

**Major Histocompatibility Complex (MHC)** - A large chromosomal region consisting of over 200 genes that play a role in immune recognition.

**Familial Imprinting** - Learning the phenotype of kin who have been recognized by other means. How mice learn their MHC type.

**In-fostering** - Taking a newborn organism out of its natal family and moving it to a family of the same phenotype as its genetic family.

**Relative risk** - The ratio between the risk of homicide per child living with both genetic parents and those living with one genetic parent and one step-parent at each age group.

**Pathology** - A dysfunctional state of an organism or a part thereof, compromising normal, adaptive, evolved functioning.

**Lactoferrin** - An iron-binding molecule that makes up 20% of human milk protein.

**Virulence** - The harmfulness of a pathogen. Low levels allow the host to function better than do high levels.

**Plasmids** - Circular pieces of DNA that infect bacteria and can transmit genes such as those for anti-biotic resistance.

**Theory of Mind (also, mindreading)** - The ability to infer the thoughts of others. A “module” that is thought to be lacking or slow to develop in children with autism. Investigated using the “Sally-Ann Test”.

**By-product** - The increased rate of child abuse and homicide of step-children by their step-parents is not an adaptation, but a \_\_\_\_\_ of discriminative parental solicitude.

1. Which of the following are consistent with the hypothesis that humans use MHC as one mate choice criterion:

- a) Hutterite couples who share MHC haplotypes have unusually short inter-birth intervals.
- b) Fewer Hutterite couples than expected by chance share MHC haplotypes.**
- c) In a study by Wedekind and Furi, sniffers who said a T-shirt odour reminded them of a mate or ex-mate shared fewer alleles than average with those T-shirt donors.**
- d) Both males and females find the odour of T-shirts worn by MHC-dissimilar males to be more attractive than those worn by MHC-similar males.

2. For which of the following infants would you be least likely to expect infanticide to occur? (**choose only one answer**)
- a) An infant who shows signs of paternity other than the mother's social mate
  - b) An infant who is very ill
  - c) The smaller infant in case of a multiple birth (twins)
  - d) An infant whose mother loses her husband
  - e) **A 9 month-old infant whose mother has just given birth to a new child**
3. Kristen Hawkes' "Grandmother hypothesis" refers to a possible explanation for what?
- a) Women invest more in their children and grandchildren than do men.
  - b) **Human females undergo menopause.**
  - c) Males die younger than females.
  - d) Males find younger women more attractive than older women.
4. When Ekman studies the emotions of New Guineans, he found that:
- a) they were disgusted by different foods than were Western people.
  - b) **they choose the same faces as people from Western cultures in response to stories about emotions.**
  - c) when instructed to make a facial expression they reported feeling the emotion that is associated with that expression.
  - d) **the faces they made to display emotions were usually correctly guessed by people in Western culture.**
5. Depression may have been less common in the EEA because our ancestors
- a) **were more physically active**
  - b) did not have reasons to be depressed
  - c) had a better diet
  - d) **lived near family and interacted with fewer strangers**
  - e) consumed drugs in low amounts
6. According to your textbook, why might people keep pets?
- a) **Pet owners gain benefits from associating with certain animals.**
  - b) A recent mutation causes people to invest resources in pets.
  - c) **The appeal of pets is a by-product of our parental adaptations.**
7. In which of the following cases would you expect the virulence of a sexually transmitted disease to decrease?
- a) **People decide to have fewer sex partners.**
  - b) People decide to have more sex partners.
  - c) People increase sanitation by purifying the water supply.
  - d) The disease evolves the ability to be transmitted by a mosquito vector.
  - e) Drug treatments allow sufferers of the disease to live longer and feel fewer symptoms.

8. Myopia (nearsightedness) is an example of disease caused by:
- Heterozygote advantage
  - Genetic susceptibility**
  - Design compromise
  - Novel environment**
  - Defenses against pathogens
9. Genetic imprinting is a phenomenon where a gene in a fetus is either active or not, depending on which parent the fetus inherited the gene from. From what you have learned so far, which of the following genes would you expect to be activated by **paternal** imprinting but *not* maternal imprinting?
- Genes that increase blood flow to the fetus**
  - Genes that decrease the fetus's ability to produce human placental lactogen, a chemical that increases the mother's insulin resistance
  - Genes that produce human chorionic gonadotropin, a chemical required to maintain pregnancy**
10. Which of the following are consistent with the Trivers-Willard hypothesis?
- Most cultures bias infanticide towards females.
  - The mean value of estates where daughters were willed more than sons is lower than the mean value of estates where sons were willed more than daughters.**
  - Fatter female elk produce more sons than daughters, while thinner female elk produce more daughters than sons.**
  - Sons are preferred at the bottom of an ethnic hierarchy, but daughters are preferred at the top of the same hierarchy.

