


Visual requirements and obstacles for normal reading function

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The motivation / drive to read is very strong

Don't read this text!
 Your instruction is to NOT read this text, stop right now! Why are you still reading? Stop immediately, by reading this text you show how little control you have over your own brain....
 Ok, you lost... loser!


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...even under poor conditions

DO YOU FINID THIS SMILPE TO RAED?

Because of the phenomenal power of the human mind, most people do. According to research at Cambridge University, it doesn't matter what order the letters are in. The only important thing is that the first and last letter be in the right place. The rest can be a jumble and you can still read it without a problem. This is because the human mind does not read every letter by itself, but the word as a whole. Talk about cool.

Read and understand forward & backward. You won't believe your eyes.


BRAIN GAMES 


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Reading difficulties - common complaint

Reading is normally fluent but can be compromised by several complaints

- blur
- double vision
- jumping/moving words
- uncomfortable eyes
- vertigo
- headache



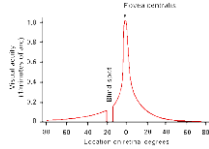
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Which are the visual requirements for a normal reading function?



Visual acuity

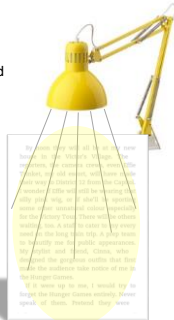
- Visual acuity is the ability to see details
→ 1.2 is considered normal decimal acuity
- Should normally not differ more than one row between the eyes
- Refractive errors most common cause for low visual acuity





Contrast sensitivity

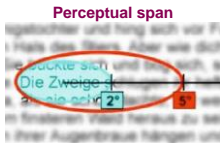
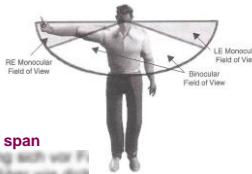
- The ability to distinguish objects against background
- Our world is not black and white!





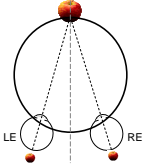
Visual field – the ability to detect and localize

- Important with normal visual field for:
 - visual orientation
 - maintaining balance
 - detect and localize objects
 - reading
 - etc.



Normal binocular vision



- Two eyes – one world
→ two images is fused into a single binocular percept
- Binocularity improves:
 - visual acuity
 - reading in low contrast conditions
 - depth perception
 - eye–hand coordination
- Diplopia present when binocular fusion breaks down



Ocular near response


When viewing a near object, the eyes have to:


- converge – to place the object of interest in the two fovea
- accommodate – to focus the image


Reading eye movements

Bävern är en mycket skicklig simmare. I vattnet når den hastigheter av mer än elva kilometer i timmen. För att skydda sig mot kylan har bäverns hud tusentals små hårstrån och ett tjockt lager med fett. Med hjälp av sina stora lungor kan den stanna under vattenytan mer än tjugo minuter utan problem.




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Eye movement control


Fixational eye movements 

- To maintain stable binocular fixation on a small target
- To allow fixation on a word during reading


Saccadic eye movements 

- Fast shifts of the line of sight between targets
- To move the eyes over the text during reading



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Visual problems when reading

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Disturbed near viewing

Refractive errors (hyperopia, astigmatism)

- blurry text and text-shadows

Accommodative disorders

- reduced ability to increase accommodation, blurry text

Presbyopia

- age related decline in accommodative ability, blurry text

Convergence disorders

- reduced ability to focus visual axes at near, moving text

Latent strabismus

- reduced ability to view near for prolonged periods



Reduced eye movement control

- Convergence disorders, latent strabismus
- Jumping/moving words when tired

Här vill svenskarna helst ha sommarstuga
 Nära havet ska det vara när svenskarna köper fritidshus. Här är listan på de hetaste geografierna för stugdrömmar. Högst av allt rankas ett ölandskap.

Det har varit en bra affär för de flesta att äga fritidshus. De senaste fem åren har priserna stigit cirka 40 procent för en genomsnittligt sommarhus i landet. Men det är inte var som helst som köparna står på kö. Alla helst vill vi nämligen köpa i en handfull särskilt hetta geografier. Läs vidare om hur de hetaste fritidshusgeografierna rankas i år, när svenskarna själva får ranka dem.

Bistad med Björnehövdén hamnar i år på niende plats bland Sveriges mest attraktiva fritidshusregioner. Fintur har Hälsönd ligger före, men inte långre. Det är SVAI som i år lig enklst följar alternativen om hur de ser på fritidshus och var de helst ska ligg.



Reduced eye movement control

- Nystagmus
- Illusion of movement of the visual surrounding



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Treatment of disturbed near viewing

- Refractive errors (hyperopia, astigmatism)
- spectacles for distance and near



Accommodative disorders

- reading spectacles (+1.00 D) and vision training (8-35 y)



Presbyopia

- reading spectacles (power depends on ability, between +1.00 to +2.50)



Convergence disorders

- reading spectacles with prism base in and vision training



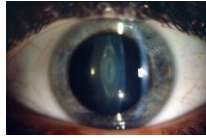
Latent strabismus

- reading spectacles with prism base in



Ophthalmological causes

- **Cataract** – low visual acuity, poor contrast vision
- **Macula degeneration** – low visual acuity, poor contrast vision, defect visual field
- **Glaucoma** – low contrast vision, defect visual field
- and more...



Conclusions

- There are different kind of visual obstacles that affects reading ability
- A thorough visual examination reveals most obstacles
- Many of the obstacles can be relieved by optics, visual training or a better lamp
