Behavioral Ecology

1. When we ask why a behavior evolved or what its adaptive value is, this is a question of _____ causation.

2. _____ studies behavior, behavioral genetics, and comparative psychology.

3. Tinbergen is credited with founding the field of behavioral _____, the study of how natural selection shapes behavior.

4. Animals tend to feed on prey that maximize their net energy intake. This is called _____ _____ Theory.

5. Animals that acquire energy efficiently during foraging will increase their fitness by having more energy available for _____.

6. _____ is any behavior that results from experience rather than maturation.

7. Learning is possible only within the boundaries set by an innate predisposition called _____.

8. Interactions with individuals of the same or other species may be competitive or cooperative; collectively they are referred to as _____ _____.

9. _____ choice is strongly influenced by the degree of parental investment required and is exhibited by the sex with the higher parental investment

10. Alarm calling seems to be an example of _____ _____, that is, it favors relatives.

11. Chemical signals that mediate interactions between two or more members of a given species are called _____.

12. Artificial selection and hybridization can demonstrate the _____basis of behavior.

    A. cognitive
    B. instinctive
    C. genetic
    D. associational
    E. endogenous

13. Animal behavioral researchers have identified some specific _____ that control behavior.

    A. environments
    B. instincts
    C. taxis
    D. conditions
    E. genes

14. The type of learning that is involved in predator/prey interactions where an alteration in behavior is a response to a stimulus is called

    A. instinctive learning
    B. nonassociative learning
    C. associative learning
    D. habituation learning
    E. cognitive learning

15. A nonassociative learning called _____ can be defined as a decrease in response to a repeated stimulus that has no positive or negative consequences.

    A. instinctive learning
    B. imprinting
    C. desensitization learning
    D. habituation learning
    E. cognitive learning

16. As an animal matures, it forms attachments to other individuals and develops preferences. This process is called

    A. instinct
    B. imprinting
    C. associational learning
    D. habituation
    E. sensitization

17. The sleep/activity cycle in humans is an example of

    A. innate rhythm
    B. transduction rhythm
    C. circadian rhythm
    D. behavioral rhythm
    E. exogenous rhythm

18. Current research in behavioral ecology focuses on the overall contribution that behavior makes to an animal's

    A. fitness
    B. learning
    C. competitive strategies
    D. foraging efficiency
    E. length of life

19. The movement toward or away from some stimulus is referred to as

A. instinctive
B. classical conditioning
C. associative learning
D. taxis
E. kineses

20. Changes in animal activity that are dependent on a stimulus are called

A. taxis
B. kineses
C. instincts
D. releasing mechanisms
E. fixed action patterns

21. The processing of information and response in a manner that suggests thinking in the animal is called

A. endogenous behavior
B. environmental induced behavior
C. instinctive behavior
D. associative behavior
E. cognitive behavior

22. All of the following disciplines provide logical and natural linkages to the study of animal behavior except

A. genetics
B. evolution
C. philosophy
D. physiology
E. ecology

23. All of the following are examples of animal behavioral responses to environmental cues except

A. the feeding frenzy
B. the mating ritual
C. bee waggle-dance
D. resistance to infection
E. migration

24. Proximate causation examination includes

A. animal nerve networks
B. animal phylogeny
C. animal internal state
D. a and c
E. a and b

25. The genetic basis of behavior is supported by

A. hybridization studies
B. studies on the behavior of twins
C. artificial selection experiments
D. a and b
E. a, b and c

26. The signal from the environment that triggers a stereotyped behavior is a

A. conditioned reflex
B. fixed action pattern
C. reinforcing stimulus
D. releasing mechanism
E. sign stimulus (key stimulus)

