



## Effects of planar and non-planar driver-side mirrors on age-related discomfort-glare responses

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### Abstract

In this study, we evaluated subjective nighttime discomfort-glare responses on three different types of planar and non-planar driver-side mirrors on two age groups. Fifty-six individuals (28 young [18–35 years] and 28 old [65 years and over]) participated in this experiment. Subjective discomfort-glare rating scores on three different types of driver-side mirrors were assessed utilizing De Boer's rating scale in a controlled nighttime driving environment (laboratory ambient illuminant level—1 lux with headlight turned off). Three driver-side mirrors included planar “flat mirror”: radius of curvature 242650.92 mm, reflectivity 0.60114, and surface reflectance 0.60568; “curved mirror”: radius of curvature 1433.3 mm, reflectivity 0.21652, and surface reflectance 0.58092; “blue mirror”: radius of curvature 1957.1 mm, reflectivity 0.25356, and surface reflectance 0.54585. The results indicated that with the same glare level (as measured by angle of incidence and illuminance in front of the eyes), older adults reported worse feelings of glare than their younger counterparts. Furthermore, the results indicated that both young and older adults reported worse feelings of glare for planar driver-side mirror than non-planar driver-side mirrors. These results suggest that older adults' criterion of discomfort-glare is more sensitive than their younger counterparts, and importantly, the non-planar driver-side mirrors can be beneficial in terms of reducing nighttime discomfort-glare for both the young and the elderly.

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