



This presentation is part of the COGAIN Deliverable D3.4

# Eye Control Hints and Tips

by

the Network of Excellence on

Communication by Gaze Interaction

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*(Please click on speaker icon on each page  
to hear the presentation)*

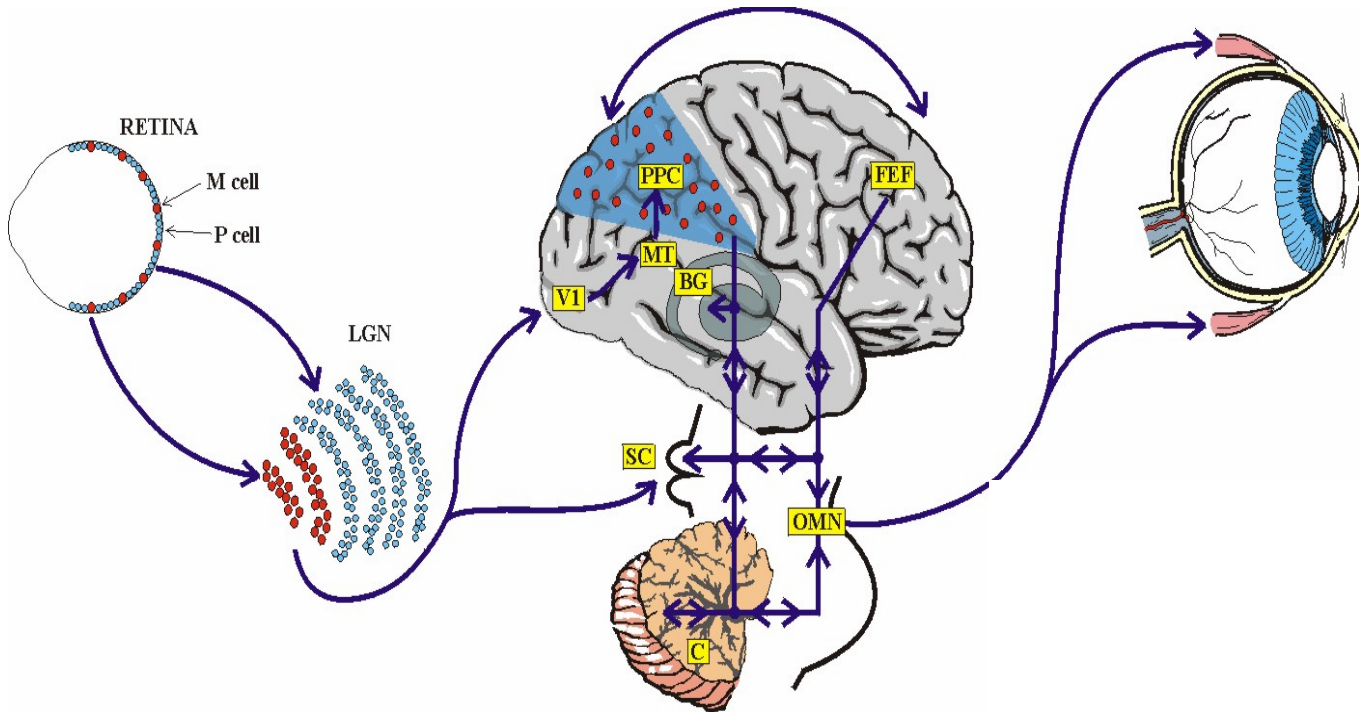


# Adaptation of eye gaze communication aids for users with « visual » problems

Jacques Charlier, Sébastien Vermandel  
Metrovision, Department of R&D, Pérenchies, France

