Supplemental material for "Examining cognitive differences in expert meditators and non-meditators older adults"

Table of contents

Appendix 1. Description of the additional data

- **Framingham Risk Score (FRS):**

This scale [1] is about cardiovascular risks and includes items such as total systolic blood pressure, diabetes diagnosis, cholesterol, high-density lipoprotein cholesterol, antihypertensive medication, and smoking status. The score ranges from -10 to 46, with higher scores representing a higher cardiovascular risk.

- **Brain amyloid load:**

The amyloid standard uptake value ratios were corresponding to late (50-60min) with Florbetapir-PET acquisition: Amyvid (AV45) solution for injection of 4MBq/kg, 47 slices 2.7x2.7x3.27mm³.

- **Apolipoprotein genotype:**

Participants were considered as ε4 positive when they had at least one ε4 allele (i.e., ε2/ ε4, ε3/ ε4 or ε4/ ε4), and ε4 negative when no ε4 allele (i.e., ε2/ ε3 or ε3/ ε3).

- **Meditation composite scores:**

The development of the meditation composite scores is based on a theoretical framework categorizing meditation practices into attentional, constructive, and deconstructive types based on the cognitive mechanisms these practices primarily target or necessitate [2]. A detailed description of the composite development process has previously been published [3]. Higher (attentional, constructive, and/or deconstructive) composite scores are associated with higher capacities in the psychological processes characterizing the (attentional, constructive, and/or deconstructive) meditation type(s). For participants naïve to meditation, the meditation composite scores should be used with great caution, and as reflecting possible cognitive dispositions for these psychological processes.

References:

1. D'Agostino, R. B. et al. General cardiovascular risk profile for use in primary care: The Framingham heart study. *Circulation* **117**, 743–753 (2008).

2. Dahl, C. J., Lutz, A. & Davidson, R. J. Reconstructing and deconstructing the self: Cognitive mechanisms in meditation practice. *Trends Cogn Sci* **19**, 515–523 (2015).

3. Schlosser, M. et al. Measuring psychological mechanisms in meditation practice: Using a phenomenologically grounded classification system to develop theory-based composite scores. *Mindfulness* **13**, 600–614 (2022).

Supplemental Table S1. Group-effect on subjective and objective cognition with i) Amyloid, APOE, FRS as covariates, ii) with anxiety and depression as covariates.

	i) Amyloid, APOE and FRS as covariates	ii) Anxiety and depression as covariates
Group effect on CDS delta score, *estimate (95% CI)*	-1.70 (-8.94, 5.54)	3.46 (-2.72, 9.64)
Group effect on ASQ delta internal score, *estimate (95% CI)*	-0.72 (-2.88, 1.43)	-0.32 (-2.20, 1.55)
Group effect on ASQ delta external score, *estimate (95% CI)*	**-3.15 (-5.29, -1.01)**	**-2.37 (-4.17, -0.57)**
Group effect on attention score, *estimate (95% CI)*	-0.05 (-0.45, 0.36)	-0.08 (-0.48, 0.31)
Group effect on executive score, *estimate (95% CI)*	0.26 (-0.14, 0.67)	0.27 (-0.13, 0.67)
Group effect on memory score, *estimate (95% CI)*	**0.60 (0.18, 1.01)**	**0.56 (0.16, 0.96)**
Group effect on PACC5 score, *estimate (95% CI)*	0.19 (-0.21, 0.60)	0.13 (-0.26, 0.52)

Note. CI: Confidence Interval, CDS: Cognitive Difficulties Scale, ASQ : Attentional Style Questionnaire, PACC : Preclinical Alzheimer Cognitive Composite, APOE : APOlipoprotein E genotype, FRS: Framingham Risk Score, **significant effects in bold**.

