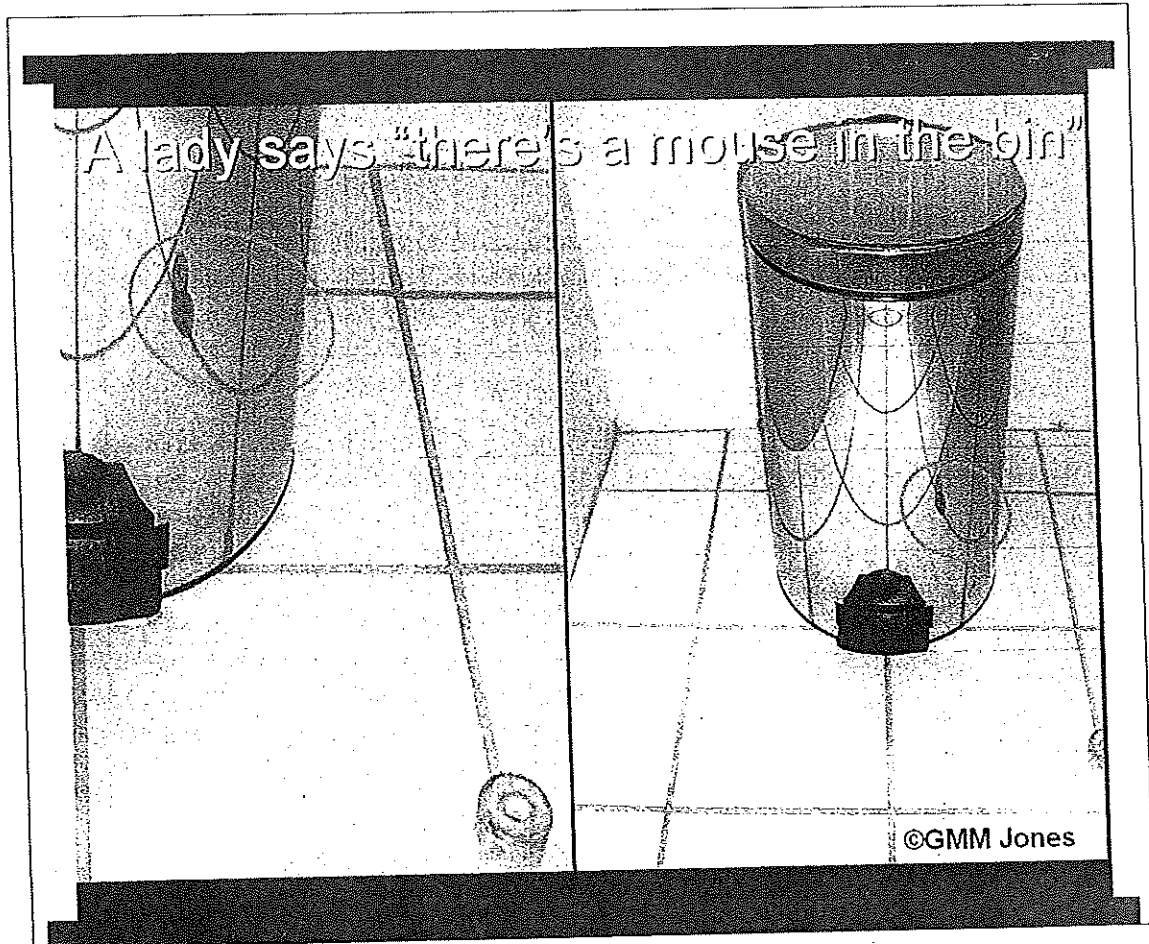


Notes to accompany the presentation:

**"Solving the mystery of the 'mouse in the bin', and others
(how advances in neuroscience are assisting dementia care)"**

Dr. Gemma MM Jones



A lady, a resident in a care home, is adamant that there's a mouse in the bin! She repeats this, and the caregiving staff keep telling her that isn't so. One of them even goes over to the bin to look in it, in an attempt to convince her. Yet, the lady continues to say this, in a rather surprised and amused tone of voice.

One of the caregivers becomes annoyed because family visitors are due to arrive, and such exclamations are not very good advertising for the cleanliness of the care home. She tells the lady, again, that there is no mouse in the bin and to stop saying this. However, the lady continues.

Finally when the caregiver wonder what the lady is seeing, and goes to sit next to her. She notices what the lady is looking at: she realizes that the lady was reporting 'literally' what she was seeing (unable to say 'the image in the highly reflective cylindrical surface of the bin is a distorted reflection of the doorstop, and tile line-curvature look just like a mouse in the bin'.)

What are possible consequences to care, if her mistake is not accurately understood?

- . being thought to be hallucinating, and unhelpfully being given anti-psychotics
- . having caregivers, family and other residents distance themselves from her because she is thought to be crazy or psychotic

Should you intervene, and if so how?

Assess whether what she is seeing is troubling her, (and other residents, staff, visitors). In this instance the lady is not frightened, but seems somewhat amused by what she is seeing. If she was frightened, there would be a need to intervene immediately. Also, if what she is saying is perturbing others, there is a need to intervene. Possible solutions?
E.g. Move the lady, or move the bin out of sight, put a matt plastic layer onto the bin.

Is the lady having a hallucination?

No. A hallucination is where someone sees something that is not present. In this instance, the lady is seeing an object/image (a high quality illusion) which is really present (with real retinal vision), but she is misinterpreting it.

