

# **Landing site distributions versus pupil diameter**

## **Method**

### **Subjects**

The experiment involved a total of twenty two native Irish speakers. The participants came from both the National University of Ireland Maynooth (NUIM) and University College Galway (UCG). They were compensated for their participation by Foras Na Gaelige.

### **Aparatus**

Experimental materials were presented on a 21-inch Samsung SyncMaster 1100MB CRT monitor controlled by an nVidia Geforce FX5200, 256MB RAM graphics card with a refresh rate of 100 Hz non-interlaced. The resolution of the monitor was 1024 x 768 pixels and the screen subtended 42.8 (41.4 cm) horizontally and 32.1(30.3 cm) vertically. This results in 24 pixels per deg at a viewing distance of 52.6 cm. Eye movements were recorded using an EyeLink II (SR Research Ltd.) head-mounted, video-based eye tracker. The EyeLink II has a maximum sampling rate of 500 Hz. It was calibrated for each subject by instructing them to fixate a series of nine dots (0.4 diameter) displayed in a 3x3 grid pattern on the screen. Participants were seated with their heads stabilised by a chin-rest. They viewed the display binocularly, though only their right eye was calibrated. Stimuli were presented and controlled by a display PC and eye movement data were collected using a separate recorder PC.

### **Materials**

The corpus of text used for this experiment was taken from a book written by (Jeier, 1977). The materials that were used as sentences were the same materials used by(Ralph Radach & Reilly, 2008) but translated to Irish by native speakers from the department of Irish at NUIM.

### **Design**

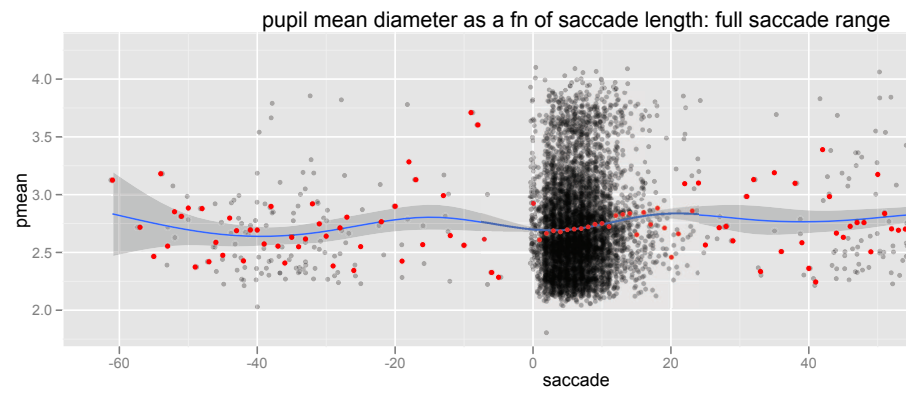
The present study included two experimental sessions, a training session followed by a main session. The training session was used to instruct the participant on how to carry out the experimental task of the main session. The main experimental session consisted of two blocks. One block where the participant would be required to read the sentence and answer a question orally. The other block involved the participant answering a multiple choice question about what they had read.

### **Procedure**

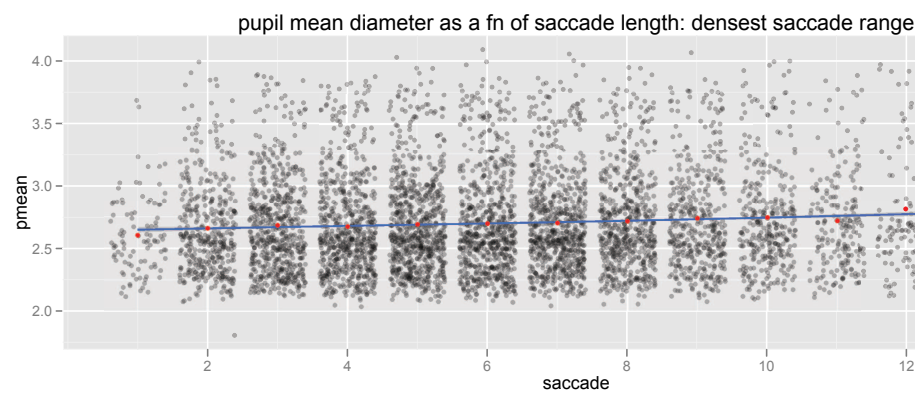
Participants were tested individually. At the beginning of the experimental session a calibration routine was initiated by the participant pressing a button on

