

Improving Vigilance for Homeland Security Personnel

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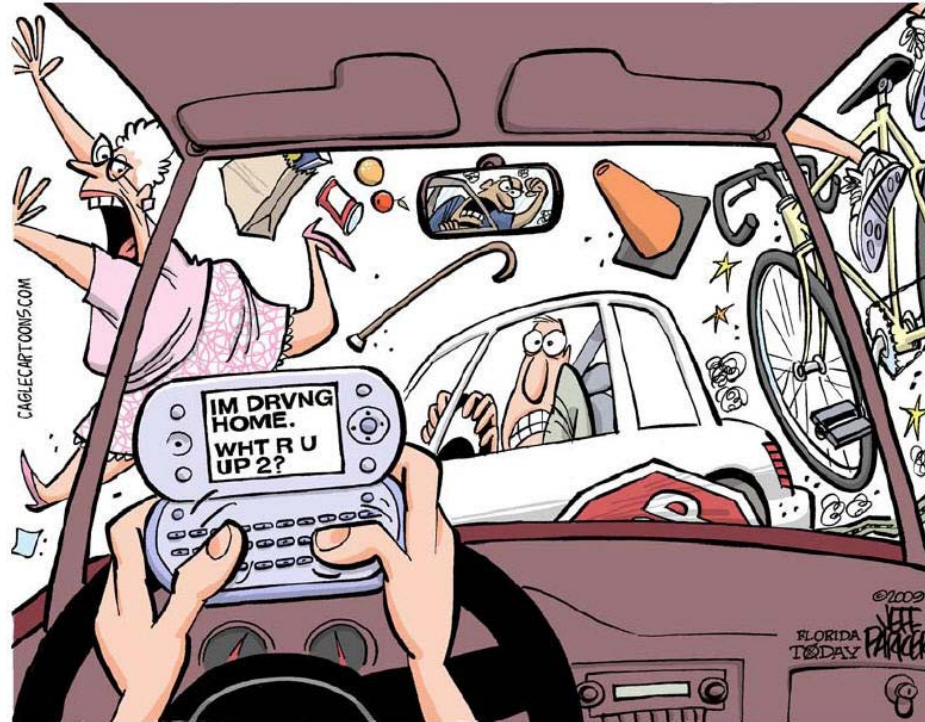
Ryan DeWitt, Ryan DeWitt Design

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Research Questions

- Are some people better at vigilant tasks than others?
- Can improved vigilance be trained?



Jeff Parker / Florida Today, courtesy CagleCartoons.com



What Does Vigilance Entail?

Focus on visual search:

- Ability to sustain attention for prolonged sessions.
- Ability to stay “on task”.
- For some DHS occupations also requires vigilance to:
 - Potentially subtle events.
 - Infrequent events.
 - With high stakes for missing events.



Are Some People Better Visual Searchers?



- Videogame players?
- Older adults?
- Bilinguals?



Motivation

Prior work (including our own) suggests:

- Visual search is an attention-demanding (i.e., vigilance) task.
- There are individual differences in the ability to maintain such vigilance.
- Some people should be better visual searchers.
- **GOAL:** Create an easily implemented battery of assessments that can reveal *individual differences in the ability to maintain vigilance* and perform visual search accurately and efficiently.



Research Tasks

- Experiments involve:
 - Current
 - Traditional vigilance tasks:
 - Search for target among distractors.
 - Inclusion of cues to (re)focus attention.
 - Simulated environment to add realism.
 - Tests for individual differences.
 - Top down v. bottom up processing.
 - Planned
 - Simulation training:
 - Step-by-step approach labeled FAPV long employed by RTI.
 - Variation in simulated environment ‘parameters’.



Vigilance, Gaze Tracking, and Stress

- Focus is on improving vigilance under stress.
- It is known that better performers demonstrate smoother gaze patterns than poorer performers when under stress.
- This study is turning it around:
 - Train smooth gaze patterns.
 - Simulate a stressful situation.
 - Determine any effect of gaze pattern on performance (and physiology).



Progress to Date

Client meetings:

- Visit to TSA to discuss baggage screening research needs, including vigilance.
- Visit to DHS Transportation Security Lab (TSL).

Materials:

- Acquired materials from a separate RTI project.
- Reusing simulation materials from another RTI project.

Experiments underway at Duke and RTI.

