

CH. 11. VERBAL BEHAVIOR - STUDY QUESTIONS

1. If understanding verbal behavior requires language-specific principles, what problem does this create for the interpretation of verbal behavior? For its experimental analysis?

2. In your own words, what are the five claims that have been made by those who hold that the interpretation of verbal behavior is beyond the reach of a selectionist, or biobehavioral, account? (You may be better able to state these claims after reading the sections that treat each of them in turn.)

Physiological and Anatomical Contributions to Verbal Behavior

3. How is the human vocal apparatus specialized for the production of speech? Use the anatomical terms p_____ and l_____ in your answer. (See **Figure 11.1**.)

4. Summarize research with chimpanzees, our nearest relative among the primates, regarding work on (a) vocal and manual speech and (b) "reading" and "writing" using plastic symbols. What methods were used, what results were obtained, and what are the major conclusions to be drawn from this research?

5. An increase in the size of the frontal lobes is a major way in which the brains of humans and chimpanzees differ. What are the possible implications of this fact for the operation of internal reinforcement in the human brain? What is the potential relevance of this for verbal behavior? (See also Question 78.)

Lateralization of Brain Function

6. What does it mean to say that a brain function is *lateralized*?

7. Does lateralization occur only in the control of verbal behavior, and only in humans? Explain.

8. In the evolution of brain function, how might the control of verbal behavior have become lateralized?

Speech Centers: Evidence from the Aphasias

9. W_____ 's area is involved in the perception of speech sounds. Summarize evidence indicating that the contribution of _____ 's area to the perception of verbal stimuli in listening and reading is dependent upon the selection history (experience) of the person. (Use the terms *kana* and *kanji* in your answer.) What are the implications for such findings for the view that speech perception is innate?

10. Given that what are selected are environment-behavior relations, or discriminated operants, is the notion of a lexicon reasonable? (Be able to define l_____.) In general, are words the basic units of analysis in verbal behavior? Explain, using the word "paper" as an example.

11. Summarize the neuropsychological evidence concerning whether brain damage causes the loss of words; i.e., l_____ access. Instead of a loss of lexical a_____, how could you interpret these findings from a selectionist perspective?

12. In selectionist terms, how would you interpret the observation that the woman who could not read words could nevertheless detect spelling errors in those same words?

Categorical Perception

13. Summarize the major characteristics of the perception of speech sounds that demonstrate the complexity of the process. Use the technical term *phoneme* in your answer. (See **Figure 11.2.**)

14. If you have not already done so, describe the phenomenon of c_____
p_____. (See **Figure 11.3.**) Is this phenomenon a speech-specific adaptation? Explain, referring to edge effects.

15. Describe the method and findings from the study by McGurk in which subjects listened to speech sounds while watching a video of a person speaking. What is the significance of these findings? How could you interpret these findings?

Babbling

16. What are the possible functions of babbling? (Can babbling be related to the earlier discussion of the role of activity-dependent mechanisms in neural development—see p. 182?)

17. Is babbling an operant? What evidence indicates that babbling is affected by its consequences? What is the contribution of babbling to the three-step process of variation, selection, and retention?

PARALLEL PROCESSES IN VERBAL BEHAVIOR

18. When a verbal response occurs, is it always guided by the same stimuli? Answer this question using an example in which a person describes a car accident to a friend and to a jury. Are only verbal stimuli important for the guidance of verbal behavior? If not, what are the implications for understanding verbal behavior solely in terms of verbal variables?

19. Indicate, using an example, what is meant by the term p_____ t_____.
(See **Figure 11.4.**)

20. Indicate the difference between when pausing or breaks occur in written and spoken verbal responses. What is the significance of this difference for the view that the word is an appropriate unit for the analysis of language? (See **Figure 11.5.**)

21. Is the auditory stimulus always the same for a given phoneme? Answer making use of information from speech spectrographs.

22. If a short burst of white noise replaces a phoneme in a sentence, what is the effect on speech perception? Is this type of result unique to speech perception? Relate the finding to earlier work on fuzzy boundaries in "concept" formation (p. 134) and "reconstruction" in visual perception (p. 203).

23. Comment on the following statement: A sequence of words in written or spoken language can be thought of as a behavioral chain in which each word in the sentence functions as a discriminative stimulus for the emission of the next word in the sentence.

24. In vocal speech, the mouth and tongue movements—or a_____ movements—are often different for the same phoneme. Under what circumstances is this likely to occur? Refer to computer

simulations that illustrate the answer to this question. Is *parallel transmission* only found with speech movements? Explain using an example of the movements of the arm and hand to grasp an object.