27. By evaluating and selecting mates with superior qualities, an animal can increase its

A. reproductive success
B. learning
C. competitive strategies
D. foraging efficiency
E. length of life

28. In birds, if the offspring require extensive care, usually involving both the male and female, they are called

A. semelparous species
B. altricial species
C. precocial species
D. iteroparous species
E. sympatric species

29. The modification of behavior as a result of experience is called

A. association
B. behavior modification
C. habituation
D. learning
E. sensitization

30. Habituation belongs to which of the following types of learning?

A. nonassociative
B. behavior modification
C. conditioning
D. innate release
E. associative

31. If an unrelated stimulus, such as the ringing of a bell, was presented at the same time as the meat powder, over repeated trials, a dog would salivate in response to the sound of the bell alone. This kind of response is called

A. behavioral learning
B. classical conditioning
C. deviant behavior
D. operant conditioning
E. imprinting

32. An animal learns to associate its behavioral response with a reward or punishment in

A. behavioral learning
B. classical conditioning
C. deviant behavior
D. operant conditioning
E. imprinting

33. Pigeons learning to associate food with colors and danger with sounds is an example of

A. learning preparedness
B. behavioral learning
C. deviant behavior
D. sensitization
E. imprinting

34. The scientist who conducted the now famous "imprinting" experiment on geese is

A. Mendel
B. Russel
C. Lorenz
D. Darwin
E. Raven

35. Recent research revealed that the development of psychological well-being and growth is influenced by

A. imprinting
B. physical contact
C. sensitization
D. associative learning
E. pheromone levels

36. A behavior that has evolved to aid relatives, although at personal risk, and thus increases the chance of your genes being passed on to the next generation is known as

A. altricial behavior
B. instinctive behavior
C. kin selection
D. operant conditioning
E. adaptive behavior

37. The scientist who described inclusive fitness as the effect an individual has on propagating its alleles through its own reproduction and through kin selection was

A. Mendel
B. Darwin
C. Wallace
D. Tinbergen
E. Hamilton

38. Social insect colonies are composed of highly integrated groups called

A. clines
B. ecotypes
C. castes
D. species
E. filial relatives

39. Insect workers propagate more of their own alleles by helping their mother reproduce rather than by reproducing themselves; thus, they share a larger fraction of their _____ with the next generation.

A. food resources
B. time
C. genome
D. ability to defend their nest
E. home

40. Courtship is dependent on

A. social releasers
B. a stimulus/response chain
C. an alarm call
D. taxis
E. size and colors

41. Chemical messengers used for communication between animal species are called

A. hormones
B. pheromones
C. genes
D. enzymes
E. immune chemicals

42. Foraging bees communicate with other bees in a waggle dance to give information about the food. The important cue in the dance is the

A. angle between the food source and the hive in reference to the sun
B. distance of the food source
C. amount of the food, flower type, and odor
D. a and b
E. b and c

43. One type of evolutionary analysis of behavior pioneered by Tinbergen was the study of the

A. inheritance of behavior
B. innate releasing mechanisms
C. neural networks involved
D. survival value of behavior
E. timing of rhythmic behavior

