grated. To test this hypothesis, we asked 90 healthy young adults to watch and mentally replay video clips depicting continuous events (without EBs) lasting from 3 to 15 s (Fig. 1). We found that remembering duration was close to the actual stimuli duration for short events, but smaller for longer ones. These results support the view that temporal compression emerges when events composing daily life activities are too long to be fully held in working memory.

References

Baldassano, C., Chen, J., Zadbood, A., Pillow, J.W., Hasson, U., Norman, K.A., 2017. Discovering event structure in continuous narrative perception and memory. Neuron 95 (3), 709–721.e5. https://doi.org/10.1016/j.neuron.2017.06.041.

Zacks, J.M., 2020. Event perception and memory. Annual review of psychology 71, 165–191. https://doi.org/10.1146/annurev-psych-010419-051101.

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Situating metamemory within metacognition in healthy aging

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One explanation of the decline in episodic memory in healthy aging is that the memory strategies of older adults are less effective than those of younger adults. This ability to implement memory strategies to efficiently allocate cognitive processes hinges on metacognitive function. Metacognition seems to rely on a domain general process in younger adults (Mazancieux et al., 2020), whereas dissociations are observed in the metamemory of older adults. Older adults are less accurate than younger adults to judge their memory in an episodic task, but they are as accurate as younger adults to judge their memory in a semantic task. This study aims to situate metamemory within metacognition in healthy aging. We hypothesized that older adults are less accurate than younger adults to judge their episodic memory performance. Additionally, we thought that there is no age effect on metacognitive efficiency in other cognitive domains. Participants had to provide confidence judgments on a recognition phase in four cognitive domains: episodic memory, semantic memory, visual perception, and executive functioning. Data were collected in a large sample (N = 373) of participants aged from 18 to 80 and were analyzed using a hierarchical Bayesian framework. Results showed no effect of age on metacognitive efficiency in the four tasks, including the episodic task (see Fig. 1). This study brings new evidence for the absence of metacognitive deficit in aging. Furthermore, the results suggest that the domain-general process of metacognition is stable throughout the lifespan. A previous study also showed no effect of age on metacognitive efficiency using retrospective confidence judgments in a perception task and a memory task (McWilliams et al., 2023). Thus, the cognitive processes that support retrospective confidence judgments seem to be preserved in aging and cannot explain the episodic-memory deficit observed with prospective judgments.

References

Mazancieux, A., Fleming, S.M., Souchay, C., Moulin, C.J.A., 2020. Is there a G factor for metacognition? Correlations in retrospective metacognitive sensitivity across tasks.

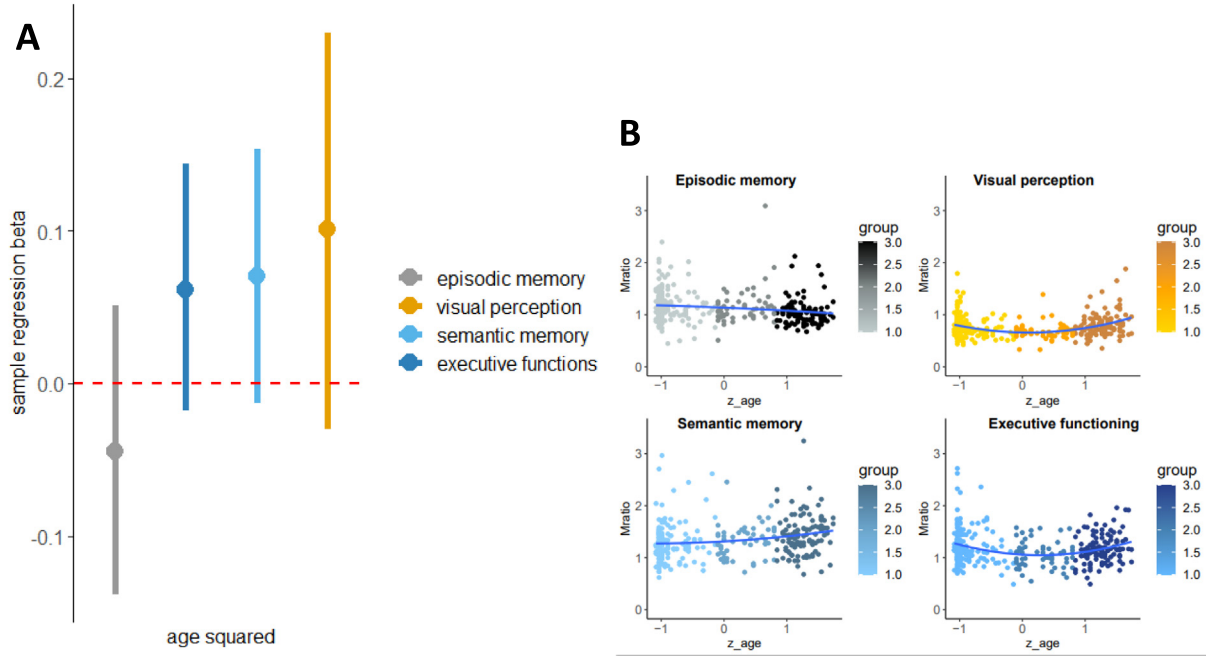

Fig. 1. A: Mean estimates of betas of the quadratic term with 95% high-density intervals (HDIs) in the four tasks. B: Distribution of Mratio by age in the four tasks.

