

(1) Terms/concepts to know: contrastive sounds, phonemes, international phonetic alphabet, categorical perception, within-category perception, across-category perception, voice onset time, high amplitude sucking procedure, habituation, dishabituation, head-turn preference procedure, head-turn technique, goldilocks effect, maintenance and loss theory, functional reorganization theory, contrastive feature, unimodal distribution, bimodal distribution, Switch Procedure, minimal pair, Stager-Werker task, neighborhood hypothesis, visual choice task

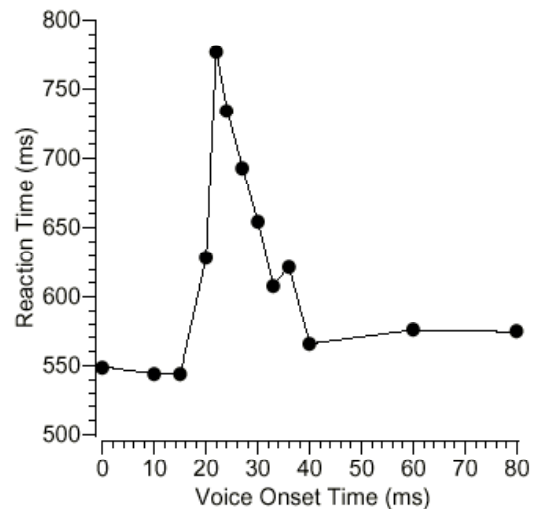
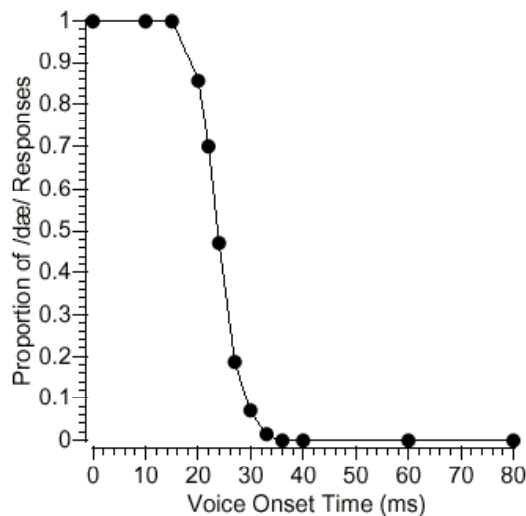
(2) Describe one way you can recognize if two sounds are phonemic in a language.

(3) “All languages use the same set of contrastive sounds.” Describe one way that you could interpret this statement as false. Can you think of any way to interpret it that might make it true?

(4) Will the acoustic signal of the vowel sound “oo” (as in the English word *boot*, represented as [u] in IPA) vary between speakers of the same language? If so, give an example that shows this variation. If not, explain why not.

(5) Give an example of contrastive sounds in English that differ only in their voice onset time (VOT). Which has a shorter VOT and which has a longer one?

(6) Consider the graphs below. The lefthand one shows subjects’ responses to a task while the righthand one shows their reaction time.



(a) Briefly describe what decision a subject must make for a discrimination task.

(b) Briefly describe what decision a subject must make for an identification task.

- (c) Is the task the subjects were asked to perform a discrimination task or an identification task? Explain how you know. (Hint: Look at the x axis labels for both graphs, and the y axis label for the lefthand graph.)
- (d) Why does reaction time rise sharply in the righthand graph? Your answer should make reference to both when the sharp rise occurs (when compared to the lefthand graph) and what it means for the subject to have the reaction time rise in this kind of task.

(7) Why is reaction time longer at a category boundary for an identification task?

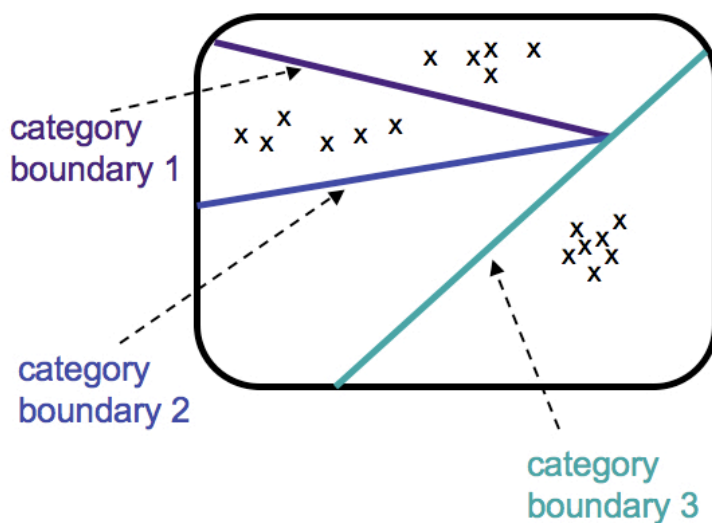
(8) Why is reaction time shorter when stimuli cross a category boundary than when stimuli are within the same category for a discrimination task?

