

# Neural Activation during Phonological Processing in Primary-School Children with Limited Reading Experience: Insights from Rural Côte d'Ivoire

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Funders:

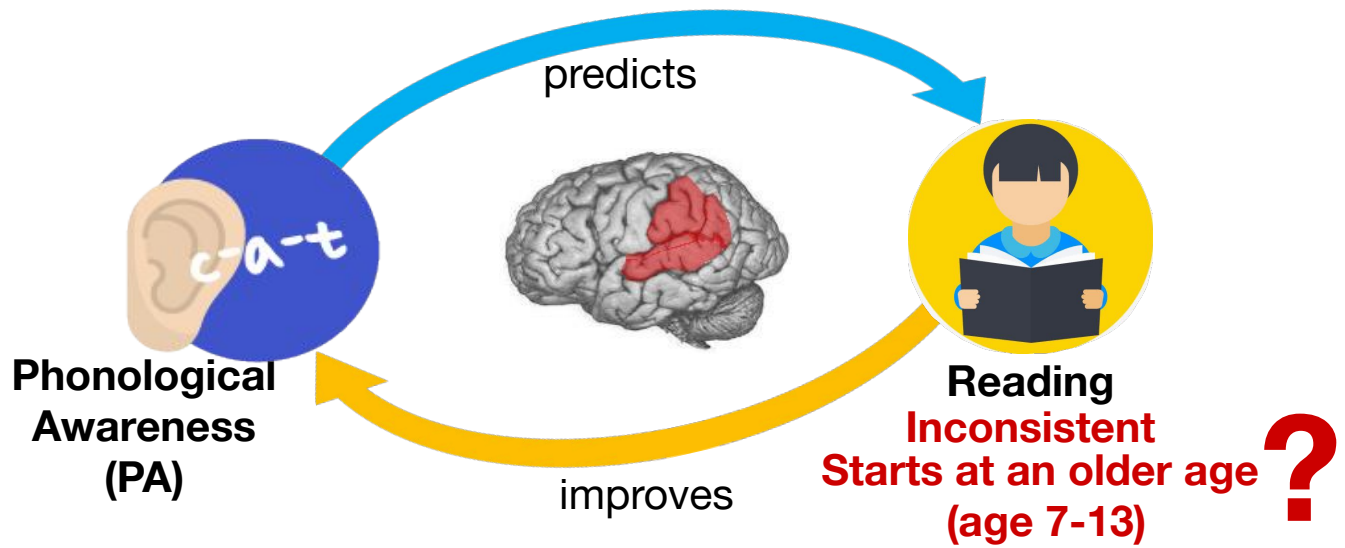


Our Promise to Youth



# Research Question

How does the absence of reading experience across childhood impact neural activity in left temporoparietal cortex underlying phonological processing, and in turn, children's reading skills?



## Hypothesis

Inconsistent and low-quality reading experience impacts neural activity in the left temporoparietal cortex for phonological processing, and children's reading skills, and crucially, this impact is age-dependent

Younger vs older children will show different neural activity for phonological processing

# Methods

## Participants

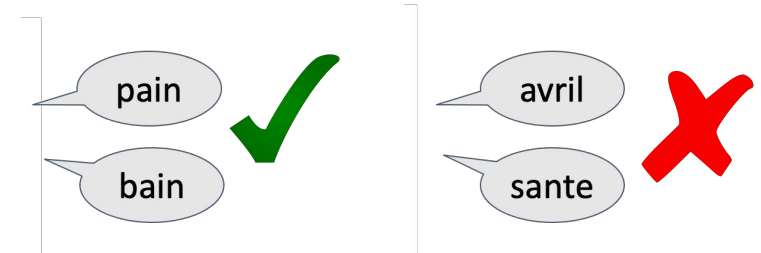
93 children (53 boys) in rural Côte d'Ivoire ages 7-13 (M=10.3, SD=1.59)



