Cheat Sheet

Table 51.1 Influence of Cross-Fostering on Male Mice*

Species	Aggression Toward an Intruder	Aggression in Neutral Situation	Paternal Behavior
California mice fostered by white-footed mice	Reduced	No difference	Reduced
White-footed mice fostered by California mice	No difference	Increased	No difference

Chapter 51 Questions

1. **What is a behavior?**
2. **What are the four questions that are needed to understand a behavior?**
3. **What is proximate causation?**
4. **What is ultimate causation?**
5. **What is behavioral ecology?**
6. **What is *Gasterosteus aculeatus*?**
7. **What is a fixed action pattern?**
8. **What is a sign stimulus?**
9. **What is migration?**
10. **What is a circadian clock?**
11. **What are circannual rhythms?**
12. **What is a signal?**
13. **What is communication?**
14. **What is a stimulus-response chain?**
15. **What are the four modes of animal communication?**
16. **What is *Apis mellifera*?**
17. **What are pheromones?**
18. **What is the queen substance?**
19. **What is innate behavior?**
20. **What is a cross-fostering study?**
21. **Describe the effects of cross-fostering California mice with white-footed mice.**
22. **Can the influence of experience on behavior be passed to progeny?**
23. **What is a twin study?**
24. **What is learning?**
25. **What is imprinting?**
26. **What is spatial learning?**
27. **What is a cognitive map?**
28. **What is associative learning?**
29. **What is classical conditioning?**
30. **What is operant conditioning?**
31. **Can animals link any pair of features in the environment?**
32. **What is cognition?**
33. **Describe the extent of honeybee cognition.**
34. **What is problem solving?**
35. **What are corvids?**
36. **What is social learning?**
37. **What is culture?**
38. **What is foraging?**
39. **What is the *forager* gene?**
40. **What is the optimal foraging model?**

41. **What are mating systems?**
42. **What is promiscuous mating?**
43. **What is a monogamous relationship?**
44. **What is a polygamous relationship?**
45. **What is polygyny?**
46. **What is polyandry?**
47. **What is sexual dimorphism?**
48. **What is certainty of paternity?**
49. **What is sexual selection?**
50. **What is intersexual selection?**
51. **What is intrasexual selection?**
52. **What is mate-choice copying?**
53. **What is agonistic behavior?**
54. **What is game theory?**
55. **What is the *fru* gene?**
56. **What neurotransmitter allows voles to make pair-bonds?**
57. **What is altruism?**
58. **What is inclusive fitness?**
59. **What is Hamilton's rule?**
60. **What is kin selection?**
61. **What is reciprocal altruism?**
62. **What is the tit for tat strategy?**
63. **What is sociobiology?**

Chapter 51 Answers

1. Action carried out by muscles under control of the nervous system
2. What stimulus, what physiological mechanisms?
   How does experience during growth influence response?
   How does behavior aid survival/reproduction?
   What is the behavior's evolutionary history?
3. How a behavior occurs/is modified
4. Why a behavior occurs in the context of natural selection
5. Study of ecological/evolutionary basis for animal behavior
6. Three-spined sticklebacks, attack other males based on red belly
7. Sequence of unlearned acts directly linked to simple stimulus, unchangeable, carried to completion
8. Trigger for FAP, external cue, simple stimulus
9. Regular, long-distance change in location
10. Internal mechanism that maintains 24-hour activity cycle
11. Behavioral rhythms linked to yearly cycle of seasons, based on daylight periods
12. Stimulus transmitted from one organism to another
13. Transmission and reception of signals, has role in proximate causation
14. Responses to each stimulus is stimulus for next behavior
15. Visual, chemical, tactile, auditory
16. European honeybee, communicates using "dance language". Movements, sounds, odors cause other bees (followers) to go to food source. Half-circle in one direction, straight run with wagging, half circle in other. Straight run angle with vertical indicates angle of food source with sun. More waggles, more distance. Tight circles while waggling = nearby food, look in all directions
17. Chemical substances for communication
18. Pheromone of queen honey bee, attracts worker to queen, inhibits development of ovaries in workers, attracts males (drones) to queen during mating flights
19. Behavior that is developmentally fixed
20. Young of one species placed in care of adults from another
21. See picture
22. Yes
23. Researchers compare behavior of identical twins raised apart with behavior of those in same household
24. Modification of behavior as result of specific experiences
25. Establishment of long-lasting behavioral response to particular individual or object, can only take place during specific time period in development (sensitive period)
26. Establishment of a memory that reflects the environment's spatial structure
27. Representation in an animal's nervous system of spacial relationships
28. Ability to associate one environmental feature with another
29. Arbitrary stimulus becomes associated with particular outcome

30. Trial-and-error learning, animal first learns to associate behaviors with reward/punishment then repeats/avoids behavior
31. No, pigeons can associate danger with sound but not color, rats can avoid bad foods by smell, but not by sight or sound
32. Process of knowing that involves awareness, reasoning, recollection, and judgement
33. Can distinguish same and different and recognize human faces
34. Cognitive activity of devising a method to proceed from one state to another in face of obstacles
35. Crows, ravens, jays
36. Learning through observing others
37. System of information transfer through social learning or teaching
38. Searching for, recognizing, capturing, and eating food
39. Gene that dictates how far *Drosophila* larvae travel when foraging. Larvae with for^R (Rover) allele travel twice as far as those with for^S (sitter).
40. Compares benefits of nutrition with costs of obtaining food, natural selection should favor foraging behavior that minimizes costs and maximizes benefits
41. Length and number of relationships between male and females
42. No strong pair-bonds
43. One male with one female
44. Individual mating with several of other sex
45. One male, multiple females
46. One female, multiple males
47. Extent to which males and females differ (among monogamous, males/females similar. In polygamous, sex that attracts multiple is typically larger/showier)
48. How likely that the female's usual mate fathered the female's offspring, for internal fertilization is low but males engage in behaviors that increase certainty and females usually take care. For external fertilization is high, so males as likely to take care of young
49. Form of natural selection in which differences in reproductive success are consequence of differences of mating success
50. Individuals choose mates on basis of characteristics of other sex
51. Competition between members of one sex for mates
52. Behavior in which individuals in a population copy mate choice of others
53. Often-ritualized contest that determines which competitor gains access to a resource
54. Evaluates alternative strategies in situations where outcome depends on strategies of all the individuals
55. In *Drosophila melanogaster*, controls entire courtship ritual of male fly. Without it, males do not court/mate with females (short for fruitless). Females have different form, which when replaced with male form causes females to court other females
56. Antidiuretic hormone (vasopressin, ADH)
57. Behavior that reduces animal's individual fitness but increases fitness of other individuals
58. Total affect an individual has on proliferating its genes by producing offspring/helping relatives produce offspring

59. rB>C where r is coefficient of relatedness (average number of genes shared with recipient), B is extra offspring that recipient would contribute, C is number of offspring lost
60. Natural selection that favors altruism by enhancing reproductive success of relatives
61. Exchange of aid, invoked to explain altruism between unrelated humans, limited to species with social groups stable enough that individuals have many chances to exchange aid
62. Individual treats another in same way it was treated last meeting. Always altruistic on first encounter and will remain so as long as reciprocated, will retaliate immediately if cooperation not reciprocated but return to cooperation as soon as other becomes cooperative
63. Relationship of human behaviors to evolution: Certain behavioral characteristics exist because they are expression of genes that have been perpetuated by natural selection