

Psych156A/ Ling150
Homework 2: Sounds

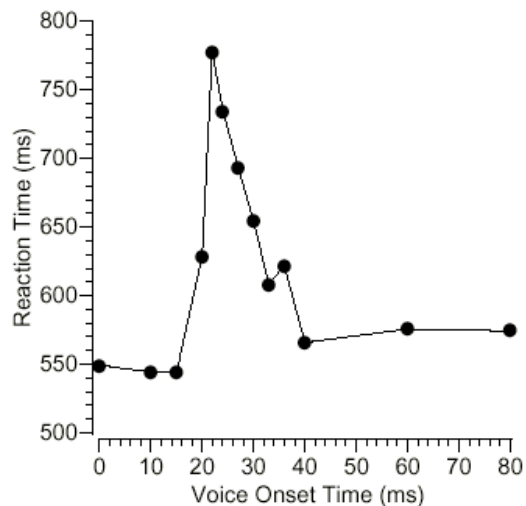
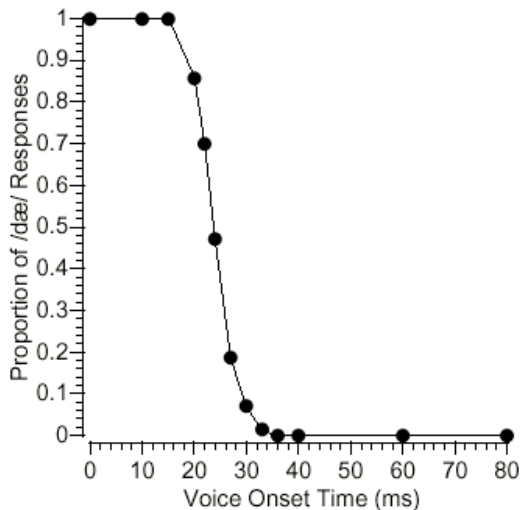
1) Contrasts [3 pts]

(a) Our friend Sigmund von Hacklestein has heard that sounds can be acoustically different but not contrastive in a language, and was a bit fuzzy on how that could be. To help Sigmund out, describe one way you can recognize that two sounds in a language are contrastive (sometimes called phonemic). [1 pt]

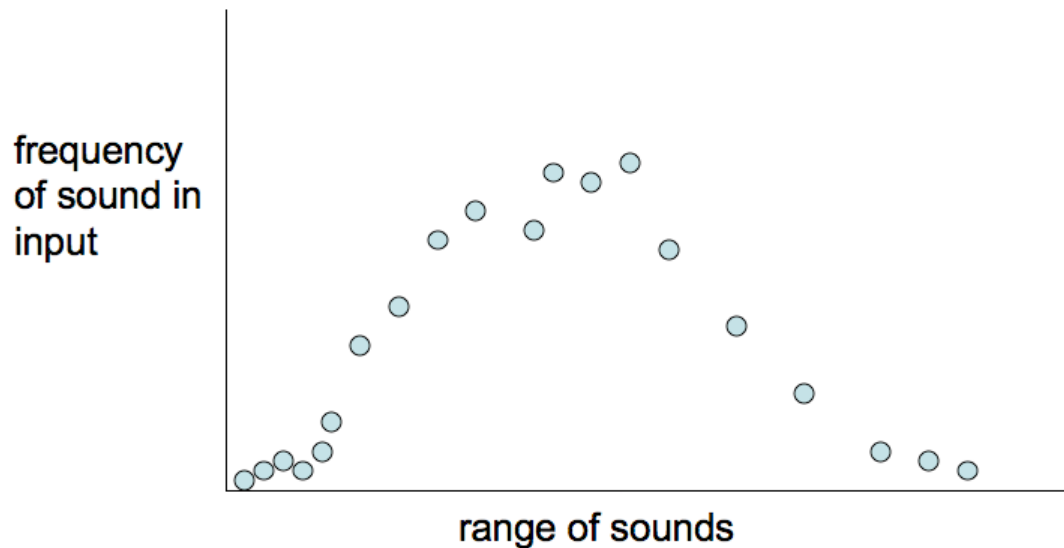
(b) Sigmund has just returned from an excursion among the Guins, and has recorded some language data from them. He has found that the word “moop” means “to slip on a squishy patch of ground”. The word “noop” also means this. Given this information, do you think that “m” and “n” are contrastive sounds in the Guin language? Explain why or why not. [2 pts]

2) Sigmund the Scientist [8 pts]

Sigmund has just been reading about categorical perception of speech sounds, and was very impressed by an experiment that measured people’s ability to judge what sound they heard and how long they took to make their decision. However, he’s forgotten the exact details of the experiment. Given the graphs below, explain to Sigmund what information is available from the experiment. Specifically, explain what information you can draw from each graph individually and both graphs combined together, regarding speech perception. Make sure you identify what the x and y axes represent for each graph.



3) Sigmund was very impressed by Vallabha *et al.* (2007)'s model of predicting categories from speech data. He thought he would try to apply it to a set of data he has from Guin. Given the following data distribution, how many categories is the model likely to posit? Be sure to explain why you think the model would posit that many categories over some other number. [4 pts]



4) Uncertain Sigmund

Sigmund hasn't quite been paying strict attention in class and is unsure about some of the information below. For each statement, state whether it is true or false, and then explain why you think it is true/false. It is usually best to support your answer with an example where appropriate, as Sigmund is much more easily convinced that way. [3 pts each]

- (a) "Infants lose their ability to perceive all non-native sound contrasts at the same time."
- (b) "The Functional Reorganization Theory of speech perception states that humans consciously impose a filter onto the acoustic signal in order to get the perceptual categories that are salient in the native language."
- (c) "Looking longer at one test condition over the other in the Switch Procedure shows that children are not sensitive to the sound distinction between the words."
- (d) "Dietrich, Swingley, & Werker (2007) found that English 18 month olds are never able to tell the difference between words that differ only by their vowel sounds."