results

Tables one through three present the summarized results from six of the articles reviewed under this analysis with key metrics aligned in columns. The main purpose of each study varied in that some were concerned with measuring self-perception, while others focused on the characteristics that influence self-perception. The tables provide a summary of the subjects and findings in the studies evaluated in our review.

Table 1 – Six article sample of study categorization data for self-perception of older drivers' abilities studies showing the participant data and questionnaire methodologies.

Article		PARTICIPANTS														
	Number	Age min	age max	age mean	men	women	current driver?	prior known disibilities?	how many people	which disibilities?	Road test?	prolonged data collection?	how	how many months?	recurring questionnaire?	clinical exam?
Schulz, P., Spannhorst, S., Iffland, B., & Toepper, M. (2017). Do self-reports provide valid information about driving fitness in seniors? International Journal of Geriatric Psychiatry, 32(2), 231–232. Retrieved from max.toepper@evkb.de	87							N	N	N						
	87						Y	Y		87 alzheimers						
Choi, S. Y., & Lee, J. S. (2017). Cognitive basis about risk level classifications for the self-assessment of older drivers. Journal of Physical Therapy Science, 29(3), 401–404. https://doi.org/10.1589/jpts.29.401	46	65			36	10	Y	N	N	N						
Koppel, S., Charlton, J. L., Richter, N., Di Stefano, M., Macdonald, W., Darzins, P., ... Marshall, S. (2017). Are older drivers' on-road driving error rates related to functional performance and/or self-reported driving experiences? Accident Analysis and Prevention, 103, 1–9. Retrieved from sjaanie.Koppel@muarc.monash.edu.au	227	76	89	80.67	66.70%	33.30%	Y	N	N	N	N	Y	researcher would sit in the car with them on a familiar route aprox 20-15 minutes long	12 months apart	Y - two times, 12 months apart	N
Agramunt, S., Meuleners, L., Chow, K. C., Ng, J. Q., & Morlet, N. (2017). A validation study comparing self-reported travel diaries and objective data obtained from in-vehicle monitoring devices in older drivers with bilateral cataract. Accident Analysis and Prevention, 106, 492–497. https://doi.org/10.1016/j.aap.2016.10.021	47	58	89	74.1	27	20	Y		bilateral 47 cataracts		N	Y	"in- vheicle monitoring device"	1 week	Y - travel diary	Y - cognative test
Craig. C. M., & Levulis, S. J. (2017). The relationship between global and information processing factors and self-perceived risky driving among older adults. In Proceedings of the Human Factors and Ergonomics Society (Vol. 2017–Octob, pp. 1447–1451). https://doi.org/10.1177/1541931213601847	1222	38	94	64	542	680	Y	N	N	N	N	N	N	N	N	Y - cognative abilities
Pavlou, D., Papantoniou, P., Papadimitriou, E., Vardaki, S., Economou, A., Yannis, G., & Papageorgiou, S. G. (2017). Self-assessment of older drivers with brain pathologies:				63.1	65%	35%	Y	N	44	N						N - previous medical data

Table 2 - Six article sample of study categorization data for self-perception of older drivers' abilities studies showing questionnaire variables and results.

Article	QUESTIONNAIRE/ MEASUREMENT METHODS				RESULTS		
	questionnaire type	Other information	Content/Variables to be measured	Tasks for Participants	Results MOVE/ MAKE MORE COLUMNS ->	Do people self restrict?	Do people under-estimate driving ability?
Schulz, P., Spannhorst, S., Iffland, B., & Toepper, M. (2017). Do self-reports provide valid information about driving fitness in seniors? International Journal of Geriatric Psychiatry, 32(2), 231–232. Retrieved from max.toepper@evkb.de							
Choi, S. Y., & Lee, J. S. (2017). Cognitive basis about risk level classifications for the self-assessment of older drivers. Journal of Physical Therapy Science, 29(3), 401–404. https://doi.org/10.1589/jpts.29.401							
Koppel, S., Charlton, J. L., Richter, N., Di Stefano, M., Macdonald, W., Darzins, P., ... Marshall, S. (2017). Are older drivers' on-road driving error rates related to functional performance and/or self-reported driving experiences? Accident Analysis and Prevention, 103, 1–9. Retrieved from sjaanie.Koppel@muarc.monash.edu.au			test whether: 1. self selected driving routes change over time 2. driving behavior changed over time, 3. on road total driving maneuver error rates are related to functional performance and/or self reported driving experiences			Y	N
Agramunt, S., Meuleners, L., Chow, K. C., Ng, J. Q., & Morlet, N. (2017). A validation study comparing self-reported travel diaries and objective data obtained from in-vehicle monitoring devices in older drivers with bilateral cataract. Accident Analysis and Prevention, 106, 492–497. https://doi.org/10.1016/j.aap.2016.10.021	background, experiences/ confidence, MMSE			undergo 3 visual tests, a cognative test, a researcher administered questionnaire, keep a travel diary for 1 week and have their vheicle monitored.	people grosly overestimated the amount of time they spent driving in the logbook when compared to the data collection device log		
Craig. C. M., & Levulis, S. J. (2017). The relationship between global and information processing factors and self-perceived risky driving among older adults. In Proceedings of the Human Factors and Ergonomics Society (Vol. 2017–Octob, pp. 1447–1451). https://doi.org/10.1177/1541931213601847	Big Five Inventory, scenarios		outcome variable, general risk taking, personality factors, information processing	participate in a phone interview and then some went on to complete 3 hour face to face interview with cognative tests and questionnaires			N
Pavlou, D., Papantoniou, P., Papadimitriou, E., Vardaki, S., Economou, A., Yannis, G., & Papageorgiou, S. G. (2017). Self-assessment of older drivers with brain pathologies:						N	N