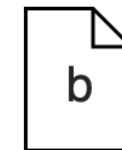
## fNIRS Neuroimaging

Measured hemodynamic response during Rhyme Judgment Task

## Rhyming Judgement Task



## Reading Tasks (from EGRA):



Letter

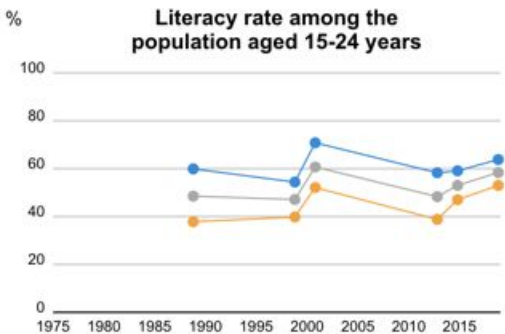


Word



Pseudoword

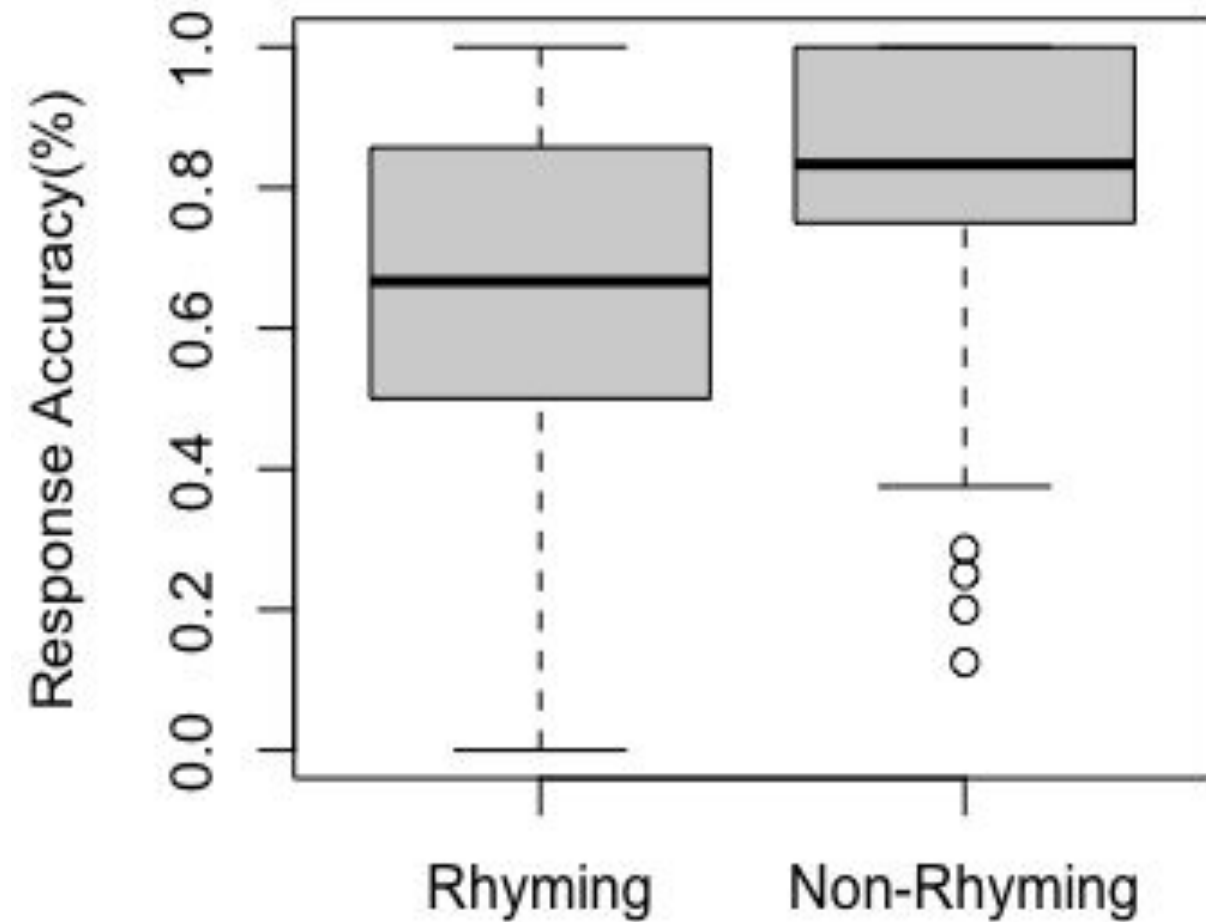
Literacy rate among the population aged 15-24 years



