Unit III: Biological Bases of Behavior

Module 14

Behavior Genetics: Predicting Individual Differences

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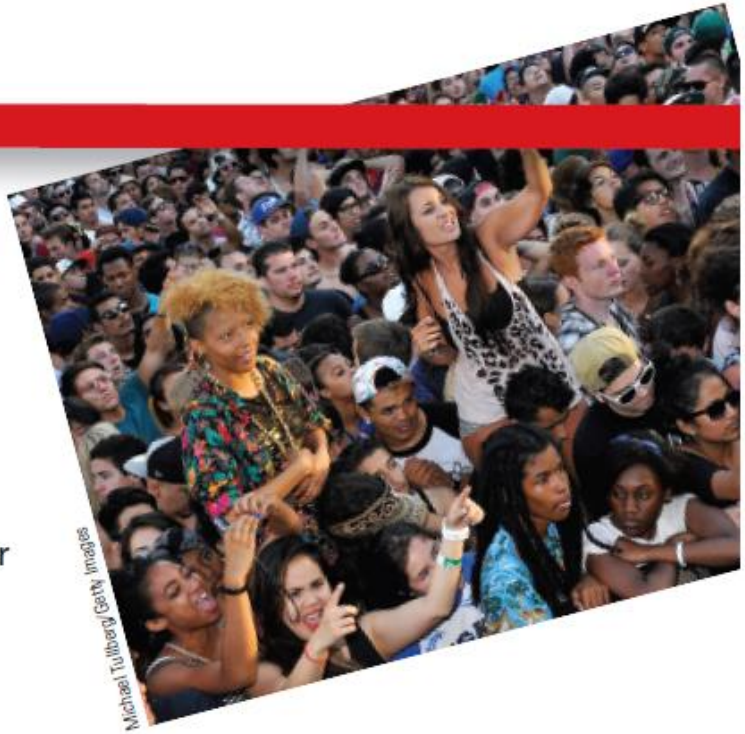
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Module Learning Objectives

- **14-1** Define *genes,* and describe how behavior geneticists explain our individual differences.
- **14-2** Identify the potential uses of molecular genetics research.
- **14-3** Explain what is meant by heritability, and discuss how it relates to individuals and groups.
- **14-4** Discuss the interaction of heredity and environment.

