

GENE-ENVIRONMENT INTERPLAY IN EARLY LIFE COGNITIVE DEVELOPMENT

Megan Wright

Early Language Webinar

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UNIVERSITY
of York







GENETIC INFLUENCE ON LANGUAGE DEVELOPMENT

- 13-17% heritability of expressive vocabulary
- Identified genes may help infants to develop language and produce sounds
 - linked with autism, dyslexia, speech-sound disorders, and the development of reading

ENVIRONMENTAL INFLUENCES ON LANGUAGE DEVELOPMENT

- Socio-economic status
 - Differences between children from low and high SES as early as 2 years of age
 - Children from low SES families score on average 6 IQ points lower than children from high SES backgrounds
- Maternal speech
 - Quality and quantity of language is important
 - Mediates the relationship between SES and children's vocabulary development

von Stumm, S., & Plomin, R. (2015). Socioeconomic status and the growth of intelligence from infancy through adolescence. *Intelligence*, 48, 30-36.

Hoff, E. (2003). The specificity of environmental influence: Socioeconomic status affects early vocabulary development via maternal speech. *Child development*, 74(5), 1368-1378.





OUR STUDY

Gene-environment interplay in early life
cognitive development



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THE HUNGRY MIND LAB TEAM



Professor Sophie von Stumm
Head of the Hungry Mind Lab



Dr. Allie Nancarrow
Postdoctoral Researcher



Megan Wright
Research Project Coordinator

GENE-ENVIRONMENT INTERPLAY

- Gene-environment interplay = how genetic and environmental factors interact to influence complex traits



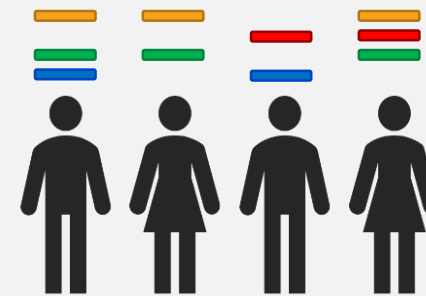
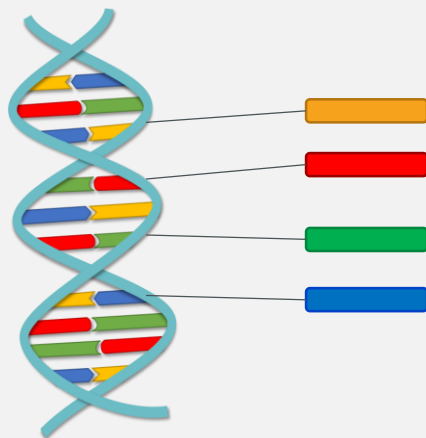
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GENETIC FACTORS: GENOME-WIDE POLYGENIC SCORES

- Use large sample sizes
- Identify tiny DNA variants associated with a certain trait



ENVIRONMENTAL FACTORS

Home environment

- Number of siblings
- Number of books
- CHAOS scale
- Breastfeeding
- Nursery

Neighbourhood environment

- Proximity to green spaces
- Crime rate
- Pollution
- Income decile
- Traffic density





POTENTIAL IMPACT OF OUR RESEARCH

- Cognitive development and early language skills have important influences on educational success and later life outcomes
- Early identification of children who would benefit from intervention
- Personalized interventions

SUMMARY

- Early language development is influenced by both genetic and environmental factors
- Understanding the gene-environment interplay in children's early cognitive development is crucial for identification and personalization of interventions.



THANK
YOU!



www.hungrymindlab.com/gene-environment-interplay



@HungryMindLab



m.wright@york.ac.uk

