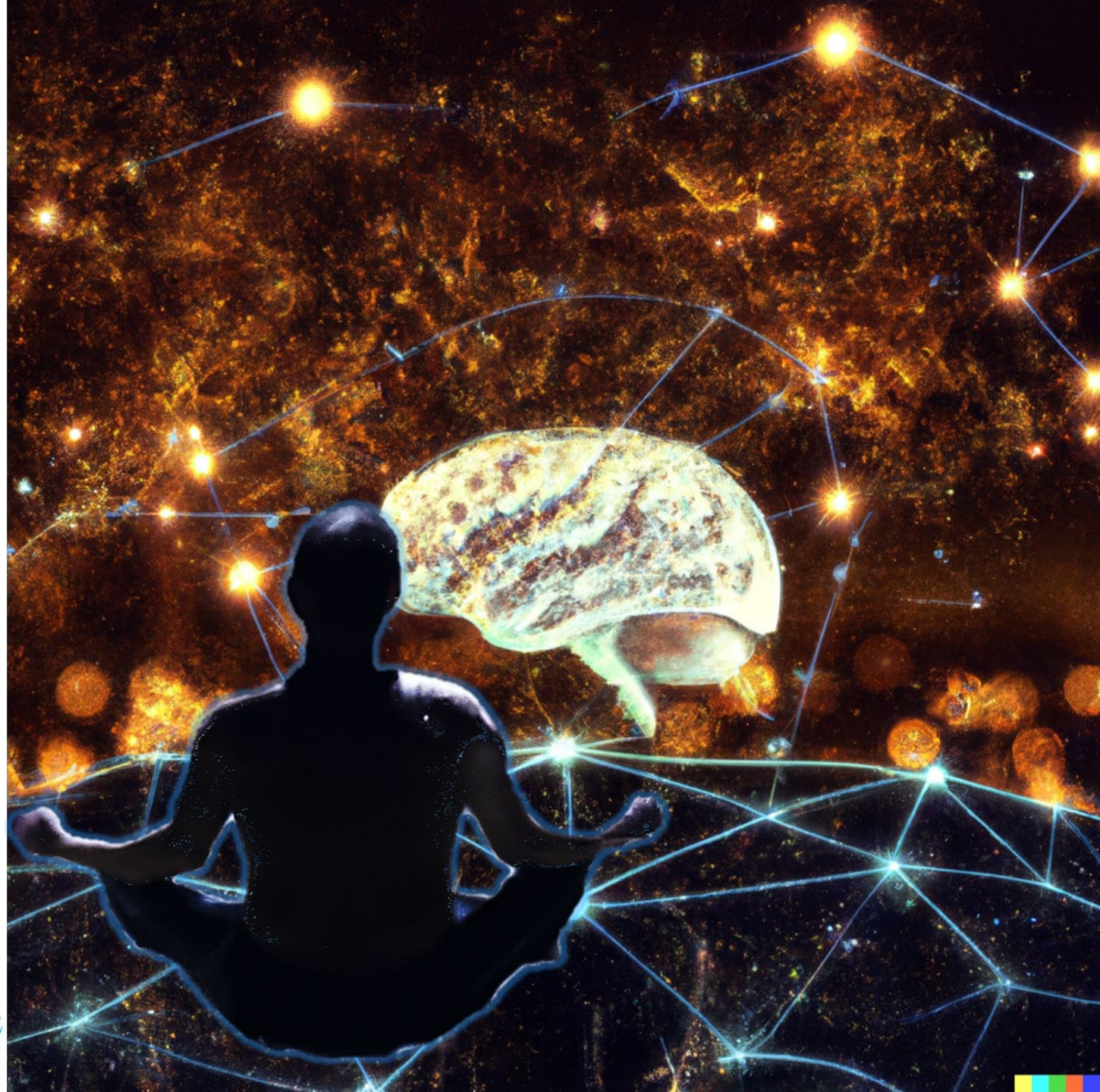


Meditation: Impact on Mental health in aging and AD

Gaël CHETELAT

*Unité Inserm U1237, Equipe NeuroPresage
Centre Cyceron, Université Caen Normandie, Caen*

www.neuropresage.fr



Insert polling question #1 here



INCREASE in the NUMBER and PROPORTION of OLDER adults from 1950 to now and to 2050 (estimation)

Increase in number

Increase in proportion

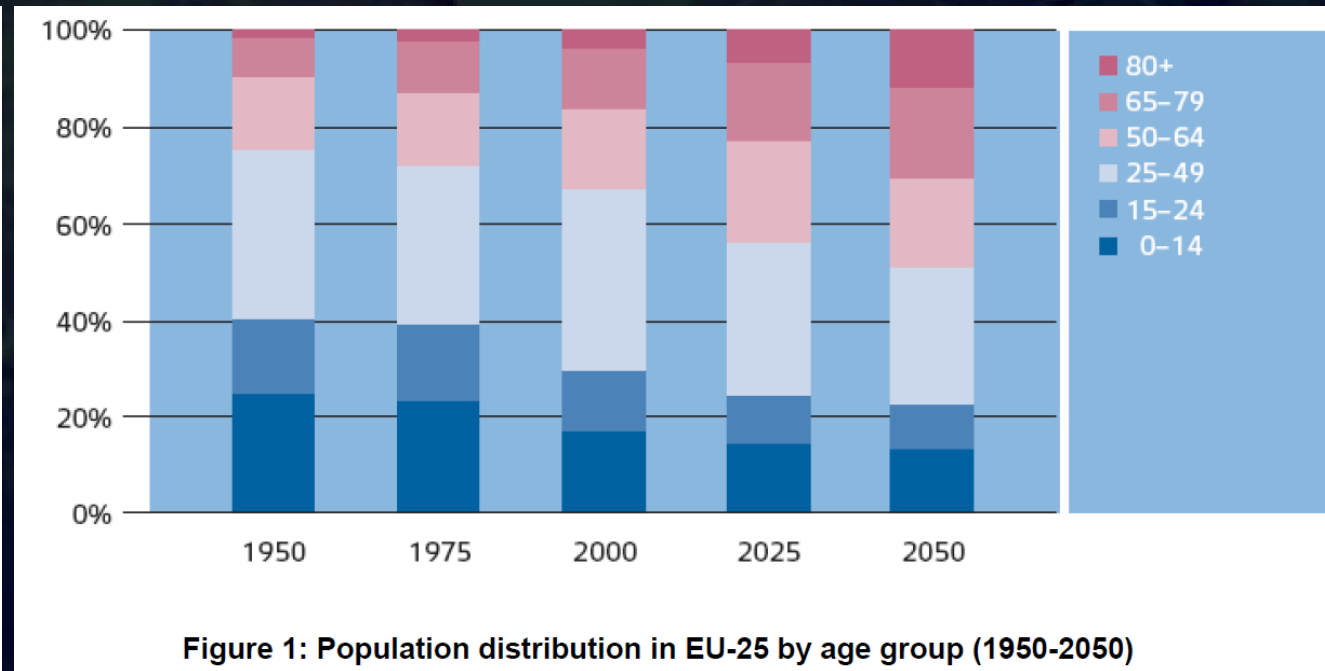
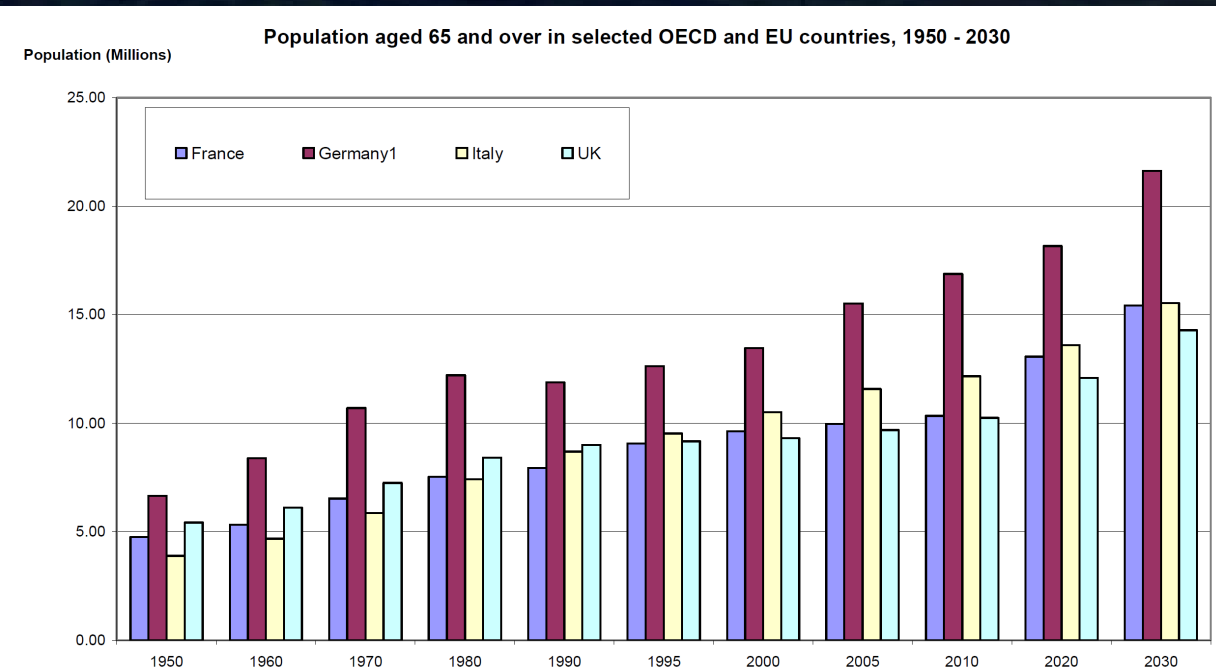


Figure 1: Population distribution in EU-25 by age group (1950-2050)

Source: World Population Prospects (United Nations)

Jané-Llopis, E., & Gabilondo, A. (Eds). (2008). Mental Health in Older People. Consensus paper. Luxembourg: European Communities.



Main conditions that degrade the quality of life of people as they are getting older

DEPRESSION:

10 to 15% of individuals aged > 65 years



Jané-Llopis, E., & Gabilondo, A. (Eds). (2008). Mental Health in Older People. Consensus paper. Luxembourg: European Communities.

SLEEP PROBLEMS:

Up to **50%** of individuals aged > 65 years



*Ohayon & Vecchierini, Sleep, 2005
Ancoli-Israel, Sleep Med, 2009*

DEMENTIA:

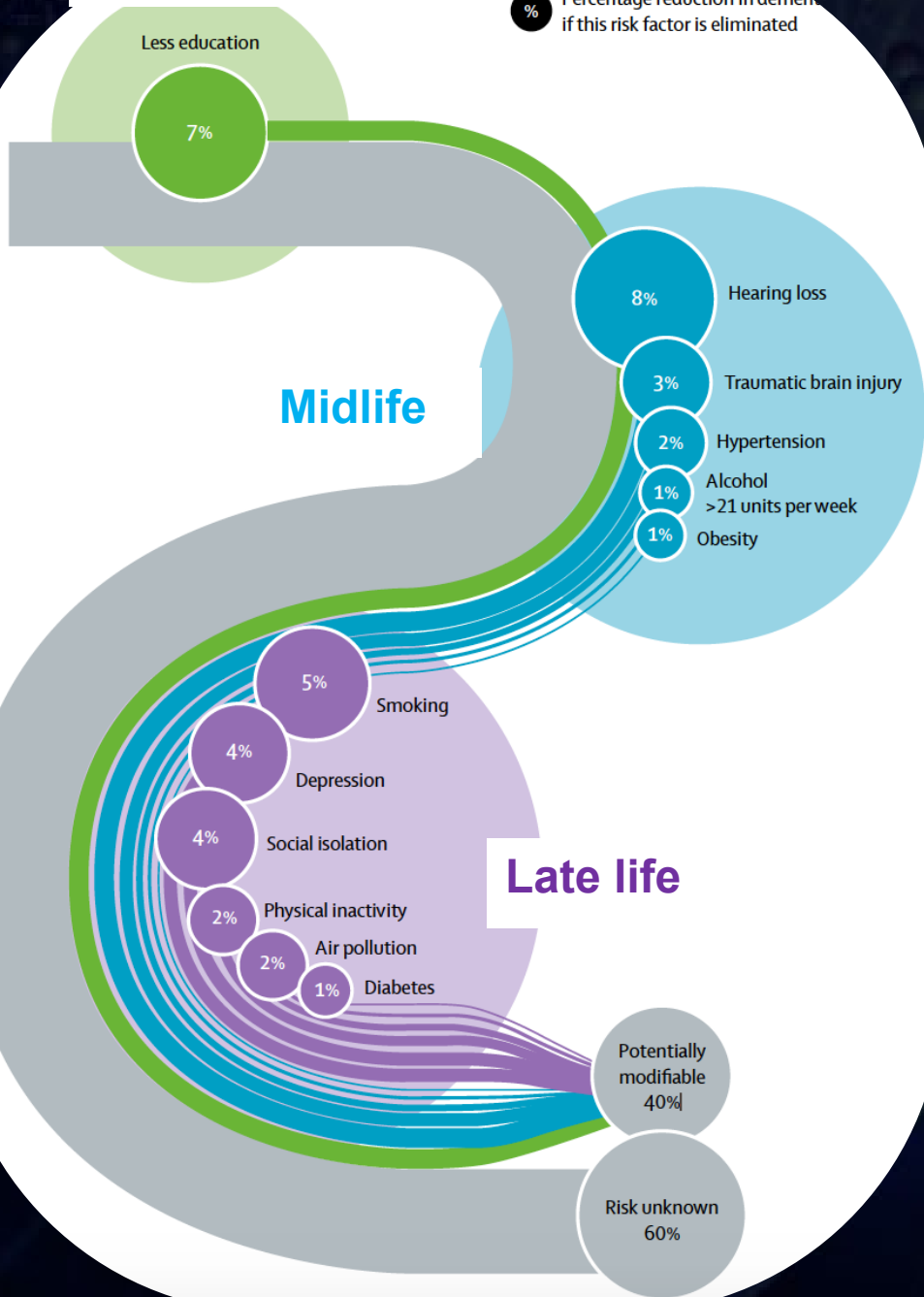
About **10%** of individuals aged > 65 years



(WHO; Rogers et al., 2019; <http://www.ipubli.inserm.fr/>).