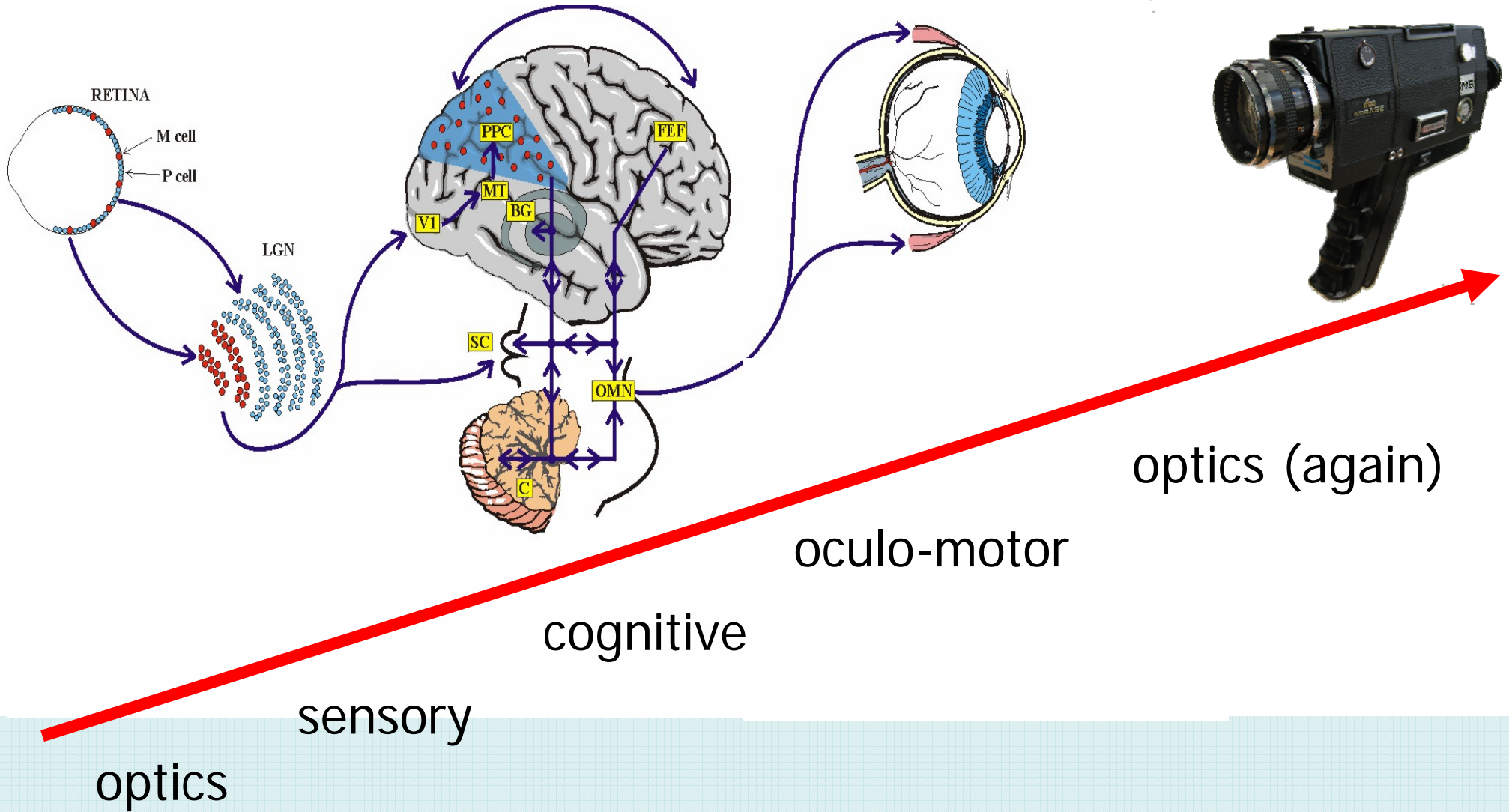
Dr Sabine Defoort-Dhellemmes  
Lille Medical Center, Lille, France

