

**EFFECTS OF MULTI-MODAL WARNING SYSTEMS ON ELDERLY
DRIVERS' PERCEIVED URGENCY AND COMFORT**

By

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(ABSTRACT)

The objective of the study was to investigate multi-modality effects (visual and auditory) on the perception of urgency in elderly individuals addressing issues of safety and comfort. Twenty individuals (10 young, 10 elderly) from Montgomery County of Virginia participated in the laboratory study. In the pre-experimental audiometric tests, as expected elderly individuals had higher hearing thresholds (dBHL) than young across all the frequencies (250, 1000, 2000 and 4000 Hz) of pure tones. The difference was more pronounced at 4000 Hz. In visual acuity tests administered, elderly individuals had a lower Snellen VA than young at both near and far distances. The participants also were administered Bausch and Lomb color test; all participants were able to differentiate red color. Method of adjustment was used to collect empirical data. Rating test was administered after every treatment to objectively assess the participants' feeling of perceived urgency associated with the auditory warning signal. All the participants rated the experimental sound as urgent. Repeated measures was conducted to remove

variations due to time and treatment conditions. A mixed-factorial design was used to investigate the main and interaction effects. The age effect was found to be marginally statistically significant. Modality and trial effects were not found to be significant. The reanalysis conducted after removal of outliers resulted in marginal statistical significance for age and modality main effects. Although not significant, a trend was seen in the pulse intensity levels (dBL) across modalities in the elderly individuals. Future research should be conducted to investigate modality effects in elderly individuals in a naturalistic driving environment which would give a better insight of the effects of dual modalities.