Journal of Experimental Psychology: General 149 (9), 1788–1799. https://doi.org/10.1037/xge0000746.
McWilliams, A., Bibby, H., Steinbeis, N., David, A.S., Fleming, S.M., 2023. Age-related decreases in global metacognition are independent of local metacognition and task performance. Cognition 235,. https://doi.org/10.1016/j.cognition.2023.105389 105389.

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Age differences in the mechanisms underlying remembering events vividly and confidently

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The way humans remember events changes across the lifespan. Older adults rely to a greater extent on gist rather than perceptual detail for episodic memory judgements. Additionally, older adults subjectively rate their memory's vividness as greater or equally high as young adults despite poorer performance on episodic memory tasks. This study aims to explore how the content and specificity (semantic gist versus perceptual detail) of event memories relate to the subjective experience of memory vividness and memory confidence, and how this relationship is affected by healthy ageing. 100 healthy older adults and 100 young adults will be tested online, using an adapted version of a paradigm developed by Cooper and Ritchey (2022). At encoding, participants will be asked to generate a distinctive story in order to associate together (1) a theme word, (2) a person, (3) a place, and (4) an object, to create unique events. Immediately afterwards, participants will be tested on their memory for the identities of the event components (indexing semantic gist), and on a lure discrimination task (indexing memory for perceptual details). The performance on the memory tasks will then be used to explore the relationship between episodic specificity and content and subjective memory measures, obtained via continuous subjective ratings of vividness and confidence at memory test. This research will contribute to the limited body of evidence exploring the relationship between subjective and objective attributes of episodic memory across the lifespan.

References

Cooper, R.A., Ritchey, M., 2022. Patterns of episodic content and specificity predicting subjective memory vividness. Memory & Cognition 50, 1629–1643. https://doi.org/10.3758/s13421-022-01291-5.

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Modeling familiarity through the combination of deep learning and Hebbian training

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In this work, we designed a connectionist model for familiarity recognition to understand the mechanisms behind familiarity on natural images. Past computational models successfully reproduced familiarity on abstract patterns with continuous neurons. They were inspired by the perirhinal cortex (PRC) which has been shown to be crucial during familiarity recognition (Bogacz & Brown, 2003). In fact, a small fraction of neurons in the PRC called *novelty neurons* respond in a stronger manner when new stimuli are presented. Besides, when a stimulus become familiar, its activity in the PRC is reduced compared to novel ones (Brown & Aggleton, 2001). Here, we implemented familiarity recognition on natural images with the combination of a Convolutional Neural Network and a two-layers Feedforward Network, the latter uses Hebbian training to learn natural images (Fig. 1). To test the abilities of the model, we implemented a forced-choice recognition (FCR) task and performed four simulations. During the training phase, a number N of images were learned by the model. During the testing phase, two images were presented simultaneously to the network: a new image and an image learned during training. The model had to

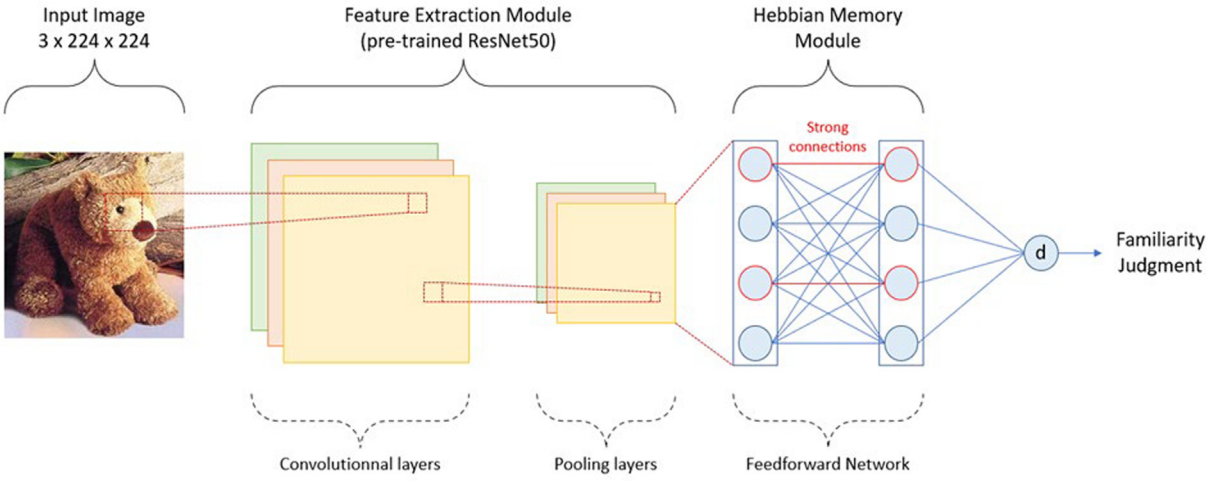

Fig. 1. Global architecture of the model. This model was designed with three successive modules. In the first module, a convolutional neural network is used to mimic the processing of a stimulus by the visual brain area. We used a pre-trained version of ResNet50 to extract the features of an image. The second module is a two-layers forward-propagation neural network. It learns the features of an image extracted previously with an Hebbian learning rule. This memory module projects on an inhibitory interneuron called *d* which is used for the familiarity decision about an image. When two images are presented, the one with the highest level of inhibition *d* is chosen by the model as familiar.