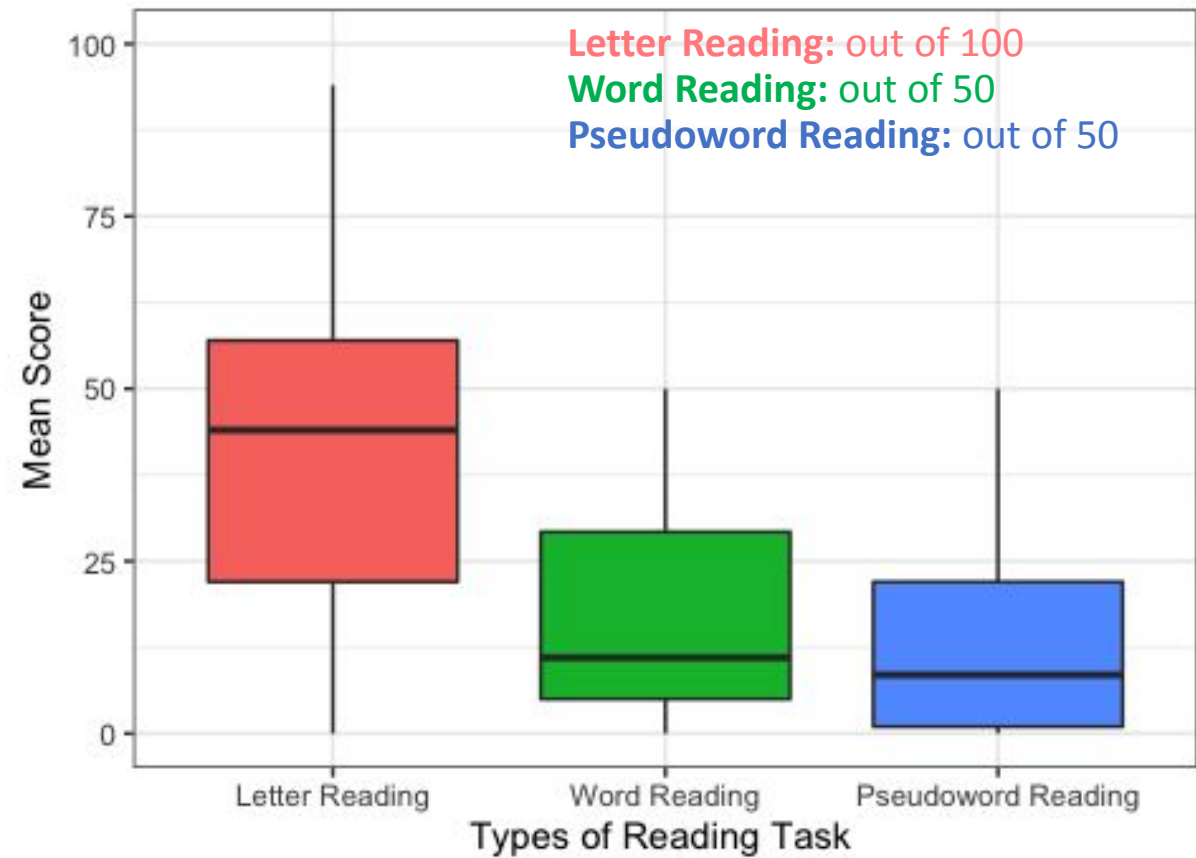
● Male ● Female ● Total

# Behavioral Results

## Rhyming Judgment Task



## Reading Task

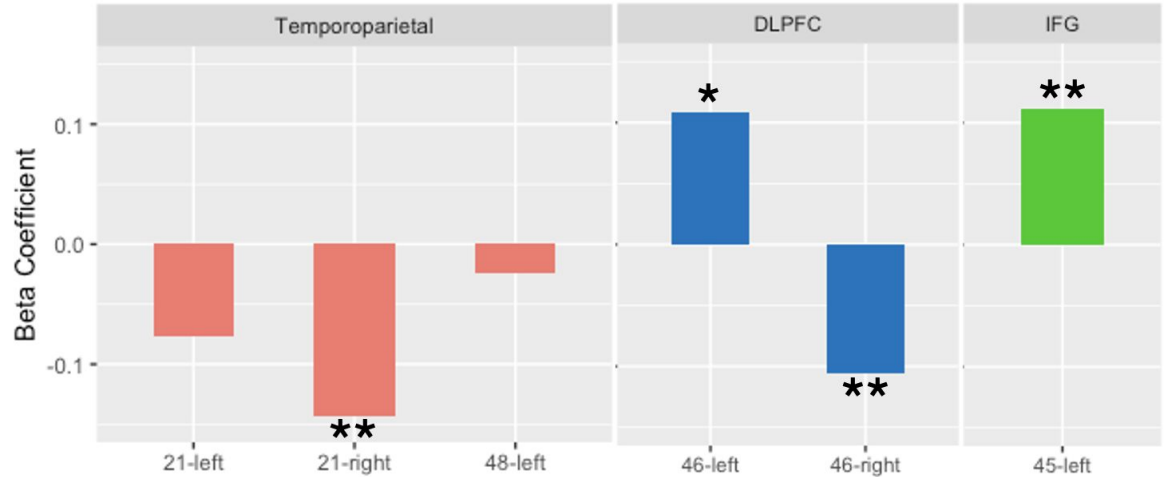


# Neural Activity during Phonological Processing

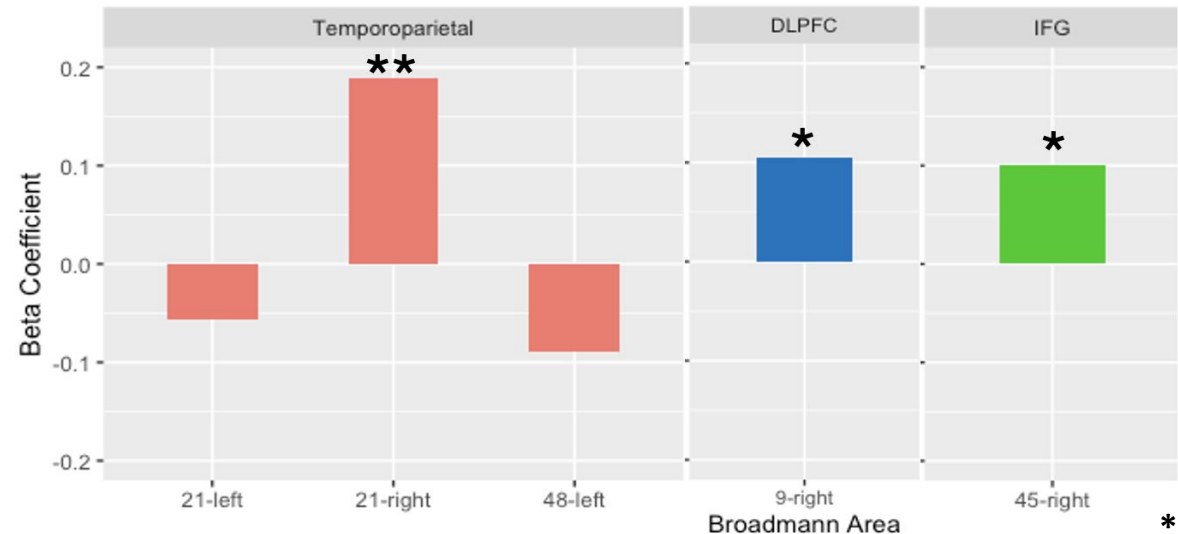
(for Rhyming vs. Non-Rhyming Condition)

Young>Old

Children with *higher* reading scores

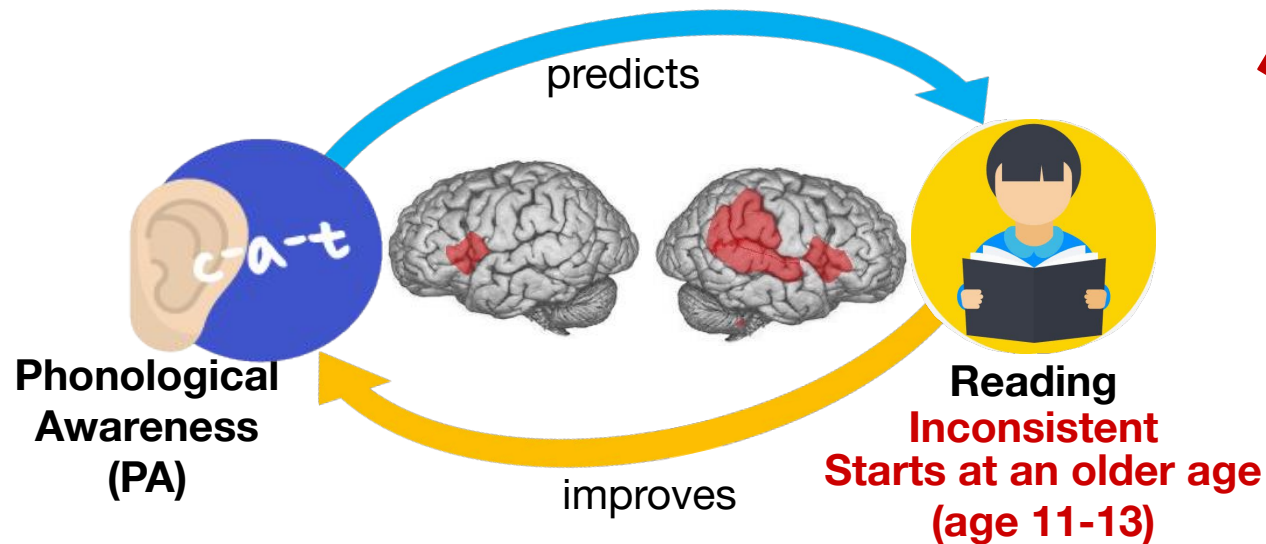


Children with *lower* reading scores



\*q<0.05; \*\*q<0.01

# Conclusion



## Age of reading experience

**New:** Patterns of neural activation that underlie phonological processing depend on the age of reading experience

Age differences for phonological processing observed in right temporo-parietal cortex and bilateral inferior frontal cortex

Our findings suggest that the reciprocal PA-reading link differs across development