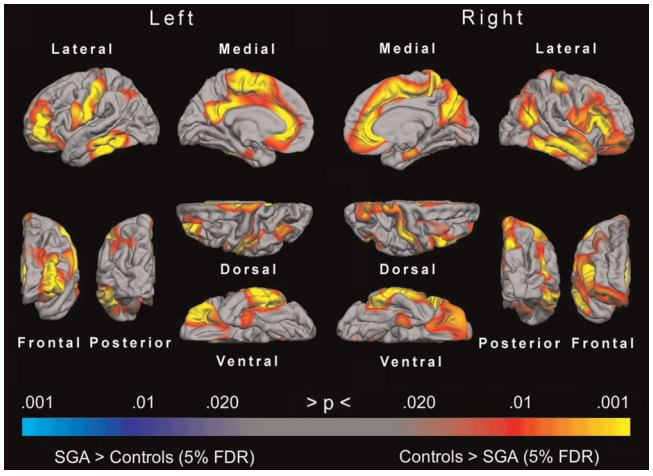

Abstract O-058 Figure 1 Group differences in surface area change between SGA young adults and controls. The mapping of cortical surface area reduction in SGA young adults and controls is shown on the reconstructed cortical surface. Cortical areas with statistically significant difference between groups are shown in colour, and the colour scale shows the dynamic range of the statistically significant changes (in p-values), red to yellow reperesents an increasing expansion of the cortex in SGA group to fit the template, thus surface area reduction in these areas compared with controls. All significant clusters survived FDR correction at $p < 0.05$. No areas with surface area expansion (blue areas) were found in the SGA group compared with controls

Background/aims Being born small-for-gestational-age (SGA), a proxy for fetal growth restriction (FGR) has been related to poor school performance, lower academic achievement and cognitive problems. The aim of this study was to investigate whether young adults born SGA at term had reduced brain volumes, cortical surface area and/or cortical thickness, and whether brain morphometry measures were related to cognitive functioning.
Methods In this population-based follow-up study at age 20, 58 term-born SGA (birthweight < 10 th centile, mean: 2915 g) and 81 non-SGA controls (birthweight >10 th centile, mean: 3707 g) were included. MRI-examinations at 1.5 T were obtained in 47 SGA and 61 control subjects. Image analysis was performed by the FreeSurfer, version 5.1. IQ was assessed by Wechsler Adult Intelligence Scale 3rd edition (WAIS-III).
Results Total brain volume was smaller in the SGA than in the control group (-5.6%; $p < 0.001$). This reduction included most structures, but relative volumes were the same. Cortical surface area was significantly reduced in the SGA group compared with controls in multiple regions across the cerebral cortex, especially in the frontal, parietal and temporal lobes compared with controls (**Figure**). The reduction in surface area in the SGA group was most pronounced in the anterior cingulate gyri bilaterally. No associations were found between brain measures and IQ measures in either group.
Conclusions Young adults born SGA at term have a global reduction in brain volume and regional reductions in cortical surface area. This may have long term consequences for cognitive functioning.

O-059 IMPAIRED EXECUTIVE FUNCTIONS IN COMPLEX TASKS IN CHILDREN AND ADOLESCENTS BORN VERY PRETERM

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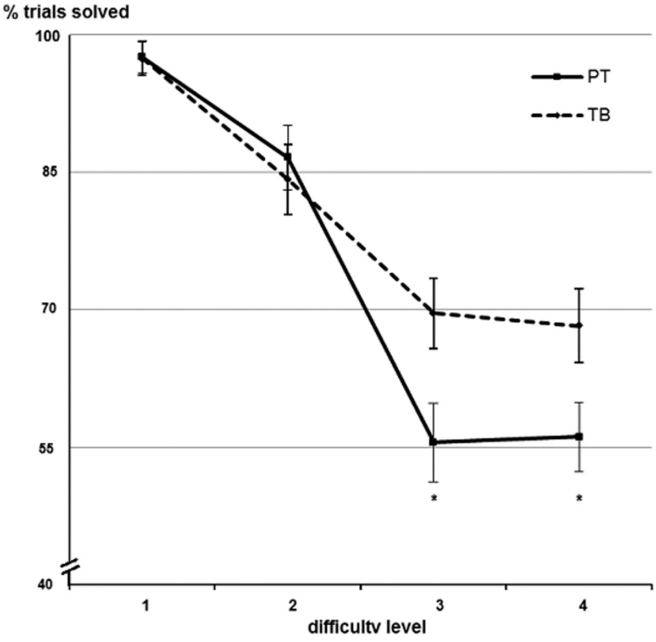
Introduction Many studies have found impaired performance in executive functions (EF) in children born very preterm (VPT) [1]. EF play a pivotal role for academic achievement and personal autonomy. Demands in both domains and, in parallel, the dependence on EF ability in daily life continuously increase in later childhood and adolescence [2].
Methods Forty-one VPT children/adolescents between 10 and 16 years with normal general cognitive abilities and 43 healthy term-born (TB) peers were examined. Parents reported on their children's EF ability in the home and school environment using the Behaviour Rating Inventory of Executive Functions, BRIEF. Additionally, computer-based testing using the CANTAB test battery provided objective measures of executive functioning.
Results Parents of VPT children rated EF abilities of their children poorer than parents of TB children, with 10–20% of all VPT children experiencing clinically relevant EF problems vs. none of the TB children. In computerised EF tests, an interaction between birth status and task difficulty was found for various EF components: Performance of VPT and TB children was comparable in lower but poorer in higher difficulty levels for VPT children (e.g., *Fig. 1* for planning accuracy).
Conclusions Executive function difficulties in VPT children and adolescents become more pronounced with increasing task demands. As EF demands in daily life become more complex in later childhood and adolescence, EF deficits may hinder optimal development in former VPT children.

REFERENCES

1 for a review : Aarnoudse-Moens *et al*., Pediatrics 2009; Mulder *et al*., Dev Neuropsychol 2009
2 Burnett *et al*., Eary Hum Dev 2013



Abstract O-059 Figure 1 VPT participants solve significantly fewer trials as the level of planning demands increases