44. Which of the following plays an important ecological role in maintaining genetic isolation?

A. physiology
B. courtship signals
C. psychology
D. intelligence
E. all of the above

45. Activity changes which depend on the intensity of stimulus are called

A. taxis
B. imprinting
C. kineses
D. associative learning
E. cognitive learning

46. Birds use which of the following to migrate?

A. the sun
B. the stars
C. magnetic fields
D. electrical currents
E. a, b, and c

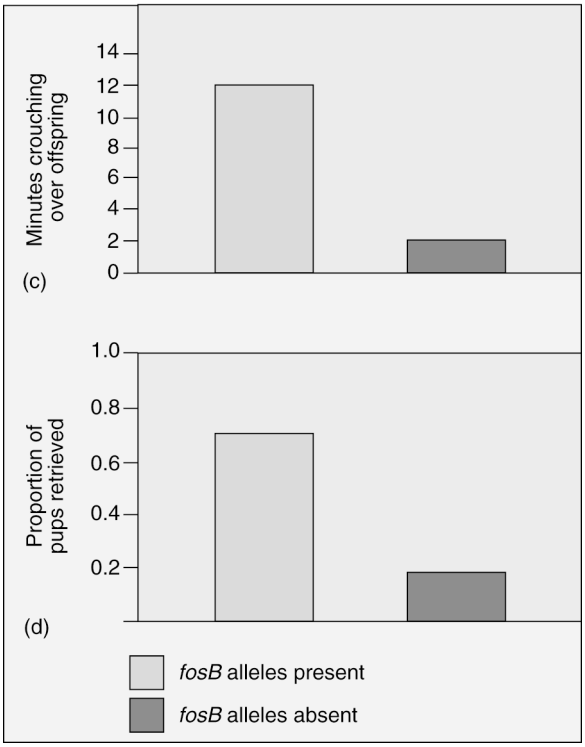
47. If a scientist is conducting an observation on animal behavior—for example, how an animal's senses provide a physiological basis for that behavior—she would be asking about the

A. ultimate causation
B. proximate causation
C. stereotyped causation
D. ethnological causation
E. fixed action pattern causation

48. If a scientist is conducting an observation on animal behavior—for example, a male bird's song and the female bird's response—she would be asking about the

A. ultimate causation
B. proximate causation
C. stereotyped causation
D. ethnological causation
E. fixed action pattern causation

49. Which of the following is an appropriate interpretation for the graphs below?



Maternal care in female mice, as measured by minutes crouching over offspring and proportion of pups retrieved, who have the fosB allele is

A. less than the maternal care given by female mice without the fosB allele
B. greater than the maternal care given by female mice without the fosB allele
C. the same as the maternal care given by female mice without the fosB allele
D. less than the maternal care given by female mice without the fosB allele; however, the graphs depict only minor differences, which are most likely not significant
E. cannot be determined from the graph

50. Young birds see objects flying overhead and respond by crouching down into the nest and remaining still. Over time some objects become familiar and the young birds do not crouch down. This type of learning is referred to as

A. sensitization
B. associative learning
C. operant conditioning
D. habituation
E. Pavlovian conditioning

51. In an experiment studying predator and prey relationships, a scientist offers a naïve toad a bumblebee as food. The bee stings the toad when the toad tries to catch and eat the bee. Subsequent feeding trials with the toad reveal that the toad avoids feeding on bumblebees. This is a demonstration of

A. non-associative learning on the toad's part
B. associative learning on the toad's part
C. ultimate learning on the toad's part
D. proximate learning on the toad's part
E. sign stimulus learning on the toad's part

52. Which of the following scientists is mismatched with his research?

A. Karl von Frisch conducted research on the waggle dance of honeybees.
B. Konrad Lorenz conducted research on goslings after they hatched.
C. Bernard Heinrich conducted research on chimpanzees and food finding activities.
D. Robert Tyson conducted research with mice and their abilities to run mazes.
E. Niko Tinbergen conducted research on survival value of egg coloration.

53. B. F. Skinner first introduced operant condition experiments. In these experiments an animal

A. learns to associate its behavioral response with a fixed action pattern
B. learns to associate its behavioral response with an instinct
C. learns to associate its behavioral response with its biological clock
D. learns to associate its behavioral response with a reward or a punishment
E. learns to associate its behavioral response with circadian rhythms

54. Konrad Lorenz demonstrated that newly hatched bids would direct their social behavior toward him if they saw him first after they hatched from their eggs. This is referred to as

A. cross-fostering behavior
B. operant conditioning
C. fixed action patterning
D. habituation behavior
E. imprinting behavior

55. Recently the focus of research in behavioral ecology has been on the contribution by behavior to an animal's reproductive success. This is called its _____.

