**Supplementary file**

**Characteristics of Resting-State Functional Connectivity in Older Adults after the PICMOR Intervention Program: A Preliminary Report**

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# ****A follow-up study****

To address the sustainability of the beneficial intervention effect on verbal fluency identified in our previous RCT study [1], we conducted a follow-up experiment almost 1 year after the intervention period using PVFT, although it is out of the scope of this pilot rsfMRI study. Among the 61 participants in the rsfMRI experiment (31 in INT and 30 in CONT), a total of 56 participants, including 28 participants in INT (14 females; 17 people with education for 13 years and more; age, mean ± SD = 72.82 ± 3.60 years) and 28 participants in CONT (16 females; 15 people with education for 13 years and more; age, mean ± SD = 71.89 ± 2.77 years), participated in this follow-up experiment. There were no significant differences in age [*t*(*df* = 54) = 1.08, *p* = 0.28], gender [*2*(*df* = 1, n = 56) = 0.07, *p* = 0.79], and educational level [*2*(*df* = 1, n = 56) = 0.07, *p* = 0.79] between the two groups. Also, there was no significant difference in the time span from the last day of the intervention period to the day of the follow-up experiment between INT (mean ± SD = 54.08 ± 0.55 weeks) and CONT (mean ± SD = 54.12 ± 0.36 weeks) [*t*(*df* = 54) = 0.29, *p* = 0.77]. We found a significantly larger PVFT score at the follow-up in INT (mean ± SD = 13.64 ± 4.12) than in CONT (mean ± SD = 11.36 ± 3.86) [*t*(*df* = 54) = 2.14, *p* < 0.05, *Cohen’s d* = 0.57]. Given the evidence from another intervention study that showed a remarkable improvement in the PVFT score 12 weeks after the intervention period [2], our finding extended the previous findings by demonstrating that the beneficial effect on verbal fluency could last for a longer period.

## Abbreviations

RCT: randomized controlled trial; PVFT: phonemic verbal fluency task; rsfMRI: resting-state functional magnetic resonance imaging; INT: the intervention group; CONT: the control group; SD: standard deviation.

## References

1. Otake-Matsuura M, Tokunaga S, Watanabe K, Abe MS, Sekiguchi T, Sugimoto H, et al. Photo-integrated conversation moderated by robots for cognitive health in older adults: a randomized controlled trial. Preprint at https://doi.org/10.1101/19004796 (2019).

2. Dodge HH, Zhud J, Mattek NC, Bowman M, Ybarrae O, Wild KV, et al. Web-enabled conversational interactions as a method to improve cognitive functions: results of a 6-week randomized controlled trial. Alzheimers Dement N Y. 2015;1:1-12.