Study Questions for Chapter 6: Perception


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**THIS MODULE HAS 116 QUESTIONS.**

**Learning Objectives**

- Define and compare the constructivist and nativist views.
- Describe how habituation, dishabituation, preferential looking, evoked potentials, and operant conditioning are used to study infant perception.
- Define visual acuity and visual accommodation. Know the two conditions that help young infants to see objects more clearly.
- Describe developmental changes in color vision.
- Be able to define contour and state how it is related to young infants' visual perception.
- Summarize 3 features of visual patterns that attract young infants’ attention.
- Be able to define size constancy and describe research on when it develops.
- Describe the significance of the visual cliff studies.
- Be able to define intuitive theories and describe the research on them.
- Be able to describe the effect of deafness on children's language development, how hearing is typically assessed in newborns, and list the most important factors necessary to improve language development in deaf children.
- Describe Eimas's research on phoneme perception and how the ability to distinguish between phonemes changes with age. Be able to explain how this relates to language development.
- Describe the DeCasper studies and their significance.
- Understand how taste, smell, and pain are related in newborn infants.
- Be able to describe the kind of stimulation required for normal visual development. What happens to perceptual development if these early experiences are lacking? Know how this research relates to the concept of sensitive periods.
- Be able to list and describe Gibson's three phases of exploratory behavior.
• Describe examples of cultural influences on perception. Which aspects of perceptual are and are not culturally influenced?
• Describe the development of attention during childhood.
• Be able to describe Hagen's research on central and incidental learning.
• Be able to define sensory threshold and describe what happens to thresholds as people age.
• Describe declines in sensory functioning during adulthood and when these declines generally begin.
• Define presbyopia, cataracts, and glaucoma.
• Identify factors that affect older adults' ability to process visual and auditory information.
• Describe changes in hearing, taste, and smell as we get older and be able to identify hazardous consequences for each sensory system that are based on the elderly's declining sensory capabilities. What effect do sensory changes in the elderly have on their driving and how do their driving records compare with those of younger people? Why?

6.1—Issues of Nature and Nurture

1. Describe the constructivist view of perception. Does this view take more of a nature or nurture perspective?

2. Describe the nativist view of perception. Does this view take more of a nature or nurture perspective?

3. Remember back to module 1—what does innate mean?

NOTE: Earlier you learned that each side of the nature/nurture issue is too extreme, and that the truth of development lies somewhere in between—in the complex interactions between genetic and environmental influences. You should have noticed that the nativist/constructivist controversy closely parallels the nature/nurture issue. These two views on how perception develops are extreme, and neither alone is correct. Perhaps a better way to address this issue is to ask a different set of questions. In what ways are infants prepared to learn about the world? What kinds of experiences are needed for development to proceed normally? How does the learning process work?
6.2—The Infant

4. Many important ideas in psychology can be traced back to William James. In 1890, James wrote that “the baby, assailed by eyes, ears, nose, skin, and entrails at once, feels that all is one great blooming, buzzing confusion.” What did he mean by this?

5. What is the more modern view of how young infants experience the world? Why has this view changed?

Assessing Perceptual Abilities

6. Major research methods for studying infant perception are:

7. If you encounter the same stimulus over and over again (e.g., hear your watch beep at the top of every hour), then your attention to that stimulus gradually decreases (e.g., you no longer notice the beeping). This is called ____________________.

8. If researchers repeatedly present a blue circle to an infant, and the infant can perceive this visual stimulus, what happens to the infant’s response (looking behavior)?

9. If researchers then present a red circle to the infant and the infant becomes interested and looks longer, what does that tell us about the infant’s visual perception?

10. Note that after habituation to a stimulus, if infants' attention increases in response to a change in the stimulus or to a different stimulus, this is called DISHABITUATION. How do the complementary methods of habituation and dishabituation tell us about what babies can perceive?
11. Remember back to chapter 1 on research methods. In the experiment described above, showing infants circles of different colors is the __________ (independent OR dependent) variable, and infants’ looking time is the __________ (independent OR dependent) variable. Thus, in studies of infants’ perceptual abilities, habituation and dishabituation are __________ (independent OR dependent) variables, and the kinds of stimuli shown to infants are __________ (independent OR dependent) variables.