Table 3 - Six article sample of study categorization data for self-perception of older drivers' abilities studies showing results and miscellaneous publication information.

Article	RESULTS					MISCELLANEOUS			Other
	Do people self restrict?	Do people under-estimate driving ability?	Do people over-estimate driving ability?	Does estimate accuracy equate to safer driving?	Effect on safety	Factors Impact Self-Report results	Year	Summary	
Schulz, P., Spannhorst, S., Iffland, B., & Toepper, M. (2017). Do self-reports provide valid information about driving fitness in seniors? International Journal of Geriatric Psychiatry, 32(2), 231-232. Retrieved from max.toepper@evkb.de							2017		Only 2 pages a little informat
Choi, S. Y., & Lee, I. S. (2017). Cognitive bias about risk level classifications for the self-assessment of older drivers. Journal of Physical Therapy Science, 29(3), 401-404. https://doi.org/10.1589/jpts.29.401							2016		
Koppel, S., Charlton, J. L., Richter, N., Di Stefano, M., Macdonald, W., Darzins, P., ... Marshall, S. (2017). Are older drivers' on-road driving error rates related to functional performance and/or self-reported driving experiences? Accident Analysis and Prevention, 103, 1-9. Retrieved from sjaanie.koppel@muarc.monash.edu.au	Y	N	N	N	None		2016		
Agramunt, S., Meuleners, L., Chow, K. C., Ng, J. Q., & Morlet, N. (2017). A validation study comparing self-reported travel diaries and objective data obtained from in-vehicle monitoring devices in older drivers with bilateral cataract. Accident Analysis and Prevention, 108, 492-497. https://doi.org/10.1016/j.aap.2016.10.021							2016		
Craig, C. M., & Levulis, S. J. (2017). The relationship between global and information processing factors and self-perceived risky driving among older adults. In Proceedings of the Human Factors and Ergonomics Society (Vol. 2017-Octob, pp. 1447-1451). https://doi.org/10.1177/1541931213601847		N	Y	Y	Neutral	lying and self-unawareness	2017	Men and those who scored higher on agreeableness reported less risky driving	
Pavlou, D., Papantoniou, P., Papadimitriou, E., Vardaki, S., Economou, A., Yannis, G., & Papageorgiou, S. G. (2017). Self-assessment of older drivers with brain pathologies	N	N	Y	Y	Negative				

Table 4 – Seven article sample of study categorization data for self-perception of older drivers' abilities studies showing the characterization of test subjects.

PARTICIPANTS									
Number	Age min	age max	age mean	men	women	current driver?	prior known disibilities?	how many people	which disibilities?
87							N	N	N
87						Y	Y	87	alzheimers
46	65			36	10	Y	N	N	N
227	76	89	80.67	66.70%	33.30%	Y	N	N	N
47	58	89	74.1	27	20	Y	Y	47	bilateral cateracts
1222	38	94	64	542	680	Y	N	N	N
			63.1	65%	35%	Y	N	44	N
137			68.7	60%	40%	Y	Y	93	s, alzhemiers, mild cognative

These table includes information regarding participants, such as age, number of volunteers, and participant grouping criteria, where applicable. The tables also include measurements of self-perception based on surveys and questionnaires, or objective measures, such as driving performance, along with the main findings from the study related to self-perception.

