The Role of Cell Phones in College Pedestrian Injury Risk

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Introduction

It has been well-established in the literature that distraction jeopardizes motor vehicle driver safety (Strayer & Drews, 2007), but few studies have examined distracted walking near traffic (Stavrinos, Byington, & Schwebel, 2009). At particular risk are college students, who walk frequently, have increased pedestrian injury rates compared to other adult age groups (NCIPC, 2008), and frequently use cell phones.

This study examined the impact of three forms of distraction on college students' pedestrian safety: (a) engaging in a naturalistic cell phone conversation with a research assistant, (b) a cognitively challenging spatial task by phone, and (c) a cognitively challenging arithmetic task by phone. We hypothesized the more cognitively demanding forms of distraction (the spatial and arithmetic tasks) would evoke riskier pedestrian behavior than the more naturalistic cell phone conversation task, and that all conversations would cause riskier pedestrian behavior than no distraction at all.

Method

Participants. Fifty-nine college students participated (ages 18 – 35, mean age = 19.78, *SD* = 3.00; 55% female; 44% Caucasian, 41% African American, 12% Asian, 3% Hispanic).

Protocol. Participants viewed traffic on a bi-directional, suburban road in an immersive, interactive virtual environment (Schwebel, Gaines, & Severson, 2008; Figure 1). Participants completed 12 simulated crossings: 3 with no distraction, 3 while talking on a cell phone with a previously unfamiliar researcher, 3 distracted with a spatial task that required the participant to describe the spatial layout of their home, and 3 distracted with a mental arithmetic task that required the participant to count backwards from 101 by threes.

Four pedestrian variables were considered: (a) number of hits (when participants would have been struck by vehicles in the real environment) plus close calls (when gap between pedestrian and oncoming vehicle was less than one second); (b) start gap (latency between last car passing and participants entering street, a proxy for decision-making time in previous work; Thomson et al., 2005); (c) gap size (the time from when the pedestrian starts, until a vehicle passes the crosswalk and (d) attention to traffic (the number of times the participant looked left and right until beginning to cross the street, divided by the average time waiting to cross).

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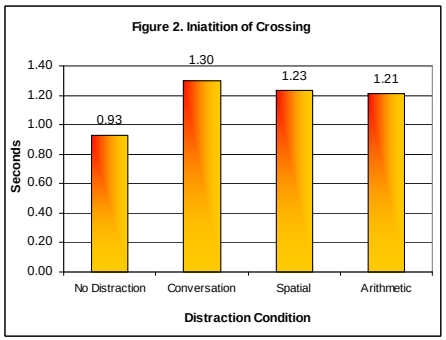
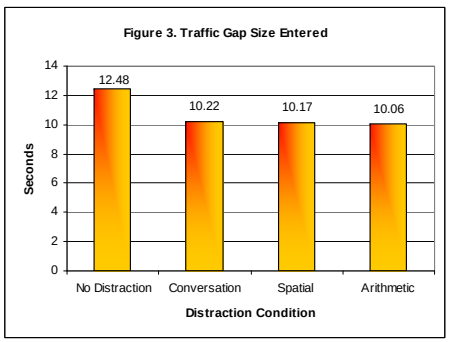
Figure 1. Virtual Reality Environment

Results

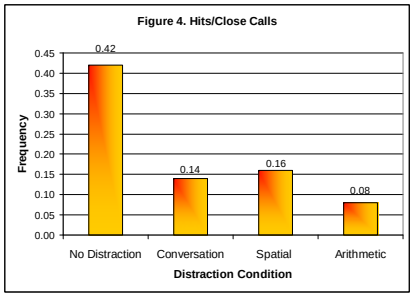
Four repeated measures ANOVAs were constructed, with distraction condition (no distraction, cell phone distraction, spatial task, and mental arithmetic) as within-subjects effects (Figures 2-5). As expected, participants exhibited safer pedestrian behavior during the undistracted trials compared to all forms of distraction. Post-hoc analyses revealed no differences between the three distraction conditions; in general, students did not display riskier behavior while completing cognitively complex tasks than while engaging in the naturalistic phone conversation.



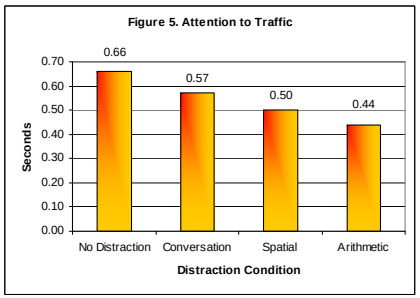
F (56) = 3.29, *p* < .05



F (56) = 27.96, *p* < .001



F (56) = 5.02, *p* < .01



F (53) = 32.36, *p* < .001

Conclusion

Cell phone use has increased exponentially in recent years. Research suggests multitasking increases driver distraction (Kahneman, Ben-Ishai, & Lotan, 1973; Strayer & Drews, 2007) and one recent study demonstrated a similar relationship for child pedestrians (Stavrinos et al., 2009). This study offers initial evidence that any cell phone conversation – even a rather mundane one – might distract college pedestrians and put them in at risk. Universities might consider educational campaigns, notifying students of the need for minimized distraction while crossing streets.

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