Reviewer's report

Title: Association of Photopic and Mesopic Contrast Sensitivity in Older Drivers with Risk of Motor Vehicle Collision Using Naturalistic Driving Data

Version: 0 Date: 27 Sep 2019

Reviewer: Mei Boon

Reviewer's report:

Thank you for this interesting paper

Specific comments are below: "Crashes were defined as events where the SHRP2 participant's vehicle made contact with any object (vehicles, pedestrians, cyclists, animals, tree, buildings), at any speed, including non-premeditated departures from the roadway where at least one tire left the paved or intended travel surface of the road." - how were roadside kerbs treated?

Re: missing contrast sensitivity function data - was this because the stimuli were below the ability of the patients to see? Or lack of time or availability of equipment to do testing. If the former reason, it is interesting to know that results could have been even worse. How was data treated if vision was too poor to attempt the task? If the latter, was this an issue?

Was there a relationship between mesopic contrast sensitivity functions and ambient light levels or time of day when incident occurred? Although stratification may not be possible, a graphical, hence descriptive, representation of time of day (and season as that affects light levels) would be useful from a symbolic data science viewpoint. Also, was there any evidence of modification of driving behaviours for the group with poorer mesopic contrast sensitivity functions or poorer photopic contrast sensitivity functions, that could have affected results? The authors suggest those who had poor photopic contrast sensitivity functions may have modified driving behaviour. Although it cannot be compared to previous behaviours, it would be useful to ascertain percentage of night vs day time driving. Similarly, for those with poor mesopic contrast sensitivity functions. Re the latter, by way of analogy people with poor peripheral visual fields are less aware of their loss than people with poor central visual fields. In the same way, people with mesopic loss may think it is the usual reduction in vision associated with lower light levels, rather than anything untoward. Would be useful if such an analysis could be conducted with existing data to test that hypothesised reason.

A figure depicting the CSF and curve fitting process for at least one participant would be useful for the reader.

The authors should comment on which parameters were considered for inclusion in the regression model, and why other measures were not included.

Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.
Yes

Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.

Yes

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.

Yes

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I am able to assess the statistics

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