Animal Behavior 12th edition Rubenstein Test Bank

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Test Bank

to accompany

***Animal Behavior*, Twelfth Edition**

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Chapter 2: The Integrative Study of Behavior

Multiple Choice Questions

1. I say that a white-crowned sparrow sings a distinctive dialect because its genes influenced how its song system was assembled, which in turn made dialect learning possible. You say that it sings the song because of the operation of the robust nucleus of the arcopallium, which sends signals to the bird's vocal control apparatus, the syrinx. Who is correct?
a. I am wrong because learning is environmentally determined, not determined by the bird's genes.
b. You are wrong because the bird's vocal apparatus is called the larynx, not the syrinx.
c. We both may be right because our two hypotheses offer two different proximate levels of analysis of dialect singing.
d. We both may be right because our two hypotheses offer two complementary levels of analysis, one proximate and the other ultimate.
Answer: c
Learning Objective: 2.2.1 Connect the underlying molecular mechanisms to the neurophysiological changes involved in the process of song learning.
Bloom's Level: 2.Understanding

2. Research results showed that in zebra finches, the sonograms of the songs of a father and his sons reveal a close match unless a son has been deafened early in life. These results best support which hypothesis?
a. The genetic differences hypothesis
b. The acoustic stimulus hypothesis
c. The environmental adaptation hypothesis
d. The recognition hypothesis
Answer: b
Learning Objective: 2.1.3 Consider the interactive impact of genetics, acoustic stimuli, and social experiences on song learning.
Bloom's Level: 3. Applying

3. White-crowned sparrows evolved from an ancestral species that possessed the capacity for song learning. This is an example of a(n)
a. developmental explanation.
b. physiological explanation.
c. adaptive value explanation.
d. explanation relating to evolutionary history.

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Answer: d
Learning Objective: 2.3.1 Link phylogenetic hypotheses and evolutionary history to subsequent conclusions about the evolution of song learning.
Bloom's Level: 2. Understanding

4. It is difficult for a sparrow to learn a dialect, which enables females to mate with only those males with good dialects so as to increase the song competence of their offspring. This is an example of a(n)
a. developmental explanation.
b. physiological explanation.
c. adaptive value explanation.
d. explanation relating to evolutionary history.
Answer: c
Learning Objective: 2.4.4 Evaluate the hypotheses that male song signals to females as evidence of local adaption, developmental history, and/or individual condition and health.
Bloom's Level: 2. Understanding

5. Males in different populations have different forms of certain genes that influence the development of the song system. This is an example of a(n)
a. developmental explanation.
b. physiological explanation.
c. adaptive value explanation.
d. explanation relating to evolutionary history.
Answer: a
Learning Objective: 2.1.1 Identify the contribution of genetic differences to song dialects across different geographic scales.
Bloom's Level: 2. Understanding

6. The ability to sing the local dialect enables a bird to communicate more effectively with neighboring males. This is an example of a(n)
a. developmental explanation.
b. physiological explanation.
c. adaptive value explanation.
d. explanation relating to evolutionary history.
Answer: c
Learning Objective: 2.4.3 Explain the role of song type matching in male-male competition and its relationship to social stability.
Bloom's Level: 2. Understanding

7. Males in different populations are exposed to different songs, an experience that influences the kind of song that the birds learn. This is an example of a(n)
a. developmental explanation.
b. physiological explanation.
c. adaptive value explanation.
d. explanation relating to evolutionary history.
Answer: a

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Learning Objective: 2.1.2 Assess the role of early life social experiences and interactions on vocal development.
Bloom's Level: 2. Understanding

8. The differences among dialects are environmentally determined, not genetically controlled. This is an example of a(n)
a. developmental explanation.
b. physiological explanation.
c. adaptive value explanation.
d. explanation relating to evolutionary history.
Answer: a
Learning Objective: 2.1.1 Identify the contribution of genetic differences to song dialects across different geographic scales.
Bloom's Level: 2. Understanding

9. Males in different populations have song systems in their brains that operate slightly differently. This is an example of a(n)
a. developmental explanation.
b. physiological explanation.
c. adaptive value explanation.
d. explanation relating to evolutionary history.
Answer: b
Learning Objective: 2.2.2 Describe the song control system and recognize the function of important brain regions such as the HVC in the learning experience.
Bloom's Level: 2. Understanding

10. Young adult white-crowned sparrows are motivated to match their song as closely as possible to that of their neighbors. This is an example of a(n)
a. developmental explanation.
b. physiological explanation.
c. adaptive value explanation.
d. explanation relating to evolutionary history.
Answer: c
Learning Objective: 2.4.3 Explain the role of song type matching in male-male competition and its relationship to social stability.
Bloom's Level: 2. Understanding

11. Young white-crowned sparrows are remarkably good at remembering the sounds produced by adult white-crowned males singing around them. If the learning abilities of these birds evolved by Darwinian natural selection, specific conditions must have applied to the species in the past. Which of the following statements about those conditions is *incorrect?*
a. There must have been variation in the memory skills of individuals.
b. Any changes that took place in the past must have promoted greater population stability in this bird.