25. Because behavioral chaining often provides an inadequate account of sequences of verbal responses, does this mean that chaining never occurs in verbal behavior? Explain, indicating a circumstance in which chaining would likely occur.

NOVELTY IN VERBAL BEHAVIOR

26. To what characteristics of verbal behavior does the phrase *linguistic creativity* refer? Are these characteristics peculiar to verbal behavior, or does other behavior display "creativity" in the same sense? Explain.

27. What challenge does the claim of linguistic creativity present for a selectionist account of verbal behavior? After reading this section, indicate the ways in which this challenge can be met.

28. The claim of linguistic creativity assumes that the sentence is an appropriate unit for the analysis of verbal behavior. Comment on the validity of this claim?

29. If the sentence is an appropriate unit of analysis, then how do linguists treat the observation that many utterances are clearly not sentences?

30. If verbal behavior is a reflection of an underlying, innate, language-specific, and universal human endowment as some linguists claim, then how should grammatical errors be viewed? Comment on the similarity of this view to the view of Darwin's contemporaries that deviation from the species "essence" in no way detracted from the idea that each individual was a reflection of the underlying species "essence".

31. Why does selectionism regard the interpretation of irregularities and exceptions as important as the interpretation of "correct" speech? Contrast this view of irregularities with that of *essentialism*, such as exemplified in much of linguistics.

32. What is the contribution of the environment to the "uniqueness" of verbal behavior? Of all behavior?

33. Are all words operants? Are some words operants? Are some sentences single operants? Explain using examples to illustrate your answer.

34. Can the same verbal response be an operant for one speaker and not for another? Can the same verbal response exemplify multiple operants at one time and a single operant at other times? Explain.

Verbal Operants

35. This section deals with four "types" of verbal operants: t _____ responses, e _____ responses, t _____, and i _____ responses. Define each type after reading the section. (Hint: What is the guiding stimulus, what is the topography of the response, and what is the nature of the reinforcing stimulus for each type? That is, what is the three-term contingency characteristic of each type?)

Textual responses

36. Under what circumstances are *textual responses* emitted? When a _____ response occurs, must the stimulus be "meaningful" to the learner as that term is conventionally used? Explain.

37. What behavior defines the neuropsychological deficit known as a _____, and how can such behavior be interpreted from a selectionist perspective?

Echoic responses

38. Under what circumstances are *echoic responses* emitted? When an _____ response occurs, must the stimulus be "meaningful" to the learner as that term is conventionally used?

39. Provide an interpretation of the following observation: When asked a question, a listener often echoes the stimuli produced by the verbal responses of the questioner. Does the same interpretation apply equally when echoic responses occur during the course of normal conversation? (Hint: What are the guiding stimuli and reinforcers in the two cases? Are they likely to be the same or different?)

40. What neuropsychological observations bear on the notion of echoic operants? Refer to the deficit known as t _____ a _____ in your answer.

Tacts

41. Are all t _____ discriminated operants? Explain.

42. May a single word function as a *tact*? Must all *tacts* be single words? Explain. What are the implications of the foregoing for the view that the word is an appropriate unit for the analysis of verbal behavior?

43. What are i _____, and can *inflections* function as tacts? What are the implications of this for the view that the word is an appropriate unit for the analysis of verbal behavior?

44. Must all tacts be single words? Must all words be, at most, one tact? Explain using examples.

45. Would you expect a brain lesion to affect only tacts? Explain your answer. (Hint: How is a tact defined?)

46. What is the neuropsychological evidence regarding the effects of lesions on tacts? Refer to the neuropsychological deficit known as a _____ in your answer.

47. Are there lesions that affect tacts, but that spare words and phrases which relate tacts to one another? Use the term f _____ words or auto _____ in your answer.

Intraverbal responses

48. Give a specific example of an i _____ other than one mentioned in the readings. Define an *intraverbal* and indicate how your example qualifies as an _____.

49. What is the relation between intraverbals and *priming* described on pp. 242 ff?

50. The multidimensional guidance of responding was experimentally analyzed on pp. 81 ff. Comment on verbal behavior as an example of multidimensional guidance.

51. What are *grammatical frames*, and what is their relevance to intraverbal responses?

52. Do neuropsychological data indicate that intraverbals can remain intact even though other functions of words are damaged? Explain using an example and referring to *Broca's* and *Wernicke's* areas.

VERBAL BEHAVIOR CONFORMS TO RULES

[Reminder: Recall that some headings in this chapter refer to the claims of linguistics, not to views endorsed by a biobehavioral approach to verbal behavior.]

53. What observations led many linguists to claim that verbal behavior (language) is guided by rules? Illustrate such an observation with *overgeneralization* or *overregularization*.