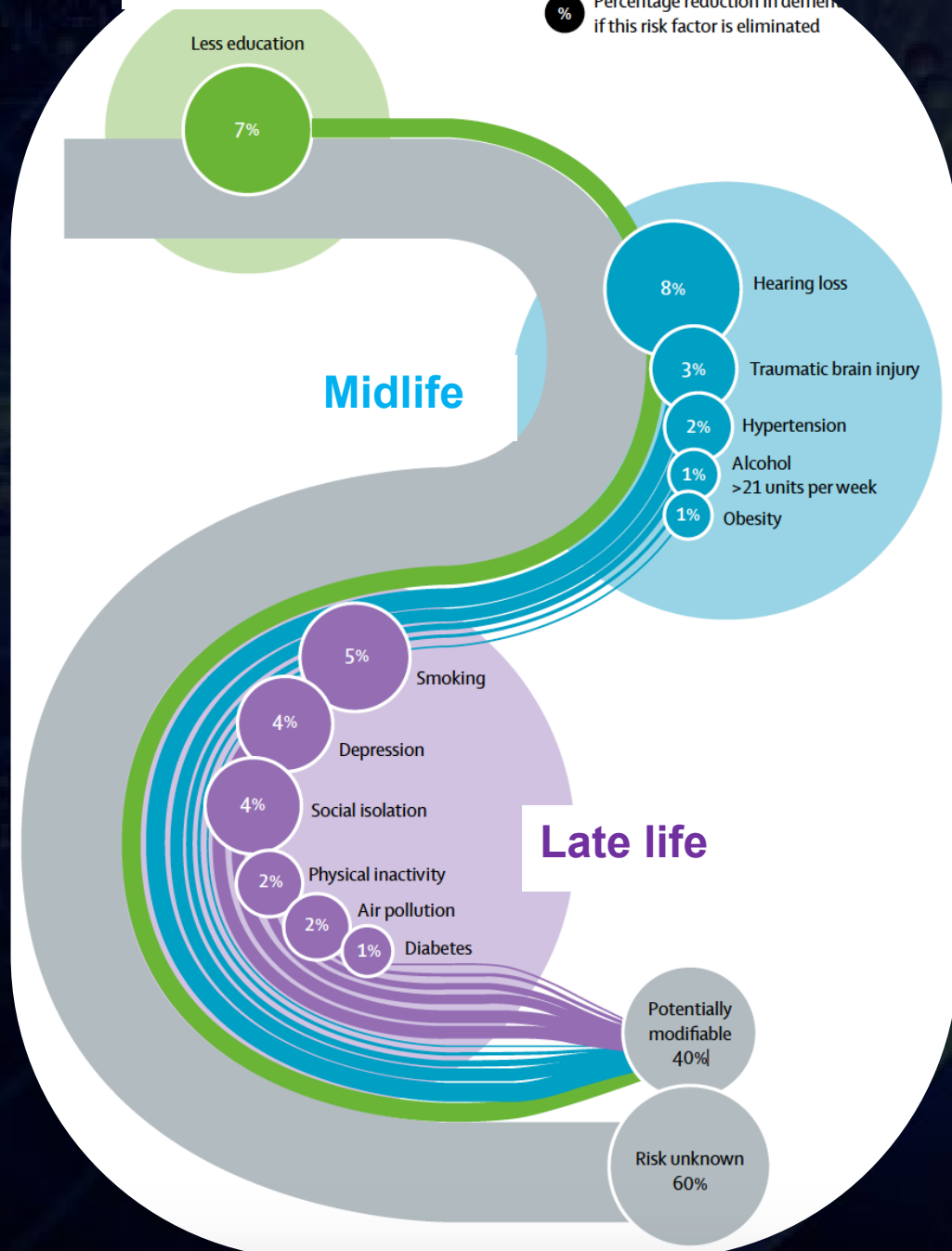
Early life

% Percentage reduction in dementia if this risk factor is eliminated



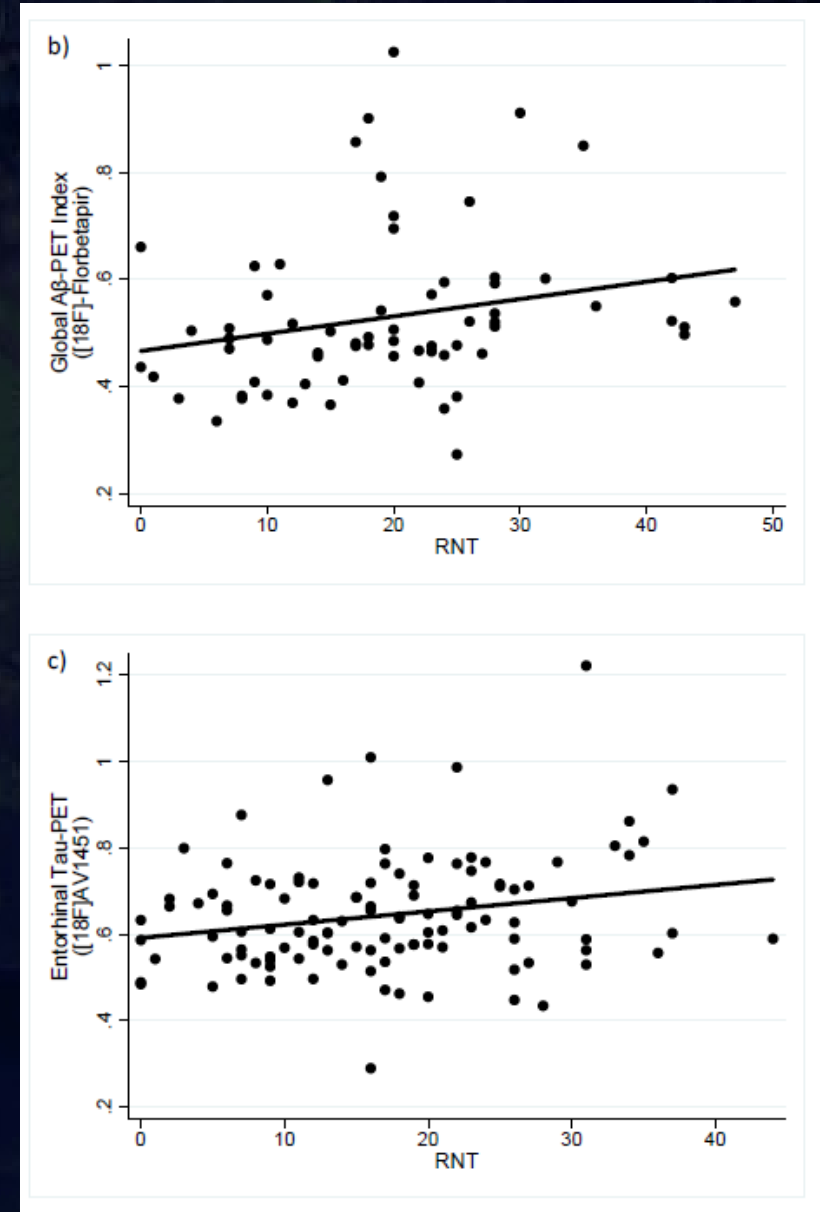
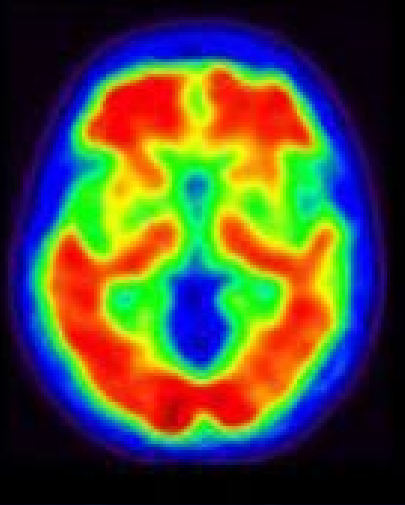
Early life

% Percentage reduction in dementia if this risk factor is eliminated

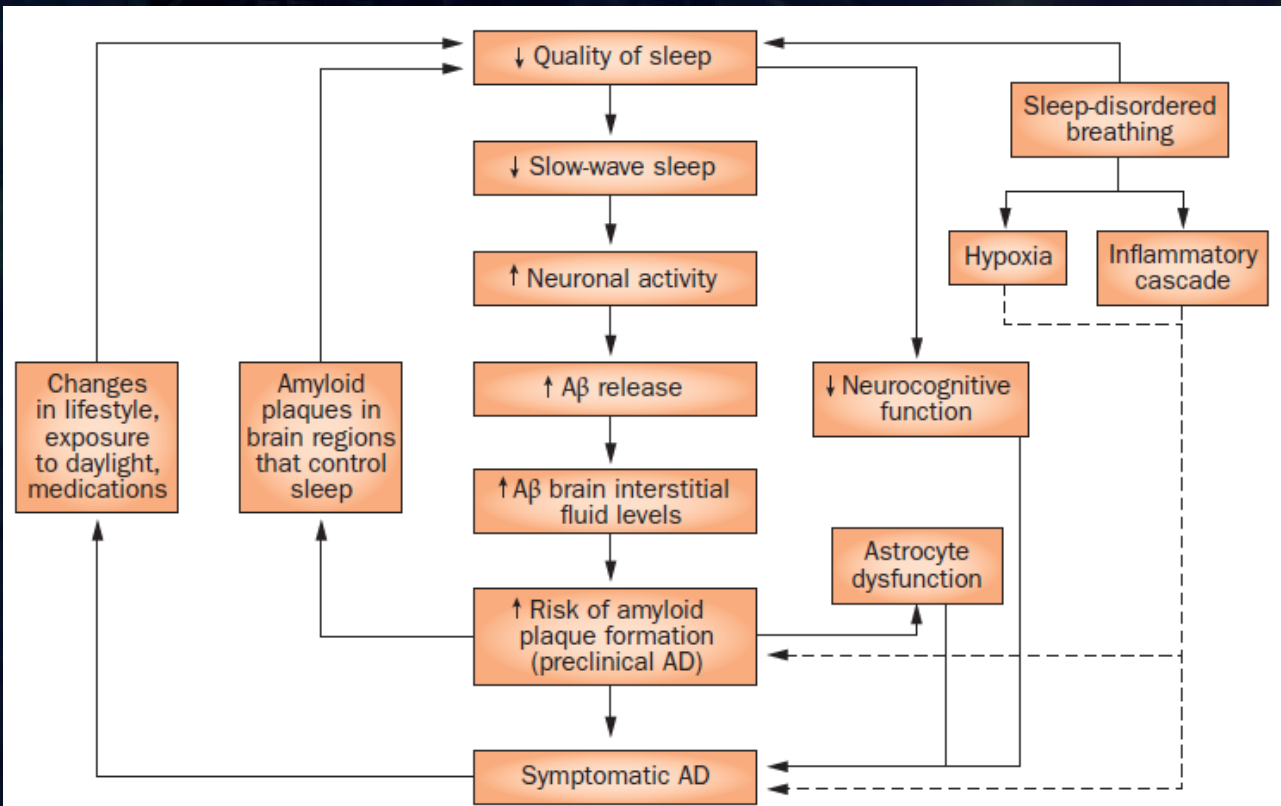


Repetitive negative thinking is associated with amyloid, tau, and cognitive decline

Repetitive negative thinking = RNT, also termed perseverative cognition, is a behaviourally measurable process that encompasses future- (worry) and past- (rumination) directed thoughts

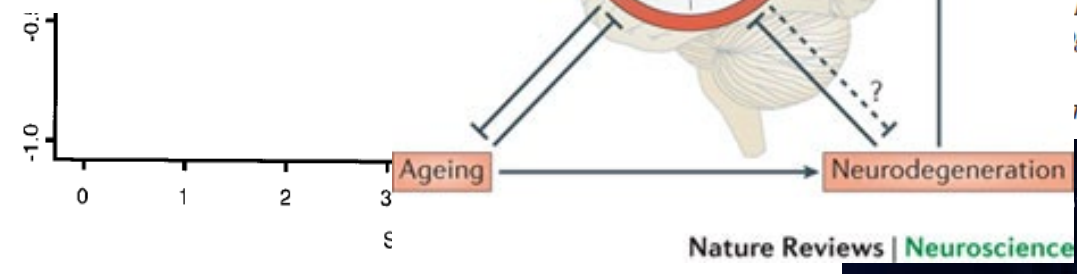
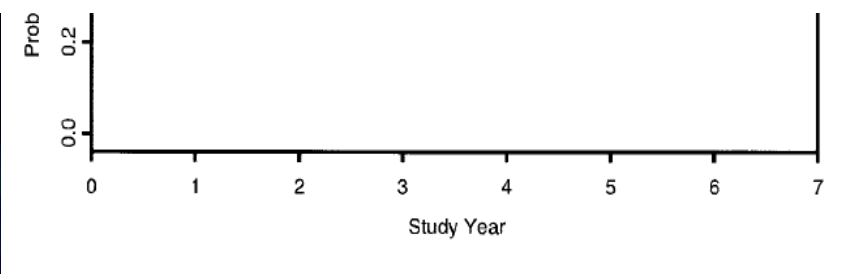


NEGATIVE EMOTIONS STRESS, ANXIETY



SLEEP PROBLEMS

Figure 1. Kaplan-Meier survival curves showing development of incident AD during the 7 years of observation in those with Center for Epidemiologic Studies Depression Scale (CES-D) scores of 0 (solid line), 2 (dotted line), or 4 or more (dashed line).



rate rate of change in sure of cognitive func- participants with Center gic Studies Depression scores of 0 (solid line), 2 r 4 (dashed line).

