Texting While Walking: Measuring the Impact on Pedestrian Visual Attention

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The use of smartphones is rapidly growing around the world. In Canada, the percentage of smart phone owners has increased from nearly 20% in 2011 to 54% in early 2012 (Power and Associates, 2012). The negative impact of mobile phone use on drivers' safety has been demonstrated (Horrey and Wickens, 2006) However, the safety hazards related to mobile phones do not only apply to drivers. A large number of road accidents involving pedestrians distracted by their phones have been reported. Studies suggest that this number is growing, especially among people under 30 years old (Schwebel *et al.*, 2012). In addition, many of the fatalities which occur among pedestrians are the result of inattention (Bungum *et al.*, 2005). Most studies have addressed this problem using observational research paradigms (Starvinos *et al.*, 2011; Hyman *et al.*, 2010) but few have systematically studied the impact of mobile communication technologies on users' attention while walking. This project aims to assess the influence of using smart phones on pedestrians' visual attention and safety.

To do so, the developed methodology employs electroencephalography (EEG) and behavioral measures. Participants will be using the text messaging functionality of a smart phone while walking on a treadmill. The experiment will take place in an immersive 3D environment at the Optometry School of the University of Montréal [1]. The 3D environment includes high-resolution floor to ceiling screens in front, and to each side of the participant. Each participant's test session will be composed of several trials which include:

- Participant is engaged in a texting conversation with a research assistant while walking on the treadmill.
- Participant is prompted to look at the screen in front of him.
- A silhouette (biologically similar to a human form) is displayed walking toward the participant with a small angle deviation. The participant is asked to verbally identify the silhouette's direction (Legault *et al.*, 2012).
- Participant continues the texting discussion.

Dependent variables will include time to report on silhouette, correctness of silhouette's reported direction, EEG frequency analyses and event-related potentials.

The experiment will take place during the month of May 2014. Twenty participants will be recruited (between 20 and 34 years old). They will have owned a smart phone for at least 6 months and use it occasionally while walking. The poster will present the complete methodology and acquisition setup along with preliminary results.

References

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[1] http://vision.opto.umontreal.ca/english/technologies/technologies_en.html#cave