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Reporting Summary

Nature Portfolio wishes to improve the reproducibility of the work that we publish. This form provides structure for consistency and transparency in reporting. For further information on Nature Portfolio policies, see our Editorial Policies and the Editorial Policy Checklist.

Statistics

For all statistical analyses, confirm that the following items are present in the figure legend, table legend, main text, or Methods section.

n/a	Confirmed	
☐	☒	The exact sample size (*n*) for each experimental group/condition, given as a discrete number and unit of measurement
☐	☒	A statement on whether measurements were taken from distinct samples or whether the same sample was measured repeatedly
☐	☒	The statistical test(s) used AND whether they are one- or two-sided *Only common tests should be described solely by name; describe more complex techniques in the Methods section.*
☒	☐	A description of all covariates tested
☐	☒	A description of any assumptions or corrections, such as tests of normality and adjustment for multiple comparisons
☐	☒	A full description of the statistical parameters including central tendency (e.g. means) or other basic estimates (e.g. regression coefficient) AND variation (e.g. standard deviation) or associated estimates of uncertainty (e.g. confidence intervals)
☒	☐	For null hypothesis testing, the test statistic (e.g. *F*, *t*, *r*) with confidence intervals, effect sizes, degrees of freedom and *P* value noted *Give P values as exact values whenever suitable.*
☐	☒	For Bayesian analysis, information on the choice of priors and Markov chain Monte Carlo settings
☒	☐	For hierarchical and complex designs, identification of the appropriate level for tests and full reporting of outcomes
☐	☒	Estimates of effect sizes (e.g. Cohen's *d*, Pearson's *r*), indicating how they were calculated

Our web collection on statistics for biologists contains articles on many of the points above.

Software and code

Policy information about availability of computer code

Data collection	N/A
Data analysis	We used R with R Studio for behavioural data analysis and SPM for analysis of fMRI data.

For manuscripts utilizing custom algorithms or software that are central to the research but not yet described in published literature, software must be made available to editors and reviewers. We strongly encourage code deposition in a community repository (e.g. GitHub). See the Nature Portfolio guidelines for submitting code & software for further information.

Data

Policy information about availability of data

All manuscripts must include a data availability statement. This statement should provide the following information, where applicable:

- Accession codes, unique identifiers, or web links for publicly available datasets
- A description of any restrictions on data availability
- For clinical datasets or third party data, please ensure that the statement adheres to our policy

De-identified behavioural data as well as code will be deposited at Boris Portal as and will be made publicly available under CC BY-NC 4.0. Any additional information, including neuroimaging data, will be made available upon request.

Research involving human participants, their data, or biological material

Policy information about studies with human participants or human data. See also policy information about sex, gender (identity/presentation), and sexual orientation and race, ethnicity and racism.

Reporting on sex and gender	All participants provided information about their sex based on self-report. We did not analyse data separately for both sexes.
Reporting on race, ethnicity, or other socially relevant groupings	All participants had the same race and ethnicity (self-reported).
Population characteristics	Participants were between 60-80 years of age.
Recruitment	Participants were recruited with flyers or media advertisement.
Ethics oversight	The study was approved by the local ethics committee (project number 2019-01779).

Note that full information on the approval of the study protocol must also be provided in the manuscript.

Field-specific reporting

Please select the one below that is the best fit for your research. If you are not sure, read the appropriate sections before making your selection.

☐ Life sciences ☒ Behavioural & social sciences ☐ Ecological, evolutionary & environmental sciences

For a reference copy of the document with all sections, see nature.com/documents/nr-reporting-summary-flat.pdf

Behavioural & social sciences study design

All studies must disclose on these points even when the disclosure is negative.

Study description	This study is quantitative experimental.
Research sample	The sample consisted of healthy older adults (age 60-80) living in and around Bern, Switzerland. We recruited participants using flyers or media avertisement.
Sampling strategy	We randomly assigned participants to the incentive or the no-incentive group. For the determination of sample size, we used G*power. We based calculations on a previous study that used incentives to enhance event-based prospective memory performance (Horn & Freund, 2021). The effect size in that study (Cohen's f = 0.25) suggested that an inclusion of n = 54 participants would be needed to find reliable effects in a repeated measures design (α = 0.01, power of 1-β = 0.99).
Data collection	Data was collected while participants were in an MRI scanner and pressed buttons to perform an event-based or time-based task.
Timing	*Indicate the start and stop dates of data collection. If there is a gap between collection periods, state the dates for each sample cohort.*
Data exclusions	For behavioural data analysis, not data was excluded. For fMRI data analysis, we had to exclude participants based on excessive movement or since they did not press a button.
Non-participation	No participants declined to participate or dropped-out.
Randomization	We randomly assigned participants to an incentive or a no-incentive group, using a formula in Excel based on sex and age.