a joystick that they held in their hand. They were asked to fixate a sequence of nine fixation markers displayed in a 3x3 grid pattern on the screen. Calibration was immediately followed by a validation routine in order to validate the initial measurement. Calibration was followed by the presentation of a fixation marker, consisting of a plus sign, shown at the left side of the screen. In order to initiate the experiment participants were required to press a button on the joystick. Once pressed the fixation marker was replaced with text. The participant then read the text and once finished they were required to fixate an empty box located in the bottom right of the screen. Once fixated the box would turn black and they could then proceed to the next trial by pressing a button on their joystick. Depending on the block of sentences that was being presented, a question or a multiple choice question appeared following the button press by the subject. They responded orally to the questions and responded to the multiple choice questions by using buttons on the joystick. This self paced sentence reading procedure was used throughout the experiment. Subjects in all conditions were asked to read the sentences silently for comprehension so that they would be able to respond to the questions.

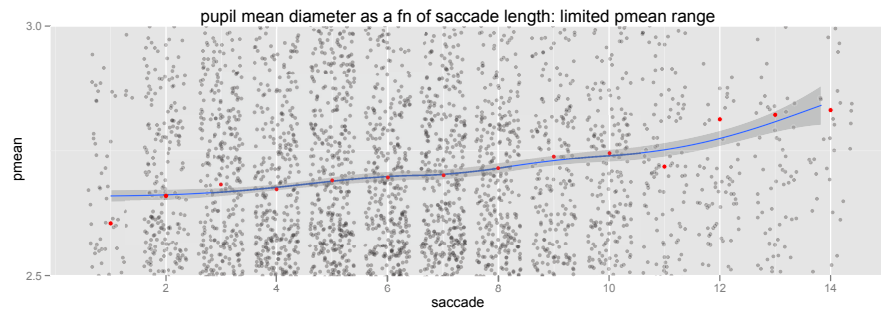
## Results



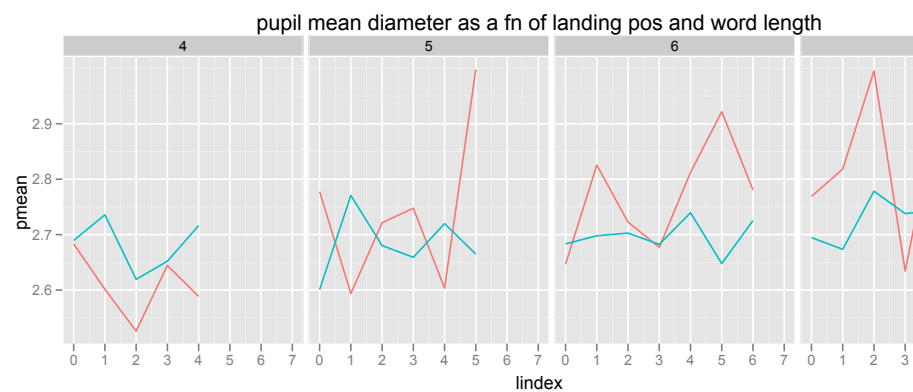
*Mean pupil diameter as a function of saccade length: Full Saccade range*



*Mean pupil diameter as a function of saccade length: Densest Saccade range*



*Mean pupil diameter as a function of saccade length: limited pmean range*



*Mean pupil diameter as a fn of landing pos and word length*

## References

- Jeier, T. (1977). *Die eskimos: Geschichte und schicksal der jager im hohen norden. (The eskimos: History and destiny of the hunters in the far north)*. Dusseldorf: Econ Verlag.
- Ralph Radach, L. H., & Reilly, R. (2008). The role of global top-down factors in local eye-movement control in reading. *Psychological Research*, 72, 675–688.