

Investigating the Development of Inhibitory Control in Early Childhood using the Tablet-based TapTap Task

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Abstract

The development of inhibitory control is an early construct of executive function (EF) and a key milestone of neurocognitive maturation. However, while its functional connectivity (fc) patterns have been well-defined in adults, its developmental trajectory in early childhood remains poorly understood. Using tablet-based EF tasks, we assessed inhibitory control in typically developing children between 2 to 6 years of age. Overall successful inhibition and improvement during competitive and non-competitive inhibition displayed converging patterns of fc. With increasing inhibitory control and task difficulty, additional frontal and parietal fc was recruited, and long-range connections established. Insights into early development and refinement of inhibitory control could provide essential information for the support in normal development as well as for the diagnosis and treatment of neurodevelopmental disorders with EF and inhibition difficulties, such as autism spectrum disorder.

Full Text

Due to technical limitations, full-text HTML conversion of this manuscript could not be completed. However, the latest manuscript can be downloaded and [accessed as a PDF](#).

Table

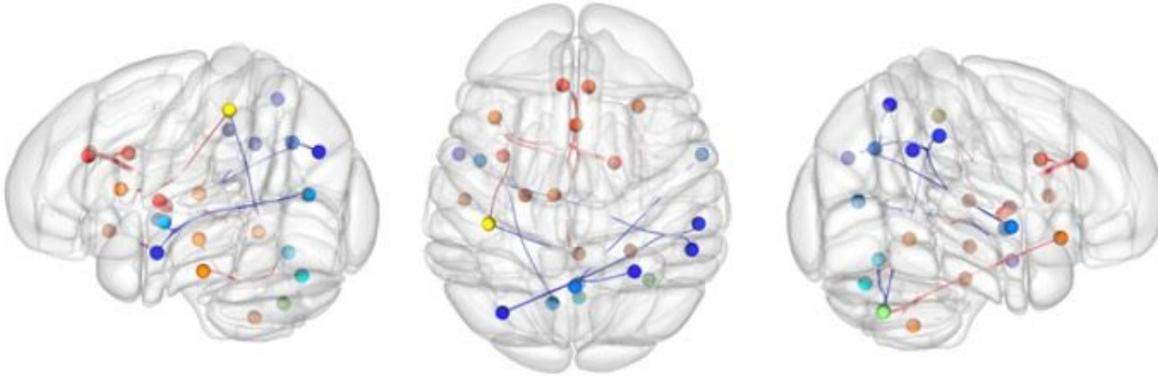
Table 1. Participant demographics

	2-3 year-olds	3-4 year-olds	5 year-olds
Number (Boys/ Girls)	11 (8/3)	16 (9/7)	11 (6/5)
Age at scan	27.36 (5.61)	48.56 (6.54)	67.73 (2.10)
Inhibition score	6.75 (4.35)	13.29 (4.03)	15.25 (1.14)
Average balls	1.02 (0.20)	1.13 (0.16)	0.66 (0.14)
Average dogs	1.17 (0.21)	1.10 (0.17)	0.87 (0.10)
SSI	0.02 (0.26)	-0.13 (0.22)	0.07 (0.16)
MSI	-0.34 (0.39)	-0.53 (0.49)	-0.73 (0.39)

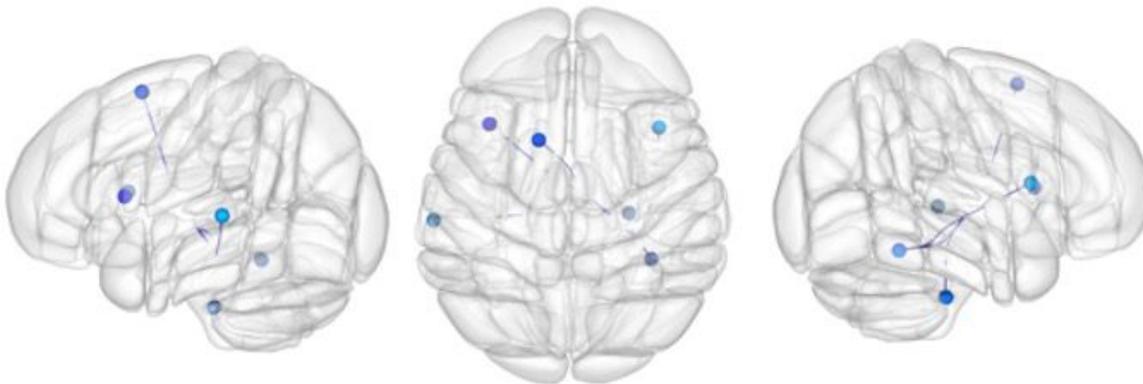
Mean participant demographics with standard deviations in brackets and age at scan is in months. No information for average balls clicked was acquired for 3 participants in the 2-3 year-olds, 11 for the 3-4 year-olds, and 8 for the 5 year-olds.

