

PERSPECTIVES ON GENE- ENVIRONMENT INTERPLAY IN PSYCHIATRY

by

Michael Rutter

MULTIPLE VARIETIES OF GENE-ENVIRONMENT INTERPLAY

1. Variations in heritability by family/societal context.
2. Environmental effects on rate of developmental perturbations (eg, effects of parental age on chromosomal anomalies, *etc*).
3. Genetic effects on environmental risk exposure (through rGE).
4. Genetic effects on environmental susceptibility (through G x E).
5. Environmental effects on gene expression.

GOAL OF STUDYING GENE-ENVIRONMENT INTERPLAY

Understanding of biological (including psychological) mechanisms.

AND

NOT detecting statistical correlations or interactions.

STARTING POINT FOR INVESTIGATIONS OF GENE-ENVIRONMENT INTERPLAY

(In the present state of knowledge)

1. Known environmentally-mediated risks (rather than identified genes).
2. Essential to test for environmental mediation (cf. value of “ natural experiments”).
3. Need to focus on proximal (rather than distal) risk mechanisms.
4. Need to determine how environmental effects “ get under the skin” (*ie*, the route of biological mediation).
5. Need to identify biological and social moderators.

CHALLENGES IN MEASURING ENVIRONMENTS

1. Need for individual-specific measures (including cognitive/affective processing).
2. Need for measures of protective, as well as risk, environments.
3. Need for measures applicable to subject and informant and observation.
4. Need for measures that can be used with large samples.
5. Need for biological measures of environmental risk effects.
6. Study of prenatal, as well as postnatal, environment.
7. Consideration of physical, as well as psychosocial, environments.

NEED FOR RANGE OF RESEARCH STRATEGIES

eg,

2. Use of brain imaging to study neural effects.
3. Identification of relevant intermediate phenotypes.
4. Use of neuroendocrine measures.
5. Use of animal models.
6. Epigenetic studies.

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