**Module 11  
Behavior Genetics and Evolutionary Psychology**

Behavior Genetics: Predicting Individual Differences

* + Genes: Our Codes for Life  
    Twin and Adoption Studies   
    Temperament and Heredity  
    Heritability  
    Gene-Environment Interaction  
    The New Frontier: Molecular Genetics

**Preview Question 1: What are genes, and how do behavior geneticists explain individual differences?**

**Behavior Genetics: Predicting Individual Difference**  
 Behavior Geneticists study our differences and weigh the relative effects of heredity and environment.

**Genes: Our Codes for Life**  
 - Chromosomes containing DNA (*deoxyribonucleic acid*) are situated in the nucleus of a cell.  
 - Segments within DNA consist of genes that make proteins to determine our development.  
 - complex molecule containing the genetic information that makes up the chromosomes  
 - has two strands-forming a “double helix”—held together by bonds between pairs of nucleotides

**Genome**Genome is the set of complete instructions for making an organism, containing all the genes in that organism. Thus, the human genome makes us human, and the genome for *drosophila* makes it a common house fly.

**Evolutionary Psychology   
Natural Selection-** the principle that, among the range of inherited trait variations, those that lead to increased reproduction and survival will most likely be passed on to succeeding generations  
**Mutation-**  a random error in gene replication that leads to a change in the sequence of nucleotides the source of all genetic diversity

**Twin and Adoption Studies**Studying the effects of heredity and environment on two sets of twins, identical and fraternal, has come in handy.

**Separated Twins**  
-A number of studies compared identical twins reared separately from birth, or close thereafter, and found numerous similarities. (Personality, Intelligence, Abilities, Attitudes, etc)  
-Critics of separated twin studies note that such similarities can be found between strangers. Researchers point out that differences between fraternal twins are greater than identical twins.

**Biological Versus Adoptive Relatives**  
Adoption studies, as opposed to twin studies, suggest that adoptees (who may be biologically unrelated) tend to be different from their adoptive parents and siblings.

Adoptive Studies  
Adoptive studies strongly point to the simple fact that biologically related children turn out to be different in a family. So investigators ask:

Do siblings have differing experiences?  
 Do siblings, despite sharing half of their genes, have different combinations of the other half of their genes?  
 Ultimate question: Does parenting have an effect?

**Parenting**  
Parenting does have an effect on biologically related and unrelated children.

**Preview Question : What is heritability, and how does it relate to individuals and groups?**

**Temperament and Heredity**  
Temperament refers to a person’s stable emotional reactivity and intensity. Identical twins express similar temperaments, suggesting heredity predisposes temperament.

**Nature *and* Nurture**  
Some human traits are fixed, such as having two eyes. However, most psychological traits are liable to change with environmental experience.  
Genes provide choices for the organism to change its form or traits when environmental variables change. Therefore, genes are pliable or *self-regulating*.   
  
**Preview Question : What is the promise of molecular genetics research?**

**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.

**Correlation in IQ Scores  
-**These results do not mean that genes determine intelligence; the remaining variance in IQ scores must be due largely to environmental influences. **-**Researchers have recently identified markers for genes that may influence IQ performance.  **-**But each of these genes, if confirmed, is likely to contribute just a tiny piece to the puzzle of genetic variation in intelligence.  **-**It is not valid to draw conclusions about group differences from heritability estimates based on differences within a group.

**Gene-Environment Interaction**  
Genes and environment affect our traits individually, but more important are their interactive effects.  
People respond differently to different people.  
 **Preview Question : How do evolutionary psychologists use natural selection to explain behavior tendencies?**

**Evolutionary Psychology: Understanding Human Nature**Evolutionary psychology studies why we as humans are alike. In particular, it studies the evolution of behavior and mind using principles of natural selection.

**Natural Selection**  
Natural selection is an evolutionary process through which adaptive traits are passed on to ongoing generations because these traits help animals survive and reproduce.

**Artificial Selection**  
Biologists like Belyaev and Trut (1999) were able to artificially rear and domesticate wild foxes, selecting them for friendly traits.   
Any trait that is favored naturally or artificially spreads to future generations.

**Human Traits**  
A number of human traits have been identified as a result of pressures afforded by natural selection.  
  
**Preview Question: How might and evolutionary psychologist explain gender differences in mating preferences?**

**Human Sexuality**  
Gender Differences in Sexuality  
Males and females, to a large extent, behave and think similarly. Differences in sexes arise in regards to reproductive behaviors.

**Natural Selection & Mating Preferences**  
Natural selection has caused males to send their genes into the future by mating with multiple females since males have lower costs involved.   
However, females select one mature and caring male because of the higher costs involved with pregnancy and nursing.

**Mating Preferences**  
Males look for youthful appearing females in order to pass their genes into the future. Females, on the other hand, look for maturity, dominance, affluence and boldness in males.

**Preview Question : What are the key criticisms of evolutionary psychology?**

Critiquing the Evolutionary Perspective  
-Evolutionary psychologists take a behavior and work backward to explain it in terms of natural selection  
- Evolutionary psychology proposes genetic determinism and undercuts morality in establishing society.  
- Where genders are unequal, gender preferences are wide, but when they are closely equal, preferences narrow down.

Evolutionary Psychologists Reply-  
- Evolutionary psychologists argue that we need to test behaviors that expound evolutionary principles.  
- Evolutionary psychologists remind us how we have adapted, but do not dictate how we ought to be.  
- Males and females are more alike than different, and if we study these differences we can establish their causes.