A. average number of mates
B. fitness
C. foraging efficiency
D. longevity
E. rate of growth to sexual maturity

56. A friend of yours is wondering about the differences between the words orientation and navigation when these two terms are used in descriptions of bird migrations. Since you have studied and know something about animal behavior, you tell your friend that

A. orientation is adjusting a bearing, while navigation is actually following a bearing
B. orientation and navigation are used interchangeably when referring to avian migrations
C. orientation is following a bearing, while navigation is setting or adjusting a bearing
D. orientation is following the sun in the day as starling do, while navigation is following a bearing with a small amount of magnetite, which is found in the heads of some migratory birds
E. orientation is the ability to find true East, navigation is the ability to find a bearing while crossing water

57. Foraging behaviors are those having to do with all of the following except

A. what an animal eats
B. when an animal eats
C. how an animal finds its food
D. how much food an animal eats
E. how an animal becomes the prey of a larger predator

58. The evolution of foraging behaviors that maximize the amount of energy gained per unit of time spent foraging is favored by

A. natural selection
B. artificial selection
C. specialization
D. altruism
E. territoriality

59. The area over which an animal moves in the course of daily activity, but which it does not necessarily defend against other animals, is its

A. family home
B. foraging space
C. home range
D. nesting site
E. territory

60. The group of reproductive behaviors called reproductive strategy has evolved partly in response to the spatial distribution of

A. food resources
B. nest sites
C. members of the opposite sex
D. members of its own colony
E. a, b, and c

61. In species where the young are precocial, meaning requiring little parental care, males may be more likely to be

A. monogamous
B. polygynous
C. polyandrous
D. polygamous
E. altricial

62. Living as a member of a group may have all of the following advantages except

A. being more resistant to disease and parasites
B. feeding rate may be increased
C. there may be greater protection from predators
D. members learn about new food sources from other members
E. more individuals scan the environment for dangers

63. The important influences on the evolution of mating systems in animals are the

A. need for parental care
B. ability of both sexes to provide parental care
C. timing of female reproduction
D. number of offspring
E. a, b, and c

64. Haldane pointed out that if he received a certain allele, the chance that one of his brothers would receive that allele would be

A. 100%
B. 50%
C. 10%
D. random%
E. 0%

65. Selection that favors altruism toward relatives is called

A. kin selection
B. mate choice
C. group selection
D. nepotism
E. reciprocal altruism

66. Eusocial (true social) insects include all of the following except

A. honeybees
B. ants
C. termites
D. fruit flies
E. wasps

67. Hamilton explained the origin of altruism in selected insect societies with his kin selection model of sex determination. Since males are haploid and females are diploid, the workers share a very high proportion of alleles, theoretically as high as 75%; this model is called

A. diploidy
B. haploidy
C. haplodiploidy
D. parthenogenesis
E. c and d

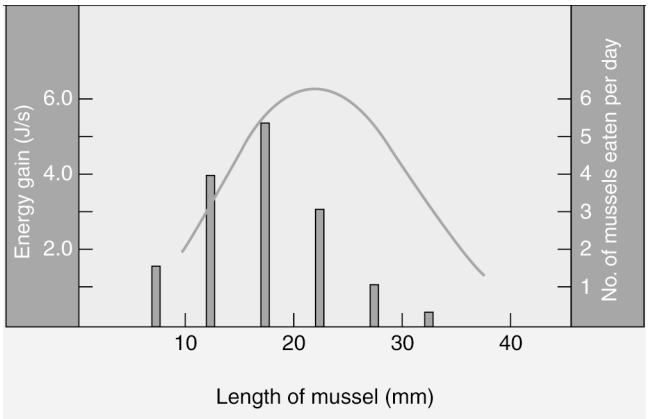
68. The queen in a honeybee colony maintains her dominance by secreting a "queen substance," which acts as a(n)

