The Expert Eye
Testing the observational skills of Scene of Crime Officers using Eye Tracking Equipment

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Aim and Objective

The aim of this experiment was to act as a pilot study when testing the observational skills of trained Scene of Crime Officers, examining a disaster scene using the eye tracking equipment Eyelink Mount desktop 1000. (Support Research, 2014).

Objective

This aim has been fulfilled, firstly, by creating a mock disaster scene of an airplane crash on the campus car park to collect a variety of photographs and video footage. The photographs were then sliced to find five final images, to become a part of the stimulus used on the eye tracking device. The device used for this particular experiment was the Eyelink 1000 mount desktop, which allowed the eye movement of an individual to be analysed using a data viewer.

Null Hypothesis: The expert will NOT complete the experiment more efficiently than the novices.

Alternative Hypothesis: The expert WILL complete the experiment more efficiently than the novices.

Introduction

Disaster environments are complex and difficult environments to work within as there may be numerous personnel present concurrently and the damage can be catastrophic and widespread. Understanding how experienced personnel view and evaluate such scenes can help in devising training strategies for inexperienced colleagues at disaster scenes. The Eyelink 1000 mount desktop allows the participant to view a digital stimulus such as a photograph or video on a computer screen, whilst allowing researchers to analyse the eye movement of the participant. Scene of Crime Officers (SOCO’s) have undergone this eye tracking process to help observe, interpret and understand their observational skills when analysing a mock disaster scene. The data collected assists in identifying any新颖 or less developed experimental strategies used by the SOC0’s. It is generally hypothesised that the SOC0’s would complete the task more efficiently than inexperienced personnel and be able to correctly identify the most evidentially probative items from a particular disaster scene. This hypothesis has been tested using the data created from the Eyelink equipment.

Method

The participants are asked to sit on a chair in front of a computer screen, with their head and chin resting on the provided rests, this is due to the rest being in the optimal position for the experiment. The participants did not need to talk through their analysis, they just had to analyse the scene to their best ability to identify any key items with potentially high evidenrial value.

Figure 1: Systematic approach used to help thoroughly search crime scenes (Jackson and Jackson, 2011).

“Systems are always present many different and unique challenges which must be addressed right away. The one constant in disasters is change” (Byrd, 2009).

Each participant is asked through the instructions on the screen, after analyzing the evidence they then are asked to look at the next image, which has already been corrected to remove the calibrations for each eye. After analyzing the evidence the participant is then asked to move onto the next image, repeating this process through all images.

Results

How many times did each participant look at the desired interest areas in the ‘practice’ image?

Table 1: shows the amount of views for each interest area in the practice image and the percentage dwell time. Table 1 shows the mean percentage dwell time across all participants for each interest area in the practice image. This method was carried out on the practice image as it was to test the participants without preconceived opinions.

Discussion

It is apparent that the participants tend to approach the scene in similar ways by focusing on key areas of interest on the practice image, potentially due to the body being an easily identifiable object and a slightly larger piece of evidence in comparison to some of the other types present. Referring to figure 4a and table 1, participant 7 looked most frequently at the body as well as for the longest period of time, whilst participant 3 looked the least amount of times for the shortest period of time. Although the amount of fixations will impact the dwell time percentage slightly, participants that have analysed the body less times have focused upon that item for a longer period than others, i.e. participant 2 fixated on the body 40 times within the two minutes whilst participant 6 fixated on the body 43 times. Participant 2 spent 12.81% of their time looking at the body whilst participant 6 spent 11.99% for the practice image. The observations of each item tended to have a large variance in numbers of times it has been looked at by different participants. In this image, it appears student 1 fixated on the gun at 50 times, (34 hours) for 19.25% of the allotted time whilst participant 7 fixated on the gun in this one image on one occasion for 0.16% of the allotted time. When SOCO participant 5 was fixated on the body 6 times within this image the statement had a significant impact on the overall experiment as this participant is a student and not used to analysing a scene in this way. The participant spent a lot of time looking at the body due to the nature of the practice experiment being used to examine and recover evidence. The results suggest at this time the technique carried out was not valuable enough to use within other interest areas. The data suggests at this time the technique carried out was not valuable enough to use within other interest areas. The data suggests at this time the technique carried out was not valuable enough to use within other interest areas. The data suggests at this time the technique carried out was not valuable enough to use within other interest areas. The data suggests at this time the technique carried out was not valuable enough to use within other interest areas. The data suggests at this time the technique carried out was not valuable enough to use within other interest areas. The data suggests at this time the technique carried out was not valuable enough to use within other interest areas.

Conclusions

This is the first report to show that when using visual search strategies monitored by eye tracking equipment: there is no significant difference between the SOC0’s fixation counts and dwell times as opposed to the students, as there was no time where the SOC0’s noticed falsely on an area or object more than the students, there is a great variety within the results to conclude that there is no significant difference between the two groups of participants, however between the nine participants as a whole it appears participant 8 (student) and Participant 7 (SOC0) both analysed the desired interest areas on more occasions than other participants, whilst also then averaging out within other interest areas. The data suggests at this time the technique carried out was not valuable enough to use within other interest areas. The nature of the project was to test the participants without preconceived opinions.

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References

Baber, C. & Butler, D. (2012) ‘Experts on take the macroscopic approach: An observational study of forensic scene examiners’ evidence awareness, whilst also mentally reconstructing the steps of the suspect. However this is one of the usual search patterns suggested that are used by our experts such as the spiral, line or grid method (Jackson and Jackson 2011). These search patterns are systematic approaches to a crime scene in order to ensure the Crime Scene Investigators have thoroughly examined a scene in the most efficient way. Usually senior Scene of Crime Officer (SOCO) attend such scenes to examine and recover evidence as explained by (Geoff and Williams, 2007) and it is in the SOC0’s opinion, whether an item is worth recovering due to its evidential value.