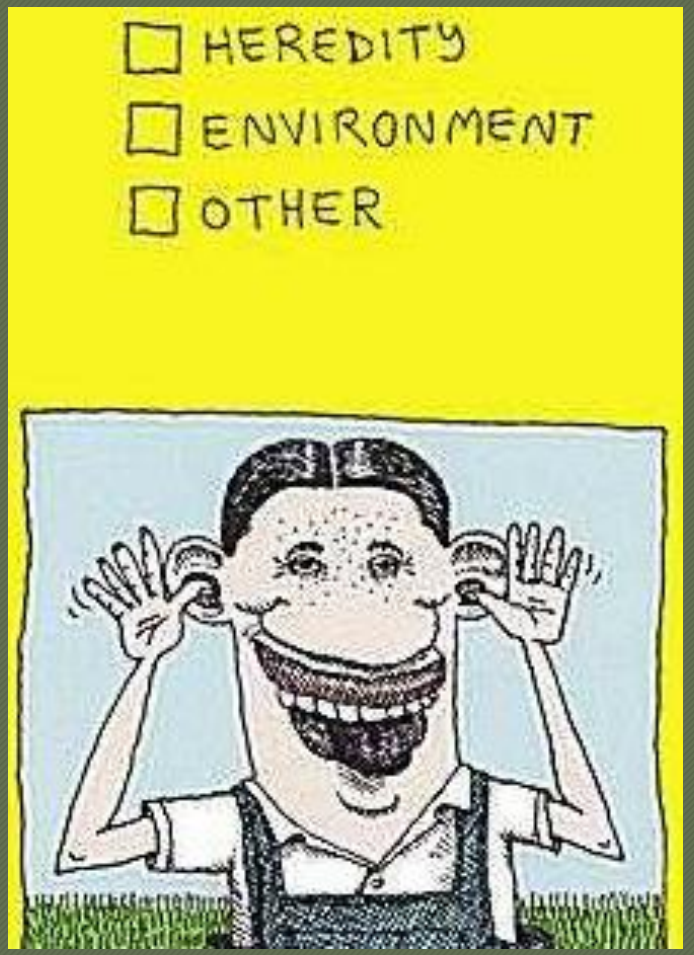
Genes & Behavior Genetics

14-1

Behavior Genetics: Predicting Individual Differences

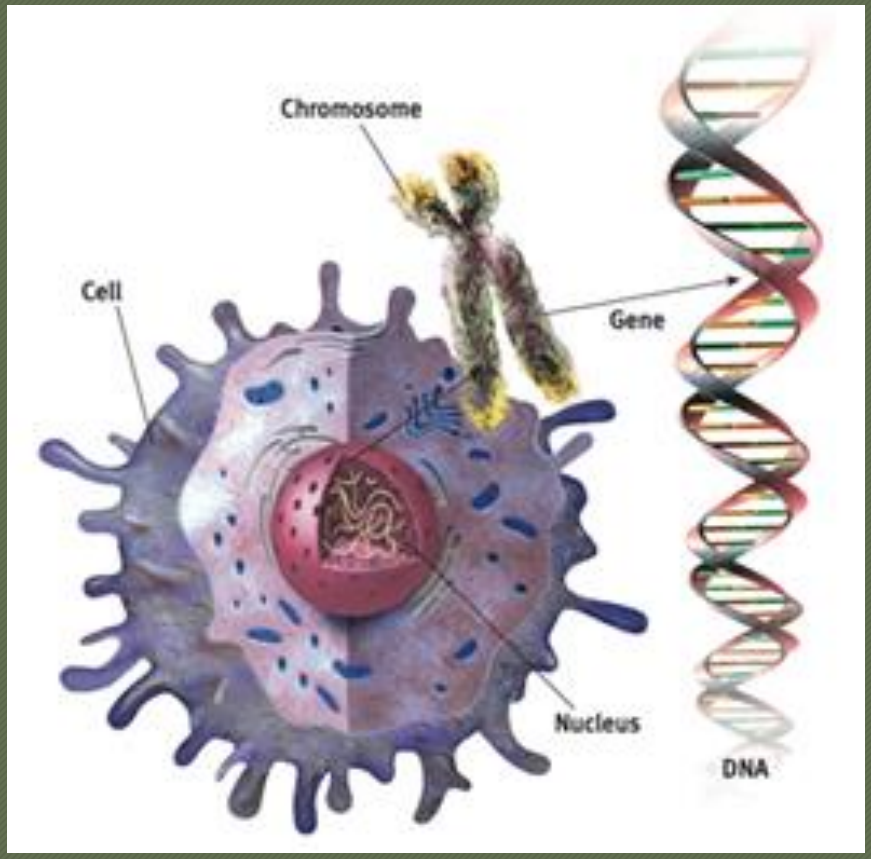
14-1

Behavior genetics is the study of our differences and the relative effects of heredity and environment.



Genes: Our Codes for Life

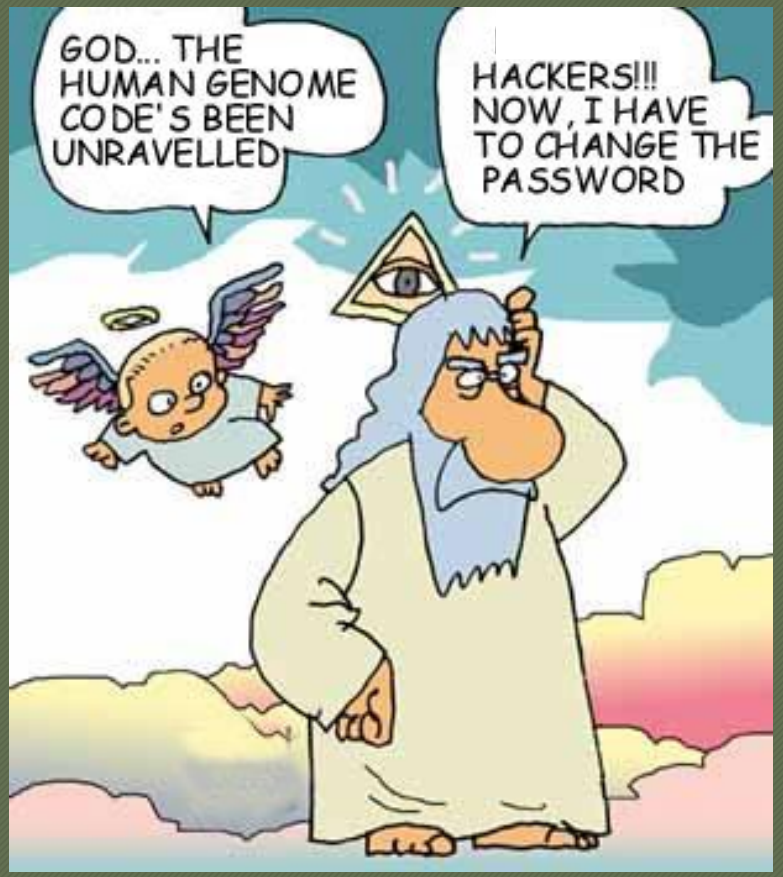
Segments within DNA consist of genes that make proteins to determine our development.



