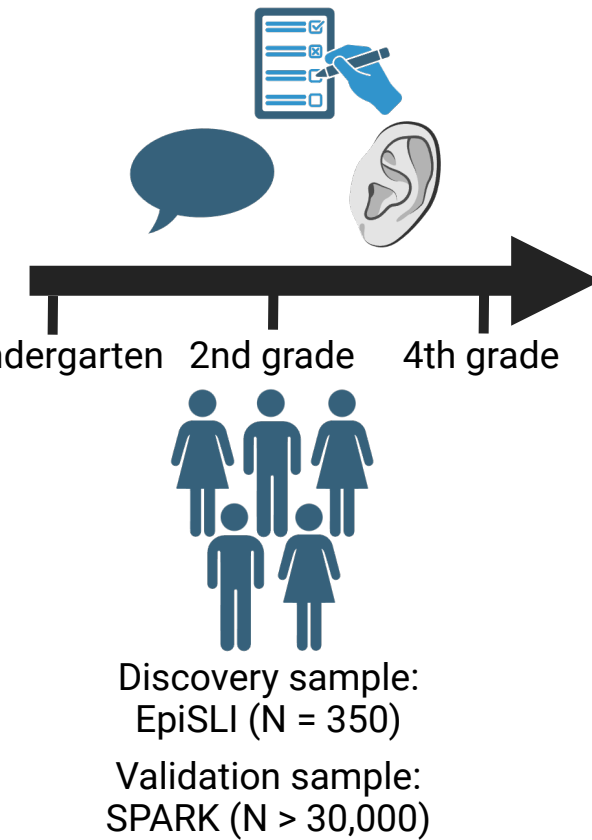


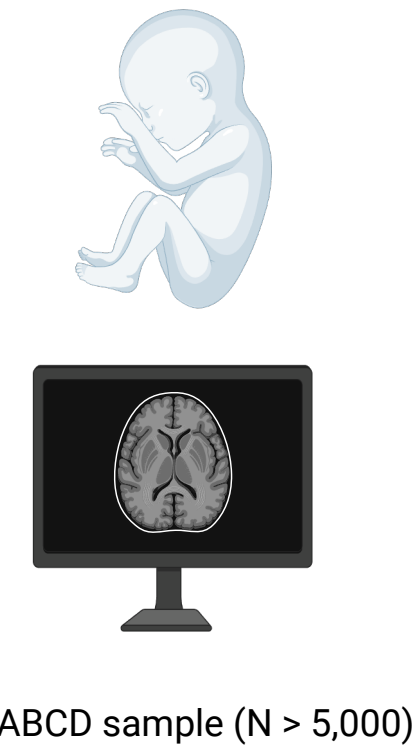
Longitudinal assessments



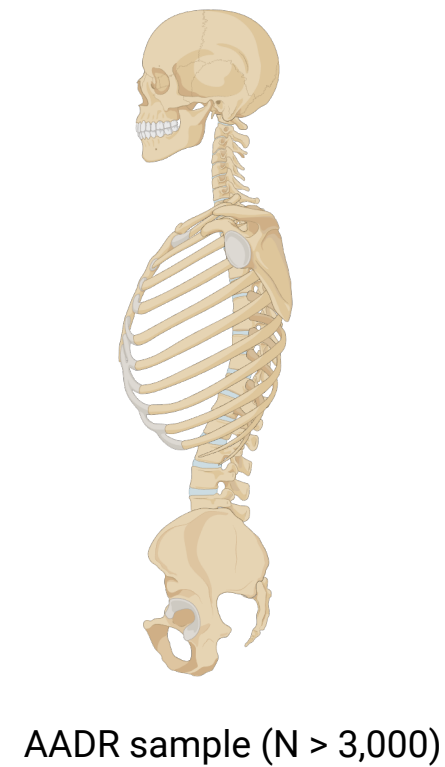
Factors

F1	Core language
F2	Receptive language
F3	Nonverbal IQ
F4	Early language
F5	Talkativeness
F6	Following directions
F7	Vocabulary

Developmental phenotypes



Ancient DNA

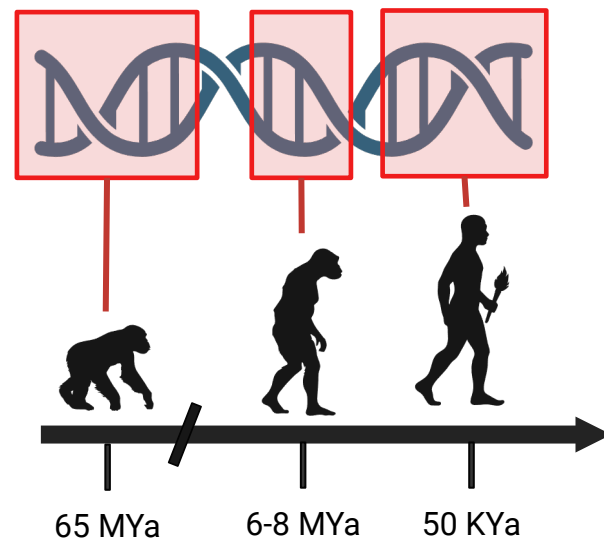


Multiple sequence alignment

Species	HAQER allele				
<i>Human</i>	A	G	G	T	C
	A	-	-	C	A
	A	-	-	C	C
	A	G	G	T	C
	A	G	G	T	C

