Michaella Petrosky & Luis Aguerrevere, PhD.

Introduction

- The purpose of the study was to determine if laboratory-induced pain has possible effects on attention as captured by eye tracking technology.
- Eye-tracking is a growing field used to detect eye movements and analyze human processing of visual information for interactive and diagnostic applications
- In one case, there was a negative relationship between levels of pain and attention to some environmental demands. (Eccleston and Crombez, 1999)
- However, other studies were not able to find a difference between levels of pain and attention (Crombez, 1996)

Method

- 36 participants: all college students.
- The participant information was collected from a Malingering study done in the laboratory (Aguerrevere, et. al, 2017) with on the control group and the acute pain group participants being used.
- The previous study found that controls and acute pain conditions did not differ from each other in TOMM scores or eye tracking indicators (Aguerrevere, et. al, 2017).
- Eye movement was recorded by the Tobii x2-650 eye-tracker paired with a 17" LCD monitor set at a resolution of 1024x768. The eye-tracker samples the position of users' eyes at the rate of 50Hz.
- Acute pain was induced using the Medoc Q-sense.
- The Medoc Q-sense quantitatively assesses thermal sensitivity and threshold.
- Pain sensitivity was assessed by the recorded temperature in which they first felt pain.
- Pain threshold was determined by the temperature when the participants indicated that the pain was overbearing.

Method cont.

- Eye tracking variables:
  - Time to first fixation
  - Total fixation duration
  - Fixation count
- Eye movement was mapped with integrated log data, user events, and TOMM drawing features during on-screen task performance.
- Areas of Interest (AOIs) were generated by a javascript application.

Results

- There is a negative relationship between pain threshold and fixation count (r=-.45, p<.05).
- Those individuals with lower pain thresholds have a significantly greater number of fixations compared to those with higher pain thresholds (see figure 1 and 2).

Conclusions

1. Subtle effects of laboratory induced pain on attention can be observed with eye tracking technology.
2. Individuals with lower pain thresholds may spend more attention fixating on a number of objects.
3. Lower pain thresholds seems to be a good indicator for higher fixation counts.
4. The results support (Eccleston and Crombez, 1999) in that levels of pain and attention to some environmental demands have a negative relationship.
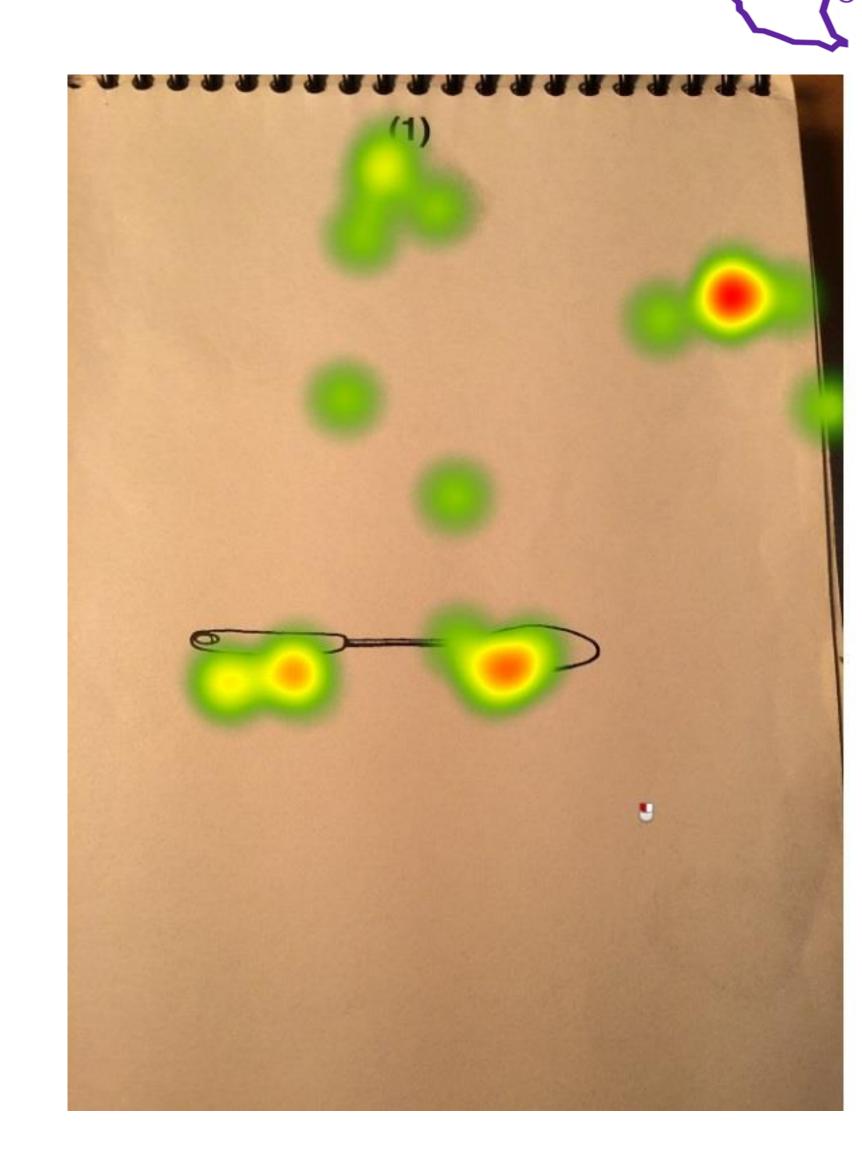