et al., Neurology, 2002

AGEING

MEDITATION

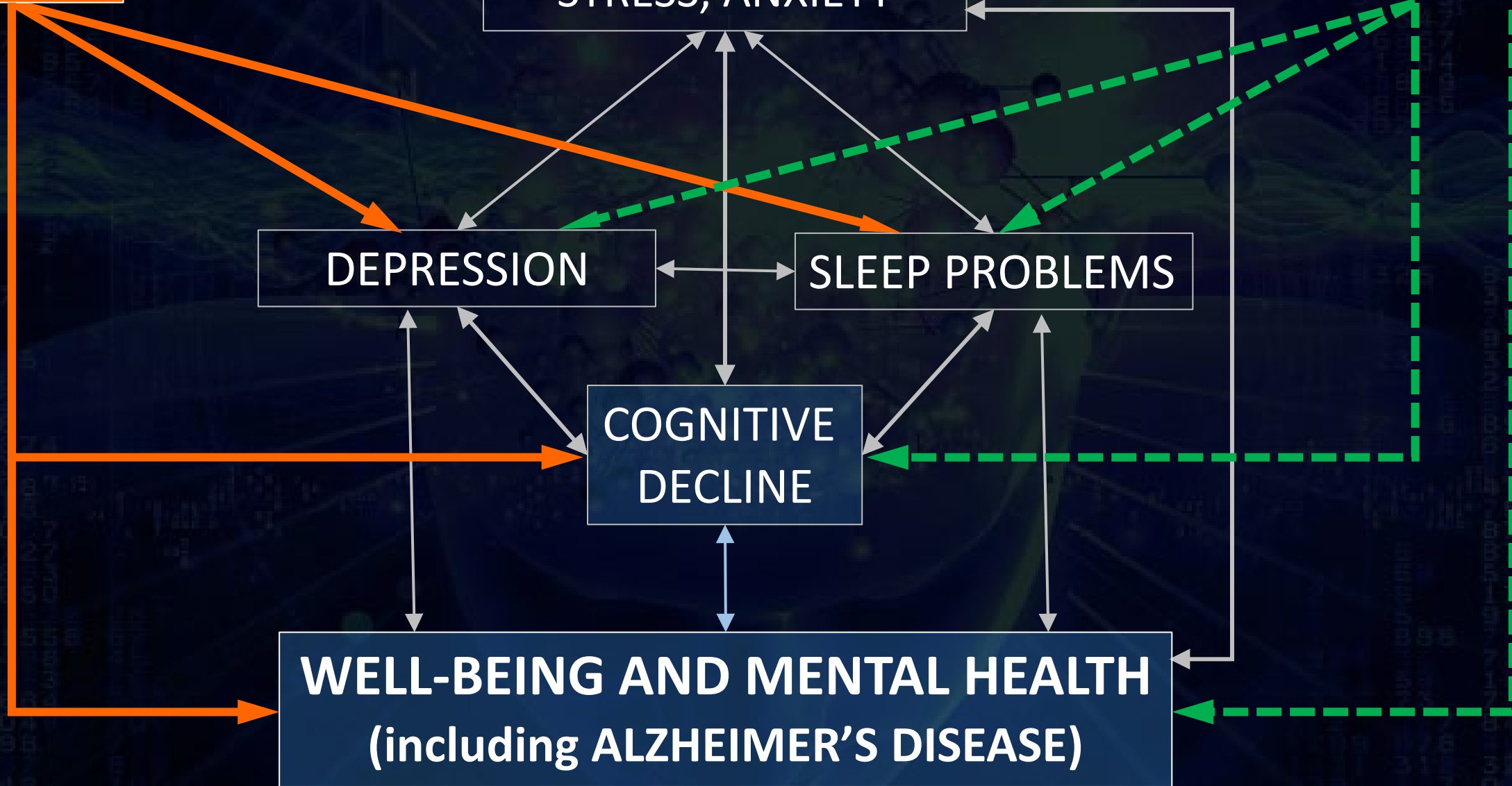
NEGATIVE EMOTIONS
STRESS, ANXIETY

DEPRESSION

SLEEP PROBLEMS

COGNITIVE
DECLINE

WELL-BEING AND MENTAL HEALTH
(including ALZHEIMER'S DISEASE)



Insert polling question #2 here



What is meditation?

MEDITATION: generic term encompassing **various forms of mental training** - such as mindfulness meditation or loving kindness and compassion meditation (LKCM). Meditation involves **complex emotional and attentional regulatory strategies** developed for various ends, including the **cultivation of well-being and emotional balance** (Lutz et al. 2004).

Secular mindfulness-based meditation is most often used in scientific research.

Mindfulness: **cultivating a vigilant awareness** of one's own thoughts, actions, emotions and motivations and **directly target attention and emotion regulation** ability, which is particularly important in the context of ageing.

LKCM : This practice aims to **cultivate feelings of love or compassion for oneself and others** and to be more accepting of emotions such as shame, self-criticism, or anger. LKCM **additionally involves altering the content of thoughts and emotions as opposed to simply observing them in MM.**

**MEDITATION IN AGING:
THEORETICAL MODEL OF
THE MECHANISMS**

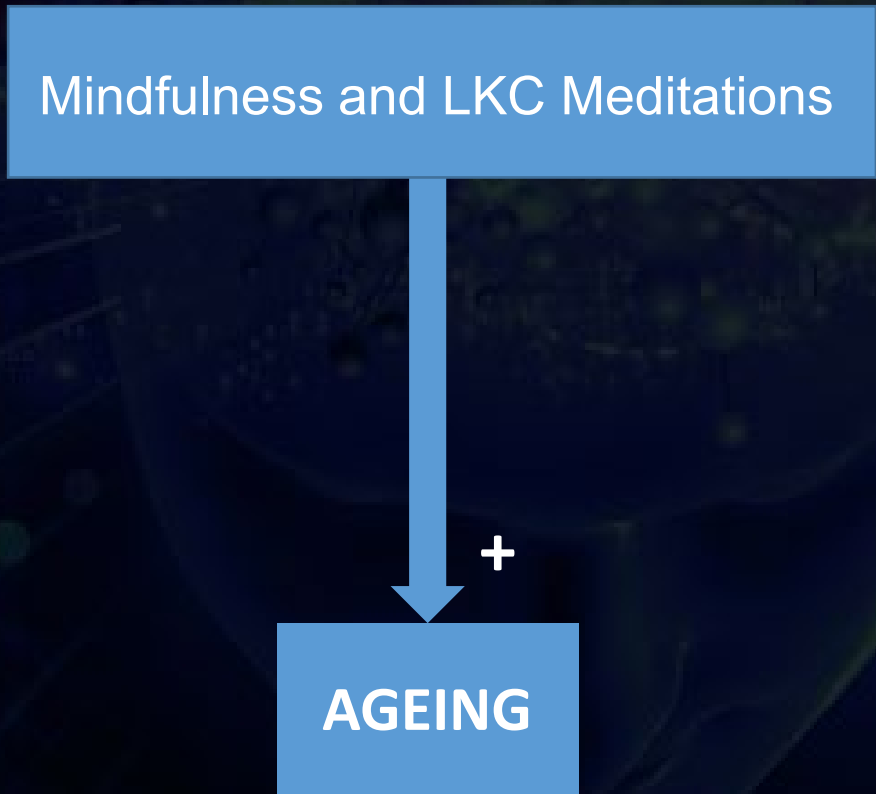


HYPOTHESIS



Antoine Lutz

Mindfulness meditation (MM) and loving-kindness and compassion meditation (LKCM) in the aging population could constitute a protective lifestyle not only on Alzheimer disease but also more generally on cognition, mental health, and wellbeing

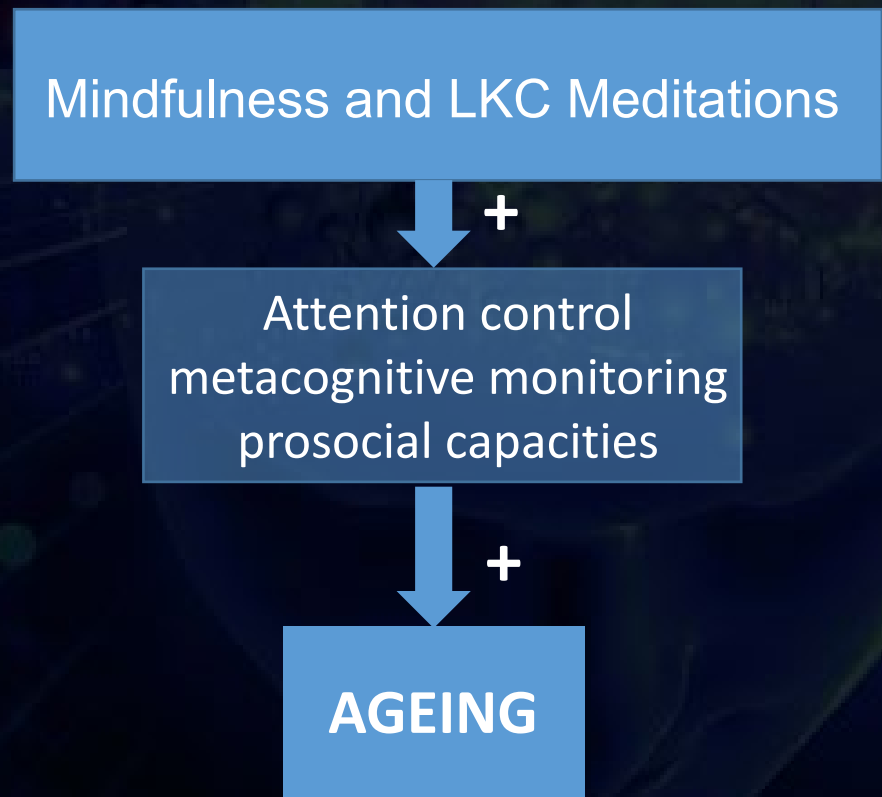


The Medit-Ageing MODEL,
by the Medit-Ageing
Research Group
Lutz, Chetelat et al., Ageing
Res Rev. 2021

THE MEDIT-AGEING MODEL

HYPOTHESIS

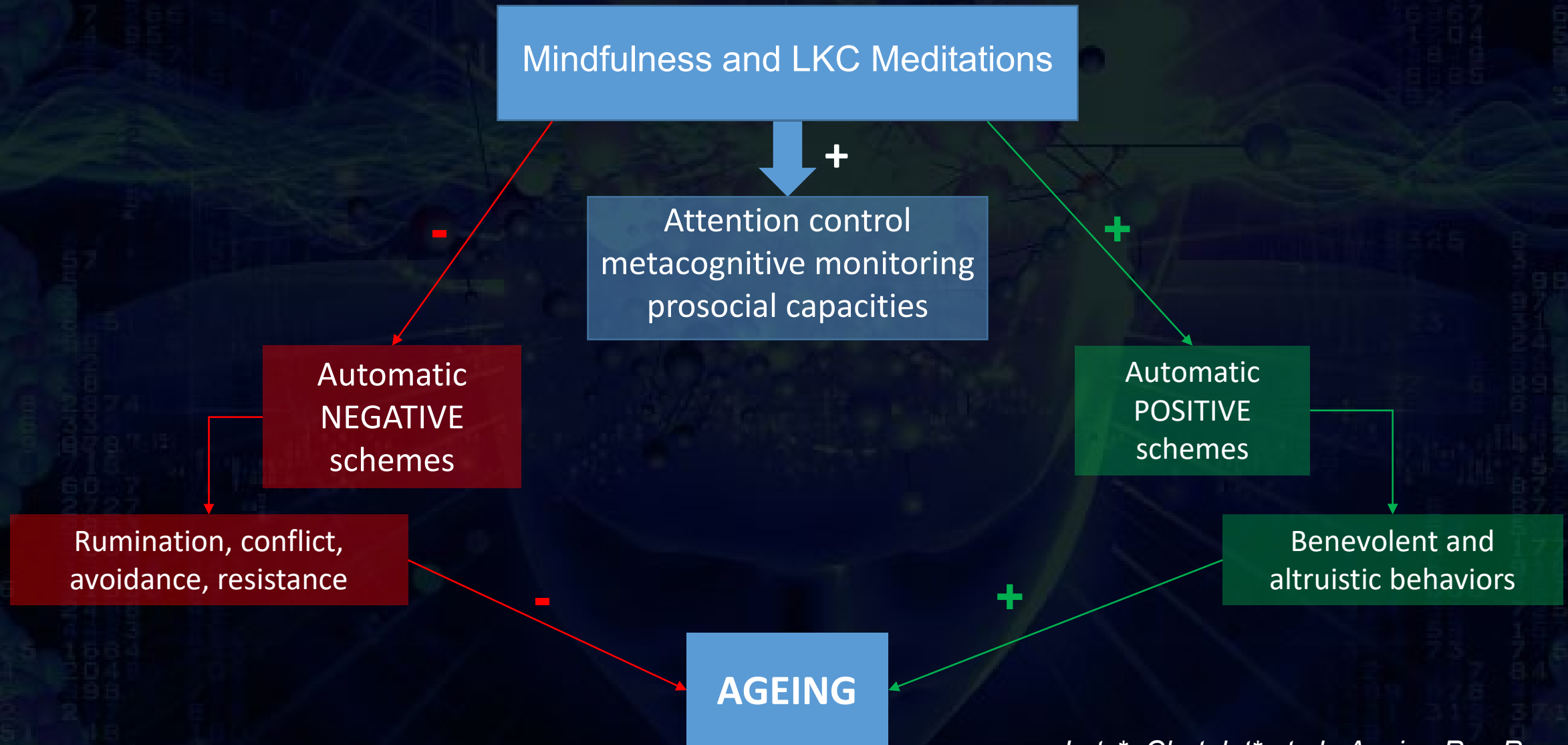
Mindfulness meditation (MM) and loving-kindness and compassion meditation (LKCM) in the aging population could constitute a protective lifestyle not only on Alzheimer disease but also more generally on cognition, mental health, and wellbeing



The Medit-Ageing MODEL,
by the Medit-Ageing
Research Group
Lutz, Chetelat et al., Ageing
Res Rev. 2021