Overall, the majority of studies report that older adults self-perceive their driving abilities to be better or higher than when they were younger. Additionally, they believed that they are better than their cohorts and all other drivers. They also tend to perceive themselves to be better or higher in capability than their objective driving ability evaluation would indicate. Specifically, for the comparison of older adults at a younger age, as measured by subjective ratings, most older adults reported that their driving ability either remained the same or became better

compared to themselves at their younger age. For example, Ackerman et al. (2010) measured the self-perception of driving abilities twice within a 3-year timeframe and found that 64% of older adults did not change their self-assessments when measured using a questionnaire using a generalized 5-point scale of self-perception. Similarly, another study (McPeek et al., 2011) used item-based scales, such as the Safe Driving Behavior Measure (SDBM), to assess older drivers' current self-rated driving ability scores compared to twenty years ago, and they

found that 68% of respondents either maintained the same impression of their driving or believed that their driving skills had improved. Finally, a third study (Blanchard and Myers, 2010) achieved concurrent results using a Perceived Driving Ability (PDA) self-perception measure. They concluded that older adults' perception of their abilities did not change significantly over a ten-year period.

For objective driving assessments, a discrepancy was observed between how older adults subjectively perceived their driving abilities and their actual real-life objective driving abilities in eight out of the nine articles that utilized objective comparisons. For instance, Marottoli and Richardson (1998) compared older adults' self-perceived driving ability score with an objective driving performance assessed by an experienced driving therapist and found no correlation. In other words, older drivers who were rated as having difficulties on the road by occupational therapists, self-rated their driving abilities either as good as, or better than, their cohorts. A second paper on this subject by Wood et al. (2013) reported that older adults did not have lower self-perception scores, even though the same group of drivers made more critical driving-related errors, when judged by an occupational therapist. Similar conclusions were found in other studies across the papers. This discrepancy between perceived versus actual driving abilities also exists for older drivers' self-rated driving performance, prior to a driving test and

in actual driving performance evaluated using a driving simulator. Only a study by Koppel et al. (2016) found that lower actual driving scores, measured by on-road evaluations, were correlated with lower self-perceived driving abilities, as measured by PDA, meaning that these drivers had a more accurate assessment of their driving skills. However, the authors did not elaborate or explain further, nor did they explore possible causations.

Discussion

This review article synthesizes the current published knowledge regarding the self-perception of driving abilities in older age as determined by a PRISMA methodology. Relevant information reported from 25 studies included attitudes concerning how older drivers perceive their own driving, the techniques used to measure self-perception of driving abilities, and the factors that influence self-perception of driving abilities. Overall, the studies converge around the notion that older adults tend to think very positively of, and in some cases, overestimate, their driving abilities and skills.

One of the main findings of this review was that the majority of older drivers, regardless of their health status, rate their driving abilities highly. In other words, when asked their opinions of their own driving abilities, the predominate response was positive. This was generally the case regardless of whether a non-self-assessed objective measure of driving

performance as determined by an expert evaluator during an on-road test or by their performance a simulated driving task had confirmed their sentiments or not. Several possible explanations may help to understand this phenomenon. First, self-ratings of driving ability may not be actually measuring older adults' true beliefs about their driving abilities as a result of self-presentation bias. Possibly, given the sometimes-negative public stereotypes associated with aging, older drivers may be trying to avoid being associated with populations known to have poor driving abilities. In this case, even though they may perceive some form of minor declines in perceptual, cognitive, and/or physical abilities that ultimately result in declines in various driving abilities, their responses to such questions on questionnaires or surveys may not reflect this reality that they would prefer to ignore. This bias, combined with avoidance behavior, can likely lead to an overestimation of driving abilities. Some older drivers also fear the threats of limited or complete removal of driving privileges, and as a result, may attempt to present their driving in a more positive light.

Alternatively, the presence of age-related cognitive challenges may also explain the dominating positive response given by older drivers regarding their driving ability. Metacognition is the awareness of one's own behaviors and thoughts. A decline in metacognition in older drivers may be another explanation for the high positive self-perceived driving abilities results is. Declines in the

ability to engage in metacognitive reflection can result in false estimations of driving skills. Similarly, decrements in cognition domains, particularly memory, can lead to misrepresentation of driving abilities in older adults that may not remember their everyday driving errors. Gender differences were also found in how older drivers thought of their driving skills. In particular, four out of five studies that used gender as a moderator observed that men had higher self-ratings than women. One possible interpretation of this finding, provided by previous studies, is that women drive less than men, which may in general, be correlated with women being less confident in their own driving abilities.

