

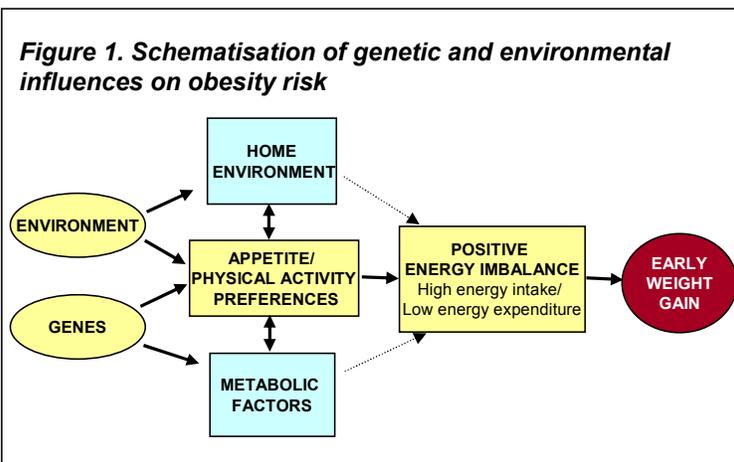
# Gemini – Health and Development in Twins

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## BACKGROUND

- Weight has a strong genetic basis (1).
- Genes must be interacting with the environment to explain the recent dramatic increases in obesity.
- Genetically determined differences in appetite and/or physical activity (PA) preferences provide an opportunity for such gene-environment interactions (figure 1).
- Growing evidence suggests that longer-term obesity risk could be “programmed” by features of the pre-natal, post-natal and early childhood environment (2-5).
- No large twin studies have assessed genetic influences on appetite and PA preferences in early life, or measured family environment alongside children’s growth.



## AIMS

1. To advance understanding of the genetic and environmental influences on obesity risk
2. To identify potentially modifiable determinants of excessive weight gain in early childhood
3. To create a research resource to contribute to a longer-term programme of integrated genetic environmental research in cancer preventive health behaviours

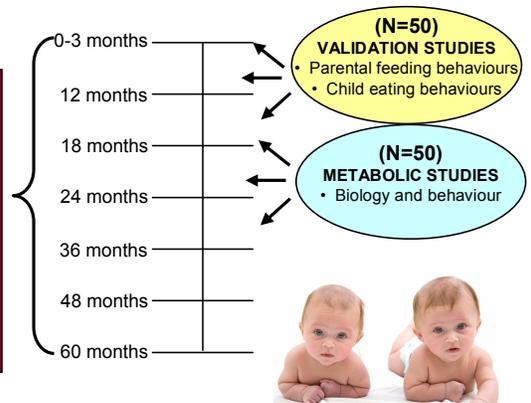
## MEASURES

**(N=2400)**  
**QUESTIONNAIRES** (via post and internet)

- Anthropometrics
- Demographics
- Child’s appetite & PA
- Parental behaviours & attitudes for eating, child feeding & PA
- Food availability

**DNA**

- Zygosity
- Future genotyping



- **QUESTIONNAIRES** will be available on-line and in hard copy
- **VALIDATION STUDIES** will be conducted in a behavioural laboratory at the University of London
- **METABOLIC STUDIES** will be conducted in a laboratory at the Institute of Metabolic Sciences, University of Cambridge.

## DESIGN

- A large population-based twin birth cohort (2400 families) is being recruited in the UK (in collaboration with the Office of National Statistics) for follow-up over 5 years.
  - A twin design permits estimations of genetic, shared and non-shared environmental contributions to appetite and PA preferences, and weight.
  - Longitudinal observation from birth permits assessment of very early influences of appetite and PA preferences, and weight, and estimation of the causal processes behind weight gain.
- 2 sub-samples (2x50 families) will be recruited for detailed behavioural and biological measurement

## COLLABORATORS

Tim Cole, Professor of Medical Statistics, Institute of Child Health  
 Robert Plomin, MRC Research Professor in Behavioural Genetics, Institute of Psychiatry  
 Stephen O’Rahilly, Professor of Clinical Biochemistry and Medicine, University of Cambridge  
 Sadaf Farooqi, Wellcome Trust Clinician Scientist, University of Cambridge

## KEY REFERENCES

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