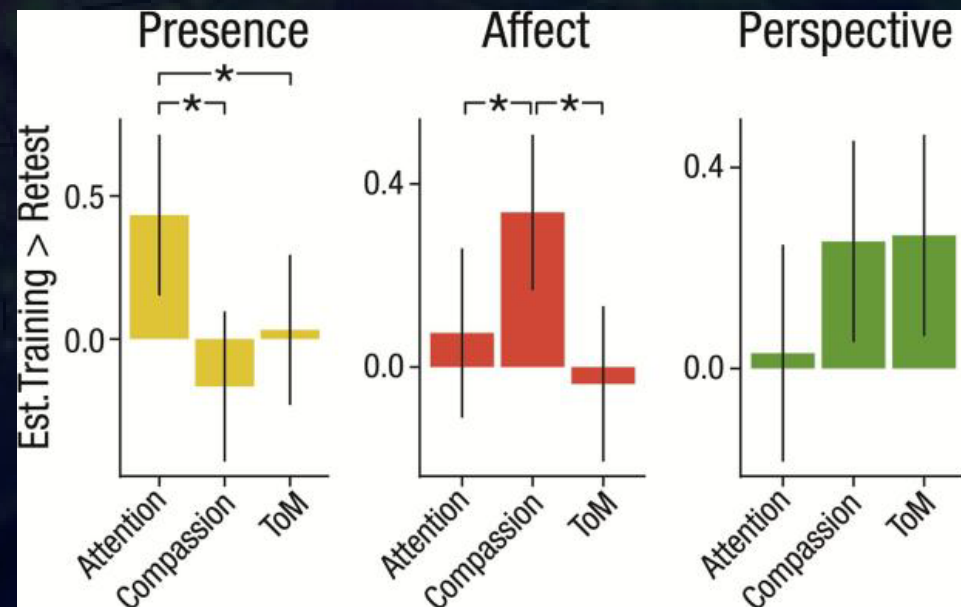
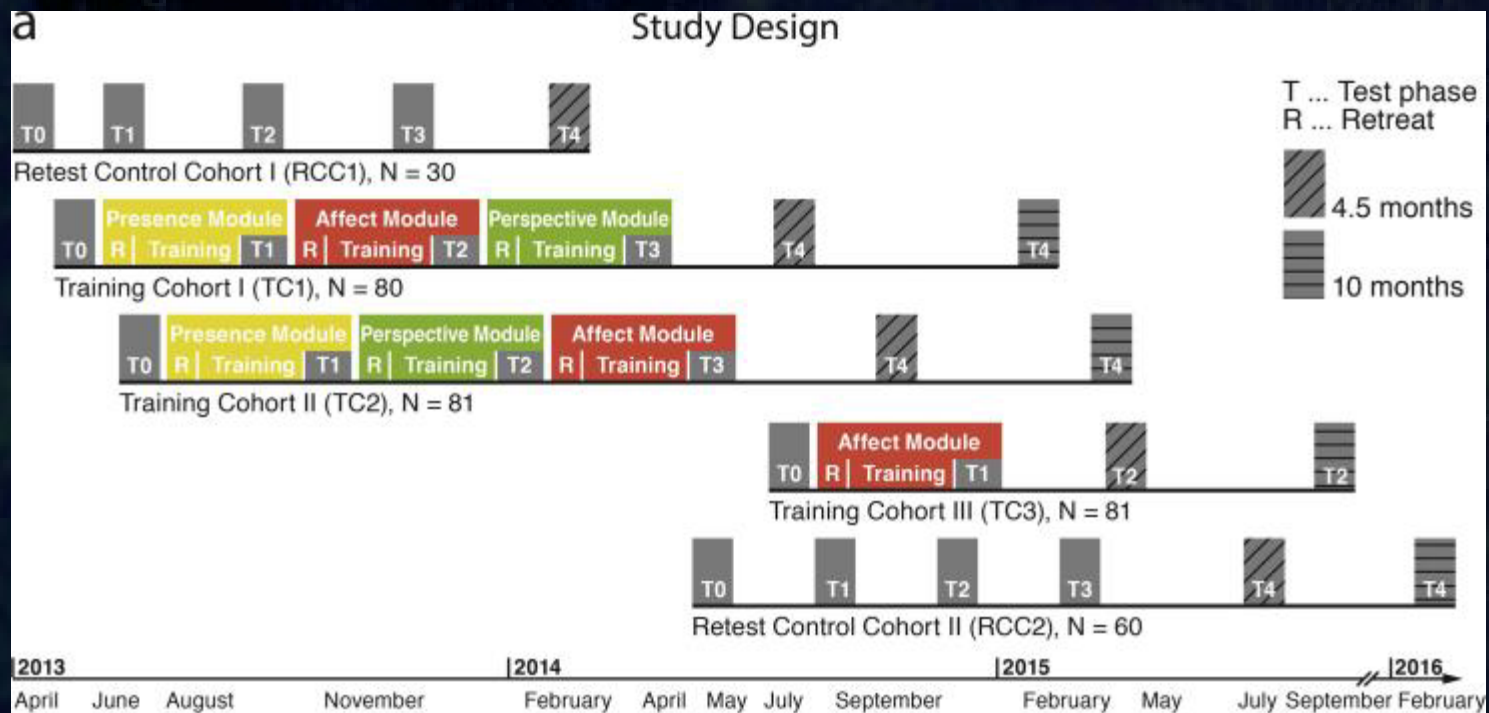
The Medit-Ageing MODEL, by the Medit-Ageing Research Group

HYPOTHESIS

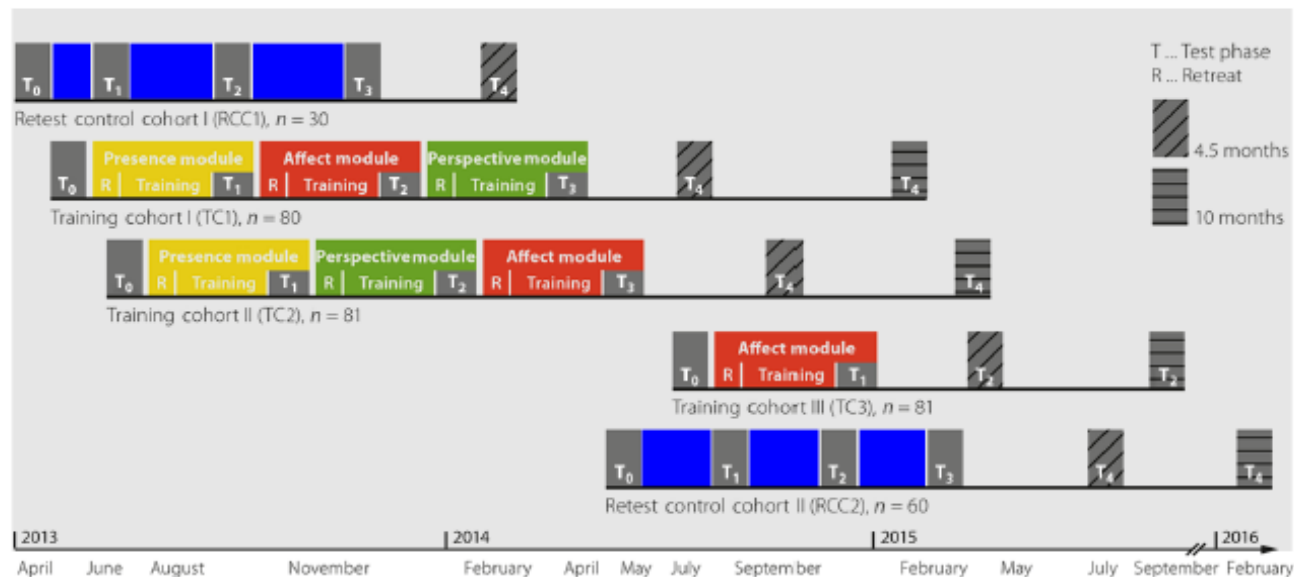


Novelty of the Meditadgeing model

- 1) Integrating mindfulness meditation (MM) and loving-kindness and compassion meditation (LKCM) to promote healthy ageing
- 2) Studying meditation interventions at multiple time-scales spanning across several years to identify the different time courses of changes induced by meditation across the psychological, neural, and biological markers of ageing



