Age differences in the fronto-striato-parietal network underlying serial ordering

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[a] I , K , CA C E B I , C
A , , C
[b] I , C A , B , C
[c] D , C A , B , C
[d] C B C , C , , B , C
[e] D , H , B , C
[f] K -IDG/ G I B , , B , C
[g] D , , , G

a r t i c l e i n f o

A :

percentage signal change relative to the whole-brain mean signal was extracted from the mask with MarsBaR 0.44 and entered into an ANOVA with a within-subject factor condition (REO+ vs. REO−) and a between-subject factor group (older vs. young). Significance was considered at < 0.013 (Bonferroni-corrected for 4 regions). Given the presence of the subcortical regions (see section 3.2) and the default mode network (see section 3.3), we also explored the group effect on the thalamus, globus pallidus, subthalamic nucleus, substantia nigra, ventromedial prefrontal cortex, posterior cingulate cortex, and Rolandic operculum.

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predicted by the PPI or the regional activation. The independent variables were the mean Fisher-transformed PPI between the 4 seeds and the BA6/32 (which showed a significant age difference in the PPI analysis, see section 3.7) and the mean percentage signal change of the 4 seeds. Significance was considered at < 0.05.

Last but not least, we examined the relationship between the PPI

was initiated. Participants might initiate reordering when all digits have been perceived, or as soon as the first digit was perceived. The process of reordering may share some of the brain resources (e.g., prefrontal and parietal activations) with the processes of encoding and retrieval. This may be difficult to depict with the current approach. Fourth, the current results are descriptive. The ultimate goal is to propose a computational or biological model of serial ordering in working memory.

5. Conclusions

We detected a distributed network for serial ordering, functionally connecting the medial and lateral prefrontal cortex with the posterior parietal cortex, globus pallidus, subthalamic nucleus, thalamus, substantia nigra, and cerebellum. Within the network, regional activation and interregional interaction were modulated by serial ordering and age. In young adults, the prefrontal and parietal regions were more activated and more strongly connected with the supplementary motor area for serial ordering (ordering-dependent interregional interaction). In older adults, the prefrontal and parietal activations were elevated in a nonspecific manner but the ordering-

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