

Impact of Auditory Affect on Urgent Behaviors on a Car Simulator

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Larios, Cintya N.; Mouloua, Mustapha; and Gentzler, Marc D., "Impact of Auditory Affect on Urgent Behaviors on a Car Simulator" (2016). *Human Factors and Applied Psychology Student Conference*. 26. <https://commons.erau.edu/hfap/hfap-2015/posters/26>

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HFAP Abstract

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Emotional content abounds the driver in different forms from billboard signs to in-vehicle devices to roadside situations. Such emotional scenes can result in unsafe driving behaviors and lead to collisions due to their ability to attract attentional resources and change driving goals to irrelevant ones (Megías et al. 2011b; Briggs et al, 2011). Recent studies have looked at the way auditory and visual emotional stimuli can impact individual's decision under Evaluative and Urgent road environment behaviors. Evaluative behaviors are known as a categorization in which people judge a scene as risky or not, whereas Urgent behaviors are time sensitive, requiring a person to quickly respond to the scene in order to avoid negative consequences (Megias et al, 2011a). Previous research has examined the way visual emotional stimuli affects driving performance; however, relatively little is known about the effects of auditory emotional stimuli (Chan, & Singhal, 2014). Among studies that examined both types of behaviors while participants viewed images depicting a driving scenario, auditory emotional stimuli served to speed Evaluative judging (judge whether the scene is risky or not), but not under Urgent judging (judge whether to brake or not) (Serrano, et al, 2013). It was also found that negative sounds lead to more performance errors in driving (Chan, & Singhal, 2014). The current study is designed to further examine a number of task features using a medium fidelity (GE Patrol SIM) driving simulator. Urgent behaviors related to a risky driving scenario and auditory sounds will be used. Using the motivational model of emotion looking at evolutionary flight-and-fight mechanisms (Bradley et al., 2001; Lang et al. 2008), we would, in contrast to previous studies of urgent behaviors, expect to find a difference under emotional content when participants drive a car simulator. A car simulator is able to mimic a real driving environment than looking at a static picture done in Serrano et al (2013). This study aims to empirically examine the effects of driver urgent behavior and time pressure on driver's hazard perception in a controlled driving simulation. In this experiment, a car following scene with sudden car decelerations will measure participant's braking, steering, and speed behavior. Participants will drive while listening to emotionally charged auditory sounds that vary in valence and arousal. Valence is how pleasant to unpleasant a stimulus is, whereas arousal is how stimulating to unstimulating a stimulus is. Emotional sounds will be instigated before a braking event occurs and will be randomized. Based on theoretical principles of the motivation model of emotion, it is hypothesized that highly arousing unpleasant sounds would have a higher impact on driving performance than pleasant and neutral sounds. Theoretical and practical implications will also be discussed.