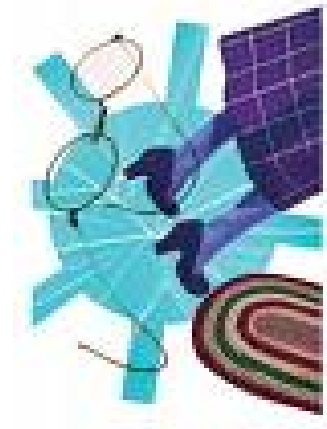


# Keeping an eye on falls



Dr Mark Hollands  
University of Birmingham

# Questions



- why do we need to see well to stay upright?
- why does our ability to see get worse as we get older?
- is there anything we can do about it?

# Why do we need vision to stay upright?

- Balance

- Close your eyes
- “Vertigo” at top of tall buildings
- “moving room” experiments



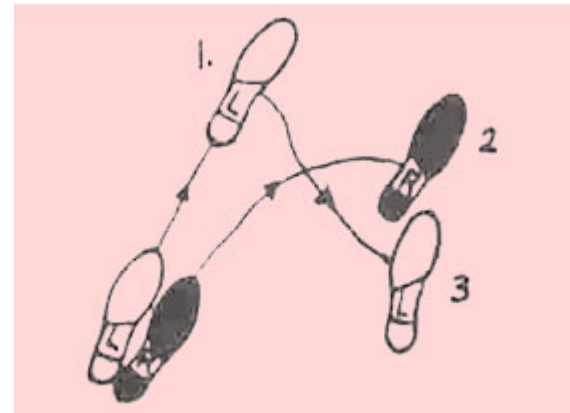
# Why do we need vision to stay upright?

- Route planning during walking
  - obstacles
  - slippery surfaces
  - safe places to step
  - slopes

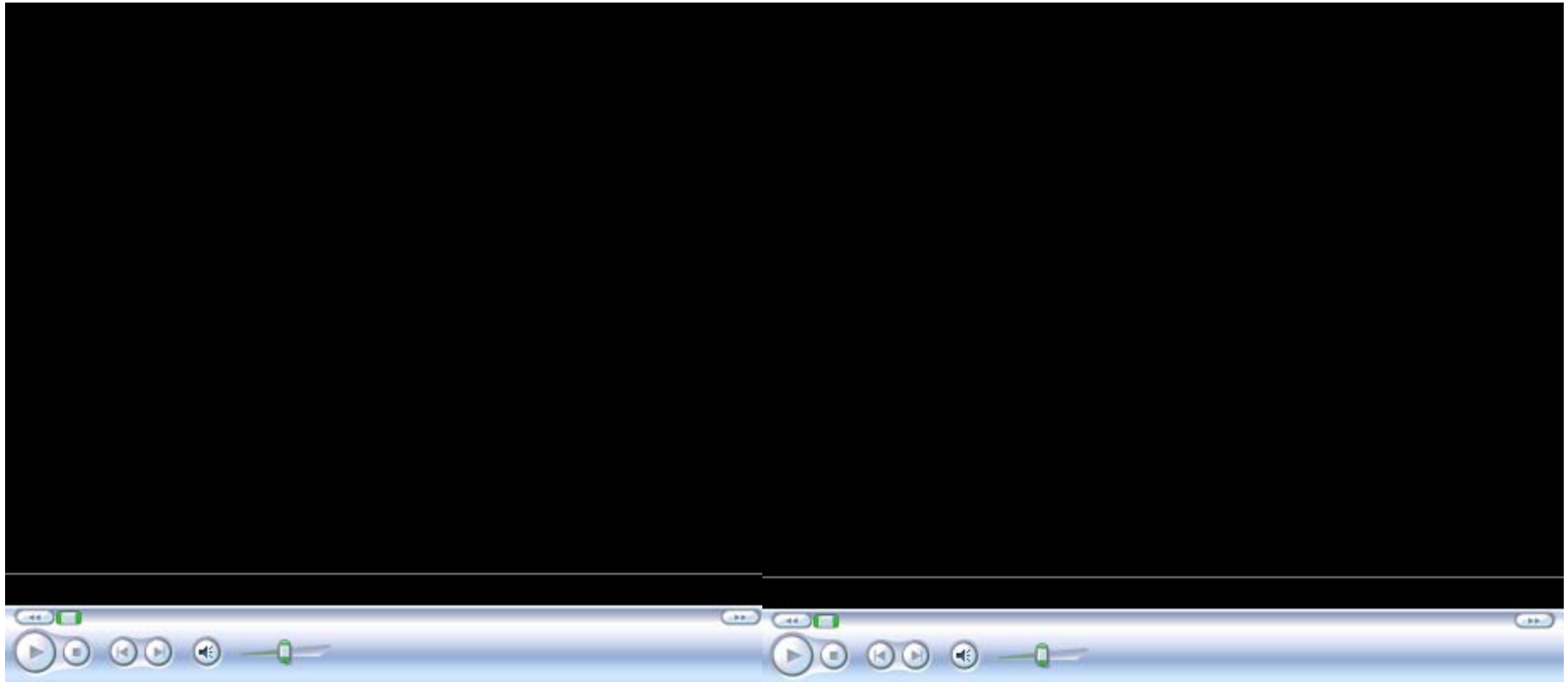


# Why do we need vision to stay upright?

## putting your feet in the right places at the right times



# Why do we need vision to stay upright?



# Why do we need vision to stay upright?

- Turning around and changing walking direction
  - eyes and head lead the way
  - optic flow (virtual corridors)



# Why do we need vision to stay upright?

- Responding to unexpected events
  - Grasping hand rail when slip or trip
  - Responding to unstable floor e.g. on bus



# Why can we not see as well as we get older?

## Eye diseases

- Cataracts
- Maculopathy
- Glaucoma
- Diabetic retinopathy

# Why can we not see as well as we get older?

## healthy ageing

- less light enters eye
- slower adjustment to changes in light level
- increased glare
- reduced visual field
- reduced sensitivity to contrast
- medical conditions e.g. changes to blood pressure and glucose levels

# Is our brain telling us to look in the right places at the right times as we walk?



- attention and cognition
- anxiety/fear of falling
- visuomotor control (how brain uses vision to make an appropriate movement)



# Is there anything we can do about it?



look after eyesight



- get regular check ups
- keep glasses clean and wear them when you are supposed to
- consider alternatives to bi and varifocals

# Is there anything we can do about it?

Visually optimize your environment

- Lighting
- Décor



# Is there anything we can do about it?

Change behaviour!

- scan ahead
- try to ignore distractions
  - keep glasses close by
    - turn on lights
    - be careful at dusk
- wear a hat on bright days