A. contraceptive
B. enzyme
C. hormone
D. neurotransmitter
E. pheromone

69. Social behavior in vertebrates is often characterized by

A. territoriality
B. inbreeding
C. mimicry
D. kin-selected altruism
E. communalism

70. Which of the following is the best interpretation of the graph of mussel size and crab feeding below?



A. mussels are selected as food sources by crabs
B. mussel size is a good predictor as to which mussel hungry crabs will select
C. mussel size does not seem to be a good predictor as to which mussel hungry crabs will select
D. crabs are not interested in mussel sizes; however, from the data presented in the graph they tend to consume the most of the largest mussels
E. crabs prefer the mussels with the smallest length for their food resources

71. Optimal Foraging Theory (OFT) proposes that natural selection favors animals whose foraging is as energetically efficient as possible. OFT make two assumptions. Which choice correctly reflects the first assumption? Natural selection favors OFT if the behavior of

A. foraging minimizes the energy required and leads to decreased reproduction
B. foraging maximizes the energy required and leads to increased reproduction
C. reproduction (more offspring per amount of forage) maximizes the energy required to gather the necessary food resources
D. foraging maximizes the energy required and leads to increased reproduction
E. foraging minimizes the energy required and leads to increased reproduction

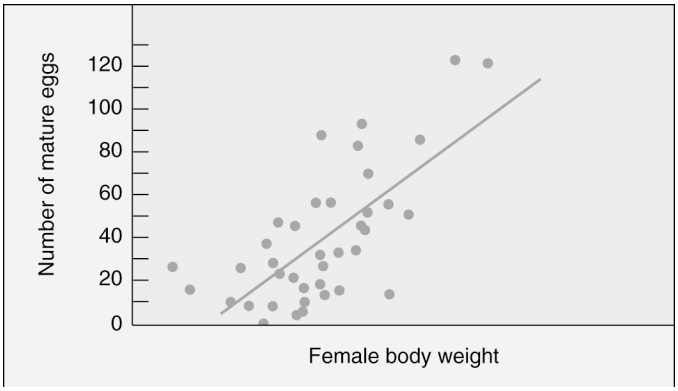
72. A friend asks you the following question: “Would you please explain the differences between home range and territory?” Which choice would be the best response to your friend’s question?

    A. Territory is the entire area that an animal can utilize for its resources, such as shelter, food, and mates. Home range is near its nest or den.
    B. Territory is the area that an animal can utilize for its resources, such as shelter, food and mates and will defend against other members of its species. Home range is near its nest or den.
    C. Territory is the area that an animal can utilize for its resources, such as shelter, food and mates, and will defend against other members of its species. Home range is the area that an animal may roam over on a daily basis.
    D. Territory is the area that an animal can utilize for its resources, such as shelter, food and mates, and will defend against others members of its species. Home range is a smaller area within the territory that the animal is found in when it is resting or hiding from predators.

73. Biologists often use economic terms to explain certain behaviors, such as energy cost to a hummingbird defending a patch of red flowers. Which statement best describes the economics of defending a patch of nectar-bearing red flowers?

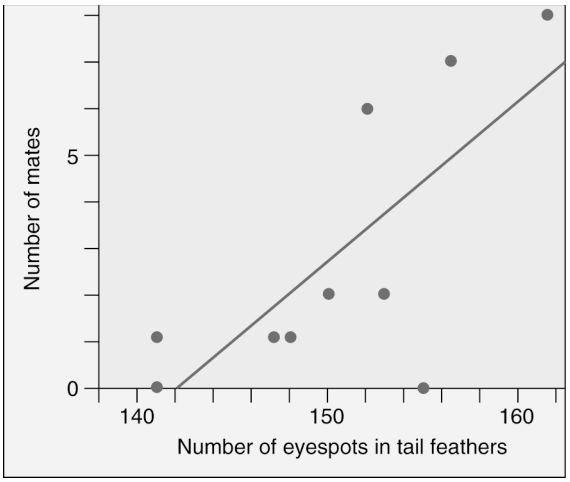
    A. Hummingbirds will defend a patch of red flowers if there is sufficient nectar to provide energy to balance the energy used to defend the patch against competitors.
    B. Hummingbirds will defend a patch of red flowers if there is sufficient nectar to keep the competitors busy.
    C. Hummingbirds will defend a patch of red flowers if there is sufficient cover for them to hide in until the competitors leave the patch. Then the defender will be able to feed without hindrance from the other birds and additionally will not have to use energy to chase away the other birds.
    D. Hummingbirds will defend only a few flowers in the patch because usually there is enough nectar for all to share.