Zoonomia sample
(N = 170 non-primate species)

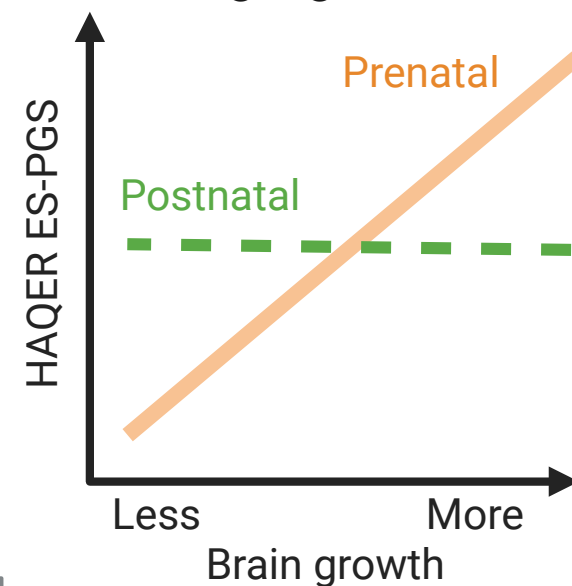
Evolutionary Stratified Polygenic Scores (ES-PGS)



H_0 : phenotype ~ background PGS
 H_1 : phenotype ~ background PGS + ES-PGS

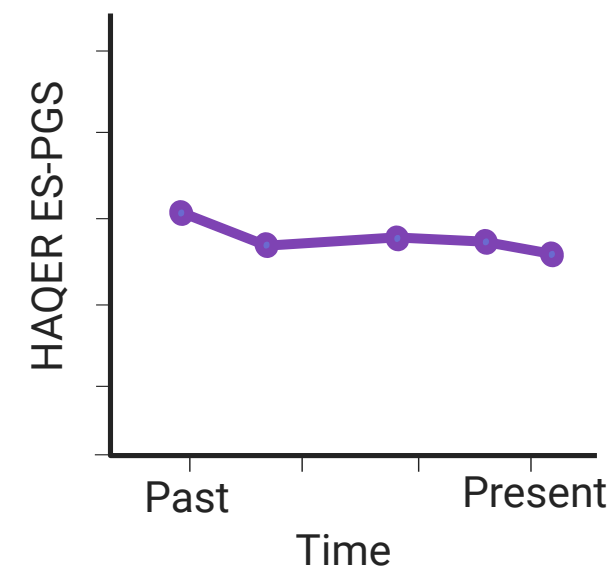
HAQERs influence language ability

Neurodevelopmental effects of language evolution



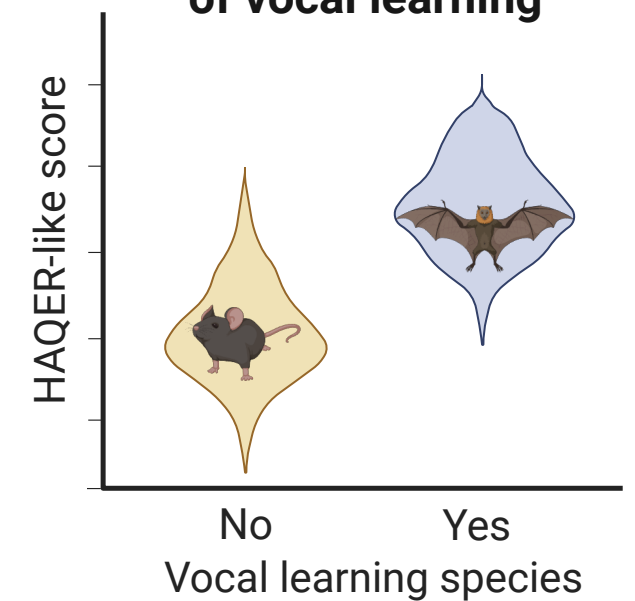
HAQERs influence prenatal brain growth

Polygenic selection



Language alleles in HAQERs have been stable throughout the past 20,000 years

Convergent evolution of vocal learning



HAQER-like sequences repeatedly evolved across vocal learning species