# « visual » problems

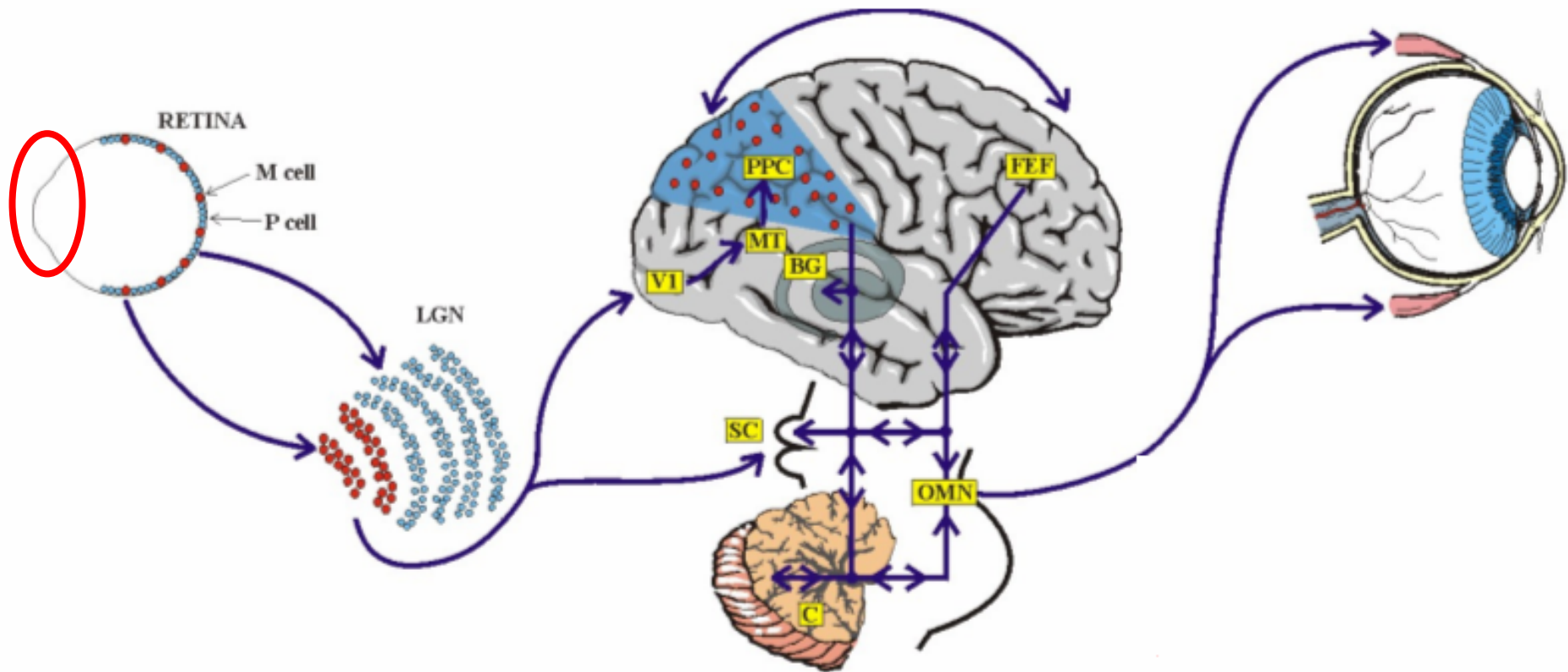


In our experience,  
70 percent of users of eye gaze communication aids  
have “visual” problems.