(9) Why did Werker et al. (1981) test both *adult* Hindi speakers and *adult* English speakers in their experiment when they were trying to determine when English *infants* lost the ability to hear Hindi contrastive sounds?

(10) Why were Salish and Hindi children tested in the experiment by Werker & Tees (1984) that examined English infants' ability to perceive non-native (Salish/Hindi) contrasts?

(11) Is the Maintenance & Loss Theory a structure-changing theory or a structure-adding theory? How do you know?

(12) Suppose a child encounters the data points below (represented by 'x's). Which category boundaries (if any) will be maintained, according to the Maintenance & Loss theory?



(13) The lecture notes discussed a study where adults were able to consciously perceive the difference between non-native sound contrasts if they were fooled into believing the sounds were water dropping into a bucket. Why is this problematic for the Maintenance & Loss theory, and how does it support functional reorganization?

(14) Is functional reorganization a structure-changing or structure-building theory? Would it find a study that shows adults can be trained to hear non-native phonemic contrasts problematic?

(15) What evidence is there that young infants are sensitive to distributional information for speech perception?

(16) In the Maye, Werker, & Gerken (2002) experiment, what did it mean that infants trained on bimodally distributed data looked longer at the non-alternating sounds as compared to the alternating sounds? (Hint: Infants tend to look longer at things that surprise them. Why would the non-alternating sounds be surprising for these infants?)

(17) In the Maye, Weiss, & Aslin (2008) experiment, what did it mean if infants looked longer at the trial where the sound changed? What stimuli were the infants trained on who looked longer at the trial where the sound changed?

(18) What evidence is there that infants can learn contrastive features from statistically distributed data (not just contrastive sounds)?

(19) Why was it important for Dietrich et al. (2007) to test English children with vowels that differ in vowel quality (as opposed to vowel duration)?

(20) Why would it be difficult for Dutch children to learn that vowel duration is a contrastive feature, just based off of the statistical distribution of sounds in Dutch?

(21) How might motherese aid infants in distinguishing sounds, assuming infants are using the statistical distribution of the data only?

(22) What evidence is there that sounds may be easier to distinguish if infants realize those sounds are part of words?

(23) Why would having a native language filter for sounds be useful to infants who are trying to learn words?

(24) In the second experiment by Stager & Werker (1997), which children performed better at the task? Why might this be surprising?

(25) In the experiment series conducted by Stager & Werker (1997), experiment 4 was a modification of experiment 2. What was the key modification? Why did it lead to different results in 14-month-olds than experiment 2 did?

(26) What does it mean if a word has a neighbor? Give an example of a word and a “neighboring” word. Why does a neighborhood account predict that 14-month-olds would produce the results found in the Stager & Werker (1997) experiment?

(27) One idea for why familiar words are more easily recognized is that they’ve been encountered multiple times (repetition). That is, the more words children know, the more words they have encountered and the more frequently they have encountered the words they know. While this is a nice story, it can’t explain the results in Werker et al. (2002). Why not? You may find it helpful to think about what the Werker et al. (2002) task was.

(28) What distinguished the 17-month-olds who were able to pass the experimental task in Werker et al. (2002) from the 17-month-olds who were not able to do so?

(29) Suppose we encountered a very advanced 12-month-old whose vocabulary was greater than 200 words. What should we predict this infant’s performance would be on the Stager-Werker word learning task, based on the Werker et al. 2002 results? Why?

(30) Swingley (2005) found that 11-month-olds can recognize the difference between familiar words and mispronunciations of familiar words. Why does this weaken the claim of the neighborhood hypothesis (and by extension the idea that the link between vocabulary size and children’s ability to distinguish phonetic differences has to do with the number of neighbors in their vocabulary)?

(31) What was the main difference in the task that Yoshida et al. (2009) used that allowed 14-month-olds to show that they can distinguish phonetic detail in word forms for novel words (as compared with Stager & Werker 1997)? Why did the task work for 14-month-olds when Stager & Werker’s original task did not?

(32) What did Thiessen & Yee (2010) discover about how abstractly 15-month-olds represent sounds? (Hint: Does acoustic context matter for learning these sounds distinctions in novel word forms? What does this mean for how abstractly these infants represent these sounds?)