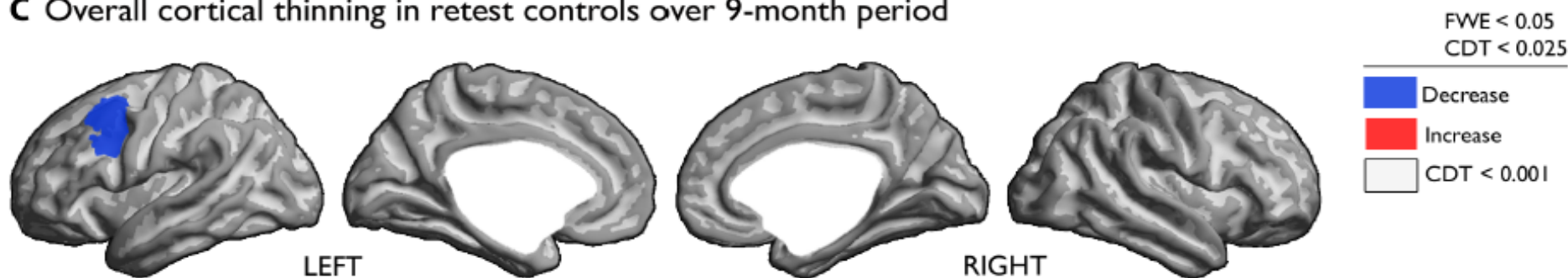
A Training design



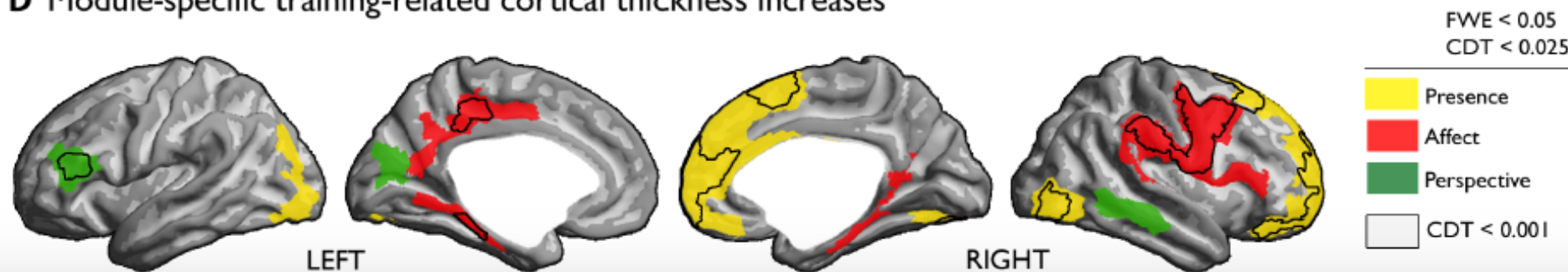
B Training modules



C Overall cortical thinning in retest controls over 9-month period



D Module-specific training-related cortical thickness increases

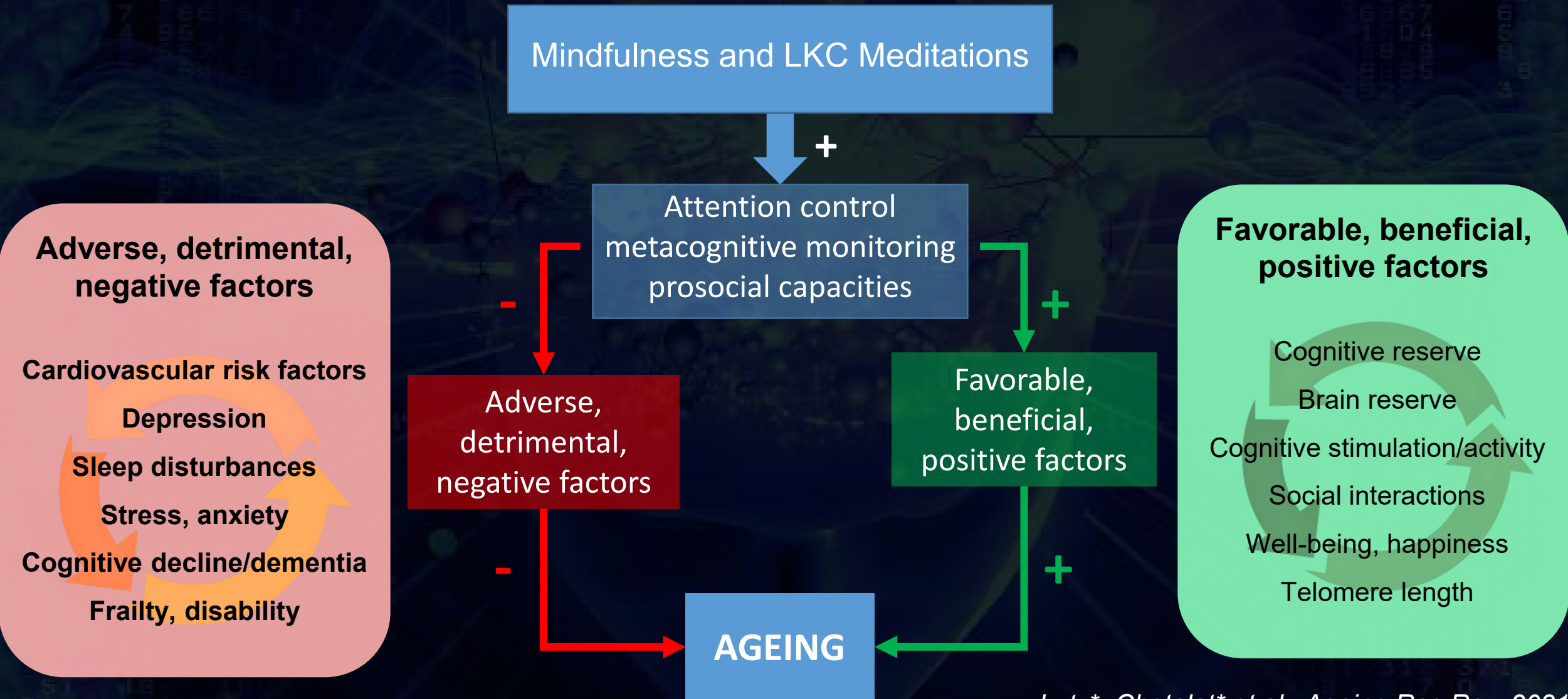


Novelty of the Meditadgeing model

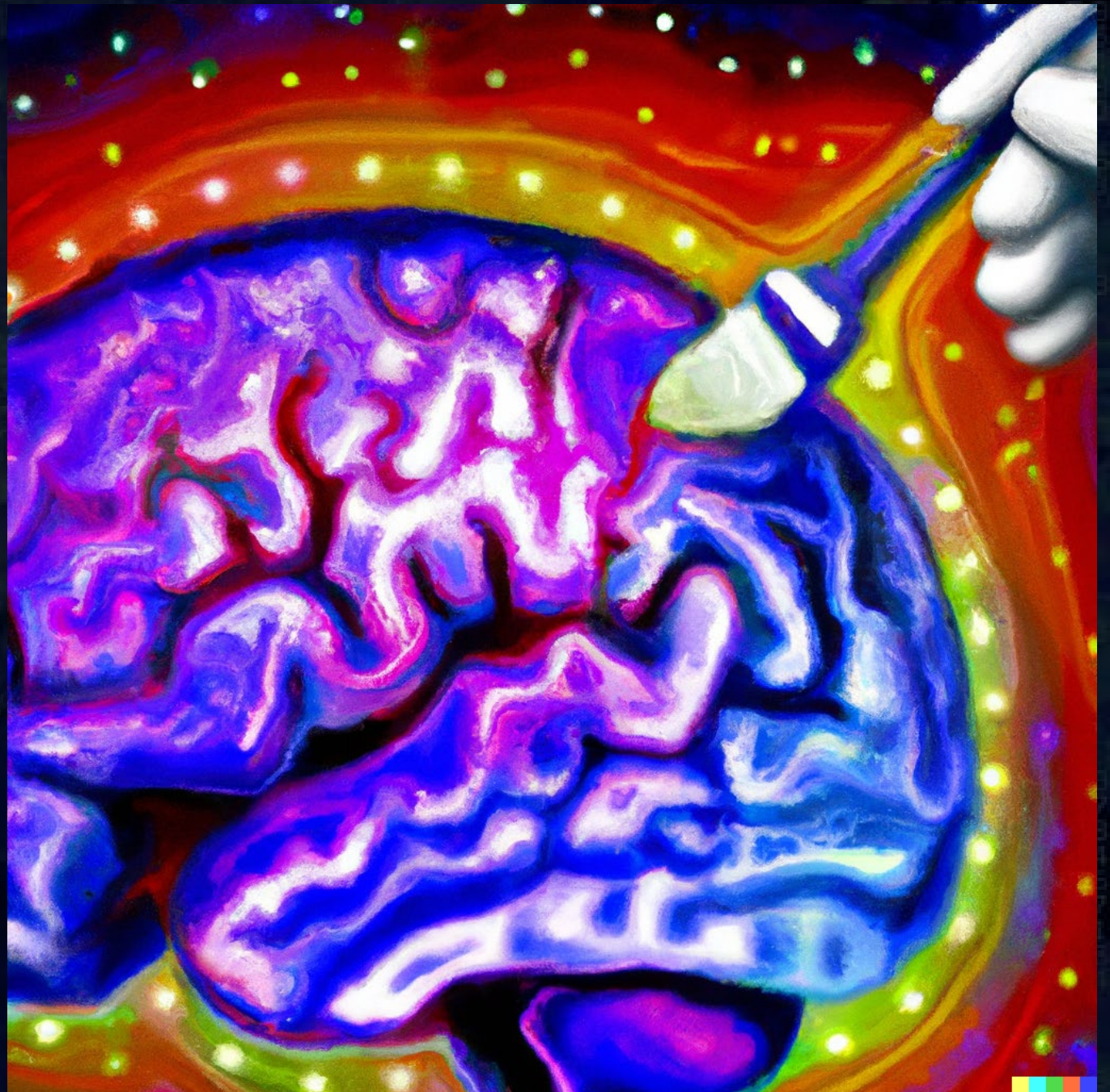
- 1) Integrating mindfulness meditation (MM) and loving-kindness and compassion meditation (LKCM) to promote healthy ageing
- 2) Studying meditation interventions at multiple time-scales spanning across several years to identify the different time courses of changes induced by meditation across the psychological, neural, and biological markers of ageing

The Medit-Ageing MODEL, by the Medit-Ageing Research Group

HYPOTHESIS



**MEDITATION IN AGING:
PRELIMINARY RESULTS**



Preliminary study on 6 « expert » meditators

Collaboration Antoine Lutz

Control data from the IMAP project



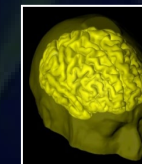
	Number of years of practice	Number of hours of practice	Percentage of time (hours) in retreat
1	24	22670	27
2	25	19970	65
3	44	32530	49
4	40	33212	49
5	49	28140	60
6	38	33500	50

	Healthy controls		Elderly expert meditators
	Whole sample	Elderly subgroup	
Sample size	186	67	6
Age mean ± SD	49.1 ± 18.7	64.8 ± 6.4	64.8 ± 3.2
(range)	(20-85)	(55-75)	(61-70)
Education mean ± SD	13.1 ± 3.2	12.1 ± 3.7	16.2 ± 2.7*
(range)	(7-20)	(7-20)	(12-20)
N females/males	97/89	38/29	3/3
MMSE mean ± SD	-	29.1 ± 1.0	29.5 ± 0.8
(range)	-	(26-30)	(28-30)

MAGNETIC RESONANCE IMAGING (MRI)



Structural MRI

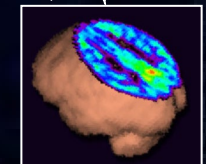


Anatomy (GM volume)

POSITRON EMISSION TOMOGRAPHY (PET)



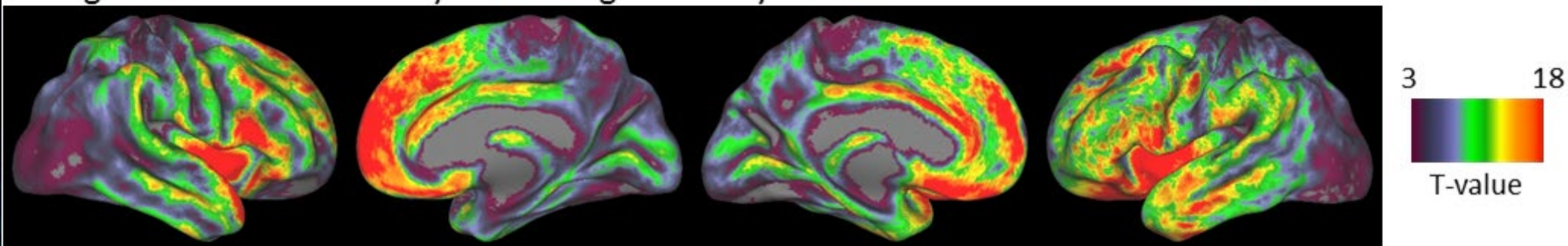
FDG-PET



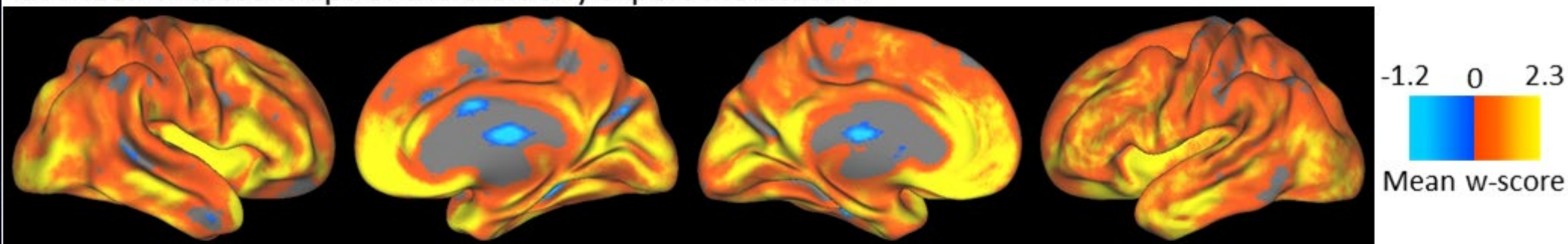
Resting-state glucose consumption

Grey matter FDG metabolism

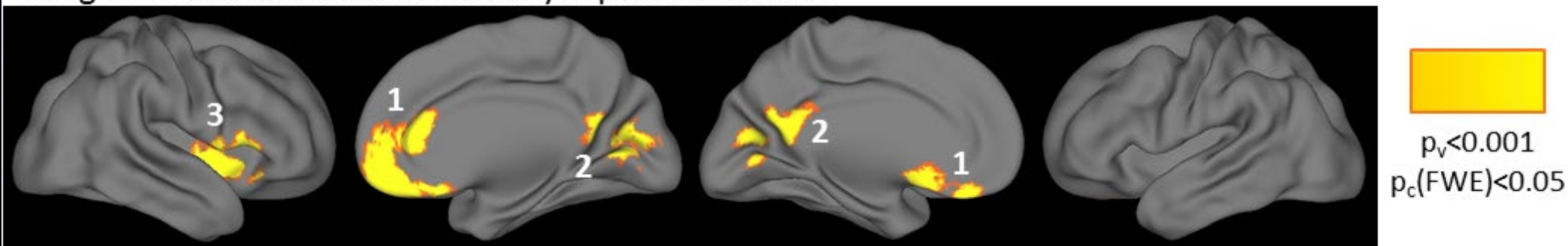
A. Age effects in 186 healthy controls aged 20-87 yrs old