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c. Better than average song "rememberers" must have been able to pass on their abilities to their offspring.
d. Better than average song "rememberers" must have had more surviving offspring on average than the typical sparrow at that time.
Answer: b
Learning Objective: 2.3.2 Compare the arguments and evidence for the competing hypotheses of song learning evolution in birds.
Bloom's Level: 3.Applying

Short Answer Questions

12. In a study by Nowicki et al. (2002), the researchers compared brain development and song learning in two groups of nestling swamp sparrows: an experimental group that was given 30 percent less food, and a control group. Their results showed that the experimental group displayed lower HVC volume and lower song copy quality. What hypothesis was Nowicki et al. (2002) testing, and what is the proposed reasoning for their findings?
Answer: They were testing the nutritional stress hypothesis. The experimental birds suffered from lower nutritional quality and higher developmental stress, which resulted in reduced song complexity and reduced brain development of the HVC.
Learning Objective: 2.4.4 Evaluate the hypotheses that male song signals to females as evidence of local adaption, developmental history, and/or individual condition and health.
Bloom's Level: 2. Understanding

13. Researchers produced three sonograms from male zebra finches: a father and two sons. One of the sons had been deafened early in life. The intact young male's song exactly matched that of his father; the deafened male produced a rudimentary sub-song. Why were these sonograms made? What aspect of the scientific process are they related to?
Answer: The sonograms constituted test evidence, data, from an experiment designed to determine the effects of early deafening on male song learning; the results enabled the researchers to conclude that the learning process involved the male bird's ability to hear himself and his father sing.
Learning Objective: 2.1.2 Assess the role of early life social experiences and interactions on vocal development.
Bloom's Level: 4. Analyzing

14. Researchers produced three sonograms from male zebra finches: a father and two sons. One of the sons had been deafened early in life. The intact young male's song exactly matched that of his father; the deafened male produced a rudimentary sub-song. Outline the complete scientific process for which the sonograms are only one part.
Answer: The experiment must have been initially imagined as part of a prediction: "If we do an experiment in which we deafen a young male, it will not be able to hear itself sing and thus should not be able to acquire a good copy of its father's song." This prediction must have been derived from a hypothesis: "Zebra finch males must be able to hear themselves sing (or hear their fathers sing) if they are to eventually come to sing their

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father's song." This hypothesis must have been developed in response to a causal question: "In the zebra finch, why do sons tend to sing like their fathers?"
Learning Objective: 2.1.2 Assess the role of early life social experiences and interactions on vocal development
Bloom's Level: 4. Analyzing

15. There are several hypothesized benefits to a bird that can sing the local dialect. Describe two hypotheses that explain the adaptive benefit of learning to sing from one's neighbor.
Answer: The adaptive hypotheses explain the acoustic, social, and/or ecological benefit to learning one's song from the local environment. The hypotheses are the following: environmental adaptation hypothesis, recognition hypothesis, information-sharing hypothesis, sexual selection hypothesis, and geographic matching hypothesis.
Learning Objective: 2.4.1 Identify the environmental conditions under which diverging song dialects and acoustic flexibility would be adaptive.
Bloom's Level: 3. Applying

16. In cooperatively breeding birds, songs provide information about the group as well as individual identity, whereas birds with smaller breeding groups (most often composed of only kin) have songs that provide group identity without individual distinction. Why?
Answer: According to the information-sharing hypothesis, species with larger breeding groups have expanded repertoires of calls to interpret information about kin and social groupings. If a species has small breeding groups that are almost always kin, all individuals learn the "family" call and utilize it to recognize the group. In larger groups of kin and non-kin, individual birds learn both their natal songs and additional calls as they join with other birds.
Learning Objective: 2.4.2 Describe the importance of song in social recognition of neighbors and information sharing with relatives.
Bloom's Level: 3. Applying

17. Describe the neurophysiological changes that occur when a young male bird is exposed to its own species' song for the first time.
Answer: Sensory signals travel to the song control center in the brain and alter the expression of genes like *ZENK,* leading to changes in cell biochemistry that modify the song control system.
Learning Objective: 2.2.1 Connect the underlying molecular mechanisms to the neurophysiological changes involved in the process of song learning.
Bloom's Level: 2. Understanding

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