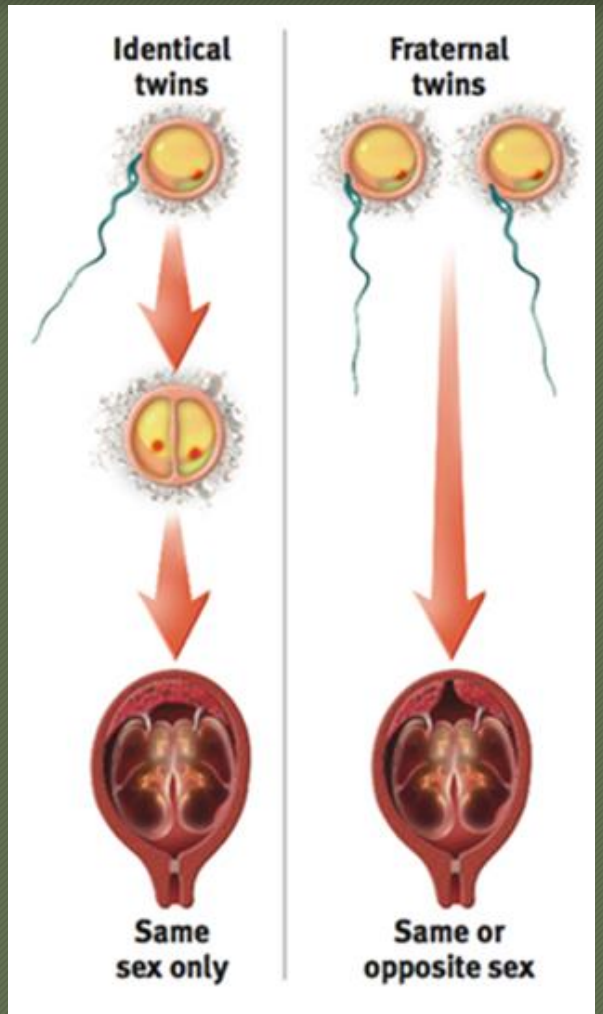
Genome

Genome - the common sequence within human DNA. It is this shared genetic profile that makes us humans, rather than chimpanzees or tulips

The Human Genome Project (an international 13-year effort) was completed in 2003. The project's goals were to determine the complete sequence of the 3 billion DNA sub-units, identify all human genes, and make them accessible for further biological study.



Twin and Adoption Studies



Separated Twins

A number of studies compared identical twins reared separately from birth, or close thereafter, and found numerous similarities.

Separated Twins
Personality, Intelligence
Abilities, Attitudes
Interests, Fears
Brain Waves, Heart Rate

Studying Identical Twins

Biological vs. Adoptive Relatives

Adoption studies suggest that adoptees (who may be biologically unrelated) tend to be different from their adoptive parents and siblings.

Molecular Genetics

14-2

Molecular Genetics

- Molecular genetics studies the molecular structure and function of genes
- Find the genes that together orchestrate traits or reveal at-risk populations for diseases

Heritability

14-3

Heritability

Heritability is the extent to which variation among individuals can be attributed to their differing genes.

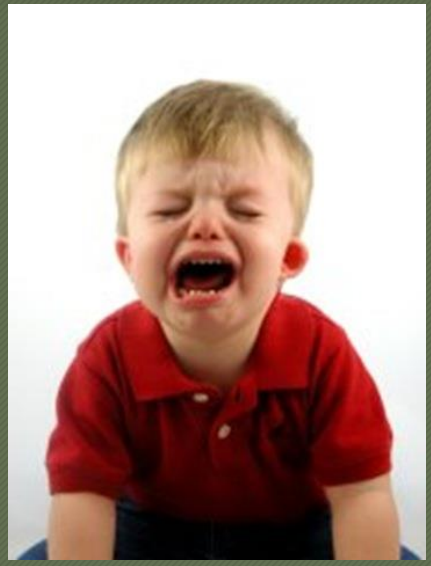
Heritability focuses on the differences between multiple organisms for a single trait. It is a description of a certain population - not an individual.

Gene-Environment Interaction

14-4

Gene-Environment Interaction

Genes can influence traits which affect responses, and environment can affect gene activity.



A genetic predisposition that makes a child restless and hyperactive evokes an angry response from his parents. A stressful environment can trigger genes to manufacture neurotransmitters leading to depression.

Epigenetics

Epigenetics studies the molecular mechanisms by which environmental triggers can switch genes on or off.