B. Mean w-score maps of the 6 elderly expert meditators



C. Significant increases in the elderly expert meditators

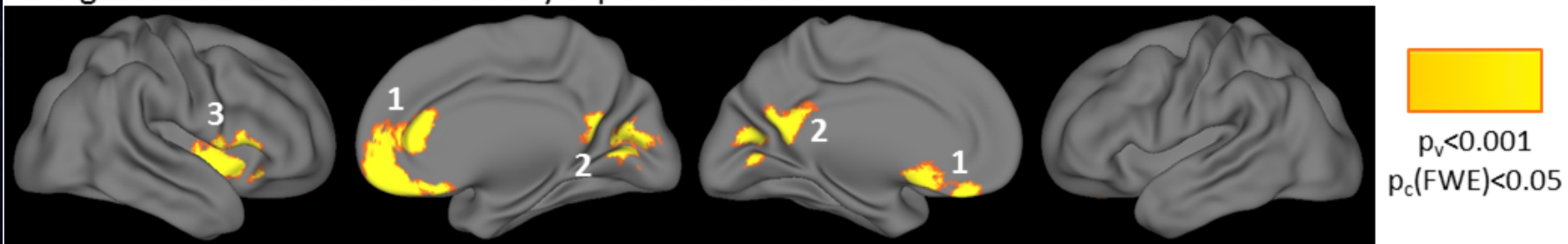


1. VMPF-ACC

2. Posterior cingulate cortex

3. Right Insula

C. Significant increases in the elderly expert meditators

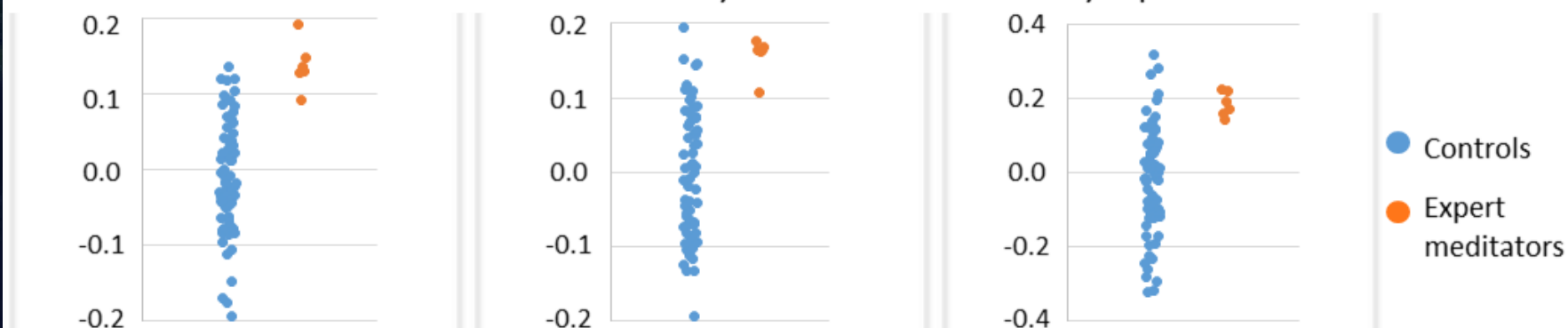


1. VMPF-ACC

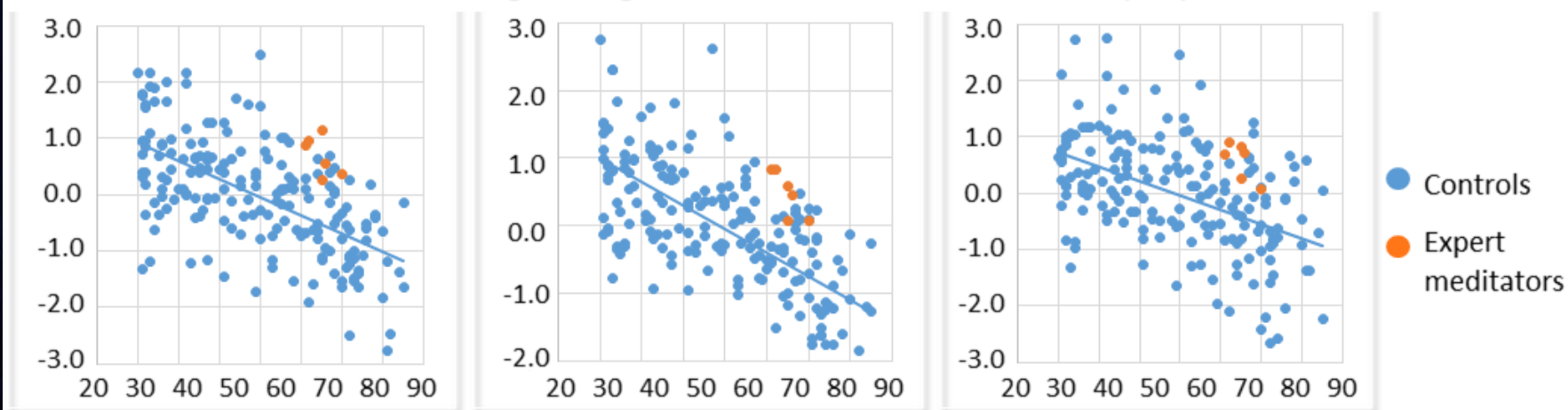
2. Posterior cingulate cortex

3. Right Insula

D. Plots of the volume residuals in the 67 elderly controls versus 6 elderly expert meditators



E. Plots of the volume residuals against age in the 186 controls and 6 elderly expert meditators



Insert polling question #3 here



**MEDITATION IN AGING:
THE MEDIT-AGEING
EUROPEAN PROJECT**



HORIZON 2020
WORK PROGRAMME 2014 – 2015

8. Health, demographic change and wellbeing
Personalising health and care

**PHC 22 – 2015: Promoting mental wellbeing in
the ageing population**



SILVER SANTÉ STUDY
MEDIT-AGEING

**Investigating the impact of meditation training on
mental health and wellbeing in the ageing population**

www.silversantestudy.fr

www.silversantestudy.eu

MEDIT-AGEING / SILVER SANTÉ STUDY: PEOPLE

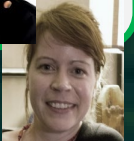
MENTAL HEALTH DETERMINANTS



Antoine Lutz

WP 1: COGNITIVE FUNCTION

Julie Gonneaud



Miranka Wirth

WP 2: PSYCHOLOGICAL WELL-BEING

Caitlin Ware



Titi Dolma



Francis Gheysen



Pascal Delamillieure



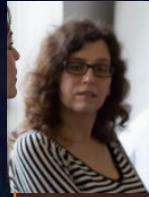
Corinne Schimmer



Martine Batchelor



Fabienne Collette



Olga Klimecki



WP3: ATTENTION



WP 4: EMOTION

Natalie Marchant



Frank Jessen

END POINTS OF AGEING

WP 5: COGNITIVE FUNCTION & WELL-BEING

Gaël Chételat



Sabine Rauchs

WP6: BIOLOGICAL MARKERS



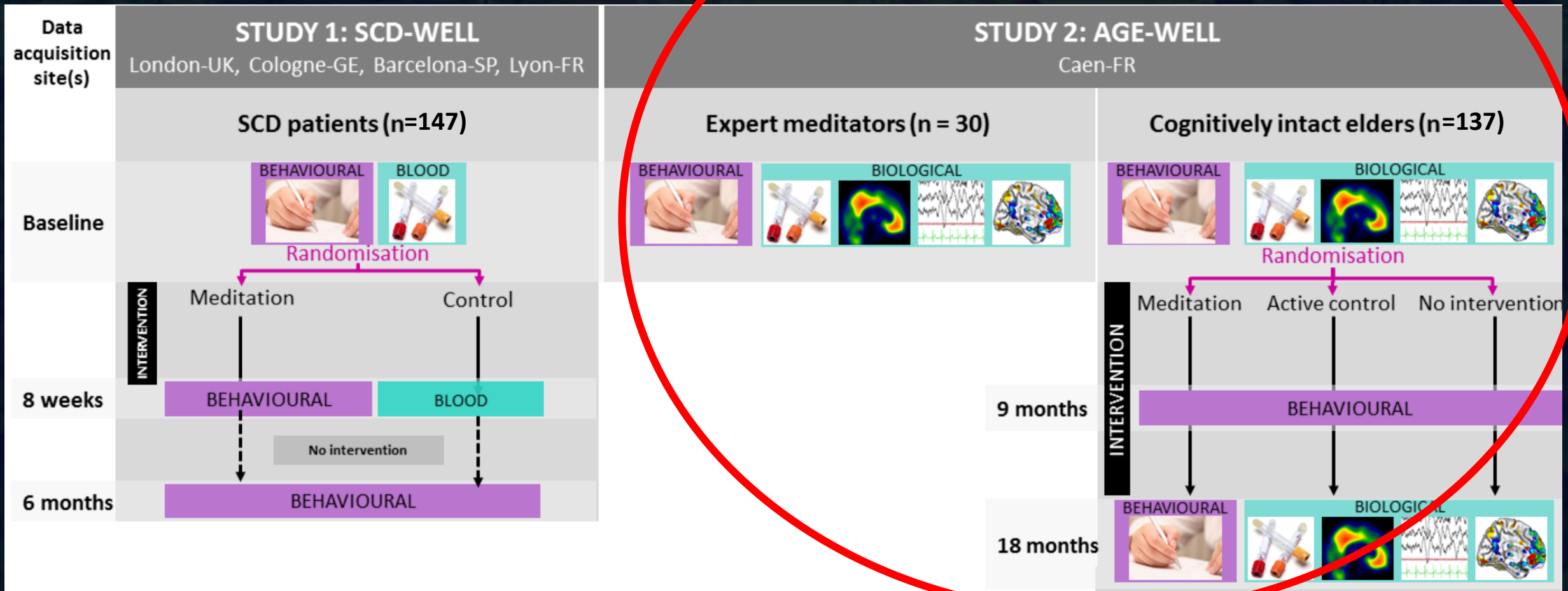
MEDIT-AGEING / SILVER SANTÉ STUDY: DESIGN



SCD-WELL



AGE-WELL



AGE-WELL



137 healthy seniors
> 65 yrs



RANDOMIZED

MEDITATION

NON-NATIVE LANGUAGE TRAINING

NO INTERVENTION

18 mths





MEDITATION

Mental training for stress reduction and emotion regulation

ENGLISH

Cognitive stimulation through foreign language learning

During 18 months

- Once a week: 2 hrs group practice with expert instructors
- Every days: 20 min or more daily practice (with a tablet)
 - One entire day of intensive practice

Research

JAMA Neurology | **Original Investigation**

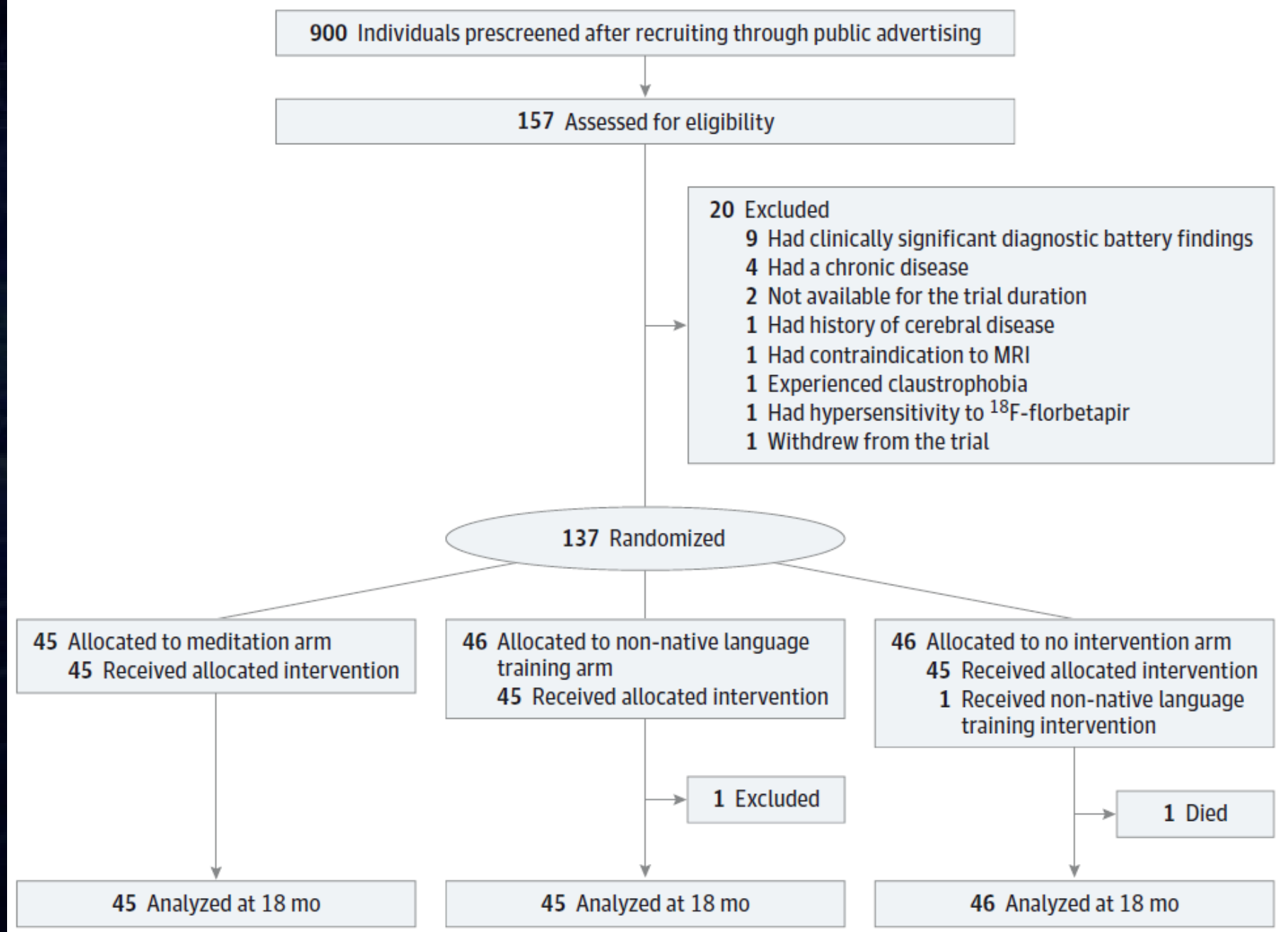
Effect of an 18-Month Meditation Training on Regional Brain Volume and Perfusion in Older Adults

The Age-Well Randomized Clinical Trial

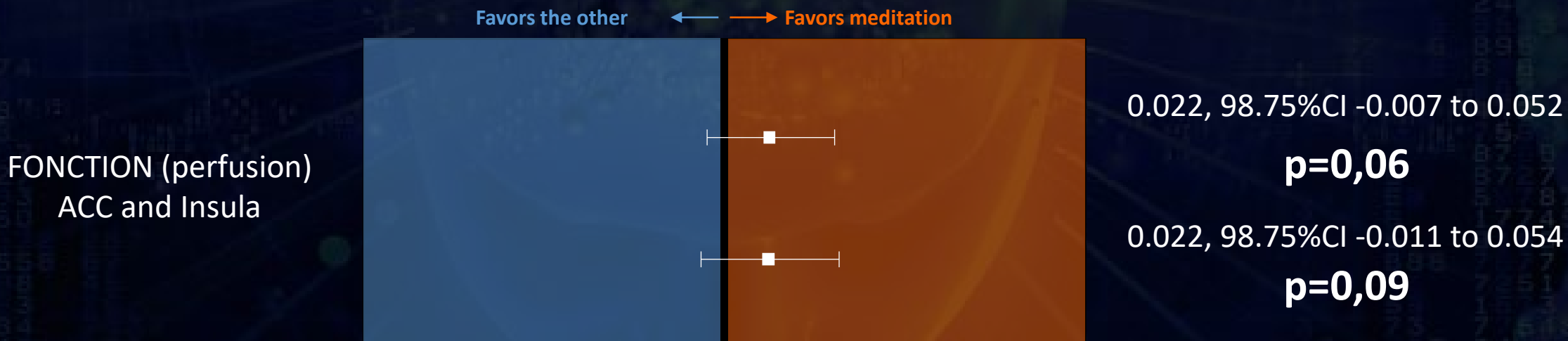
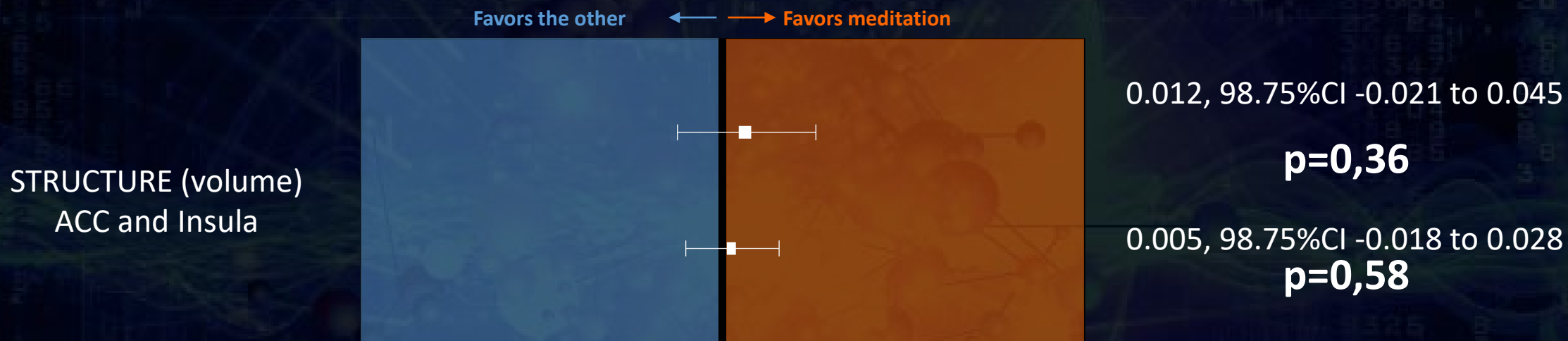
Gael Chételat, PhD; Antoine Lutz, PhD; Olga Klimecki, PhD; Eric Frison, MD, PhD; Julien Asselineau, MSc; Marco Schlosser, MSc; Eider M. Arenaza-Urquijo, PhD; Florence Mézenge, MSc; Elizabeth Kuhn, PhD; Inès Moulinet, PhD; Edelweiss Touron, MSc; Sophie Dautricourt, PhD; Claire André, PhD; Cassandre Palix, MSc; Valentin Ourry, PhD; Francesca Felisatti, MSc; Julie Gonneaud, PhD; Brigitte Landeau, MSc; Géraldine Rauchs, PhD; Anne Chocat, MD; Anne Quillard, MD; Eglantine Ferrand Devouge, MD; Patrik Vuilleumier, MD; Vincent de La Sayette, MD; Denis Vivien, PhD; Fabienne Collette, PhD; Géraldine Poisnel, PhD; Natalie L. Marchant, PhD; for the Medit-Ageing Research Group