Figures

Successful Inhibition Score



Successful Inhibition Score 2-3 < 3-4 years



Successful Inhibition Score 2-3 < 5 years

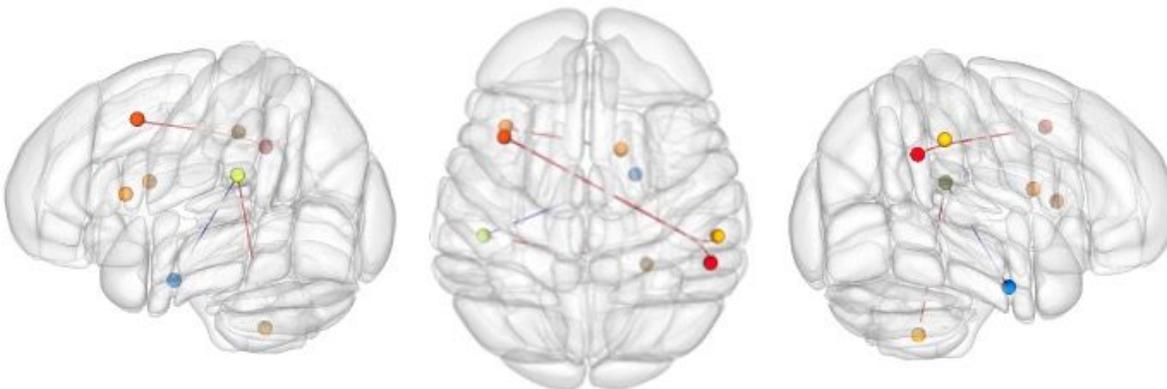
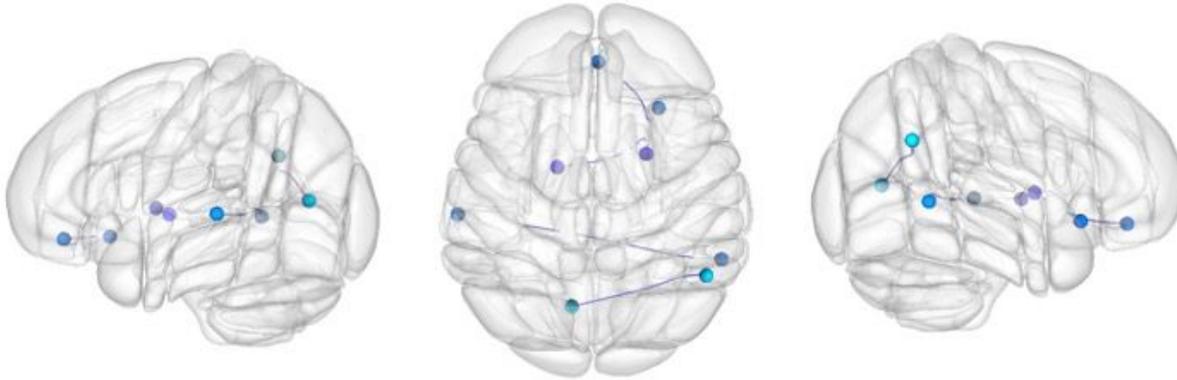


