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7. Author(s) Michael J. Flannagan and Mary Lynn Buonarosa		8. Performing Organization Report No. UMTRI-2012-25			
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16. Abstract Several light sources are now available for use in automotive headlighting, offering a variety of colors or spectral power distributions (SPDs) within nominally white lamps. This has prompted interest in determining what SPD might be best for headlamps. Selection of headlamp SPD may involve several considerations, including drivers' subjective preferences for color. This study was designed to address the issue that appears to be most important for objective visibility effects of headlamp SPD: Do rod photoreceptors contribute to the detection of pedestrians by drivers at night? This issue is important because pedestrian crashes are the type of crash most affected by the lack of natural light at night, and because a contribution of rod photoreceptors would mean that some form of mesopic photometry would be more appropriate for measuring headlamps than conventional photopic photometry. Participants drove vehicles equipped with tungsten-halogen (TH) headlamps and detected pedestrians standing by the side of the road at night. The pedestrians wore four different colors of clothing: dark red, light red, dark blue, or light blue. Detection distance was better predicted by photopic reflectance of the garments than by scotopic reflectance. These results indicate that rod photoreceptors probably have little if any influence on pedestrian detection at night. The results of this study suggest that conventional photopic photometry is appropriate for assessing the visibility, and likely safety, provided by headlamps. Within the standard range of white, headlamp color probably has no effect on headlamp performance after photopic spectral luminous efficacy has been taken into account. Choice of color may therefore depend more on subjective considerations, which can include subjective glare effects as well as driver preference. Future research into the possible role of rod vision in night driving should further evaluate pedestrian detection, as well as how rods may contribute to the driver and pedestrian vision provided by street lighting.					
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