Trial profile

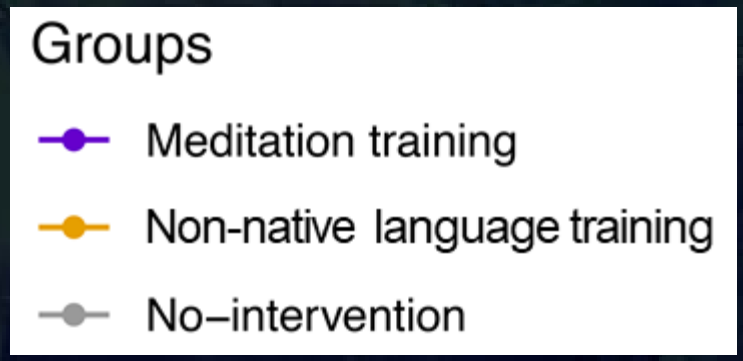
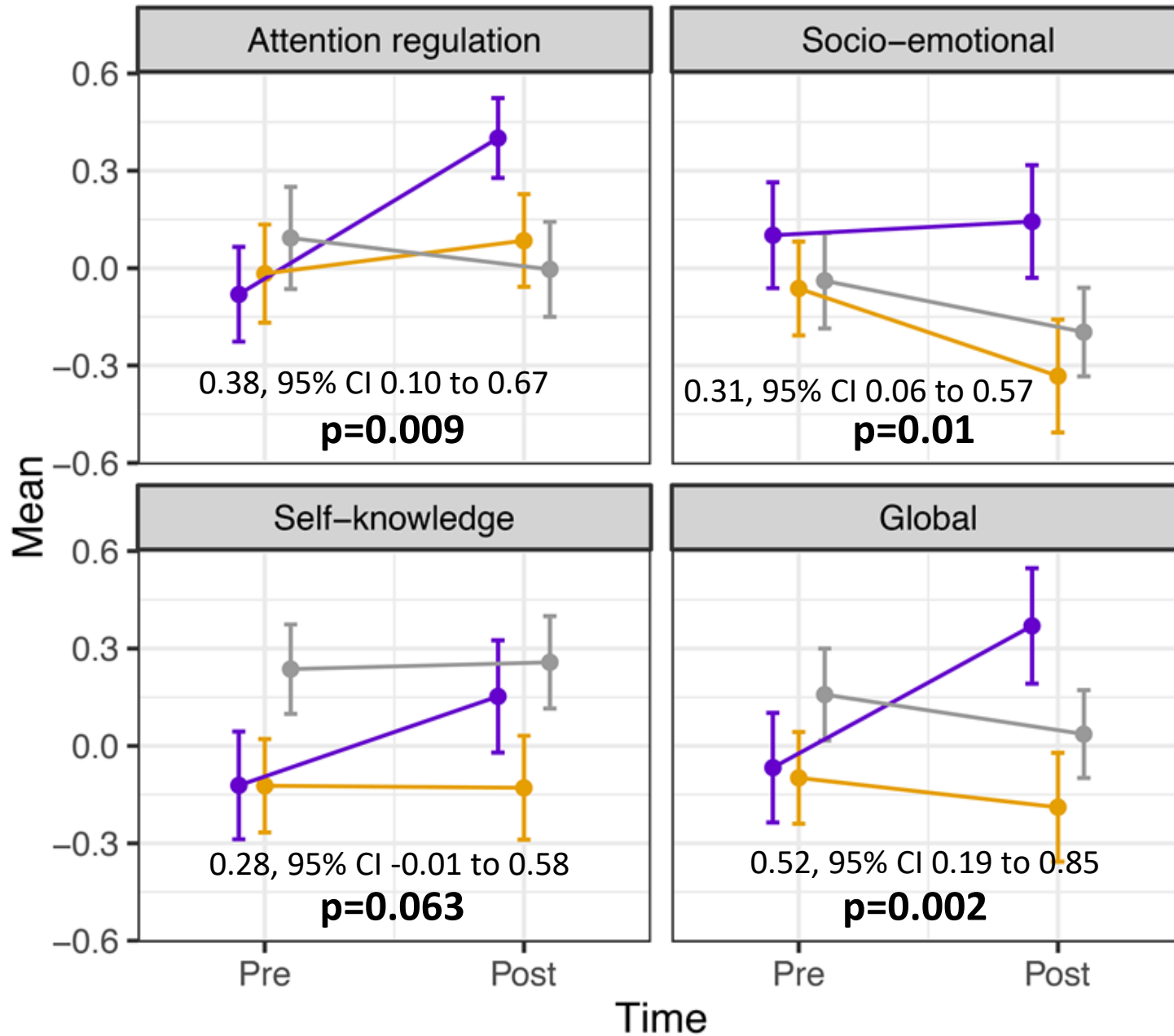
Of the 137 randomized participants, one was excluded from all analyses due to major eligibility criteria not met (not included in the analyses), one died during the follow-up, and one revealed not to have followed his allocated arm (randomized to no-intervention but attended non-native language) – those two later participants being retained in the analyses and treated by the intention-to-treat principle, as specified in the statistical analysis plan.



CO-PRIMARY OUTCOMES



MAIN SECONDARY OUTCOMES



<https://goldseniors.ch/>



AVANT-PREMIERES

Salle comble pour la projection spéciale en avant-première le 29 avril en présence de Matthieu Ricard! Le film avait été présenté en projection privée à Caen aux participants, en présence des scientifiques qui ont conduit l'étude européenne Silver Santé mesurant...



SORTIE SUISSE

27 septembre : sortie suisse romande, 7 décembre : sortie suisse allemande et suisse italienne, d'autres avant-premières avec débats en présence du réalisateur seront programmées dans les jours précédant ces sorties (plus d'infos sur la page Diffusion)...



FESTIVAL

„Golden Seniors“ présenté en première mondiale aux Journées de Soleure les 21 et 23 janvier, a fait salle comble lors des deux projections.

Please insert the video here: <https://vimeo.com/857183117#> =

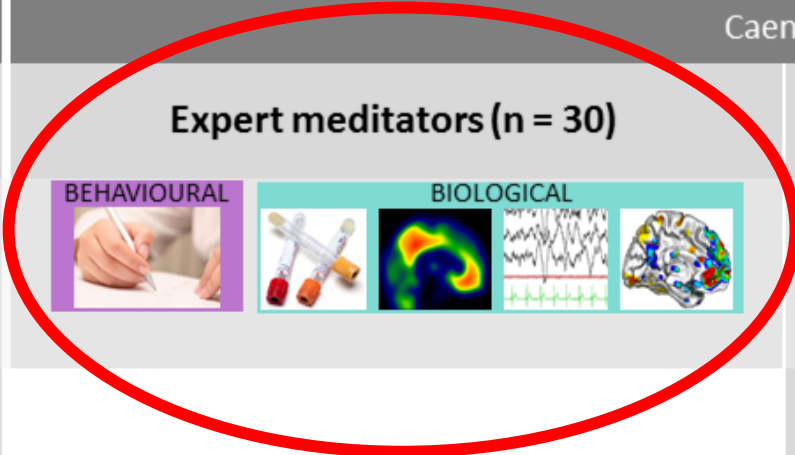
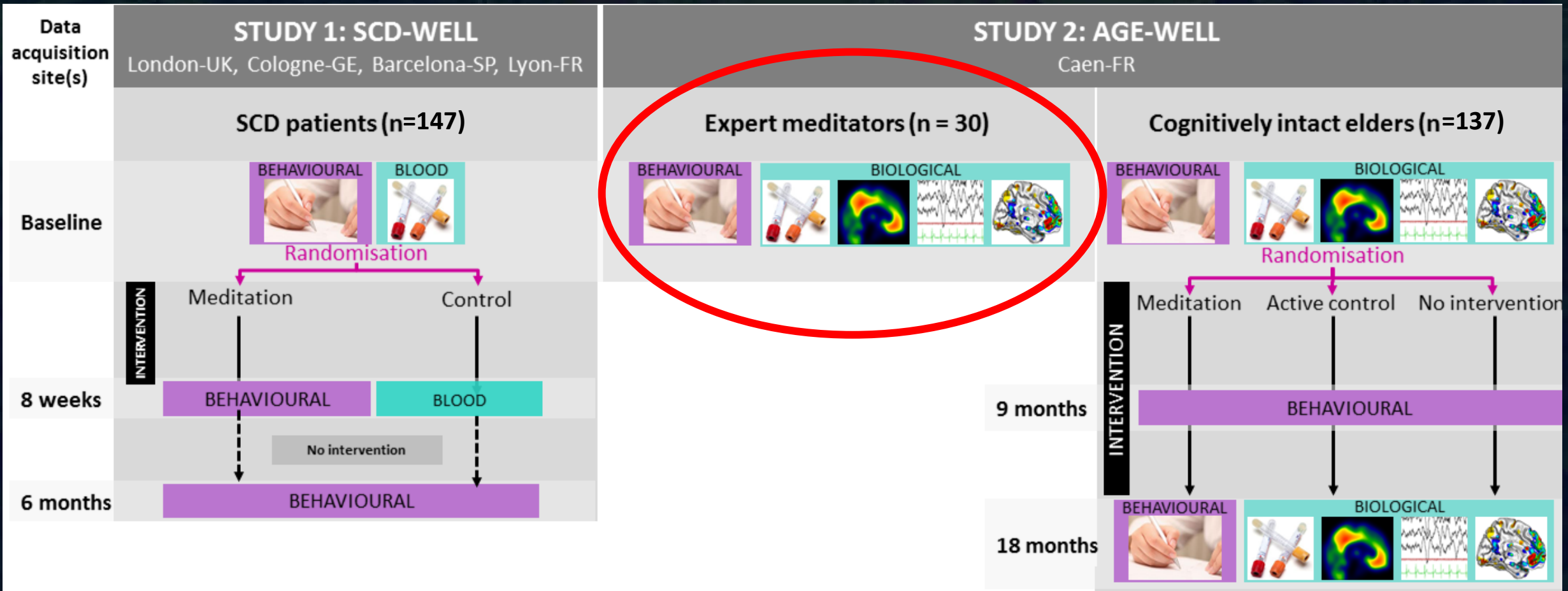
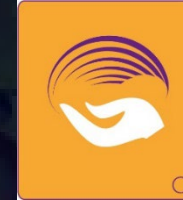


MEDIT-AGEING / SILVER SANTÉ STUDY: DESIGN

SCD-WELL



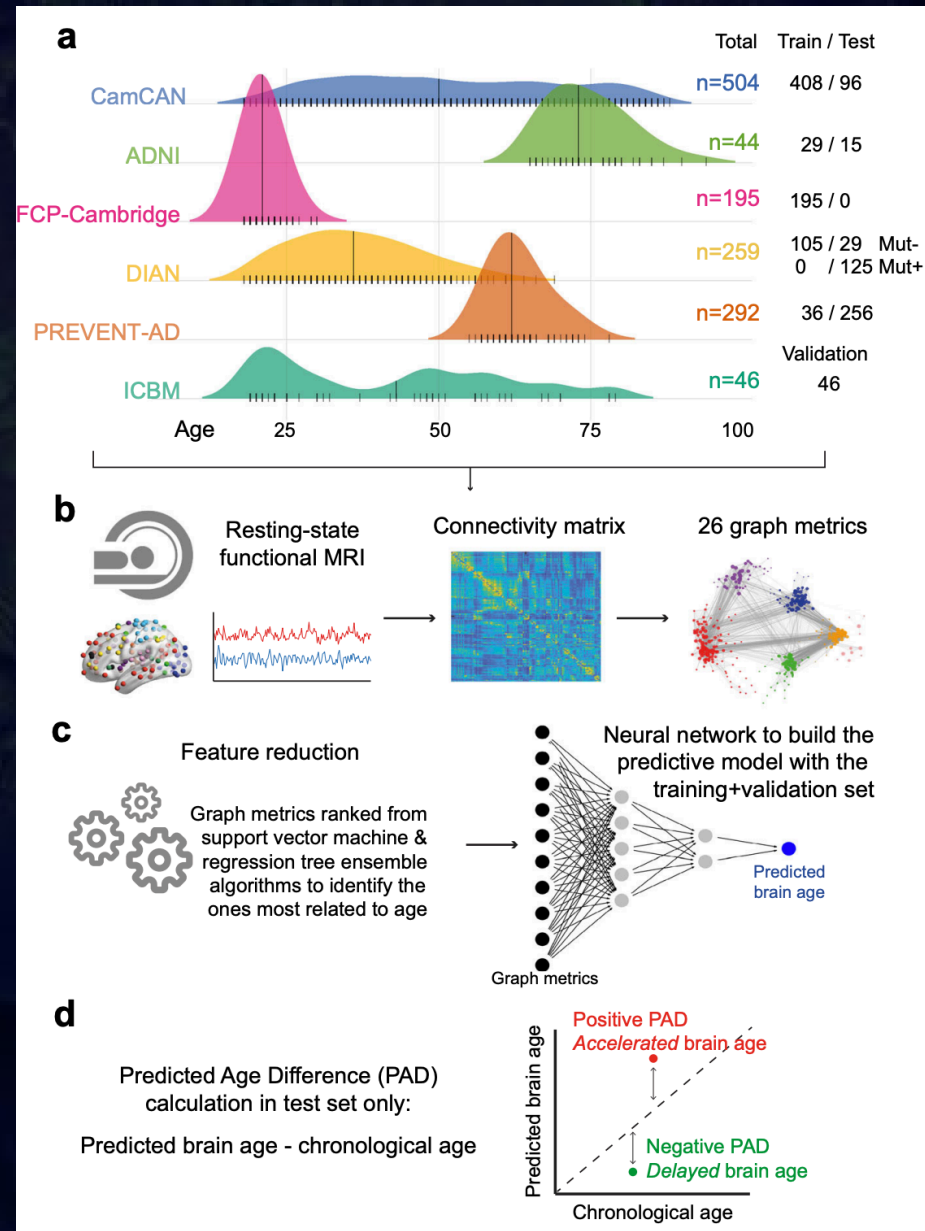
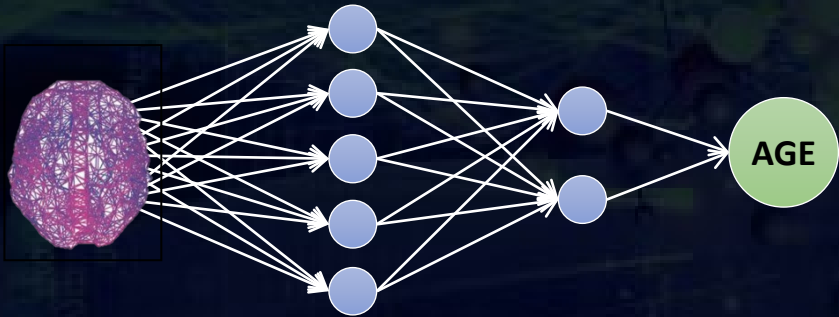
AGE-WELL





