

High Heritability of fMRI Brain Activity Patterns Determines Individual Differences in Neurocognition

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Little is known about the heritability of fMRI activation. In a functional MRI experiment with an extended family twin design, we examined heritability of brain activation patterns in a numerical working memory task. Brain areas presenting high heritability in number processing tasks were different from those involved in working memory: a heritable brain site was observed in the intraparietal sulcus in the number processing while large heritable brain surfaces was observed predominantly in the left hemisphere in the working memory task. Therefore, the individualized properties of brain-activation can be subserved by genetically driven activations of brain sites that are in part non-typical for the cognitive functions per se.