Supplementary Material

for

"A decision-neuroscientific intervention to improve cognitive recovery after stroke"

by

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Table S1. Effect of pre-intervention score upon cognitive improvement

Measure	r	F (1/80)	p
WSST			
forward	-.031	0.784	.378
backward	-.407	25.609	< .001
VLMT			
learning	-.009	0.518	.474
delayed recall	-.236	123.174	.036
delayed recognition	-.405	16.146	< .001

Notes: Pearson's correlation coefficient (second column from left) between pre-intervention score and degree of pre-post change (Δ) across all patients, and determined effect of pre-intervention score upon degree of pre-post change in the ANCOVA models (third and fourth column).

Table S2. Relationship between dose of Wizard training and cognitive improvment

Measure	r	$CI_{95\%}$	p_{corr}
WSST			
forward	.293	[-.038, .567]	.087
backward	.127	[-.209, .437]	.459
VLMT			
learning	.439	[.129, .671]	.008
delayed recall	-.074	[-.393, .260]	.671
delayed recognition	.123	[-.213, .434]	.479

Notes: Partial correlations, controlling for the effect of pre-intervention performance levels (pre scores), between conducted amount of Wizard training and cognitive outcomes (Δ) in training-attenders of both the precommitment and the control group (n= 36).

Table S3. Exploratory comparisons of cognitive improvements of precommitment and control group vs ST group

	Precomm. group		Control group		ST group		comparison improvement (Δ)	
Measure	pre	post	pre	post	pre	post	P vs ST p	C vs ST p
WSST								
forward	5.52 (0.34)	5.80 (0.47)	4.60 (0.39)	5.43 (0.47)	4.75 (0.28)	4.86 (0.34)	.640	.046
backward	2.96 (0.47)	4.00 (0.51)	2.73 (0.37)	3.43 (0.40)	3.04 (0.37)	3.28 (0.29)	.093	.424
VLMT								
learning	26.76 (2.18)	31.48 (2.94)	25.50 (1.86)	27.67 (2.29)	23.82 (1.93)	24.64 (1.87)	.051	.468
d. recall	4.96 (0.68)	5.60 (1.04)	4.33 (0.61)	6.50 (1.05)	3.21 (0.56)	4.11 (1.05)	.757	.214
d. recogn.	2.80 (1.69)	4.72 (1.77)	3.87 (1.36)	5.00 (1.63)	3.11 (0.92)	4.571 (0.98)	.860	.994

Notes: Exploratory analysis, not corrected for multiple comparisons. WSST = Wechsler Spatial Span Test; VLMT = Verbal Learning and Memory Test; Precomm./P = Precommitment; C = Control; ST= standard therapy, d. = delayed; recogn. = recognition.

Bayesian analyses of main effects

In addition to the frequentist statistics reported in the main manuscript, we tested our hypotheses with Bayesian analyses, performed in JASP. Bayesian statistics, specifically the Bayes factor (BF), provide an estimate of how much more likely the observed data are under the specified hypothesis compared to under the alternative hypothesis. Bayesian t-tests assessed our prediction that training frequency and total training duration would be higher in the precommitment group than in the control group. Bayesian contingency tests tested whether the proportion of never-attenders was lower in the precommitment group.

To test the predicted effectiveness of Wizard training on visuospatial and verbal memory functions, Bayesian ANCOVAs compared the improvements scores of patients who performed add-on Wizard training versus those who did not (whilst controlling for pre-intervention scores), and Bayesian correlation analyses tested for a positive relationship between total Wizard training duration and cognitive improvements. Finally, Bayesian ANCOVAs assessed if cognitive improvements were stronger in the precommitment than the control group, controlled for pre-intervention scores. We report the BF, the median of the posterior distribution (δ, a measure of effect size) for t-tests, and the posterior mean of the parameter estimates for each level (β) for ANCOVA contrasts, and there 95% credible interval ($CI_{95\%}$).

Results from Bayesian tests of the precommitment effect on training frequency and dose

Bayesian t-tests provided strong evidence for training frequency (BF = 31.30, δ = .766, $CI_{95\%}$ = [.243, 1.316], Fig. S1A) and total amount of Wizard training (BF = 21.93, δ = 0.732, $CI_{95\%}$ = [.209, 1.277], Fig. S1B) being higher in the precommitment group than in the control group. Likewise, a Bayesian contingency test found strong evidence for the proportion of ever-attenders being lower in the precommitment group (BF = 116.5, log odds ratio = -1.948, $CI_{95\%}$ = [-3.371, -0.754]).

Results from Bayesian analyses of the training effect on cognitive outcome

Patients who performed Wizard training had credibly stronger improvements than those receiving ST only in the WSST backward score (BF = 38.601, $\beta_{\text{add-on-Wizard}}$ = 0.563, $CI_{95\%}$ = [0.214, 0.920], Fig. S1C), and the learning capacity score of the VLMT (BF = 4.274, $\beta_{\text{add-on-Wizard}}$ = 1.831, $CI_{95\%}$ = [0.301, 3.412], Fig. S1D). Additionally, strong evidence for a positive relationship of moderate strength between total Wizard training duration and degree of improvement was found (BF= 9.94, ρ = .397, $CI_{95\%}$ = [0.113, 0.644]). The ANCOVAs comparing improvements of the precommitment group versus the control group favoured the null hypothesis (WSST backward score: BF = 0.319, VLMT learning: BF = 0.498).

