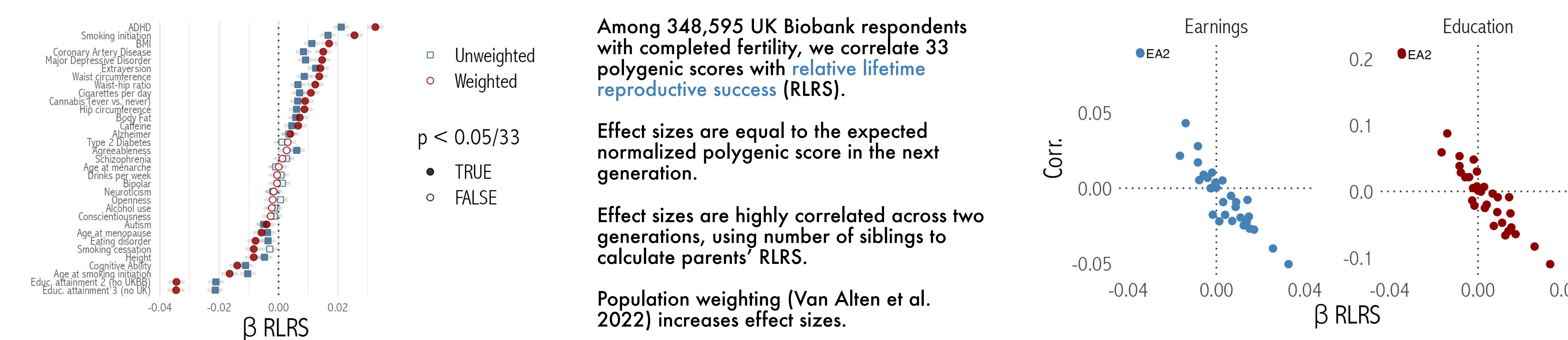# Human capital mediates natural selection in contemporary humans

David Hugh-Jones University of East Anglia davidhughjones@gmail.com @davidhughjones
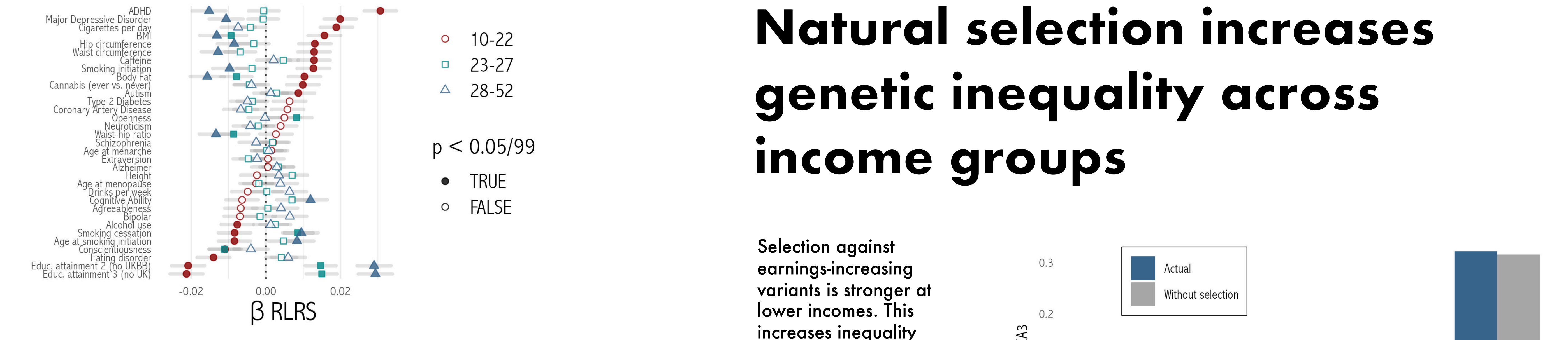Abdel Abdellaoui Amsterdam UMC a.abdellaoui@amsterdamumc.nl @dr_appie

Polygenic scores predicting lower earnings and education are being selected for

Among 348,595 UK Biobank respondents with completed fertility, we correlate 33 polygenic scores with relative lifetime reproductive success (RLRS).

Effect sizes are equal to the expected normalized polygenic score in the next generation.

Effect sizes are highly correlated across two generations, using number of siblings to calculate parents' RLRS.

Population weighting (Van Alten et al. 2022) increases effect sizes.

Effects vary by...

Income and education

Age at first live birth (women)

correlations reverse among older mothers

Living with a partner

and number of lifetime partners

Economic theory of fertility can explain these results

Polygenic scores correlate with earnings-increasing human capital. This has two effects on fertility...

... a fertility-increasing income effect: children become more affordable.

... a fertility-decreasing substitution effect: time spent on children has a higher cost in foregone earnings.

This model can explain the patterns in our data, if the substitution effect is stronger at lower income levels. A mediation analysis shows that education significantly mediates the link between polygenic scores and fertility for 18/23 scores where there is a significant link.

Natural selection increases genetic inequality across income groups

Selection against earnings-increasing variants is stronger at lower incomes. This increases inequality between income groups, and the unfairness of the genetic lottery (Harden 2021). Natural selection increases the correlation of polygenic scores with income for 28 out of 33 scores, with a median increase of 16.43%.