It is also important to highlight that the few studies explored the effects of health-related limitations, such as vision impairments, on self-perception of driving abilities. A few exceptions to the high self-rating trend were identified across the studies. In general, drivers with known impairing conditions do tend to rate themselves as having poorer driving abilities when asked only about themselves. This may be explained by a heightened awareness of their condition as a result of the constant reminder of their own health limitations. However, these same participants also rate themselves more positively when asked to compare their skills to other drivers, which could be related to them not being knowledgeable about the abilities of their peers.

The findings from this review may ultimately help to inform policy recommendations that keep all drivers safer on the roadway. For example, if overestimation of driving skills is found to persist, then the development and promotion of interventional programs may be warranted. These programs can make older adults more aware of problems and appreciative of their actual driving abilities. They could help recalibrate older drivers' perceptions to become more aligned with reality. According to the National Highway Traffic Safety Administration, many states have existing laws and provisions that provide specific licensing requirements for older drivers. However, for policy makers, requiring senior participants who show signs of discrepancies between perceived and actual driving abilities to attend structured courses or engage in training using either simulators or real-world driving, might be considered as part of relicensing in older age. Here, instead of relying on the standard driving examination, a variety of different driving scenarios including varying weather conditions, road types, intersection types, or traffic situations could be introduced to determine actual driving skills under those conditions. Similarly, regular driving tests, potentially in concert with the timing of primary care appointments, could be administered to track any progression of age-related declines. Finally, policy makers should also support legislation that would require all automobiles, produced after a certain year, to be

equipped with minimum assisted-driving and safety features and technologies that significantly benefit older drivers.

Recommendations and Conclusions

In conclusion, understanding how older adults perceive their driving ability is an important first step toward developing strategies to help them examine and properly calibrate their driving behavior. Overall, it was found that older drivers mostly have a positive view of their driving skills, whether confirmed by an objective observation in a study or not. While this review provides valuable knowledge regarding the self-perception of older adult drivers, future work should investigate improved subjective and additional objective assessment tools, as well as other factors, including personal comfort with driving that might also help to explain how aging populations determine their own driving skills. In addition, better consistency regarding how researchers utilize synonyms for self-perception, like self-rate, self-assess, and self-awareness, as well as the particular methods used for measuring driving abilities would promote an overall higher quality of research. Ultimately, this will ensure that cohesive findings are available for safety experts and human factors professionals and researchers who develop practical solutions for maintaining the safety of older drivers.

References

M.L. Ackerman, D.E. Vance, V.G. Wadley, K.K. Ball (2010). "Indicators of self-rated driving across 3 years among a community-based sample of older adults" *Transportation Research Part F: Traffic Psychology and Behaviour*, 13, pp. 307-314, doi: 10.1016/j.trf.2010.06.003.

R.A. Blanchard, A.M. Myers, (2020). "Examination of driving comfort and self-regulatory practices in older adults using in-vehicle devices to assess natural driving patterns", *Accident Analysis and Prevention*, 42, pp. 1213-1219, doi: 10.1016/j.aap.2010.01.013.

S. Koppel, J.L. Charlton, J. Langford, M. DiStefano, W. MacDonald, Z. Vlahodimitrakou, Barbara L. Mazer, Isabelle Gelinas, Brenda Vrkljan, Kinga Eliasz, Anita Myers, Holly A. Tuokko, Shawn C. Marshall, (2016). "Driving task: How older drivers' on-road driving performance relates to abilities, perceptions, and restrictions", *Canadian Journal on Aging*, 35, pp. 15-31, doi: 10.1017/S0714980816000015.

R.A Marottoli, E.D. Richardson, (1998). "Confidence in, and self-rating of, driving ability among older drivers", *Accident Analysis and Prevention*, 30, pp. 331-336, doi: 10.1016/S0001-4575(97) 00100-0.

R. McPeek, A.L. Nichols, S. Classen, J. Breiner, (2011). "Bias in older adults' driving self-*assessments: The role of personality", Transportation Research Part F: Traffic Psychology and Behaviour*, 14, pp. 579-590, doi: 10.1016/ j.trf.2011.06.001.

D. Moher, A. Liberati, J. Tetzlaff, D.G. Altman, D. Altman, G. Antes, (2009), "Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement", *Annals of Internal Medicine*, doi: 10.7326/0003-4819-151-4-200908180-00135.

J.M. Wood, P.F. Lacherez, K.J. Anstey, (2013). "Not all older adults have insight into their driving abilities: Evidence from an on-road assessment and implications for policy", *Journals of Gerontology Series A Biological Sciences and Medical Sciences*, 68, pp. 559-566, doi: 10.1093/gerona/gls150.