

# COGNITIVE PERFORMANCE IN BUSH FIRE FIGHTERS

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## AIM

- To develop a test battery that taps into the cognitive aspects of the fire fighter task.

## WHY?

- Fire fighters need to be mentally switched on to be safe and efficient on the fireground. Things like making decisions, effective communication, being alert and vigilant, reacting quickly/correctly, remembering instructions or information, and safely operating equipment all require cognitive input.
- During campaign fires, fire fighters experience different stressors (e.g. long periods of work, high temperatures, smoky conditions). The effects of such stressors on cognitive function is not known.



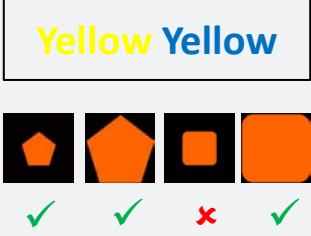


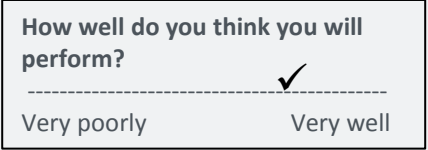
## HOW?

- We spoke to a number of firefighters about the cognitive aspects of work on the fireground.
- Five cognitive tasks were selected, as well as questionnaires measuring mood, fatigue and performance, and a driving simulator (see Table 1).

## APPLICATION?

- Cognitive test batteries such as this can be used in a variety of research settings
- Information relating to cognitive performance in fire fighters under various conditions will inform Australian fire fighting agencies about potential risks for health, safety and performance of their personnel. Such information will help with decisions about manning, work hours, workload, working conditions and task allocation.

Table 1: Cognitive test battery

<p><b>Memory</b></p> 	<ul style="list-style-type: none"> <li>This task assesses long term memory.</li> <li>Participants must operate a CFS pager, and are then given 20 seconds to read a CFS issued pager message describing an incident.</li> <li>They must then prompted to recall at least 3 aspects of the message directly after completing the PVT test.</li> </ul>
<p><b>Vigilance</b></p> 	<ul style="list-style-type: none"> <li>Assessed using the Psychomotor Vigilance Test (palm pilot version), which is one of the most well-validated indicator of performance deficits attributable to fatigue and sleep loss.</li> <li>Participant must press a button when a target appears on the screen.</li> <li>The test takes 5 minutes to complete</li> </ul>
<p><b>Complex Attention</b></p> 	<ul style="list-style-type: none"> <li>Stroop test (4mins): Measure of speed processing and automaticity of reading. Part 1, participants press coloured key that matches the colour of the word. Part 2, press coloured key matching colour of the word (colour of word does not match the word)</li> <li>Go/No-Go task (4mins 40sec): Measure of response inhibition. User must click when 3 items appear (go) but not when 1 item appears (no-go).</li> </ul>
<p><b>Hand-eye Co-ordination</b></p> 	<ul style="list-style-type: none"> <li>Hand-eye co-ordination is tested using a tracking task (OSPAT).</li> <li>Participants are required to keep a moving cursor on a central target using a mouse track ball.</li> <li>The test takes 45 seconds to complete.</li> </ul>
<p><b>Driving Simulator</b></p> 	<ul style="list-style-type: none"> <li>To simulate travel to and from the fire ground, participants are required to drive a car simulator at the start and end of the testing day (York Driving Simulator).</li> <li>Participants must follow all standard road rules.</li> <li>The simulator runs for 30 minutes each session.</li> </ul>
<p><b>Subjective Questionnaires</b></p> 	<ul style="list-style-type: none"> <li>Participants are asked to rate their performance (pre and post session), and also their level of fatigue, and alertness.</li> <li>Mood is also collected at the end of each day (POMS).</li> <li>Users either circle the most relevant item from a list, or place a mark on a scale.</li> </ul>