Contribution of Physiological Limitations of Vision to Change Blindness
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Previous Research
Change Blindness is the failure to detect changes to a scene or object (Simons & Levin 1997). Often caused by lack of attention (Rensink 2000).

Results using flicker paradigm suggest it takes a long time to detect changes
(Rensink, O’Regan, & Clark 1997).

When cued to look where a change may be, participants detected changes with near perfect accuracy (Wilson & Goddard 2011).

Limitations of Vision
Visual acuity is greatest at the fovea. Fovea has a diameter of only 2° (Egiazaryan & Mertin 2011).

Analysis
To determine if a participant fixated on a change, a region with a radius of 2° was constructed around each change.

A change was considered “detected” if the participant clicked on the change.

Research Question
Do the limitations of vision contribute to Change Blindness?

Methods
Participants (N=12, mean age 19.6) located differences between two drawings.

A faceLAB 5.0 eye tracking system was used to record the location of participants’ fixations.

A chinrest was used to prevent head movement.

Results
We performed a one-way MANOVA. There was a significant difference between the 1.5 and 3 minute conditions [F(2,12) = 4.31, p = 0.28; Wilks’ Lambda = .48; Partial eta squared .519].

Using a Bonferroni adjusted alpha of .025 results for fixation type were considered separately. Full Fixation showed a significant difference [F(1, 14) = 12.94, p = .003; partial eta squared = .48].

Discussion
In the vast majority of cases, changes were detected with a Full fixation. This suggests that there is a physiological prerequisite to change detection, and that change blindness is not only attentional.

Changes detected with a Half or Zero Fixation may be due to equipment error.

References