Julie Gonneaud

Functional 'Brain Age'

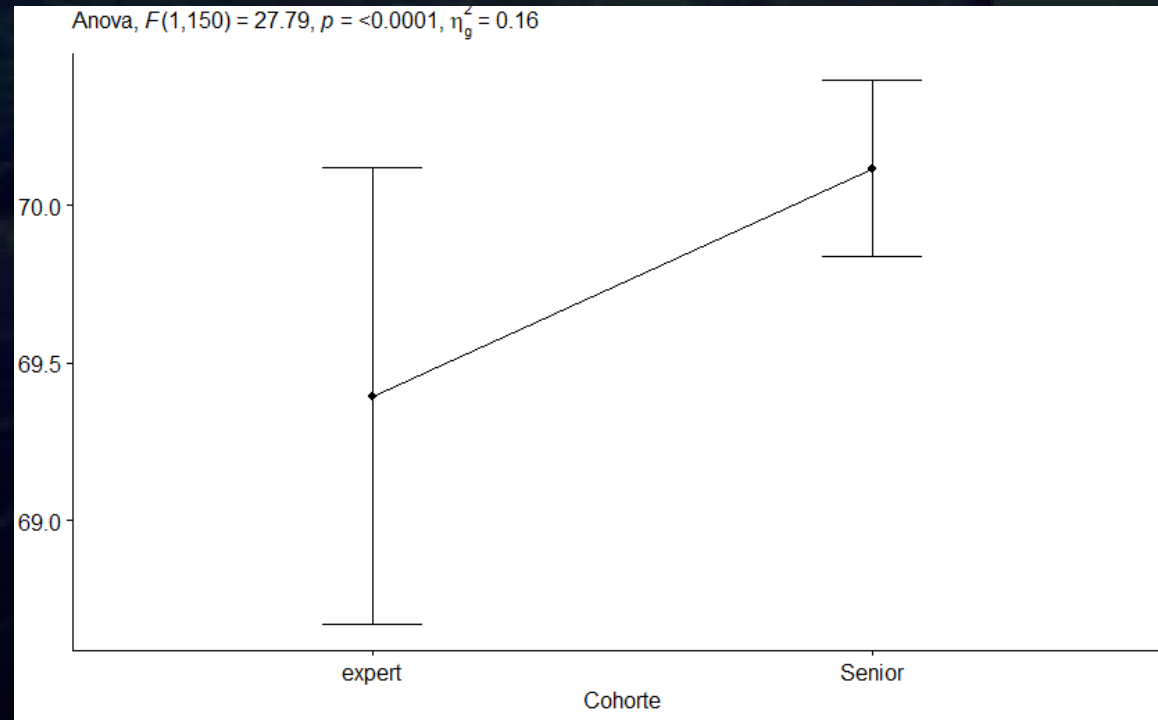


Comparison of meditation experts and controls



Sacha Haudry,
PhD student

Difference of predicted brain age between experts and seniors

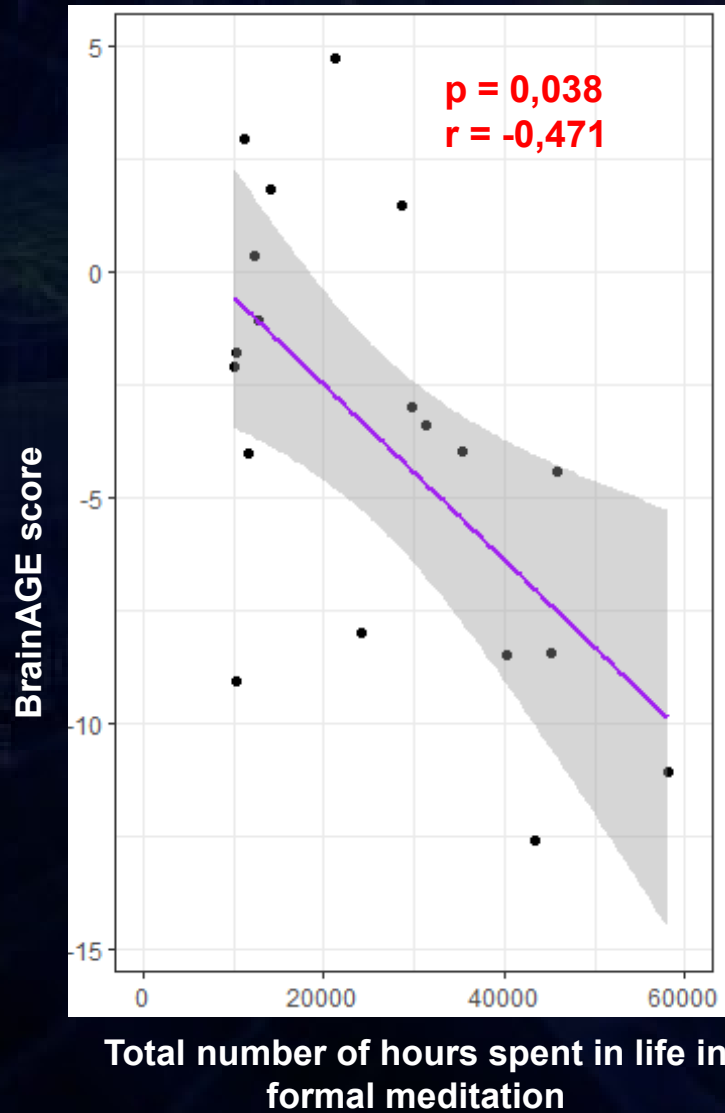


Links between brain ageing and expertise

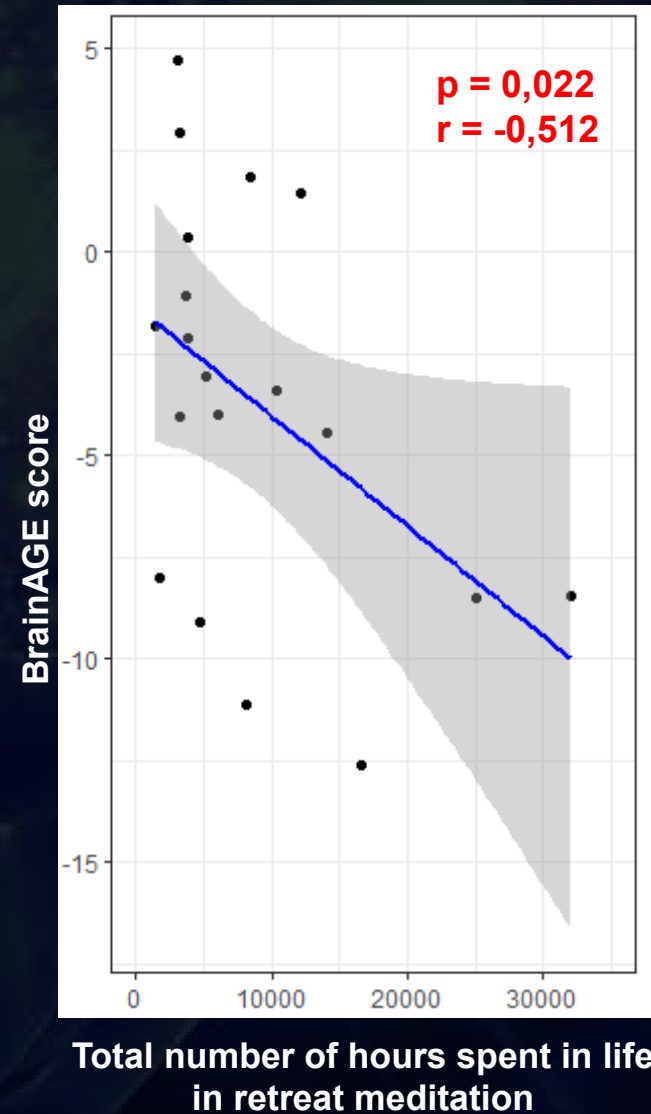


Sacha Haudry,
PhD student

Relation of BrainAGE to time spent
in formal meditation time



Relation of BrainAGE to time spent
in retreat meditation





Silver Santé Study

Investigating mental health & well-being in the ageing population



SCIENTIFIC PUBLICATIONS

Julie Gonneaud, Ilana Moreau, Francesca Felisatti, Eider Arenaza-Urquijo, Valentin Ourry, Edelweiss Touron, Vincent de la Sayette, Denis Vivien, Gaël Chételat Men and women show partly distinct effects of physical activity on brain integrity

<https://doi.org/10.1002/dad2.12302>

Marco Schlosser, Thorsten Barnhofer, Florence Requier, Yacila I. Deza-Araujo, Oussama Abdoun, Natalie L. Marchant, Gaël Chételat, Fabienne Collette, Olga M. Klimecki, Antoine Lutz & Medit-Ageing Research Group Measuring Psychological Mechanisms in Meditation Practice: Using a Phenomenologically Grounded Classification System to Develop Theory-Based

Search ...



LATEST NEWS

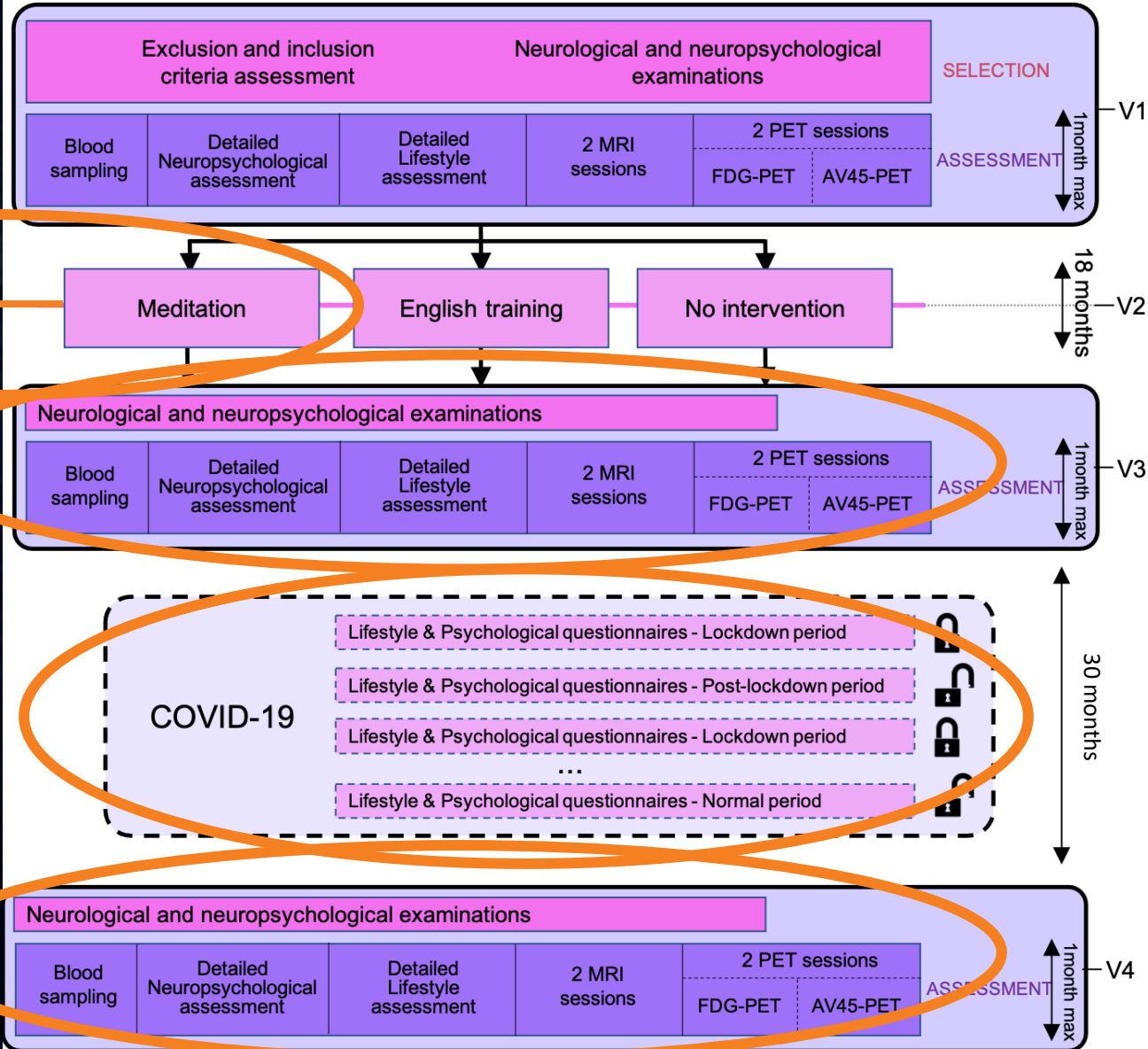
- 2022 closes the formal funded period for Silver Sante Study but the work continues thanks to new additional funding
- The association between physical activity and brain health partly differs between men and w



AGE-WELL : TO BE CONTINUED



- 135 cognitively unimpaired older adults (>65yo)
- 18-month intervention program (3 arms)



silversantestudy.eu



meditageing-app@cyceron.fr

Insert polling question #3 here



Medit-Ageing Team

Questions?



SilverSanteStudy.eu

Neuropresage.fr

NeuroPresage Chetelat's Team