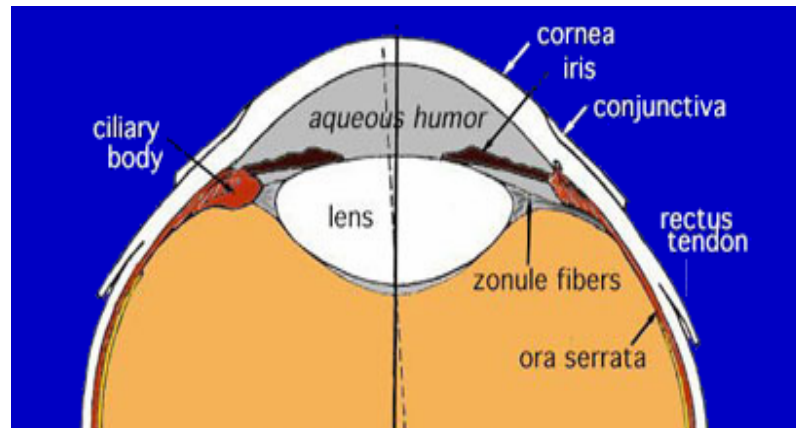
# « visual » problems



# Optical problems

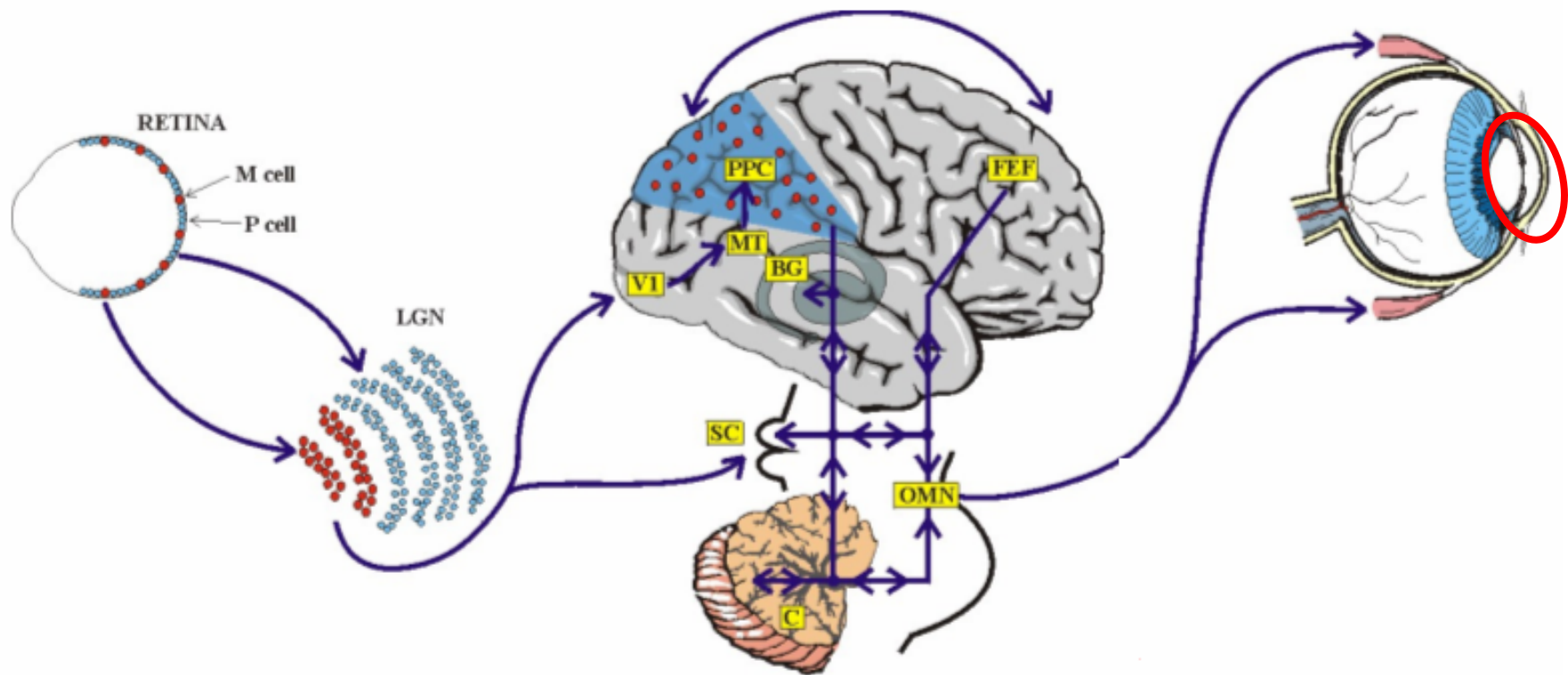


# Optical problems



- refractive errors: short distance correction
- diffusion errors, opacities... (cataract, ...)

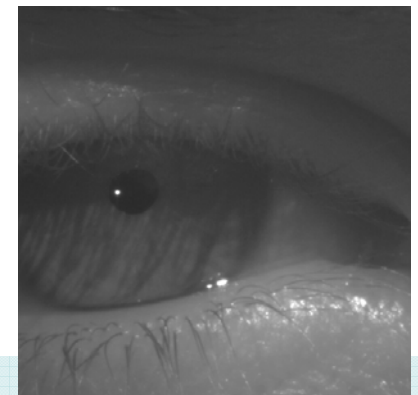
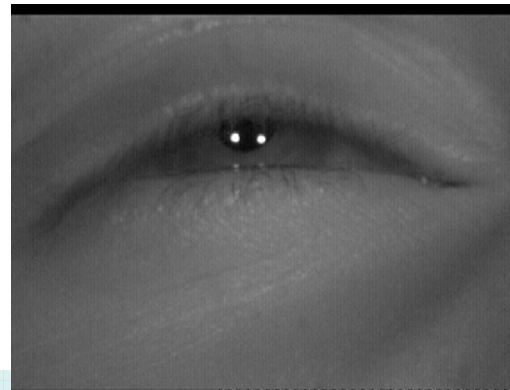
# Optical problems