12. How does preferential looking differ from habituation? How are these two methods similar?

DIFFERENCES:

SIMILARITIES:

13. In preferential looking, what can researchers conclude if infants look equally long at two different stimuli? When preferential looking doesn’t work, what is an alternative method that may reveal infants’ preferences?

14. Remember back to chapter 1 on research methods. In experiments testing infants’ perceptual abilities, the kinds of stimuli shown to infants would be the __________ (independent OR dependent) variable and infants’ preferential looking (looking preferences) would be the __________ (independent OR dependent) variable.

15. Researchers also study infant perception by measuring how their brains respond to different stimuli. This method of recording the electrical activity of the brain is called ____________________.

16. Describe an example of how Skinner’s principles of operant conditioning can be used to study the perceptual capabilities of infants.

Vision

Basic Capacities

17. Define visual acuity.
18. Objects appear blurry to young infants unless what two conditions are met?

19. Why do objects appear blurry to young infants?

20. Define visual accommodation.

21. Do 4-month-old infants see colors?

22. If you habituate an infant to the color blue and then change the color to another shade of blue, what happens?

23. If you habituate the infant to the color blue and then change the color to a shade adults would label as green, what happens?

24. Note that this happens even though the difference in wavelength between Blue 1 and Green is equal to the difference between Blue 1 and Blue 2. What does this finding suggest?

25. Describe developmental changes in the ability to see color.

26. These findings regarding color vision are most consistent with a ________________ (constructivist OR nativist) view.

**Pattern Perception**

27. Young infants look longer at patterns that have high contrast borders (sharp boundaries between light and dark areas) and patterns with large amounts of light/dark transitions, also known as ________________.

28. Infants are also attracted to displays that are ________________ (as opposed to static). This means that the displays contain ________________.
29. Young infants also look longer at moving patterns and patterns that are ___________________________ (highly complex OR moderately complex OR very simple).

30. Now, summarize three features of visual patterns that attract young infants’ attention.

31. A simple explanation for these early visual preferences is:

32. Because young infants’ eyes are small and their neural receptors are immature, they have poor visual acuity and see a highly complex checkerboard as ___________________________ ___________________________ The pattern in a ___________________________ checkerboard can be seen.

33. What important developmental changes happen at age 2 to 3 months that produce a major breakthrough in perception of forms?

Depth Perception

34. Define size constancy.

**NOTE:** For a real life example of size constancy, think about driving down the road. If the car in front of you seems to stay the same size (retinal size or the image the car casts on the retina of your eye), then you know that the car ahead is: ___________________________ ___________________________.

If the car ahead of you is increasing in retinal size, then you that that it is: __________ ___________________________.

If the car ahead of you is increasing very rapidly in size then you know that it is in the wrong lane and about to collide with you. This example explains how important size constancy is in everyday survival.
35. Granrud (2006) found that 4-month-old infants have size constancy. What method(s) did he use to demonstrate this early ability?

36. Describe the findings of Granrud’s study. What do these findings tell us about size constancy in young infants?

37. Check back to the beginning of this paragraph. How early do infants show size constancy?

38. These findings are consistent with a __________ (constructivist OR nativist) view.

39. Gibson and Walk tested crawling infants on an apparatus called the visual cliff. Why is this apparatus called a visual cliff and what were their findings?

**IMPORTANT NOTE**: Let us pause here to clarify and expand upon the findings of the visual cliff research. Although the original Gibson and Walk studies found that most crawling infants avoided the deep side of the visual cliff, later research by Campos and colleagues found that crawling experience made a difference. Infants who have just started crawling are more likely to cross over the deep side of the visual cliff, whereas infants who have been crawling for about four to six weeks are significantly less likely to cross over the deep side of the visual cliff.

40. When infants first begin to crawl, they are __________ (more or less) likely to cross the deep side of the visual cliff. After infants have been crawling for a month or more, they are __________ (more or less) likely to cross the deep side of the visual cliff.

41. What is a limitation of using the visual cliff to test depth perception?
42. Campos and colleagues studied infants who were too young to crawl and their response to the visual cliff. What response to the visual cliff did these researchers measure?

43. Campos and colleagues selected infants about 2 months old and measured their response to being held over the deep side or the shallow side of the visual cliff. What do you think would happen to you if someone held you out over the Grand Canyon? Would you experience changes in heart rate? _______ You would expect that in that situation, your heart rate would _______________ (increase or decrease).

