



FSTAR Evaluation

Testing the Efficiency of Literature Searches

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Talk Outline

- ▶ Introduction / Motivation
- ▶ Experimental Design
- ▶ Methods
- ▶ Expected Results
- ▶ Issues / Questions

Introduction / Motivation

▶ Introduction / Experience

- Associate Dean for Academic Affairs for the College of Science
- Participated in evaluations of several projects with IAFC
 - Volunteer Firefighter Recruitment and Retention
 - Four Phases in two states
 - SAFER grants
 - RESCUES
 - Researchers Creating Useable Emergency Solutions
 - Dovetailed with FSTAR earlier phase
 - Tested fact sheets against full research papers
 - Focus groups regarding concerns
 - Now with FSTAR II



▶ Motivation

- One goal of FSTAR is to more effectively provide access to research regarding the fire service
 - Can we test (evaluate) whether or not that goal is being met?
 - The work described herein has been submitted to the Institutional Review Board with regard to human subjects research, and has been approved

Experimental Design

- ▶ Essentially – making comparisons in literature search performance
 - Two comparisons – within groups and across groups
 - Across groups – two populations
 - Members of the fire service
 - Broadly defined... anyone who self-identifies as a member of the fire service
 - Firefighters, staff, support personnel and others may have a legitimate need to search the literature for research regarding the fire service
 - Graduate students
 - Accustomed to performing literature searches
 - Relatively easy population to access
 - Idea is to see if there is any significant difference between populations, or if the effectiveness of the search is the same regardless of background
 - Within groups (and within entire population combined)
 - Some participants are asked to search using the FSTAR repository
 - Some participants are asked to search using their favorite browser and the internet



Methods

- ▶ Data Collection – Ongoing as we speak
 - Ask for participation and provide information seeking informed consent
 - Ask participant to search for one of three articles, either with or without FSTAR
 - Poplin, Gerald S., et al. "Establishing a proactive safety and health risk management system in the fire service." *BMC public health* 15.1 (2015): 1.
 - Jahnke, Sara A., et al. "Health concerns of the US fire service: perspectives from the firehouse." *American Journal of Health Promotion* 27.2 (2012): 111-118.
 - Liu, Yunlong, and Sean Cassady. "A modified critical velocity for road tunnel fire smoke management with dedicated smoke extraction configuration." *Case Studies in Fire Safety* 2 (2014): 16-27.
 - Capture their search activity – SpyAgent records:
 - Computer usage time; Websites visited; Windows opened; Applications ran; Documents and files opened; Keystrokes and mouse clicks; Screenshots

Establishing a proactive safety and health risk management system in the fire service

Gerald S Poplin^{1,2*}, Keshia M Pollack³, Stephanie Griffin², Virginia Day-Nash², Wayne F Peate², Ed Nied⁴, John Gulotta⁴ and Jefferey L Burgess²

Computer Usage

Username	Total Active Time	Total Idle Time
FSTAR	00h:03m:51s	00h:00m:36s

[> back to top](#)

Websites Visited

Website Visited

Keystrokes Typed

Application	Window Title
ApplicationFrameHost.exe	Start ?- Microsoft Edge
fstaresearch.org [Enter] poplin [Enter] jjqh[Backspace][Backspace]q[Backspace]anke poston [Enter] liu [Enter]	
McUICnt.exe	no title
[Ctrl][Alt]	
sysdiag.exe	no title ()
fstar [Enter]	

Mouse Click [left]	5365-11362 Featured Study Establishing a Proactive Safety ar
Mouse Click [left]	5365-11362 Featured Study Establishing a Proactive Safety ar
Program Closed	PickerHost.exe

Methods (II)

► Analysis

- Statistical comparisons across and within populations
- Descriptive statistics
 - How long did it take to search, and who took longer? By how much?
 - How many failed searches were there? By which group?
 - How many mouse clicks, websites visited, etc. to reach the goal
 - Compared across populations/sub-populations, and by research article
- Inferential statistics to test whether the differences in performance (if any) are statistically significant
 - Testing whether the performance of the two populations is significantly different
 - t-test is the classic test



$$t = \frac{\bar{X}_1 - \bar{X}_2}{s_{X_1 X_2} \cdot \sqrt{\frac{1}{n}}}$$

where

$$s_{X_1 X_2} = \sqrt{s_{X_1}^2 + s_{X_2}^2}$$

Expected Results / Issues / Questions

▶ Expected results

- Expect that FSTAR searches will be faster/more efficient
 - Perhaps not dramatically faster
 - There is a more direct path to the articles with less internet “noise”
- Expect more failed searches using broad internet access

▶ Potential Issues

- Always concerned with “n” – number of observations
- Short timeline – have to get it right the first time

▶ Questions/Comments?