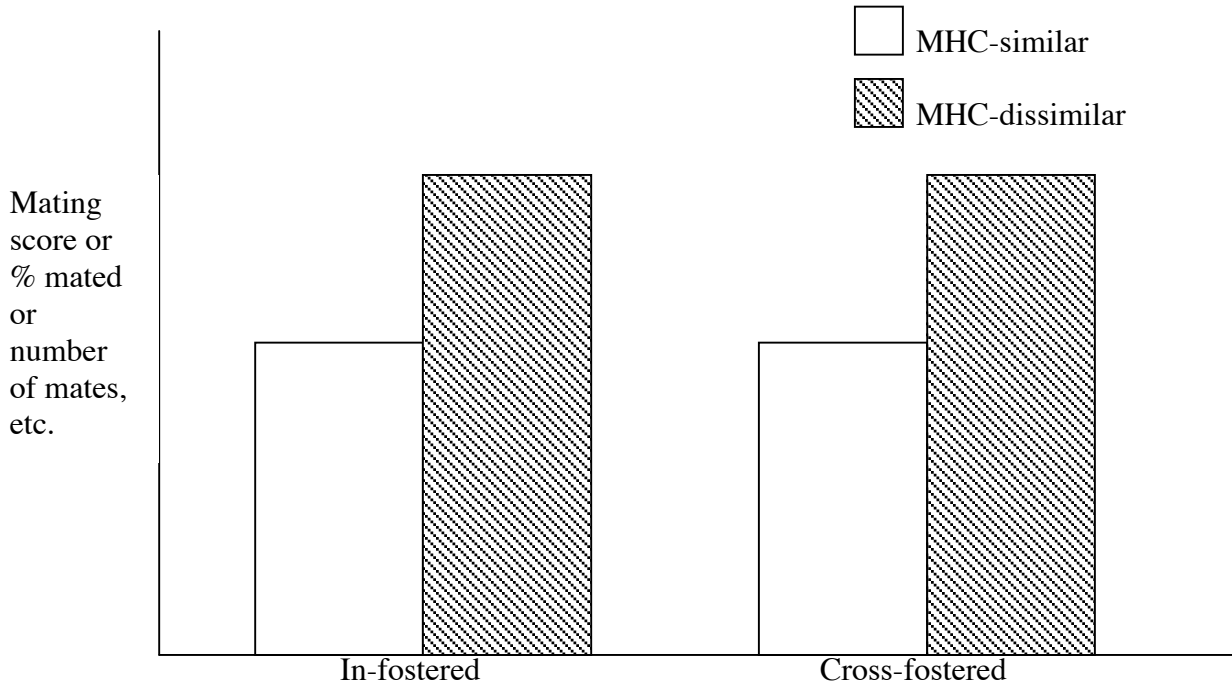
(4 points) Explain the concept of "Darwinian aesthetics" and describe two **experiments** (not observations) that support the claims.

**"Darwinian aesthetics" is the study of what humans perceive as beautiful or pleasant. It is based on the idea that humans may have evolved to find pleasant those objects or scenes that would have been useful or adaptive in the EEA.**

**Examples:**

- People prefer the acacia tree morphology that indicates fertile soil.**
- Children shown pictures of different landscapes say they would prefer to visit the savannah.**
- People prefer landscape paintings to abstract paintings.**
- People prefer objects with fractal patterns like those found in nature.**
- I also accepted experiments about human beauty if and only if you accurately described Darwinian aesthetics as applicable to both human and non-living beauty, indicating that you read that part of the textbook.**

(6 points) Penn and Potts used cross-fostering and in-fostering to determine that mice engage in familial imprinting to learn their MHC type and choose mates. Draw and **label** the graph that you would expect if the following conclusion had been made instead: *Mice use self-inspection and **not** familial imprinting to choose mates.*



(2 points) Extra credit: Draw and label the graph you would expect if the fostering process itself caused the effect that would have otherwise been interpreted as familial imprinting.

