Introduction

- The left inferior frontal cortex (IFC) has been associated with a variety of language functions including semantic and phonological processing.
- Studies have indicated distinctive, yet partially overlapping subregions in IFC which have different responses profiles to phonological text.
- Previous research has shown different IFC activation in struggling readers compared to typical readers in real word and pseudoword tasks.
- This study investigates the effect of intensive reading instruction on frontal language regions in struggling young readers.

Methods

- Participants: 27 children 8-13 yrs who struggle with reading were enrolled in an 8-week intensive summer reading instruction program.
- A functional localization paradigm was administered at 5 timepoints (sessions) over the course of the year:
  - Pre-Intervention: Immediately before intervention
  - Post-Intervention: 6 Months after intervention
- Tasks: One-back (image repetition) and Fixation (color change)
- Visual Categories were grouped into 3 categories for analyses:
  - Pronounceable Text: Real Words and PseudoWords
  - Unpronounceable Text: Consonants and Falsefonts
  - Other: Objects, Faces and Limbs
- Experimental Design

Experimental Design

- An analysis of struggling young readers found that frontal language regions respond more strongly to tasks that demand attention.
- This task preference is strongest for phonological (pronounceable) text compared to unpronounceable text and text-like symbols.
- This task effect magnitude increases in IFS following intervention.
- Reading Intervention drives increased suppression for non-text in frontal language regions.
- Text selective regions in the precentral gyrus increase in size following intervention.

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References