44. Campos found that these young infants showed no change in heart rate when held over the _______________ (shallow or deep) side of the visual cliff, but they did experience a heart rate change when held over the _______________ (shallow or deep) side. However, their heart rate did not increase – it decreased. A deceleration of heart rate is associated with attention. If you are listening carefully to something your heart rate will decrease slightly. That's what happened here. The young infants could perceive that the deep side was different than the shallow side because they paid more _______________ to it. However, since their heart rate went down rather than up, they were not afraid. This suggests that infants have depth perception before they can crawl, but they need some crawling experience to associate a sharp drop off with _______________.

**IMPORTANT NOTE:** The fear of heights hypothesis is only one possible explanation for how experience crawling mediates the avoidance response on the visual cliff.

45. Look back over the last several questions and notes and let’s summarize these findings. The original visual cliff studies by Gibson and Walk were designed to test infants’ _______________. However, Campos and colleagues showed us that infants have depth perception long before they begin to crawl. These researchers used changes in infants’ _______________ to demonstrate that infants can discriminate between the shallow and deep sides of the visual cliff. When babies do begin to crawl, at first they will _______________ (cross or avoid) the deep side of the visual cliff. After 4-6 weeks of crawling experience, the infants will begin to (cross or avoid) the deep side of the visual cliff.

46. Is this research consistent with the nativist view?

**The Infant as an Intuitive Theorist**

47. According to research by Spelke and colleagues, infants look longer at "impossible" events that violate laws of physics. Infants seem surprised when a ball dropped behind a screen is later shown under a shelf rather than resting on it. They look longer at this _______________ event than at the comparison event where the ball’s motion stops when it reaches a barrier. Infants are also surprised when a ball drops
behind a screen and then appears to be magically suspended in midair. These findings hint that infants know something about the laws of ________________.

Findings from these “violation-of-expectation” tasks have led some developmental psychologists to conclude that infants come into the world equipped with organized systems of knowledge known as ________________  ________________.

48. Views like the one described in the above question are consistent with a ________________ (constructivist OR nativist) view.

Explorations: Can Babies Count?

49. Wynn used the ________________ technique to assess whether 5-month-old infants understood number concepts. [HINT: Remember the major research methods from question #6 above.]

50. If babies see two objects placed behind a screen one at a time, and then the screen drops to reveal a display with either 1 or 2 objects, which display do they look at longer? ________________ Thus, infants looked at the ________________ (correct OR incorrect) outcome.

51. Wynn initially interpreted these findings to mean that infants have number sense from an early age (probably innate). What alternative explanation has been offered for these findings?

Hearing

Basic Capacities

52. Newborn infants can localize sounds—they are startled by loud noises and will turn away from them, but will turn in the direction of softer sounds. This means that the hearing of newborn infants is ________________ (poor OR very good OR at adult levels).

53. Infants seem to prefer listening to auditory stimuli that are relatively ________________, a finding consistent with their visual preferences for moderate complexity.

Applications: Aiding Infants and Children with Hearing Impairment

54. How is hearing usually assessed in newborns? [HINT: Remember the major research methods from question #6 above.]

55. Why is it important to identify hearing loss early in development?
56. What are the two most important factors in intervention for hearing impaired children?

Speech Perception

57. Infants 2 to 3 months of age are very good at discriminating basic speech sounds (called ____________________). As your book mentions briefly, Peter Eimas did the original research on infants' phoneme perception. Eimas presented sounds to infants (e.g., the syllable /ba/ and measured their sucking behavior. As the syllable was repeated over and over the infants eventually stopped sucking. Eimas is using the __________________ method. [HINT: Remember the major research methods from question #6 above.] When the babies stopped sucking, we would say they had __________________ to the sound /ba/. Then Eimas changed the sound to /pa/ and the babies began sucking again. This increased sucking would be called ____________________. This indicated that the babies could do what?

58. The fact that babies can distinguish speech sounds long before they learn language is evidence supporting the _______________ (constructivist OR nativist) perspective.

59. Infants can discriminate some speech sounds better than adults can. Give two examples of cases where infants are better than adults at discriminating speech sounds.