# Optical problems



- Reflections from optical aids
- Masking of the pupil



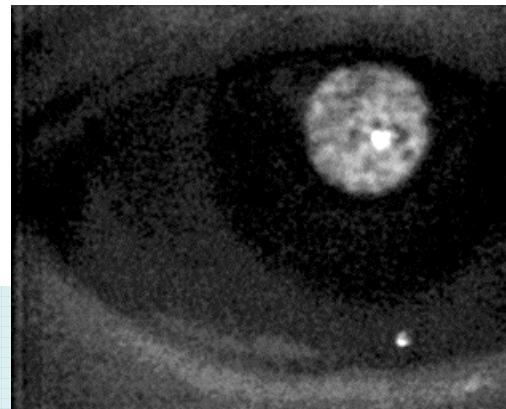
# Optical problems



➤ Reflections from  
intraocular lens,  
respiratory masks, etc



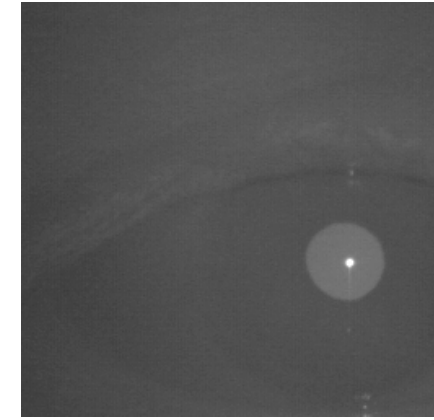
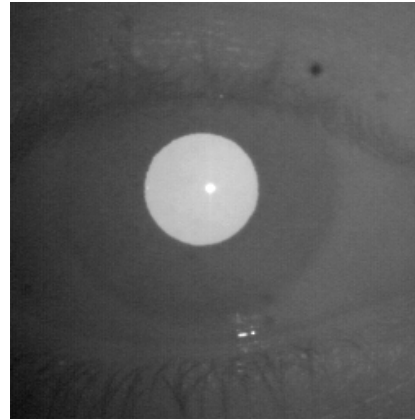
➤ Defects of the cornea  
and /or the tear film



# Optical problems



➤ Images obtained with  
a bright pupil eye tracker



➤ Image obtained with  
a dark pupil eye tracker





- Need a detailed image of the eye to identify problems
- Need ways to easily position the eye gaze system relative to the head of the user.