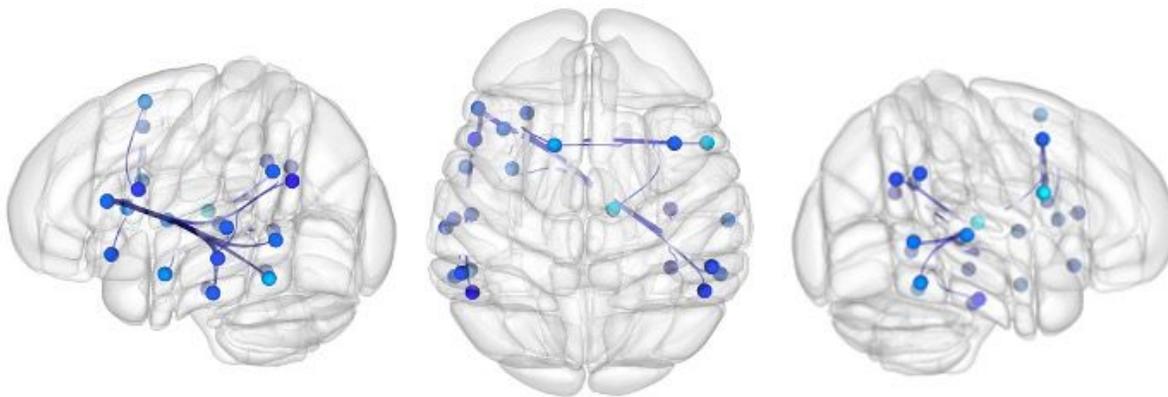
Figure 1

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Non-Competitive Inhibition



Non-Competitive Inhibition 2-3 < 3-4 years



Non-Competitive Inhibition 2-3 < 5 years

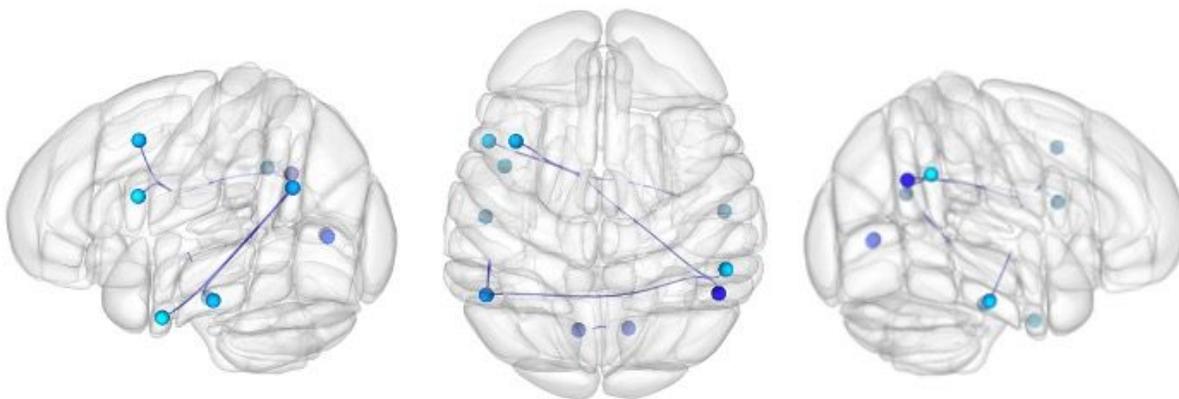
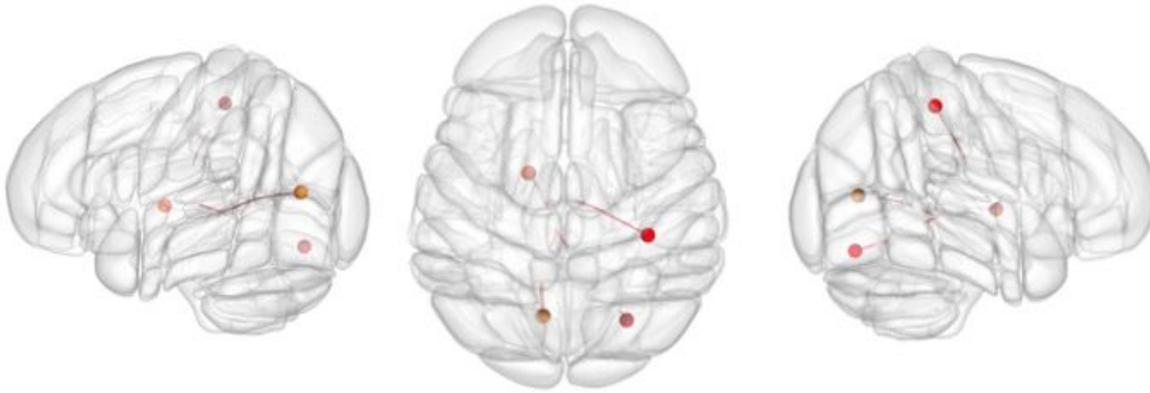