Supplemental Table S2. Effects of meditation capacities on Attentional Style Questionnaire (ASQ) and memory

Predictors	Estimate (95% CI)	F (df)	P
(A) ASQ external score			
Group *(experts vs non-meditators)*	-0.06 (-2.04, 1.93)	0.003 (1, 149)	.96
Education	-0.11 (-0.32, 0.09)	1.22 (1, 149)	.27
Age	0.03 (-0.13, 0.18)	0.10 (1, 149)	.75
Sex *(female vs male)*	-0.23 (-1.55, 1.09)	0.12 (1, 149)	.73
Attentional capacity	-0.27 (-0.98, 0.44)	0.57 (1, 149)	.45
Constructive capacity	-0.16 (-0.85, 0.54)	0.20 (1, 149)	.66
Deconstructive capacity	-2.24 (-2.94, -1.55)	40.74 (1, 149)	**<.0001 (R^2_{sp}=.21)**
(B) Memory			
Group *(experts vs non-meditators)*	0.40 (-0.06, 0.87)	3.67 (1, 151)	.09
Education	0.03 (-0.02, 0.08)	1.48 (1, 151)	.21
Age	-0.06 (-0.09, -0.02)	8.94 (1, 151)	**.002 (R^2_{sp}=.06)**
Sex *(female vs male)*	0.79 (0.49, 1.10)	26.27 (1, 151)	**<.0001 (R^2_{sp}=.15)**
Attentional capacity	-0.10 (-0.26, 0.06)	1.40 (1, 151)	.24
Constructive capacity	0.09 (-0.08, 0.25)	1.11 (1, 151)	.30
Deconstructive capacity	0.15 (-0.01, 0.31)	3.51 (1, 151)	.07

Note. CI: Confidence Interval, df: degrees of freedom, R_{sp}^2: semi-partial R^2, **significant effects in bold**.

Supplemental Table S3. Effects of practice on memory score and external score of the Attentional Style questionnaire (ASQ) in experts

Predictors	Estimate (95% CI)	F (df)	P
(A) ASQ (external score)			
Education	-0.01 (-0.48, 0.47)	0.00 (1, 21)	.97
Age	0.12 (-0.21, 0.45)	0.62 (1, 21)	.44
Sex *(female vs male)*	-0.18 (-3.51, 3.16)	0.01 (1,21)	.91
Practice	-0.00004 (-0.0001, 0.000001)	3.15 (1, 21)	.09
(B) Memory composite score			
Education	-0.05 (-0.13, 0.03)	1.57 (1, 21)	.22
Age	-0.06 (-0.11, -0.002)	4.59 (1, 21)	**.04 (R^2_{sp}=.18)**
Sex *(female vs male)*	0.89 (0.27, 1.46)	11.01 (1,21)	**.003 (R^2_{sp}=.34)**
Practicer	0.00001 (-0.000001, -0.00002)	4.46 (1, 21)	**.046 (R^2_{sp}=.18)**

Note. CI: Confidence Interval, df: degrees of freedom, R_{sp}^2: semi-partial R^2, **significant effects in bold**.

Supplemental Table S4. Descriptive statistics of the cognitive composite raw scores

Variables of interest	**Experts (N=27),** *Mean ± SD*	**Non-meditators (N=135),** *Mean ± SD*
Attention composite		
Coding	57.63 ± 11.53	61.10 ± 12.44
TMT A	37.41 ± 15.51	35.81 ± 11.37
Digit Span forward	9.52 ± 2.19	8.90 ± 2.37
Stroop (naming)	62.89 ± 8.28	62.07 ± 9.58
Executive composite		
TMT B	83.89 ± 31.75	83.47 ± 32.80
Digit Span backward	9.70 ± 2.40	8.25 ± 1.97
Stroop (interference-naming)	48.04 ± 17.23	50.42 ± 21.09
Letter fluency	23.22 ± 6.30	22.76 ± 6.31
Memory composite		
CVLT (sum 1-5)	56.41 ± 8.62	57.55 ± 8.07
CVLT (short recall)	12.52 ± 2.34	11.98 ± 2.70
CVLT (delayed recall)	12.81 ± 2.18	12.52 ± 2.72
Logical Memory (short recall)	16.78 ± 2.52	14.57 ± 3.04
Logical Memory (delayed recall)	15.50 ± 2.64	13.39 ± 3.46
PACC5 composite		
Mattis Dementia Rating Scale	139.37 ± 3.54	140.97 ± 2.65
Categorical fluency	35.15 ± 9.13	32.27 ± 7.80
CVLT delayed recall	12.81 ± 2.18	12.52 ± 2.72
Logical Memory delayed recall	15.50 ± 2.64	13.39 ± 3.46

Note. SD: Standard Deviation, TMT: Trail Making Test, CVLT: California Verbal Learning Test.