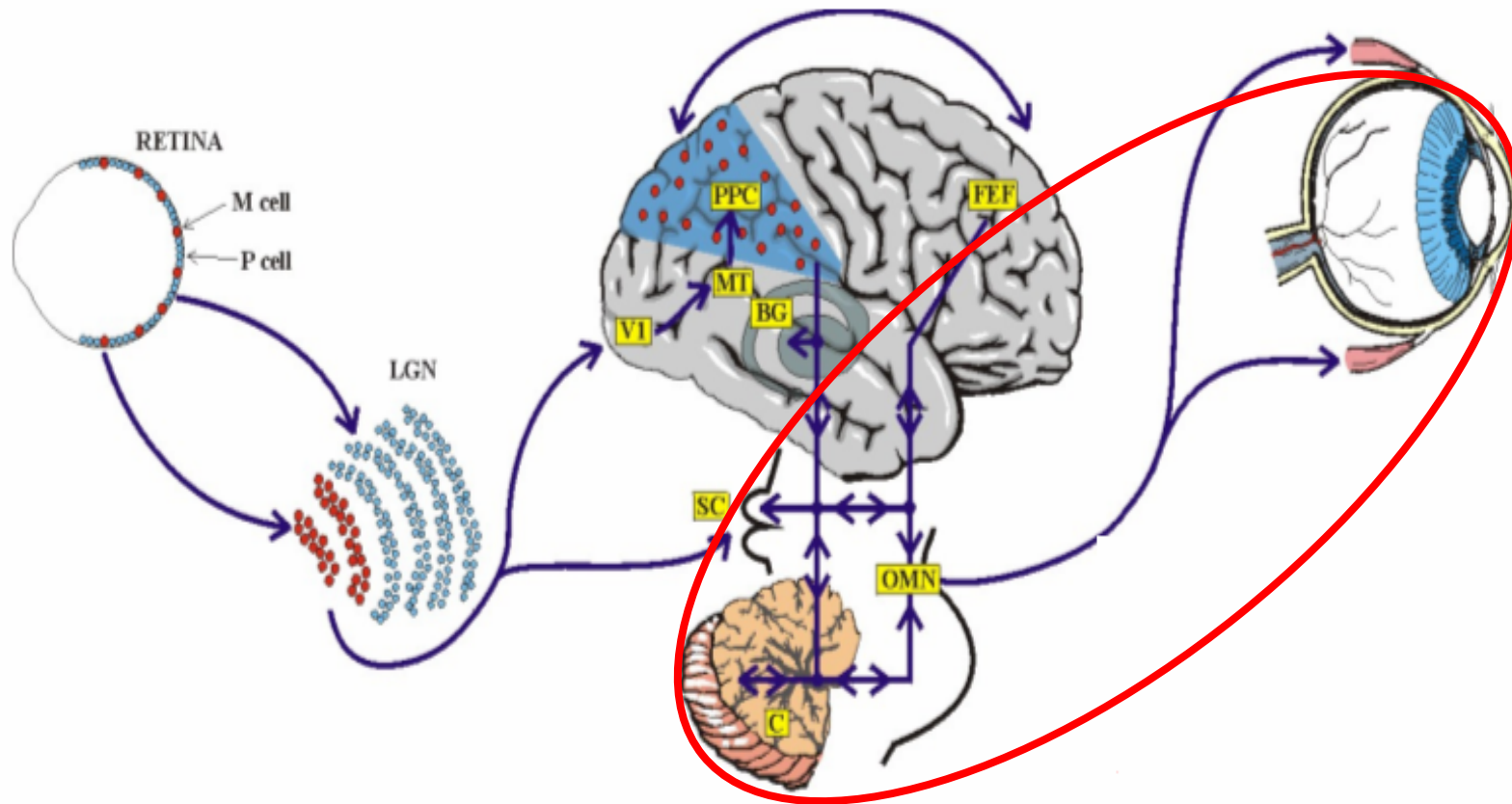


# Sensory problems



- central vision: visual acuity
- peripheral vision: visual field

# Oculomotor problems



# Oculomotor problems (1/2)



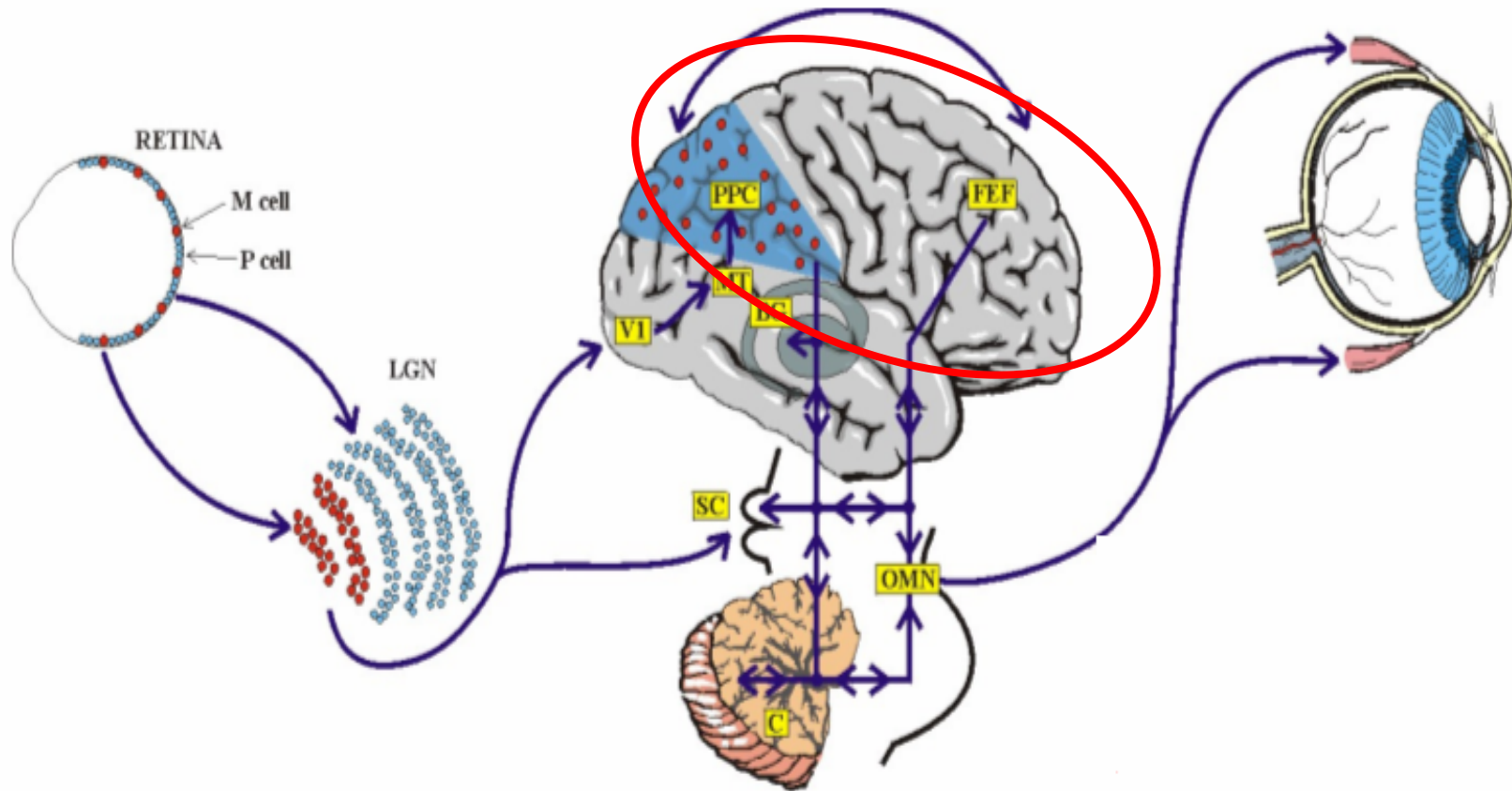
- neural control of eye movements:
  - fixation: strabismus, phoria, **nystagmus**
  - saccades: **paresis**
  - visual pursuit
- mechanical (muscle, ...)