60. What evidence is there that early auditory experiences are important in language development?

61. Do newborn infants recognize their mothers’ voices? _________ Do newborn infants recognize their fathers’ voices? _________

62. DeCasper and Spence had mothers recite a Dr. Seuss book repeatedly to their fetuses during the last six weeks of pregnancy. At birth, the researchers gave infants a pacifier that controlled two different audiotapes. One was a recording of the infants’ mothers reading the same story that the infants had heard prenatally, and the other was a recording of their mothers reading a new story that they had not heard before.
In this research procedure, infants could control what they listened to by changing their rate of sucking. When infants increased their rate of sucking over baseline, the familiar story turned on. When infants decreased their rate of sucking below baseline, the new story turned on. If the infants could remember what they heard prenatally, then what should happen to their rate of sucking?

63. The DeCasper and Spence study is an example of the __________________________ research method. [HINT: Remember the major research methods from question #6 above.] What is the dependent variable in this study?

64. Which sensory system is more developed at birth, seeing or hearing?

Taste and Smell

65. What taste/flavor has the ability to calm newborn babies (even premature infants) and can help them cope with painful medical procedures?

66. Although infants have innate preferences for sweet flavors and avoidance of __________________________ flavors, flavor preferences are highly responsive to learning. Describe a study that demonstrates early learning of preference for flavors.

67. What smell has the ability to calm newborn infants' crying even when their mothers are not present or when they undergo painful medical procedures?

68. True OR False—Breast-fed babies can recognize their mothers by smell, but bottle-fed babies cannot. Can mothers recognize their newborn infants by smell? ______

Touch, Temperature and Pain

69. Describe the benefits of touch for premature infants.
70. True OR False -- Using deep anesthesia when babies have to undergo major surgery is dangerous to their survival, and only the lightest level of anesthesia for the shortest period of time is advisable.

**Influences on Early Perceptual Development**

71. The fact that perceptual development takes place so quickly can be viewed as support for the ________ side of the nature-nurture debate. This also fits with the ________ (constructivist OR nativist) perspective.

**Early Experience and the Brain**

72. Describe how studies by Hubel and Wiesel of visual development in kittens illustrates the important role of early experience.

73. Even as little as _________________ of deprivation during the critical period of the first 8 weeks after birth can lead to permanent vision loss in kittens. What happens when an adult cat’s eye is deprived of light?

74. Define sensitive period.

75. Lewis and Maurer (2005) describe multiple sensitive periods during which vision can be influenced by experience. List and describe three of these sensitive periods.

76. What visual problem in infants can lead to permanent loss of vision if not corrected during the critical period?
77. The visual system requires stimulation early in life in order to develop normally, particularly ______________________ stimulation.

78. Although the visual system has some plasticity throughout childhood, what period of time is considered a critical period for normal development of the visual system?

79. During this time, the brain must receive ____________________________ from both eyes.

80. Exposure to auditory stimulation early in life affects:

81. The overall message here is that maturation alone is not enough; normal perceptual development also requires:

The Infant's Active Role

82. Briefly describe each of Eleanor Gibson's three phases of exploratory behavior as listed below:
   • social interactions (0 to about 4 mos) –

   • object manipulation (begins around 5 mos) –

   • independent locomotion (begins around 8 or 9 mos) –

Cultural Variation

83. Describe one example which shows no cultural influence on perception and two examples which do show that culture influences some aspects of perception.
6.3—The Child

The Development of Attention

84. Much of perceptual development in childhood is really the development of ________________.

85. What three aspects of attention develop during childhood?

More Selective Attention

86. With age, attention becomes more selective and less susceptible to ________________.

87. An example of the development of selective attention is that older school-aged children are better able to find a target visual stimulus while ignoring a ________________.

NOTE: Hagen has done research on selective attention and how it develops. He showed children pictures and instructed them to pay attention to the pictures and try to remember them later. There were other distracting elements with the pictures that they were instructed to ignore, such as a colored background. He then asked the children to remember the pictures (a measure of central learning--remembering what they were told to pay attention) but also asked if they could remember what colored background that picture was on (a measure of incidental learning--remembering irrelevant information). Incidental learning is kind of the opposite of selective attention. It is similar to what you experience when you're taking a test and you can remember the page that the answer is on and the picture at the top of the page, but you just can't remember the answer to the question. In Hagen's research, young children remember some of the pictures but also remember about as much irrelevant information as they do relevant information. Their central learning is not much better than their incidental learning. As children get older they become better able to separate "the wheat from the chaff." They remember more and more of the relevant information and less and less of the irrelevant information.