74. Male Mormon crickets choose larger females as mate choices. Which of the following statements best interpret the graph?



A. Larger females live longer and thus produce more eggs.
B. Larger females are capable of storing sperm.
C. Larger females reproduce earlier than smaller females
D. Larger females lay more eggs.
E. Larger females defend themselves better.

75. Pea fowl (peacocks and peahens) show sexual dimorphism. Which statements best describes the graphed data?



A. There are no peacocks with less than 140 eyespots.
B. The fewer eyespots that a peacock has in his tail, the more mates he attracts.
C. Actually eyespots have very little to do with mate-attracting activities. Peahens are not that interested in the numerous eyespots.
D. The more eyespots that a peacock has in his tail, the more mates he attracts.
E. There are no peacocks with more than 165 eyespots.

76. Which of the following statements is an accurate presentation of the differences in precocial and altricial?

A. Most male birds that produce altricial young stay with their mate and help take care of the young. Most male birds that produce precocial young do not stay with their mate and do not help take care of the young.
B. Most male birds that produce altricial young do not stay with their mate and help take care of the young. Most male birds that produce precocial young do stay with their mate and help take care of the young.
C. Most male birds that produce altricial young stay with their mate but do little in the way of aiding their mate. Most male birds that produce precocial young stay with their mate but do find other mates, which will increase their fitness.
D. Most male birds that produce altricial young, stay with their mate and help take care of the young; however, if any of the offspring in that clutch are precocial, the male will leave and seek other mates, which will promote his fitness.

77. Which of the following mathematical choices correctly states Hamilton's Rule? (b = benefits; c = cost; r = coefficient of relatedness)

A. $b/c + 1/r = c/r + 1/2\ r$
B. $b/c - 1/r = b/r + 1/2\ c$
C. $b/r + 1/r = c/b - 1/2\ b$
D. $rc < b$
E. $rb > c$

78. Match each of the following.

_____A. Information processing that suggests thinking.	1. cognition
_____B. Move long distances using sun and stars	2. waggle dance
_____C. A form of communication in honeybees.	3. navigation
_____D. A signal produced by one individual to communicate with another individual of a group.	4. filial imprinting
_____E. Social attachments are formed between parents and offspring.	5. social releaser

79. Match each of the following.

_____A. Imprinting	1. Karl von Frisch
_____B. Reciprocal altruism	2. William D. Hamilton
_____C. Survival value	3. Konrad Lorenz
_____D. Kin selection	4. Niko Tinbergen
_____E. Bee communication	5. Robert Trivers

Answer Key

No. on Test	Correct Answer
1	ultimate
2	Ethology
3	ecology
4	Optimal Foraging
5	reproduction
6	Learning
7	instinct
8	social behavior
9	Mate
10	kin selection
11	pheromones
12	C
13	E
14	C
15	D
16	B
17	C
18	A
19	D
20	B
21	E
22	C
23	D
24	D
25	E
26	E
27	A
28	B
29	D
30	A
31	B
32	D
33	A
34	C

35	B
36	C
37	E
38	C
39	C
40	B
41	B
42	D
43	D
44	B
45	C
46	E
47	B
48	A
-49	B
50	D
51	B
52	C
53	D
54	E
55	B
56	C
57	E
58	A
59	C
60	E
61	B
62	A
63	E
64	B
65	A
66	D
67	C
68	E
69	D
70	B

71	E
72	C
73	A
74	D
75	D
76	A
77	E
78	1-A, 2-C, 3-B, 4-E, 5-D
79	1-E, 2-D, 3-A, 4-C, 5-B