Figure 1: Fixation count within the AOIs for the three participants with the lowest pain threshold
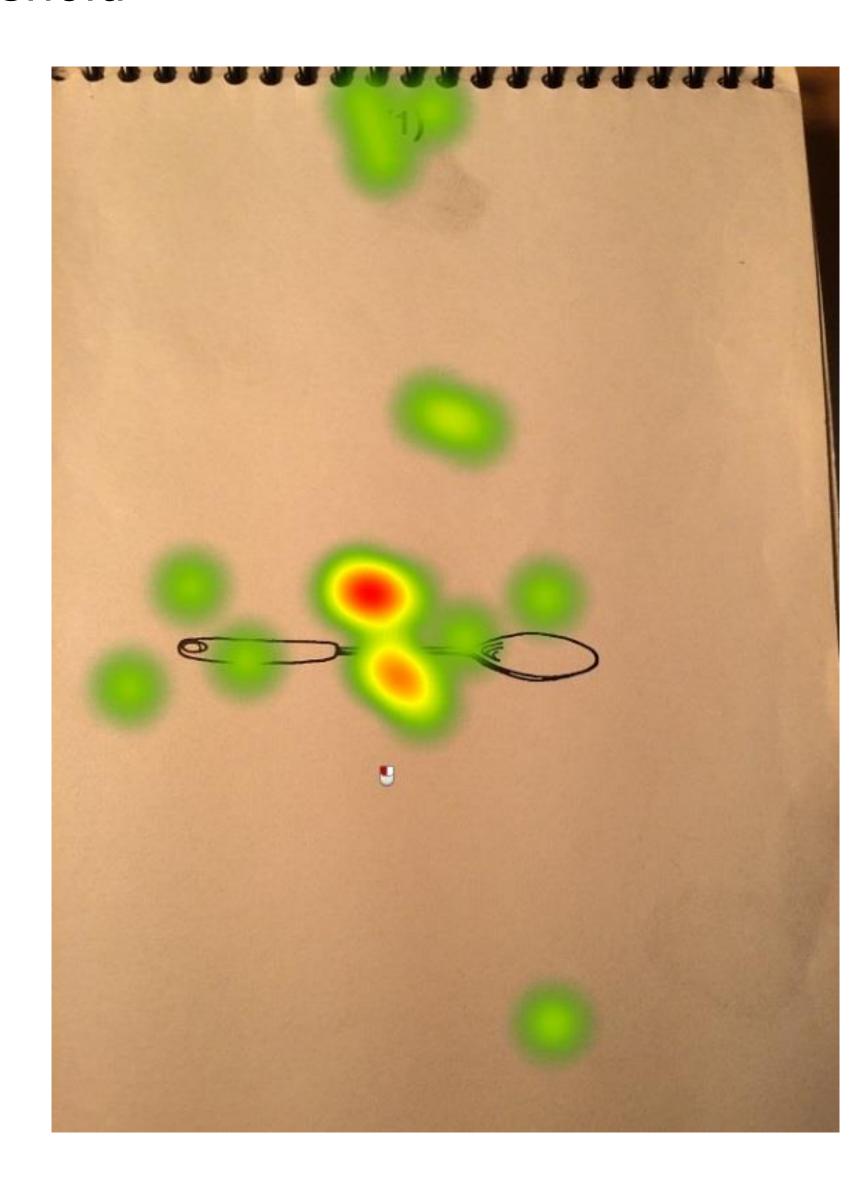

Figure 2: Fixation count within the AOIs for the three participants with the highest pain thresholds.