88. Therefore as children get older, their central learning scores should ________________ and their incidental learning scores should ________________. This reflects the fact that their attention is becoming more ________________ with age.

89. What you remember about relevant information is referred to as ________________ learning and what you remember about irrelevant or distracting information is referred to as ________________ learning. Being able to remember relevant information and tune out distractions is known as ________________.
90. **Critical thinking question.** There are individual differences in the rate at which children develop attentional skills. How does this relate to classroom teachers' and parents' perception of some children as having attention deficit disorder or ADD?

**More Systematic Attention**

91. When children engage in visual search, how does this differ from the ways that adults engage in visual search?

92. Vurpillot found that when comparing two visual stimuli (e.g., two houses) to decide if they are identical or different, preschool aged children often come to the wrong conclusion. Why?

93. At what age do children become more systematic in their visual search?

**6.4—The Adolescent**

94. What are two important changes in perception during adolescence?

**6.5—The Adult**

95. At what age do we first begin to see declines in sensory functioning, such as seeing and hearing? At what age do most people have at least a mild sensory or perceptual impairment?

96. How serious are these declines?

97. Define sensory threshold.
98. Given this definition, if Jeffrey now has to turn more lights on to be able to see and has to turn the TV volume up to be able to hear the newscaster, we say that his sensory threshold for vision and hearing is _________ than when he was younger. (higher or lower).

99. As we get older, we lose sensitivity to low levels of stimulation. This means that our sensory thresholds ________ with age. (increase or decrease)

**IMPORTANT HINTS:** The concept of sensory thresholds can sometimes be confusing. An analogy that might help you to remember what it means for thresholds to be increasing vs. decreasing is to think about the eye chart at the doctor’s office. The largest letters are at the top and the tiniest letters are on the bottom. If your threshold is higher, then you can only read the letters on top (the really big ones, which means your vision is poor). If your threshold is lower, then you can see the letters at the bottom (the really tiny ones, which means that your vision is quite good).

100. If you need more (greater) stimulation in order to perceive a stimulus, this means that your threshold is ________ (increasing or decreasing)?

101. If you need less (lower) stimulation in order to perceive a stimulus, this means that your threshold is ________ (increasing or decreasing)?

102. If you have to turn the light switch all the way to the highest setting (brightest light), then your threshold for light is ________ (high or low)?

103. If you can hear the TV even when the volume is turned down very low, then your threshold for sound is ________ (high or low)?

104. Mary has high blood pressure and her doctor wants her to cut down on salt. She complains that she can't taste her food now without more salt than she used to use. Mary's taste threshold for salt is ________ than when she was younger. (higher or lower)

105. True OR False -- Aging involves a lowering of sensory thresholds.

*Vision*

**Changes in the Pupil**

106. Describe natural aging changes in the pupil and how this affects vision. What are two examples of problems that older adults may have in their everyday lives?
Changes in the Lens

107. Presbyopia is common in middle age, when you reach your 40s. What is presbyopia, and how can it be treated?

108. What are cataracts, and how can they be treated?

Retinal Changes

109. Briefly describe two age-related changes in the retina that cause vision problems. How are these two conditions treated?

Explorations: Aging Drivers

110. List some of the reasons that elderly people have difficulty driving.

111. How do the driving records of the elderly compare with those of younger people?

112. Why is this?

Attention and Visual Search

113. Older adults have the greatest trouble processing visual information when then situation is _______________ (not exactly sure where to look) and when it is _______________ (lots of distracting information or requires divided attention). Older adults can be just as fast and efficient as younger adults when:
Hearing

Basic Capacities

114. The most common and most noticeable age-related hearing problem is loss of sensitivity to __________ frequency sounds. This condition is known as _______________.

Speech Perception

115. Under what conditions do older adults have the most difficulty hearing and understanding speech?

Taste and Smell

116. Sensitivity to taste and smell also declines with age. This means that the sensory thresholds for taste and smell are _______________ (increasing OR decreasing).

CRITICAL THINKING: Applications to Daily Living
Describe one hazard or dangerous consequence for each sensory system that may occur because of the elderly's declining sensory capabilities.

• vision

• hearing

• taste

• smell

• touch