Reporting for specific materials, systems and methods

We require information from authors about some types of materials, experimental systems and methods used in many studies. Here, indicate whether each material, system or method listed is relevant to your study. If you are not sure if a list item applies to your research, read the appropriate section before selecting a response.

Materials & experimental systems

n/a	Involved in the study
☒	☐ Antibodies
☒	☐ Eukaryotic cell lines
☒	☐ Palaeontology and archaeology
☒	☐ Animals and other organisms
☒	☐ Clinical data
☒	☐ Dual use research of concern
☒	☐ Plants

Methods

n/a	Involved in the study
☒	☐ ChIP-seq
☒	☐ Flow cytometry
☐	☒ MRI-based neuroimaging

Plants

Seed stocks

Report on the source of all seed stocks or other plant material used. If applicable, state the seed stock centre and catalogue number. If plant specimens were collected from the field, describe the collection location, date and sampling procedures.

Novel plant genotypes

Describe the methods by which all novel plant genotypes were produced. This includes those generated by transgenic approaches, gene editing, chemical/radiation-based mutagenesis and hybridization. For transgenic lines, describe the transformation method, the number of independent lines analyzed and the generation upon which experiments were performed. For gene-edited lines, describe the editor used, the endogenous sequence targeted for editing, the targeting guide RNA sequence (if applicable) and how the editor was applied.

Authentication

Describe any authentication procedures for each seed stock used or novel genotype generated. Describe any experiments used to assess the effect of a mutation and, where applicable, how potential secondary effects (e.g. second site T-DNA insertions, mosiacism, off-target gene editing) were examined.

Magnetic resonance imaging

Experimental design

Design type

Task-based fMRI, event-related design.

Design specifications

The tasks consisted of four blocks: During the first and the third block, participants performed a 1-back working memory task as an ongoing-task (Figure 1). During the second and fourth block, we added a prospective memory task to the ongoing task. One block contained the event-based task and the other block the time-based task. The order was counterbalanced across participants.

Behavioral performance measures

Correct button presses and response times.

Acquisition

Imaging type(s)

Functional MRI

Field strength

7T

Sequence & imaging parameters

T1-weighted images were obtained using a compressed-sensing accelerated MP2RAGE sequence (TR=6 s, TE=2.06 ms, TI 1 = 800 ms, TI 2 = 2700 ms, Flip angle 1 = 4°, Flip angle 2° = 5, voxel size 0.6×0.6×0.6 mm, acquisition time = 7:40 min). For task-based fMRI, we used a fat-suppressed whole-brain 2D gradient-echo EPI sequence with simultaneous multi-slice acceleration (TR=1 s, TE=24 ms, voxel size = 1.4 x 1.4 x 1.4 mm, Flip angle = 90°, slice acceleration factor = 4, in-plane acceleration = 3, acquisition time = 28:21 min, volumes = 1680).

Area of acquisition

whole-brain scan

Diffusion MRI ☐ Used ☒ Not used

Preprocessing

Preprocessing software

Pre-processing of fMRI data was done using Statistical Parametric Mapping (SPM12; Wellcome Trust Centre for Neuroimaging, London, UK), implemented in Matlab R2019b (MathWorks, Natick, MA, USA).

Normalization

We used the standard approach in SPM.

Normalization template

We used the MNI template for normalisation.

Noise and artifact removal

We analysed physiological data using the CompCor approach implemented in TAPAS. For first-level analysis, we included six nuisance regressors for movement parameters and eight regressors for physiological data.

Volume censoring: N/A

Statistical modeling & inference

Model type and settings: For first-level analysis, we used GLM models. For second-level analysis, we used a one-sample t-test or a two-sample t-test.

Effect(s) tested: For second level-analyses, we first conducted one-sample t-tests on first-level contrasts to examine which brain regions were active during event-based or time-based prospective memory in the no-incentive group. Then, we conducted a two-sample t-test to compare the incentive and no-incentive group.

Specify type of analysis: ☒ Whole brain ☐ ROI-based ☐ Both

Statistic type for inference (See Eklund et al. 2016): Cluster-wise inference. The relevant parameters reported in our results include: T-values, corrected p-values, MNI coordinates, cluster size and Brodmann areas.

Correction: The statistical threshold was set at $p < .05$ FWE-corrected at cluster level, with cluster size estimated at $p < .005$ uncorrected. In some cases, we considered results surviving a less stringent statistical threshold of $p<.05$ uncorrected at the cluster level (cluster-size estimated at $p=.005$, uncorrected).

Models & analysis

n/a	Involved in the study
☒	☐ Functional and/or effective connectivity
☒	☐ Graph analysis
☒	☐ Multivariate modeling or predictive analysis