# Oculomotor problems (2/2)



- neural control of eye movements:
  - fixation: **strabismus**, **phoria**, nystagmus
  - saccades: paresis
  - visual pursuit
- mechanical (muscle, ...)

# Cognitive problems

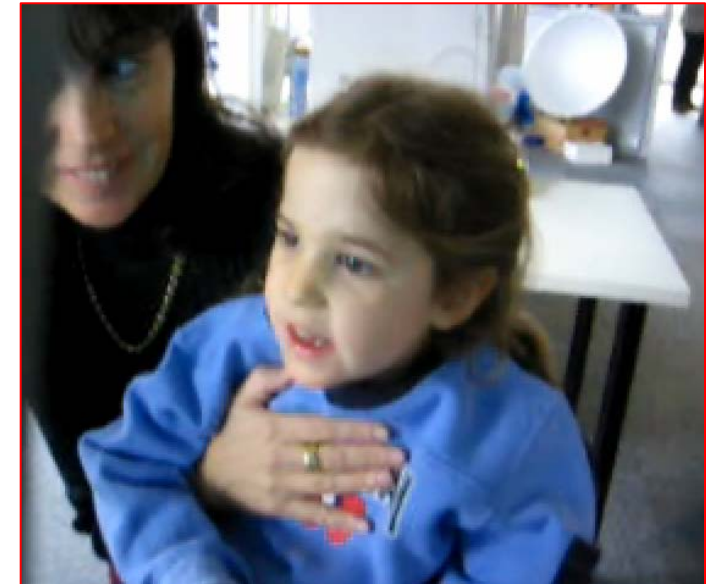
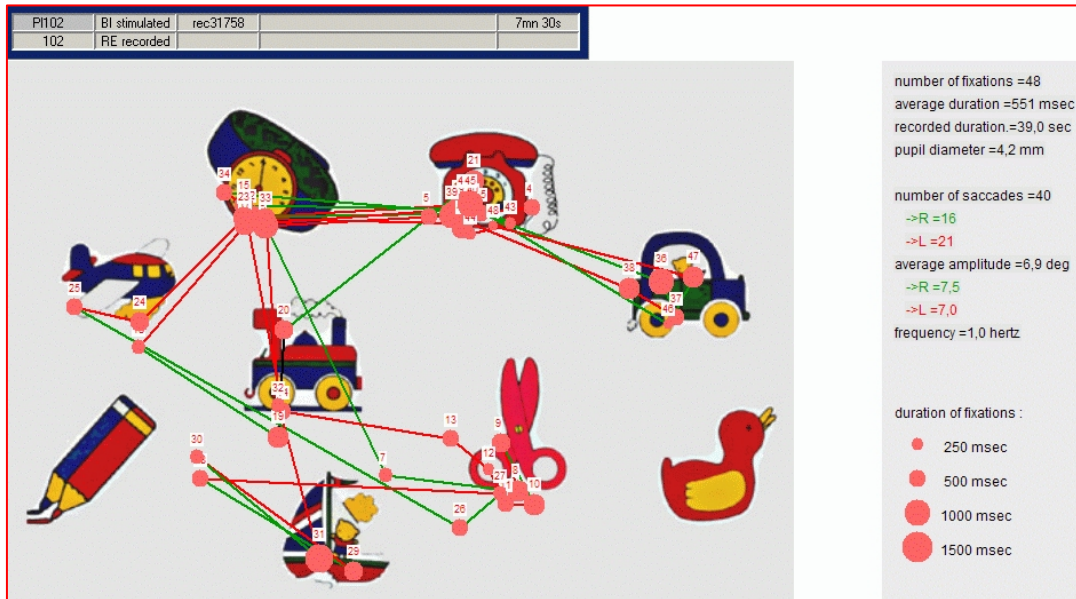


