

# Speed blindness during driving in patients with low vision

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**OBJECTIVE:** Speed blindness is a physiological phenomenon whereby the normal field of vision is perceived as narrower as the vehicle speed increases. In the case of eye diseases with a narrowing of the field of view, this impairment can be greater, so that driving can be dangerous.

**METHODS:** Normal human vision is shown to the audience with the help of Yarbus' visual model, with the central retina and 1.0 visual acuity (Snellen) fixating 6 different points in the visual field in just 2 seconds, combined with Or's vision model for people with normal vision. Visual function is modeled by Or's physiological visual model, in which environmental visual perception becomes less and less. Speed blindness is illustrated using an animated model (gif) as an illusion for normal people. The decrease in function (scotomas) in some eye diseases is reflected in these (moving) models (gif). Progressive eye diseases are also shown on this model.

**RESULTS:** It can be seen that the speed blindness losses, which physiologically arise in normal persons, are greater in eye diseases with visual loss. As eye disease progresses, the field of vision can become narrower.

**CONCLUSION:** Speed blindness is physiological. However, due to the loss of vision in the visually impaired who are still allowed to drive, it can reach to pathological extents.

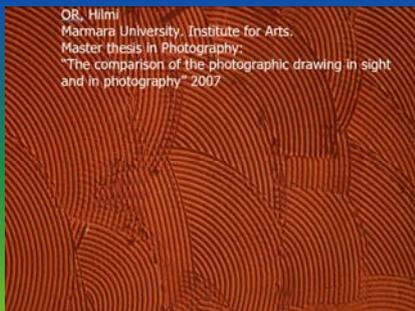


Figure 1. Photography of a wall

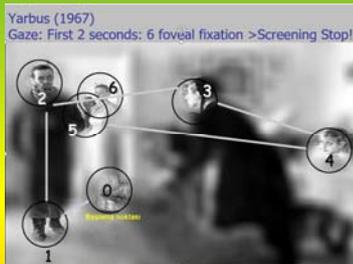


Figure 2. Visual perception of a normal eye during the first 2 seconds scanning the environment

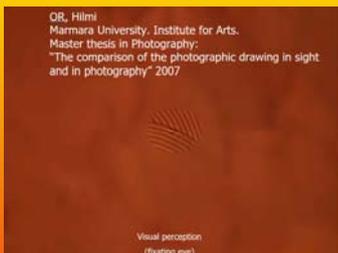


Figure 3. Visual perception of a normal fixating eye watching the wall in Figure 1 with the Yarbus visual perception results in Figure 2. The visual acuity of different parts of retina is taken into consideration (Visual model of Or).

Because this is a static poster the rotating „motion induced (speed) blindness“ GIF cannot be illustrated. Please go to the link [https://en.wikipedia.org/wiki/Motion-induced\\_blindness\\_to\\_experience\\_motion\\_induced\\_\(speed\)\\_blindness](https://en.wikipedia.org/wiki/Motion-induced_blindness_to_experience_motion_induced_(speed)_blindness).

Figure 4. Motion induced (speed) blindness of a normal eye.

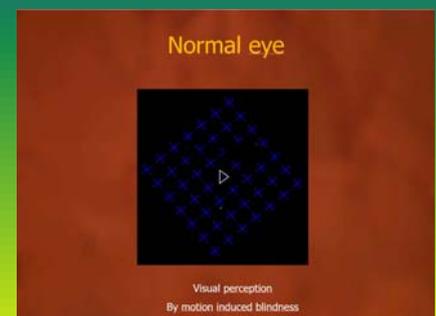
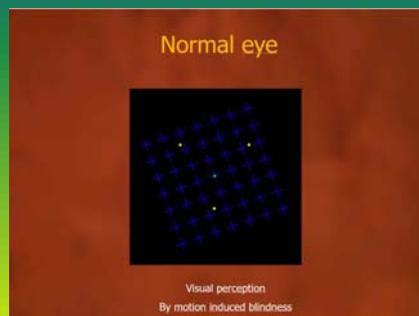


Figure 5. The rotation in Figure 4: [https://en.wikipedia.org/wiki/Motion-induced\\_blindness](https://en.wikipedia.org/wiki/Motion-induced_blindness) to experience motion induced (speed) blindness in a normal person. After fixating the green point in the middle some / all of the yellow points disappear. After some time they can be seen again.

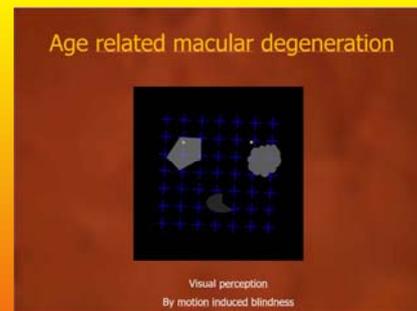


Figure 6. In macular diseases like age related macular degeneration (ARMD) there are total and/or relative scotomata in the central visual field, so that the motion induced blindness effect is more than in normals.

## Conclusions:

Speed blindness is physiological. However, due to the loss of vision in the visually impaired, who are still allowed to drive, it can reach pathological dimensions.

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