54. Describe a study that demonstrates that word inflections can be studied in the laboratory. Are these findings due entirely to variables manipulated or controlled in the experiment?

55. The three-term contingency of discriminated operant conditioning is described as a rule. Whose behavior is guided by this rule—the experimenter's or of the subject's? Explain. Language is also said to be guided by rules. If there are linguistic rules, whose behavior is guided by them, the linguist's or the speaker's?

56. In the discussion of the use of the suffix *-ed*, is the utterance *singed* (as the past tense of *sing*) one operant or two for the young child? Explain.

57. In the same discussion, Skinner states that the suffix "developed ...with respect to that subtle property which we speak of as action-in-the-past". Can "action-in-the-past" be a stimulus that guides *-ed*? If not, why not? (Hint: Recall that the goal of interpretation is to give a moment-to-moment account of behavior.)

57. If verbal behavior were found to be consistent with linguistic rules, would this require us to accept the idea that verbal behavior was guided by those rules? Explain. If verbal behavior were consistent with a set of rules, would this require that the rules were language-specific rules? Explain.

58. Summarize Skinner's interpretation of the stimuli guiding the emission of the phoneme /sp/.

59. What is the issue that is raised in the discussion of the use of "brood" and "gloomy?" Why can the issue not be settled by simply stating that "brood" is a verb and "gloomy" is an adjective?

60. Suppose that there were linguistic rules that correctly described the use of verbs and adjectives. Could these rules account for the differences between the uses of "brood" and "gloomy?" Justify your answer. (Hint: What would be required before these rules could be applied?)

61. What is the issue at stake in the discussion concerning the textual stimulus "The tove gimbles in the wabe?"

62. From the discussion, what may we conclude about whether verbal responses are controlled exclusively by environmental stimuli or whether purely verbal stimuli may also play a role? Explain.

63. What is a *verbal frame* and how might this concept help interpret the use of "brood" and "gloomy?"

64. How does the possibility that words may not be the proper units of verbal behavior affect the interpretation of the use of "brood" and "gloomy?"

65. Several different interpretations are offered for variations in the usage of “brood” and “gloomy.” How likely is it that a given response may be guided by multiple discriminative stimuli?

66. When might a grammatical frame be interpreted as a response chain? Consider the hypothetical experiment with pigeons that acquire a complex behavioral chain. In what ways does this exemplify a linguistic frame? In what ways might it not?

67. What are the issues at stake in the discussion of *nonadjacent dependencies*?

68. What are the issues at stake in the two groups of four sentences? How do the proposals of a *universal grammar* and a *language acquisition device* try to deal these issues?

69. From a selectionist perspective, what are some difficulties with the proposals of a u _____ g _____ and a l _____ a _____ d _____?

70. Instead of postulating innate grammar and language-specific learning principles, what does a selectionist approach recommend to understand verbal behavior? Would keeping a careful diary of the utterances of a child satisfy this recommendation? Explain.

THE ROLE OF EXPLICIT REINFORCEMENT IN LANGUAGE LEARNING

71. What is the empirical evidence concerning the role of explicit reinforcement in the acquisition of verbal behavior? On the "correctness" of utterances? On the "grammaticality" of utterances?

72. What was Moerk's conclusion when he reanalyzed Brown's data? Does Moerk's finding "solve" the problem of finding the reinforcement for language acquisition? Explain.

73. Comment on the role of verbal stimuli and other social stimuli as reinforcers for verbal behavior.

74. Why is the fact that communication between humans takes the form of a vocal response so important? In what critical respect do vocal responses differ from other communicative responses?

75. During language acquisition, when does the behavior of children become guided by verbal stimuli (*reception*) relative to when children emit verbal behavior (*production*)? Why must reception precede production in order for the stimuli provided by the speaker's own verbal responses to function as acquired reinforcers? (Hints: What is true behaviorally of stimuli that function as acquired reinforcers? What is true neurally of stimuli that function as acquired reinforcers? (Review the discussion of internal reinforcement on pp. 100 ff.)

76. What is a difference between signed speech and vocal speech concerning the role of acquired reinforcement in the acquisition of "grammatical" speech?

77. If acquired-reinforcement is critically important in language acquisition, then should there be individual differences in verbal behavior between cultures? Between social groups within the same culture? Can you think of examples to illustrate your answers?

78. Read the discussion of the acquisition of whistling very carefully. In what ways does this example illustrate the same biobehavioral processes that are responsible for the acquisition of language? Use the term *automatic reinforcement* in your answer.

CONCLUSION

79. State the major conclusions from this summary of a selectionist (biobehavioral) account of verbal behavior. What is the important contribution of linguistics to this subject?

80. What is your view of the major shortcomings of a selectionist account? Of a linguistic account?