

# Genetic Influences

- Distinction between genotype—genetic material—and phenotype—observable trait or feature
- Alleles
- Distinction between somatic genes and genes involved in reproduction
- Classical genetics and single gene disorders: Mendelian ratios
- Quantitative (population) genetics and polygenic disorders: The normal distribution

# Heritability Indexes

- Heritability index: not a measure of causality. Does not tell you the importance of genes in development of trait or disorder within individuals.
- Individuals differ from one another in various traits. Heritability tells you how much of the difference in specific traits is “due to” (correlated with) the genetic differences among those individuals.
- Descriptive statistic. Cannot be generalized from one set of individuals to another
- Cannot be generalized from one set of environmental conditions to another

- Genetics and Individual Differences.
- "Genetics is the branch of biology which is concerned with innate differences between similar organisms...."
- "Like so many other branches of science, genetics has achieved its success by limiting its scope. Given a black and a white rabbit, the geneticist asks how and why they differ, not how and why they resemble one another. It does not answer the question as to "why two rabbits produce rabbits and not rats, roses or bicycles?" J. B. S. Haldane.
- Similarities between genetics and psychology.

# Methods of Studying Genetic Influences

Out of that tradition came Behavior Genetics. Statistical Approach; relies on differences among people to arrive at correlations between the degree of genetic resemblance and phenotypic resemblance with respect to some trait or disorder. Way of attempting to separate nature from nurture.

- Twin studies: Differences between MZ and DZ twins.
- Adoption studies: MZ twins reared apart
- Development of heritability measures
- More recent growth of developmental biology. Merger of molecular genetics and embryology. Study the effects of genes as part of developmental process.

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- Descriptive statistic. Cannot be generalized from one set of individuals to another.
- Cannot be generalized from one set of environmental conditions to another. (Turkheimer's findings on heritability of IQ)
- Tells you nothing about workings of genes nor is it an index of their importance.
- Tells you nothing about possibility of change.

- The end of “one-gene one-outcome” genetics. Schizophrenia as an example.
- Lack of clarity about what a gene is. Role of “junk DNA”
- Epigenesis and Genomic Imprinting
- Genome Wide Association studies (GWAS). Problem of “Missing Heritability.”
- Newest Method. Genome Wide Complex Trait Analysis. (GCTA). Finds some of the missing heritability but:
- Heritabilities are still much lower than that reported by classical twin or adoption study methods. GCTA also has significant methodological problems of its own.

# Some References

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- Salk, R. H., Hyde, J. S. (2012) Contemporary genetics for gender researchers: Not your grandma's genetics anymore. *Psychology of Women Quarterly*, 36 (4). 395-410.
- An excellent recent summary of developments in genetics and their implications, not only for gender researchers, but for a broader audience of psychological researchers and practitioners.