Determining the Eye-Tracking Strategies Used in the Game "Spot the Missing Object (SMO)" by Simulator Malingerers, ADHD, and Non-ADHD.

M. Gerhold, MS, C. Martinez, BS, L. Aguerrevere, PhD

Stephen F. Austin State University

Introduction

- Typical evaluations of adult ADHD consist of behavior self-report rating scales, cognitive or intellectual functioning measures, and specific measures designed to measure attention.
- Boone (2009) suggested monitoring continuous effort is essential throughout psychological assessments.
  - Yet, few studies have contributed to malingering literature on the ADHD population.
- Many studies have reported the adequate use of symptom validity tests, which assess effortful performance in ADHD evaluations (Jasinski et al., 2011; Sollman et al., 2010; Schneider et al., 2014).
- Because of the length of ADHD assessments, individuals are likely to become weary and tired, thus impacting their performance.

Goal of Study

- This study investigates the eye movement strategies used by a clinical ADHD population, non-ADHD subjects, and malingering simulators when playing a common simple visual search task.

Participants and Method

Participants:

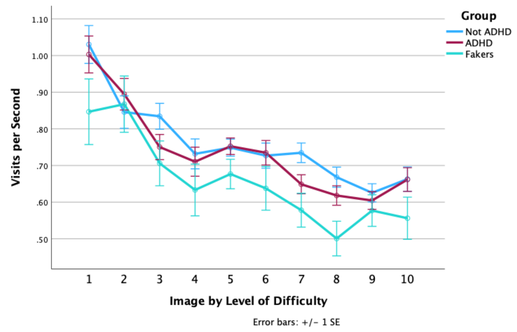
- A total of 153 college students participated in this study.
- To be placed in the ADHD group, a participant must endorse four or more symptoms on the ASRS (N = 37). To be placed in the non-ADHD, participants should have endorsed no ADHD symptoms (N = 43).
  - Participants that did not meet the above criteria for ADHD and not-ADHD were placed in an Indeterminate group.
- Within the indeterminate group, a total of 20 participants were instructed to fake symptoms related to ADHD during the session (Fakers/Simulator malingerers).

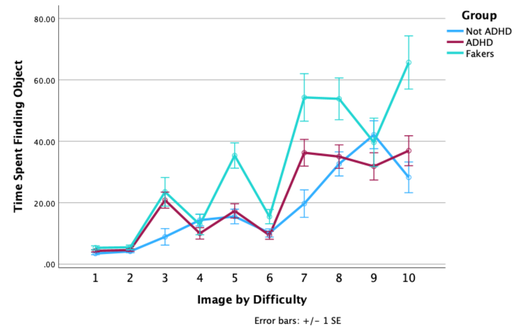
Method:

- Twelve Spot the Difference images were used as the visual picture stimuli (two were for practice without collecting data).
- Sticky by Tobii Pro (2020) was used for the collection of eye-movement data was utilized.
  - Sticky by Tobii Pro is an online self-service platform that combines online survey questions with an eye-tracking webcam, allowing participants to see images from their home computers.

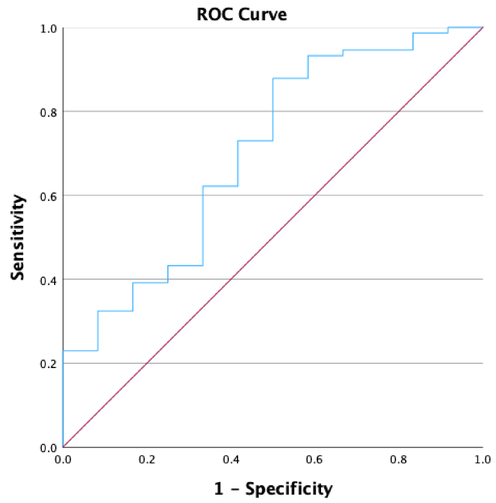
Results

Results indicated that the participants classified as Fakers had significantly fewer Visit Counts per second for all images compared to the ADHD and not-ADHD groups. Results also indicated that those classified as Fakers spent significantly more time searching compared to the ADHD and not-ADHD groups.





- Results also indicated a statistically significant Area Under the Curve (AUC) = .702; SE = .085; p .026; 95% CI = .535-.868 for average Visits per Second suggesting adequate discrimination abilities.
  - Optimal cutoffs suggest a Sensitivity of 40% with a False Positive Rate of 20%, LR= 2.



Discussion & Conclusion

- Fakers spent less energy but spent more time on each image = indicating a possible indication of poor effort
  - Fakers also got fewer answers correct
- Results indicated that eye-tracking technology could help differentiate simulator malingerers from non-malingerers with ADHD.
- Due to their close relation to attentional mechanisms, the study's results can provide insight into cognitive processes related to malingering performance.

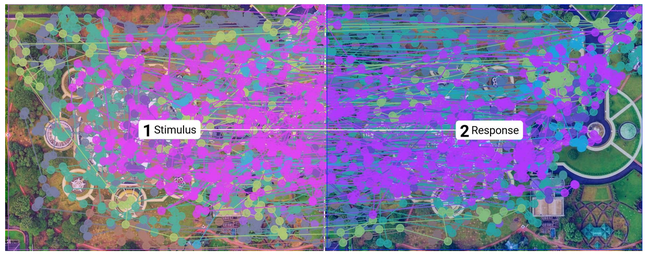
<u>Limitations</u>

- Spot the difference needs stronger support for its psychometric properties
- Fakers may have not faked (manipulation checks)
- Participants may have not been fully engaged in the tasks
- Many exclusions due to technical issues with eye-tracking camera (e.g., lighting, movement of head)
- Editing questions/images
- Only works with limited amount of images

<u>Future Studies</u>

- In lab research
- Refinement of images
- Determination of the role of effort

Gaze Plots (Visit Counts)



Acknowledgement

This project is supported by a grant from the Woodcock-Johnson Foundation.

Contact Information

Max Gerhold, MSc.
School Psychology Ph.D. Program
Stephen F. Austin State University
Email: gerholdm@jacks.sfasu.edu