

Supplement A | Boosting Behavioral Adaptability to Enhance Older Adults' Mental Health/Well-being and Quality of Life Using a Habit-Based Metacognitive Self-Help Intervention

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Supplementary results

Working memory capacity (planned)

We also explored the moderating role of working memory capacity. For the majority of outcome variables, no moderation effect was observed. Interestingly, the intervention effect on the total training frequency was moderated by working memory capacity. That is, those with relatively poor working memory adhered less well in the control group, but not in the strategy group, $F(1,77) = 9.74, p = .003, \eta_p^2 = 0.11$. No such effects were found for the total frequency of the personal target behavior in the test phase, all p 's $> .05$.

Moderating role of conscientiousness, lifestyle regularity and prospective memory (post-hoc)

Recent analyses examining the interrelations among conscientiousness, the inclination to engage in if-then planning, lifestyle regularity, prospective memory, and both quality of life and mental well-being [1], suggested that conscientiousness and lifestyle regularity may form boundary conditions to the effectiveness of (self-initiated) if-then plans in promoting goal-striving. These effects were observed only among individuals with relatively high levels of prospective memory ability. Intrigued by these findings, we explored whether conscientiousness, lifestyle regularity, and prospective memory could potentially act as moderating factors influencing the effectiveness of the MCSI. To address these questions, a series of exploratory analyses was conducted, employing methodologies similar to those used in examining the role of prior mental health status. Results are summarized in **Table SA1-1** and **SA1-2** and briefly outlined below.

High levels of conscientiousness were associated with higher behavioral frequencies of the target behavior in the test phase, but not the training phase, irrespective of group. Individuals lower in conscientiousness showed larger decreases in apathy (irrespective of group) and loneliness (strategy group only).

While lifestyle regularity did not predict any individual differences in frequency or perceived automaticity, changes in quality of life were moderated by baseline levels of lifestyle regularity. Specifically, in the strategy group, individuals with a lower lifestyle regularity, showed larger increases in quality of life. No such patterns were observed for the control group. Larger increases in the inclination to engage in if-then planning were found for those with lower lifestyle regularity prior to the intervention, irrespective of group.

In both groups, higher prospective memory ability was associated with higher frequencies in the test phase, but not the training phase. In the strategy group, individuals with lower prospective memory ability, showed larger increases in quality of life and decreases in depression. No such patterns were observed for the control group. In both groups, lower prospective memory ability was associated with a stronger improvement in apathy. Finally, individuals with lower prospective memory ability, showed a larger improvement in self-efficacy, but surprisingly this was only the case for the control group.

References

- [1] Brinkhof LP, Ridderinkhof KR, Bieleke M, Murre JM, Krugers HJ, Wit S de. Are Older Individuals Predisposed to Habitual Control More Resilient? *Curr Psychol* 2023;1–17. <https://doi.org/10.1007/s12144-023-04982->.

Table SA1-1. Exploring the moderating role of conscientiousness, lifestyle regularity and prospective memory ability.

	Conscientiousness (CON)	Lifestyle regularity (LR)	Prosp. memory ability (PMA)
SRBAI training			
M	$F(1,76) = 0.41, \eta_p^2 = 0.00$	$F(1,77) = 0.00, \eta_p^2 = 0.00$	$F(1,76) = 1.04, \eta_p^2 = 0.01$
I	$F(1,76) = 0.74, \eta_p^2 = 0.00$	$F(1,77) = 0.54, \eta_p^2 = 0.01$	$F(1,76) = 0.00, \eta_p^2 = 0.00$
SRBAI test			
M	$F(1,95) = 2.82, \eta_p^2 = 0.03$	$F(1,96) = 0.51, \eta_p^2 = 0.01$	$F(1,95) = 1.24, \eta_p^2 = 0.01$
I	$F(1,95) = 0.17, \eta_p^2 = 0.00$	$F(1,96) = 0.01, \eta_p^2 = 0.00$	$F(1,95) = 0.32, \eta_p^2 = 0.00$
Frequency (Freq) training			
M	$F(1,76) = 0.96, \eta_p^2 = 0.01$	$F(1,77) = 0.05, \eta_p^2 = 0.00$	$F(1,76) = 0.00, \eta_p^2 = 0.00$
I	$F(1,76) = 0.00, \eta_p^2 = 0.00$	$F(1,77) = 2.59, \eta_p^2 = 0.03$	$F(1,76) = 0.29, \eta_p^2 = 0.00$
Frequency (Freq) test			
	- High CON <> High Freq		
	- High PMA <> High Freq		
M	$F(1,96) = 12.6^{***}, \eta_p^2 = 0.12$	$F(1,97) = 3.15, \eta_p^2 = 0.03$	$F(1,96) = 5.03^*, \eta_p^2 = 0.05$
I	$F(1,96) = 0.03, \eta_p^2 = 0.00$	$F(1,97) = 0.01, \eta_p^2 = 0.00$	$F(1,96) = 0.14, \eta_p^2 = 0.00$
Self-efficacy (SEF)			
	- Low PMA <> greater SEF improvement in control group only		
M	$F(1,93) = 0.07, \eta_p^2 = 0.00$	$F(1,94) = 0.00, \eta_p^2 = 0.00$	$F(1,93) = 1.92, \eta_p^2 = 0.02$
I	$F(1,93) = 2.04, \eta_p^2 = 0.02$	$F(1,94) = 0.66, \eta_p^2 = 0.01$	$F(1,93) = 5.36^*, \eta_p^2 = 0.05$
Self-management ability (SMA)			
M	$F(1,93) = 0.02, \eta_p^2 = 0.00$	$F(1,94) = 1.24, \eta_p^2 = 0.00$	$F(1,93) = 0.29, \eta_p^2 = 0.00$
I	$F(1,93) = 1.35, \eta_p^2 = 0.01$	$F(1,94) = 3.00, \eta_p^2 = 0.03$	$F(1,93) = 0.32, \eta_p^2 = 0.00$
Inclination to engage in if-then planning (ITP)			
	- Low LR <> greater ITP improvement		
M	$F(1,96) = 1.86, \eta_p^2 = 0.02$	$F(1,96) = 4.64^*, \eta_p^2 = 0.05$	$F(1,96) = 1.42, \eta_p^2 = 0.01$
I	$F(1,96) = 1.14, \eta_p^2 = 0.01$	$F(1,96) = 0.76, \eta_p^2 = 0.01$	$F(1,96) = 0.22, \eta_p^2 = 0.00$
Lifestyle satisfaction (LS)			
M	$F(1,96) = 1.08, \eta_p^2 = 0.01$	$F(1,97) = 0.00, \eta_p^2 = 0.00$	$F(1,96) = 2.20, \eta_p^2 = 0.02$
I	$F(1,96) = 0.74, \eta_p^2 = 0.01$	$F(1,97) = 0.19, \eta_p^2 = 0.00$	$F(1,96) = 3.63, \eta_p^2 = 0.04$

