Stimulating Episodic Memory Using SenseCam

What is SenseCam?
A new concept for digital cameras
- Wearable, wide-angle lens
- Automatic capture
- Additional sensing ability

Sensors
- Tri-axial accelerometer
- Passive IR (body heat
- Temperature
- RGB light intensity

Viewer software for PC
- Rapid serial visual presentation (RSVP)
- Sensor data display

Properties of SenseCam Images that are Similar to Episodic Memory Images
- They represent short time slices of experience
- They are temporarily ordered
- They are visual, but samples rather than continuous
- They are not taken intentionally
- They have a ‘field’ perspective, i.e. are from the viewer’s perspective
- They are triggered by sensory changes that may correspond to event boundaries

Using SenseCam as an autobiographical memory aid

Study design
- SenseCam (experimental) or written diary (control) or no memory aid (baseline) used to record special personal events

Procedure
- Information reviewed every 2 days for 2 weeks
- Memory of the event tested before each review
- Long-term recall tested

Case Study 1
Mrs B – limbic encephalitis (Berry et al, in press)
- Cambridge Memory Clinic
- 63 year old, well-educated woman
- Limbic encephalitis in 2002
- MRI showed hippocampal damage (see Figure 1)
- Severe episodic memory impairment
- No recall of an event within 3-5 days

Case Study 2
Mrs F – Alzheimer’s disease
- Cambridge Memory Clinic
- 67 year old woman, living alone
- Alzheimer’s disease diagnosed in 2000
- Now in ‘moderate’ stages of disease
- Marked memory impairment

Case Study 3
Mr D – Alzheimer’s disease
- Cambridge Memory Clinic
- 75 year old, married man
- Marked memory impairment
- Relatively intact other cognitive functioning

What patients say about SenseCam:
- ‘Looking at the images is definitely helpful... they cue memories of things I would normally just forget’
- ‘Sharing experiences again was a ‘’sheer pleasure’’
- ‘Different to ordinary camera as ‘you see exactly what you saw’’
- ‘I have more confidence’
- ‘SenseCam is a Godsend... everyone should have one!’

Conclusions
- SenseCam powerfully stimulated the recall and consolidation of detailed autobiographical memories that would have otherwise been forgotten
- SenseCam images are particularly strong cues: characteristics of SenseCam ‘movies’ may be very similar to characteristics of visual imagery in episodic memory
- SenseCam images may stimulate hippocampal networks responsible for episodic memory storage

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