Predicting Literacy in the Brain in Emergent Readers in Rural Côte d'Ivoire
A Longitudinal Study

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INTRODUCTION

In rural Côte d'Ivoire communities, adult literacy rates are below 50% (UNESCO, 2019), and the poverty rate is over 60% (World Bank, 2020).

RQ1: How does the neurological footprint of print processing predict literacy two years later?

Ivorian children typically speak one of 60+ Ivorian languages as mother tongue, but literacy is acquired in L2 French.
Over 90% of developmental research is carried out in WEIRD contexts (Heinrich, 2010), with little understanding of developmental trajectories in global low and middle income contexts.

RQ2: How does the age of first exposure to literacy impact print processing in the brain?

Children begin school at a broad range of ages, and so are exposed to literacy for the first time at a broad range of ages, which has been shown to impact the way writing is processed (Jasińska & Petitto, 2013; 2018)
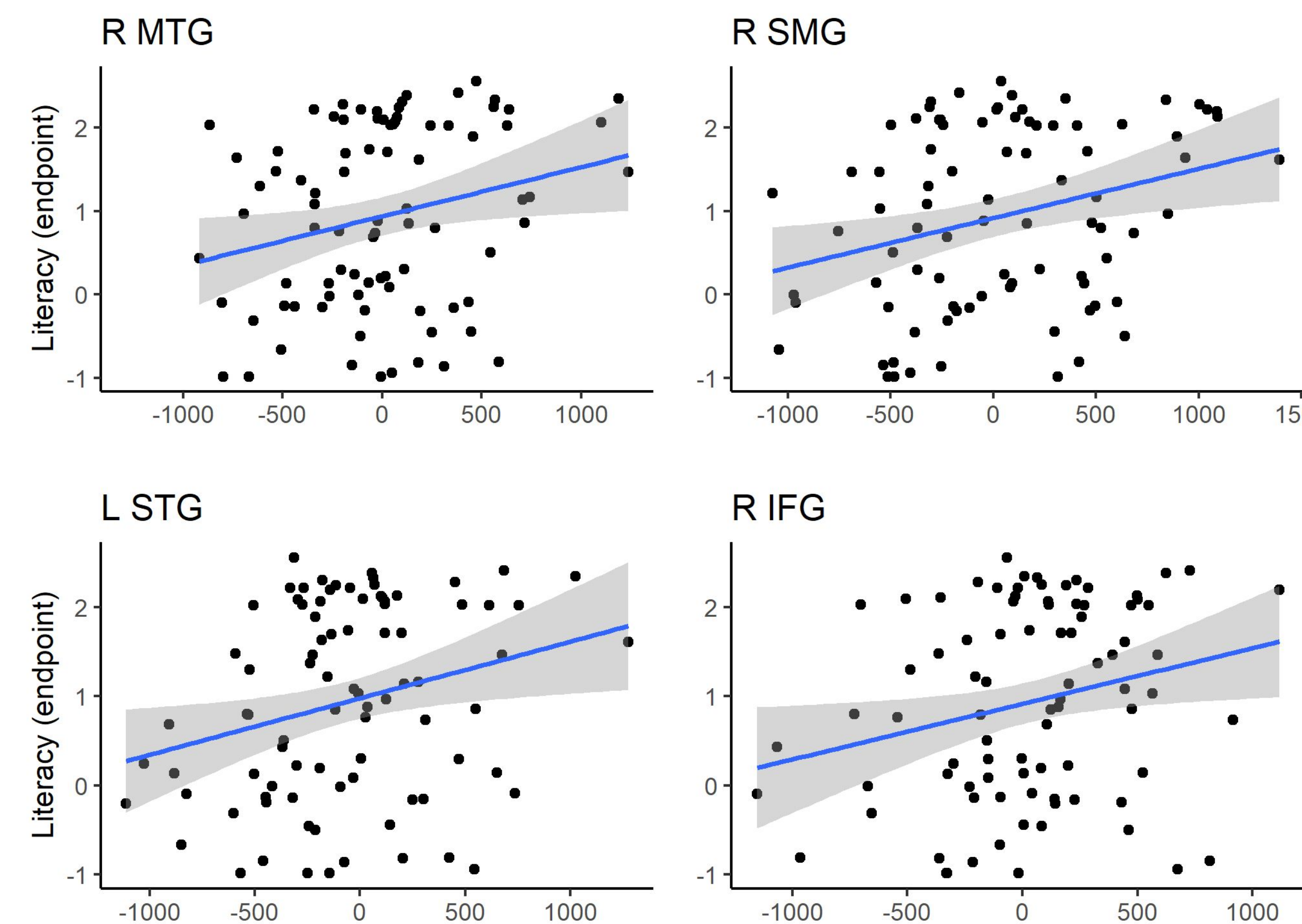
METHODS