# Cognitive problems



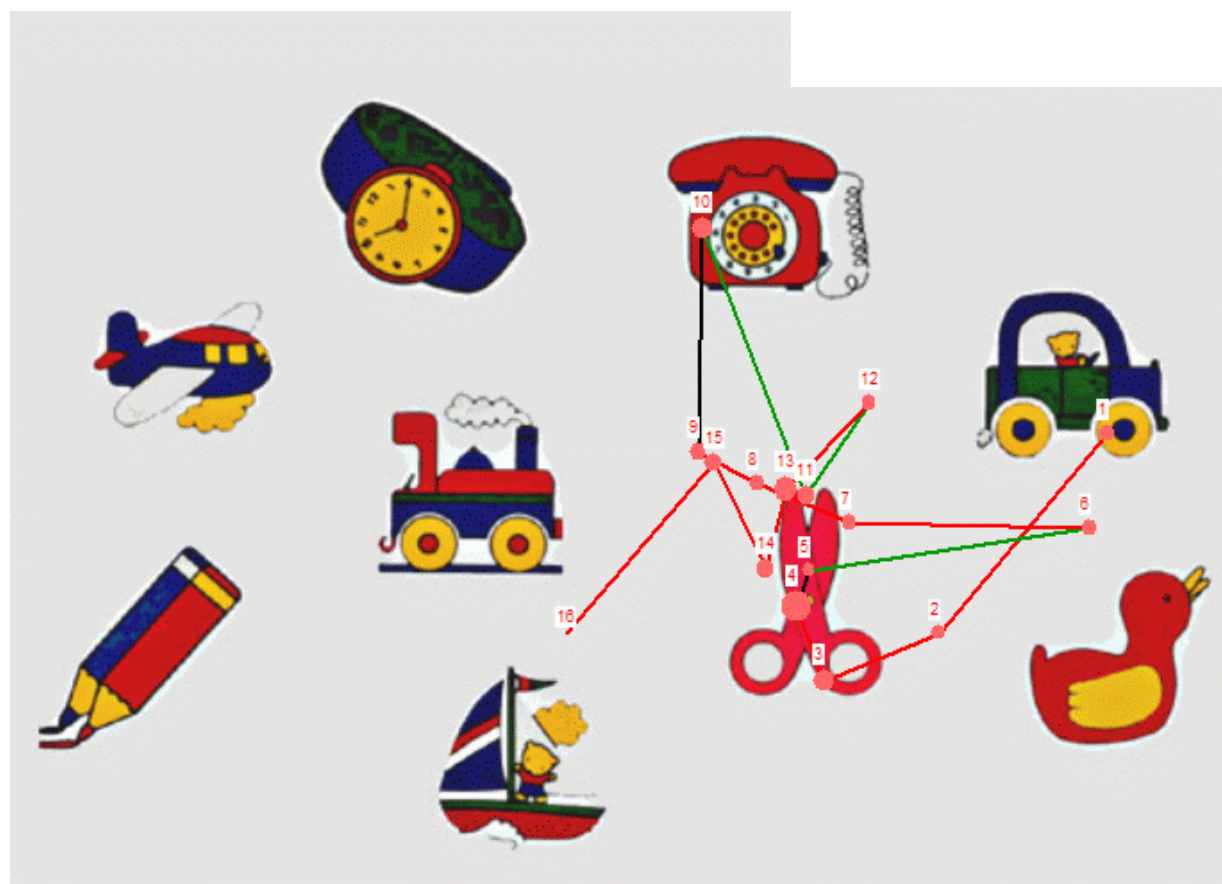
- visual agnosia
- lack of understanding
- lack of appetite for communication

# Which is which?



8 years old girl Rett syndrome

# Which is which?



Large refractive error?  
Hemianopsia?  
Paresis?  
Hemineglect?  
Understanding?  
Appetence?

# Conclusions



- Awareness of visual problems affecting the operation of EGCA is important to achieve successful adaptations.
- Solutions are frequently available in these situations which can be provided by vision care professionals

For more information...



[www.cogain.org](http://www.cogain.org)