Table SA1-2. Exploring the moderating role of conscientiousness, lifestyle regularity and prospective memory ability (continuation).

	Conscientiousness (CON)	Lifestyle regularity (LR)	Prosp. memory ability (PMA)
Quality of life (QoL)	- Low LR <> greater QoL improvement in strategy group only - Low PMA <> greater QoL improvement in strategy group only		
M	$F(1,93) = 0.42, \eta_p^2 = 0.00$	$F(1,94) = 0.19, \eta_p^2 = 0.00$	$F(1,93) = 0.91, \eta_p^2 = 0.01$
I	$F(1,93) = 3.48, \eta_p^2 = 0.04$	$F(1,94) = 10.2^{**}, \eta_p^2 = 0.10$	$F(1,93) = 5.41^*, \eta_p^2 = 0.06$
Mental well-being (MWB)			
M	$F(1,93) = 0.24, \eta_p^2 = 0.00$	$F(1,94) = 0.39, \eta_p^2 = 0.00$	$F(1,93) = 0.37, \eta_p^2 = 0.00$
I	$F(1,93) = 1.82, \eta_p^2 = 0.02$	$F(1,94) = 0.42, \eta_p^2 = 0.00$	$F(1,93) = 0.83, \eta_p^2 = 0.01$
Depression (DEP)	- Low PMA <> greater DEP decrease in strategy group only		
M	$F(1,96) = 2.97, \eta_p^2 = 0.03$	$F(1,97) = 2.12, \eta_p^2 = 0.02$	$F(1,97) = 11.4^{**}, \eta_p^2 = 0.11$
I	$F(1,96) = 0.16, \eta_p^2 = 0.00$	$F(1,97) = 4.79, \eta_p^2 = 0.05$	$F(1,97) = 10.9^{**}, \eta_p^2 = 0.10$
Loneliness (LONE)	- Low CON <> greater LONE decrease in strategy group only		
M	$F(1,93) = 0.75, \eta_p^2 = 0.01$	$F(1,94) = 0.17, \eta_p^2 = 0.00$	$F(1,93) = 1.42, \eta_p^2 = 0.01$
I	$F(1,93) = 1.08^*, \eta_p^2 = 0.01$	$F(1,94) = 2.06, \eta_p^2 = 0.02$	$F(1,93) = 0.24, \eta_p^2 = 0.00$
Apathy (APA)	- Low CON <> greater APA decrease - Low PMA <> greater APA decrease		
M	$F(1,97) = 5.72^*, \eta_p^2 = 0.06$	$F(1,97) = 0.33, \eta_p^2 = 0.00$	$F(1,96) = 5.73^*, \eta_p^2 = 0.06$
I	$F(1,97) = 0.94, \eta_p^2 = 0.01$	$F(1,97) = 2.86, \eta_p^2 = 0.03$	$F(1,96) = 0.87, \eta_p^2 = 0.01$

M: main effect (CON, LR, PMA), I: interaction effect Group* (CON, LR, PMA). * $p < .05$, ** $p < .01$, *** $p < .001$