N = 132; 5th grade; Ages 8-15; M$_{age}$=10;7
French literacy tasks: Grapheme, Word, Pseudoword naming
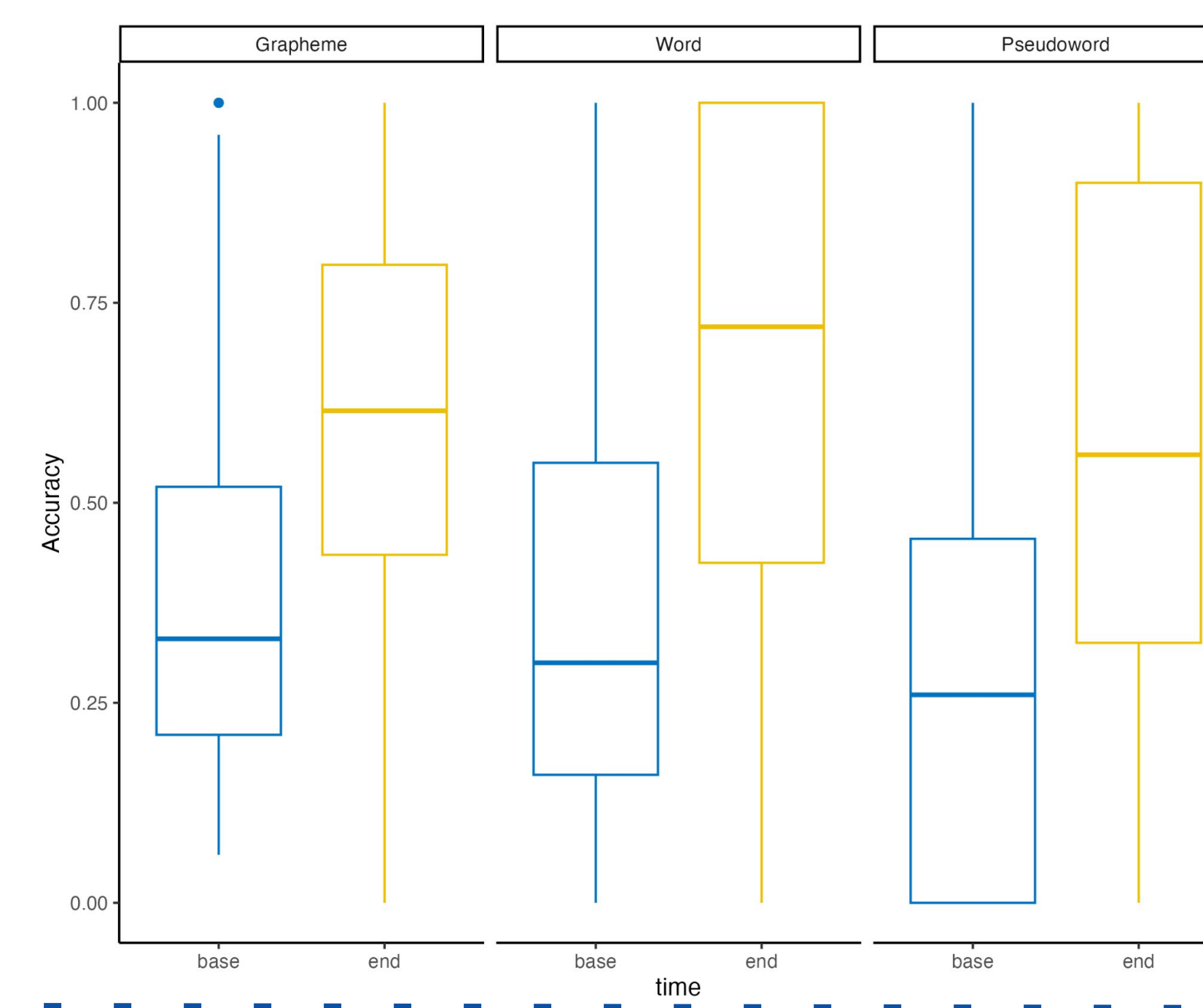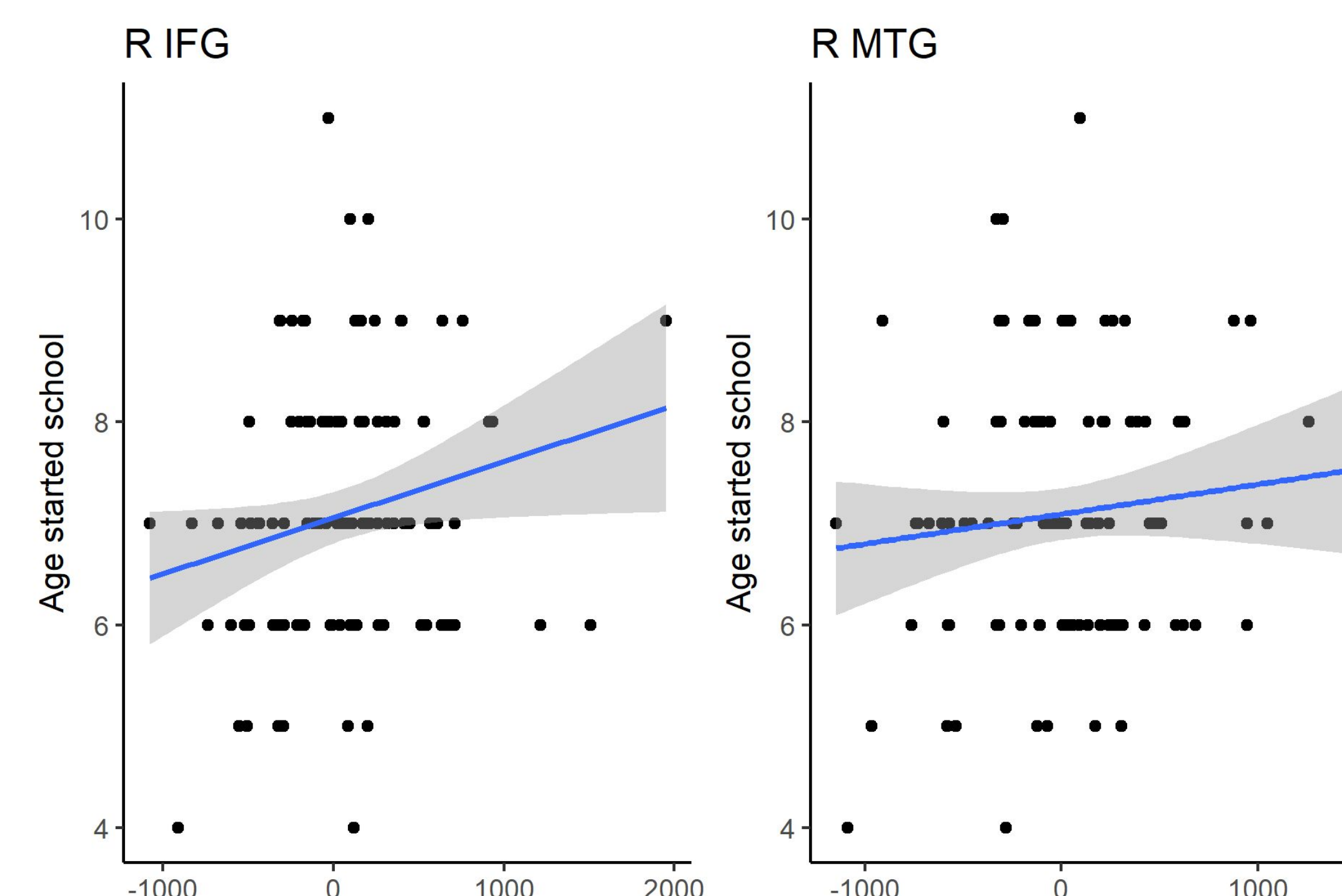**fNIRS, Print & speech:** Word, Pseudoword, Vocoded/False font

RESULTS

Predicting literacy at endpoint from activation for printed words

R MTG, R SMG, L STG, R IFG

Literacy performance

Grapheme | Word | Pseudoword

Age of literacy exposure related to print processing

R IFG, R MTG

IMPLICATIONS

Activation for written words at baseline predicts literacy skills two years later.

> Higher activation predicts greater literacy skills

> Primarily right hemisphere activation - less lateralisation?

> Controlling for age, gender

Children who started school at a later age show greater recruitment of right hemisphere for print processing.

Age of exposure to literacy impacting the organisation of the reading network.

> Lateralisation may not be a hallmark of fluent readers in children who are first exposed to literacy at an older age

LITERACY PERFORMANCE

	Accuracy (%)	
	Baseline	Endline
Grapheme	36	52
Word	34	54
Pseudo-word	26	45

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