READING IN THE BRAIN

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PROJECT SUMMARY

This study concerns the cognitive processes involved in reading an expository science text, as it is one of the main ways students acquire basic science concepts. It focuses on two aspects:

1) How do individual variation in cognitive and executive abilities interact with the linguistic abilities of the readers to modulate reading comprehension competence?
2) How is structured knowledge representation of key science concepts reflected in the brain of the student reader? How can we use brain network analyses to differentiate successful from unsuccessful readers in the comprehension process?

DATA COLLECTION PROGRESS

- Monolingual Adults
  - 52 Subjects from Hershey (2 missing behavioral data)
- Monolingual Children*
  - Finalize materials
  - Recruit & run subjects
- Bilingual Adults
  - Beijing subjects
  - More U.S. subjects (?)

*see next slide for details

Phase II (children) Progress

Completed

- Practice eye-tracker
- Mock scanner protocol & practice text
- Sorting task fixed
- Finalized fMRI scripts
- Session 2 tasks

In Progress

- Recruitment
  - ~~Craigslist ads posted~~
  - ~~Science U flyers distributed~~
  - ~~StudyFinder mod approved~~
  - FIRSt Families being contacted daily
- Make E-Prime for SRI [Aug 4]

Not yet Started

- Run subjects
  - First 2 scheduled for 7/31

DATA ANALYSIS PROGRESS

Completed

- Predictive modeling of abstract concept evolution (Ben)
- Between-text/group GLM comparison

In progress

- Manuscript: Psycholinguisitic variables (length) and connectivity (DCM) in the oculomotor network (CT, Ben, Ping)
- Connectivity (DCM) in/between the reading network and the executive function network (CT) [8/18]
- RSfMRI: functional connectivity and individual variance (Anya)
- Eye-tracking data analysis (Lindsey)

Not yet started

- Deep learning; SVM with Gaussian (Xiaowei & CT)
- DTI: anatomical connectivity and individual variance (Ben?)