What is happening, to cause her to not see this properly?

There are a variety of types of visual, and cognitive (thinking) mistakes people can make. In this instance, the lady is making a 'visual-cognitive mistake' – unable to see that the reflection in the bin is an illusion (a distortion of the floor surface and door stop, reflected in a highly polished cylindrical surface.) She is describing it the way she sees/understands it.

When people do not see things clearly, they make guesses

There are different quality guesses, from 'best, informed guesses' to 'wild guesses'.

What factors can affect vision in people with dementia?

There are a number of factors that can compound one another

- . previous vision difficulties
- . normal age-related changes to vision
- . visual diseases common to old age (such as cataracts, macular degeneration)
- . use of medications which can have visual side-effects
- . progressive visual changes associated with particular types of dementia (e.g. in Alzheimer's Disease, the entire visual system can eventually be damaged from the retina, optic nerve, lateral geniculate nucleus, through to the visual cortex).

Increasing difficulties in attention, memory, comprehension, 'reality testing' and problem solving, logical thinking ability and abstraction, and language ability can make it difficult for a person with dementia to accurately explain to others what they are or were seeing. Explanations that are given to a person with dementia to help them today, may not be remembered tomorrow, and need to be repeated.

How poor can people's vision be?

There can be large variations in the quality of what a person sees ranging from:

- . blurred, vague
 - . only partial
 - . distorted or exaggerated
 - . objects as inseparable from the background
- Individual components of vision can change (e.g. colour, depth of field, movement, lines, contrast, size of peripheral and vertical visual field, figure and object recognition).

Different types of visual phenomena (visual mistakes) can occur in people with Alzheimer's disease and some other dementias. They seem to develop in a characteristic order.

- . visuo-spatial difficulties (losing the ability to make and remember or use existing 'mental maps' of one's environment)

- . Illusions (the inability to problem-solve high quality, distorted images)
- . misperceptions (guessing, but incorrectly, at degraded or poorly perceived images)
- . genuine hallucinations (which seem to be much rarer in Alzheimer's disease than previously thought)
- . mis-identifications (difficulty naming and accurately describing what is being seen)

Q What other types of difficulties do people with dementia have?

Most caregivers have seen examples of people misinterpreting

- . shadows, dark surfaces
- . mirrors, and shiny surfaces
- . images on TV
- . highly patterned surfaces (flooring, bedspreads, curtains,...)
- . moving objects
- . depth of field

Q Do anti-psychotic medications help such 'visual/cognitive' mistakes?

No. Such medications do not help to improve various types of damage resulting from a combination of age-related changes, visual pathology, and dementia-specific damage to the visual system. It is well documented that they can make visuo-perceptual functioning worse, even causing hallucinations, in Parkinson's disease with dementia, or Lewy body dementia.

Conclusion:

We all experience many types of Illusions in everyday life (colour, depth, form, object completion); however, without having brain damage, we learn to problem-solve many of them because we can 'test reality' and remember how to interpret them each time we see them. Our brain provides us with a perception of what some have called 'a seamless reality', a sort of 'non-stop 3D film'. However, scientists are increasingly discovering how many little 'blank patches' or 'missing pieces' our brain's processing, in conjunction with our expectations, is 'filling-in' for us. The brain does this automatically, and few of us ever experience or notice such 'blank spots'. Neither can we detect how the brain 'automatically fills-in' missing pieces, does 'best guesses', or tries to solve ambiguities in sensory information.

Antipsychotics (many are anti-cholinergic) are often unhelpful for visual problems in Alzheimer's disease since it is a cholinergic-deficit illness. Listening to a person's story, their 'perceptions' of what they are experiencing, is crucial for accurate investigation and choosing interventions. The terminology used to describe a person's difficulty are also important.

Visual aids to simplify the environment and emphasize important cues can be helpful:

- increasing good-quality ambient lighting - to maximize existing vision and reduce shadows
- improving figure/background contrast
- removing reflective surfaces & mirrors
- minimizing patterns to allow the person to focus on essential information
- enhancing the visibility of carers and care-givers
- bringing important information into the person's visual field when they have severe impairments and mobility difficulties

Related questions:

- Do environments allow caregiving staff to provide professional bespoke dementia care?
- Is the care setting a pleasant environment to work in, live in, and visit?
- Are the corridor spaces outside of the lounge/living room/kitchen areas bright, engaging and friendly; like going for a walk in a nice place or neighbourhood?
- How obvious are key features related to dignity and safety (e.g. Highly visible toilet doors and handrails)?
- Are staff visible and maximally present with residents in lounges? Or, are they often absent (e.g. helping to walk individuals to distant dining rooms and retrieving persons who are lost, preventing someone from trying to leave to 'go home')?

- Are orientation cues and symbolic familiar objects visible in the reduced visual fields of older people? Can they be easily found, so they can be interacted with?
 - What space is there for various types of activities, which are unlikely to be experienced as fearful? For example:
 - for a large kitchen-type table
 - a real (or mock) fireplace to sit in front of for 'the feeling of safety or home'
 - a place where games like 'shuffle board' are set up for use permanently
 - to locate a glider or rocking chair
 - a quiet area where it's possible to put on music for a particular person
- [Also consider questions related to other types of familiar (safe) sensory cues, which can make people feel they are in a familiar environment, even when they cannot see well. E.g. can the aromas of food preparation, which stimulate appetite, be enjoyed by residents?]

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