Name(s)

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Project Number

J1222

Project Title

Blink! A Study of Blink Rates while Using Computer Devices with Different Screen Sizes

Abstract

Objectives/Goals

The objective of this study is to compare human blink rates with the use of different computer device types to help people with dry eyes. Previous studies have shown a reduction in blink rate with computer use, but to my knowledge have not compared use of different types of devices. I hypothesized that if a human subject uses four common types of computers (desktop, laptop, tablet, smartphone), then blink rate would be most reduced with the smallest device.

Methods/Materials

Using a repeated measure design, 20 test volunteers were placed in 5 test conditions in the same environment while blinks were recorded over 4 minutes for each condition after 1 minute of adjustment time: engaging in relaxed conversation (control) and then playing a standardized computer game on a 1) desktop, 2) laptop, 3) tablet, and 4) smartphone. Results were analyzed using ANOVA statistical analysis software.

Results

Mean blink rate was reduced for all of the devices compared to the control. The greatest reduction was seen with the smallest device, the smartphone, followed in increasing size by the tablet, the laptop, and the desktop.

Conclusions/Discussion

Sustained computer use has been associated with dry eye, with studies showing up to 72% of computer users suffering from dry eyes. Blinking is vital to moistening the eye. Previous studies have shown a reduction in blink rate with desktop computer use, but to my knowledge have not compared blink rate reduction with different types of devices. This study compared blink rate reduction with the use of 4 common computer devices (desktop, laptop, tablet, smartphone) and suggests that the smaller the device, the greater the reduction in blink rate. These results can help guide dry eye sufferers in their choice of a computer device type.

Summary Statement

I found that there was an inverse association between the size of a computer device type and the reduction in blink rate while using it.

Help Received

Dr. Reese helped me refine the design protocol for the study that I previously had formulated. Dr. Ben-Shahar helped me with statistical analysis.