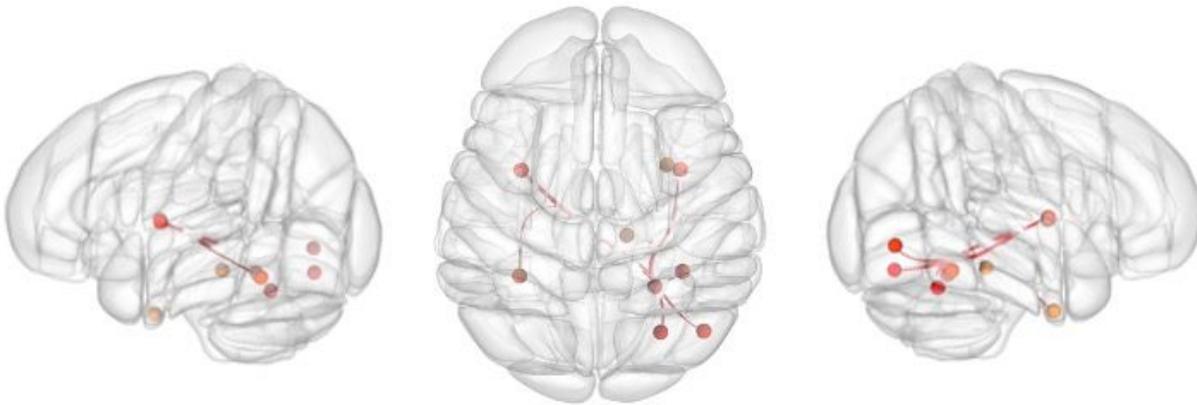
Figure 2

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Competitive Inhibition



Competitive Inhibition 2-3 < 3-4 years



Competitive Inhibition 2-3 < 5 years

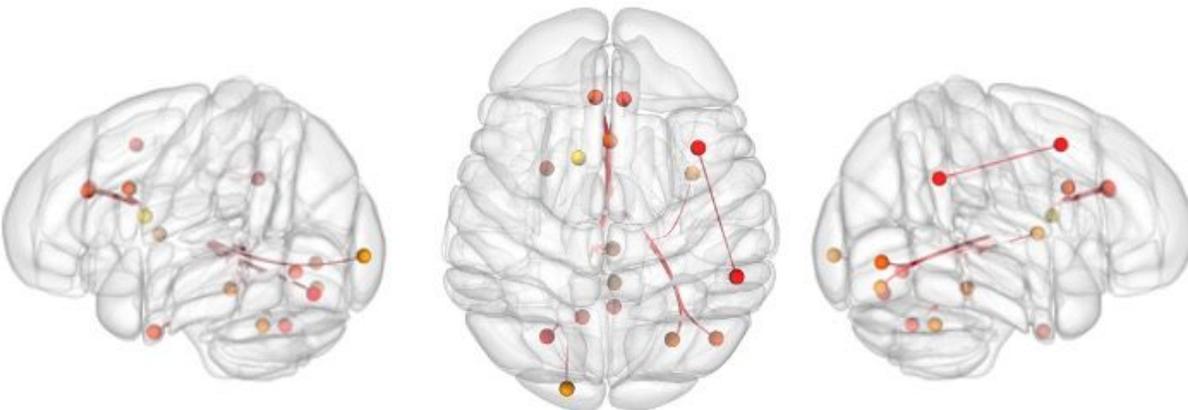


Figure 3

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Supplementary Files

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- [TableS1.pdf](#)