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16. Abstract <p>A nighttime field study was conducted to assess the effects of color on the detection of retroreflective pedestrian markings by color normal and color deficient drivers. Participants seated in a stationary vehicle, with its low-beam headlamps on, indicated when a moving pedestrian, who wore colored retroreflective markings on her legs, was just detectable. Independent variables included color (red, yellow, green, and white), retroreflective power, participant age, color-vision capability, and location of the stimulus in the visual field (centrally or peripherally located).</p> <p>This experiment demonstrated that, for persons with normal color vision, the color of a retroreflective marking affects the distance at which a pedestrian, located in the central portion of the visual field, can be detected. This result is consistent with previous research for color normal individuals (Sayer et al., 1998). Specifically, colored retroreflective stimuli were detected at distances 3 to 6% greater than a photometrically matched achromatic stimulus. Furthermore, the findings are qualitatively in agreement with the Helmholtz-Kohlrausch effect. Color deficiency had a measurable, although limited, influence on the effect of color on detection distance. The results with regard to central versus peripheral locations were not conclusive.</p> <p>This study, as well as a related previous study (Sayer et al., 1998) indicated that, under the conditions of this experiment, color influences detection distance to a lesser extent than suggested by the color correction factors prescribed in ASTM E 1501. Tentatively, the discrepancy seems to be accounted for by the size of the retroreflective markings, in terms of visual angle, at the point at which drivers first detect or recognize them. The ASTM correction factors may be appropriate for larger visual angles, but smaller correction factors may be more appropriate if retroreflective markings can be expected to have very small visual angles (approaching point sources) at critical distances. However, the influence of color and its interaction with visual angle has not been fully characterized by this study or by the previous studies of retroreflective stimuli, and further research on the effects of color, SIA, and size is needed.</p>		
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