In short, these results corroborate those obtained in frequentist statistics reported in the main test, and confirm a credible effect of precommitment upon training frequency and dose and of the add-on cognitive Training with Wizard upon visual and verbal working memory functions.

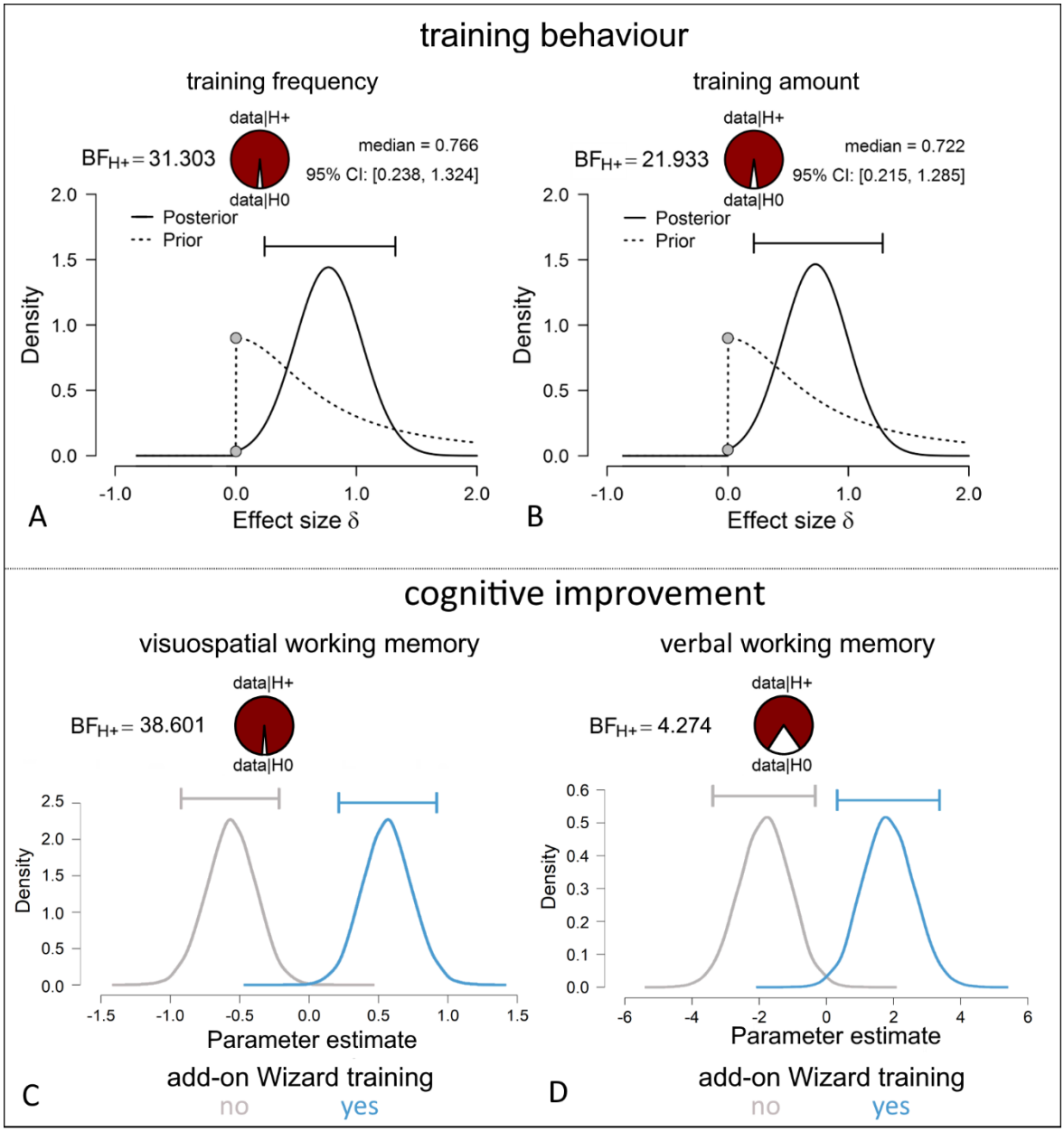

Figure S1. Bayesian analyses of training behaviour and cognitive improvement
Frequency of training (A) and total training duration (B) were credibly higher in the precommitment group than in the control group. Red pies quantify the probability of a true effect given the empirical data (posterior probability). Distribution plots are showing the effect size (δ). Improvements in visuospatial working memory (WSST backward score; C) and verbal working memory (VLMT verbal learning score; D) were credibly higher in patients who performed add-on Wizard training (in blue) than those underwent standard treatment only (in grey; controlled for pre-intervention performance scores). Red pies quantify the probability of a true training effect given the empirical data (posterior probability), the distribution plots indicate the posterior distribution of the parameter estimate (β) for each group derived from Bayesian ANCOVAs.