

LING/PSYCH 371  
SP02

This homework has two parts.

Part 1 involves listening to a tape played in class on Wednesday, 4/10. **You must be in class when the tape is played to do this homework. No special arrangements will be made if you oversleep, miss the bus, etc.**

Part 2 is due on Monday, 4/15, and involves analyzing and graphing your responses, and writing a brief summary (15 points).

Please listen and circle what you hear. There will be a tone at every line to help you keep track of where you are on the tape.

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1. ka ga  
2. ka ga  
3. ka ga  
4. ka ga  
5. ka ga  
6. ka ga  
7. ka ga  
8. ka ga  
9. ka ga  
10. ka ga  
11. ka ga  
12. ka ga  
13. ka ga  
14. ka ga  
15. ka ga  
16. ka ga  
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17. ga ka  
18. ga ka  
19. ga ka  
20. ga ka  
21. ga ka  
22. ga ka  
23. ga ka  
24. ga ka  
25. ga ka  
26. ga ka  
27. ga ka  
28. ga ka  
29. ga ka  
30. ga ka  
31. ga ka  
32. ga ka  
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33. ka ga  
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41. ka ga  
42. ka ga  
43. ka ga  
44. ka ga  
45. ka ga  
46. ka ga  
47. ka ga  
48. ka ga

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49. ga ka  
50. ga ka  
51. ga ka  
52. ga ka  
53. ga ka  
54. ga ka  
55. ga ka  
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59. ga ka  
60. ga ka  
61. ga ka  
62. ga ka  
63. ga ka  
64. ga ka  
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65. ka ga  
66. ka ga  
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73. ka ga  
74. ka ga  
75. ka ga  
76. ka ga  
77. ka ga  
78. ka ga  
79. ka ga  
80. ka ga

This homework examines the perception of "voice onset time" (VOT), an acoustic cue that is relevant for the perception of voiced and voiceless stop consonants (e.g., /g/ vs. /k/, /b/ vs. /p/, /d/ vs. /t/) in English and many other languages.

During the first part of the homework, you listened to a sequence of 80 sounds. Each of those 80 sounds was really just 1 of 8 different sounds presented in random order. These 8 sounds were synthesized using a series formant synthesizer and three formants. The formant values were held constant over the 8 sounds and were designed to cue a velar stop (/k/ vs. /g/) followed by a low back vowel (/a/). The only way in which the 8 sounds differ from one another is in the VOT value, which ranges from 0 ms to 70 ms in 10 ms steps (i.e., 0 ms, 10ms, 20 ms, 30 ms, etc.).

In class, you heard each of the 8 sounds 10 times for a total of 80 tokens. These 80 tokens were presented in 5 randomized blocks of 16. The VOT corresponding to the 8 tokens in each block is shown below:

1. 0 - 30 - 60 - 20 - 50 - 10 - 40 - 70 - 60 - 20 - 0 - 40 - 10 - 50 - 70 - 30
2. 20 - 50 - 70 - 30 - 60 - 0 - 40 - 10 - 10 - 30 - 60 - 40 - 70 - 0 - 50 - 20
3. 30 - 0 - 50 - 10 - 40 - 70 - 20 - 60 - 60 - 10 - 70 - 20 - 40 - 0 - 30 - 50
4. 10 - 70 - 30 - 0 - 60 - 40 - 20 - 50 - 30 - 60 - 10 - 70 - 20 - 50 - 0 - 40
5. 70 - 0 - 30 - 60 - 40 - 10 - 50 - 20 - 70 - 60 - 0 - 40 - 10 - 30 - 50 - 20

Calculate the number (or percentage) of times you chose the category /ga/ as the response for each of the 8 sounds and plot the results in a graph that you will then turn in.

- The VOT value should be plotted on the x-axis, and the number (or percentage) of /ga/ responses should be plotted on the y-axis.
- Remember to label the axes and to title the graph with the name of the task.
- You may draw the graph by hand or by computer (NB. Excel has a handy chart wizard). If you choose to graph by hand, write clearly and legibly.
- It is sometimes easier to answer the questions at the end if you also plot the number (or percentage) of times you chose the /ka/ category. To do this, make a second y-axis at the righthand edge of the graph.

You will be presented with three sounds in a row. The third sound is identical to either the first sound in the triplet or the second sound in the triplet, but not to both. Circle the sound (A or B) that the third sound (X) matches.

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1.	A	B	X
2.	A	B	X
3.	A	B	X
4.	A	B	X
5.	A	B	X
6.	A	B	X
7.	A	B	X
8.	A	B	X
9.	A	B	X
10.	A	B	X
11.	A	B	X
12.	A	B	X

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13.	A	B	X
14.	A	B	X
15.	A	B	X
16.	A	B	X
17.	A	B	X
18.	A	B	X
19.	A	B	X
20.	A	B	X
21.	A	B	X
22.	A	B	X
23.	A	B	X
24.	A	B	X

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25.	A	B	X
26.	A	B	X
27.	A	B	X
28.	A	B	X
29.	A	B	X
30.	A	B	X
31.	A	B	X
32.	A	B	X
33.	A	B	X
34.	A	B	X
35.	A	B	X
36.	A	B	X

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37.	A	B	X
38.	A	B	X
39.	A	B	X
40.	A	B	X
41.	A	B	X
42.	A	B	X
43.	A	B	X
44.	A	B	X
45.	A	B	X
46.	A	B	X
47.	A	B	X
48.	A	B	X

The second part of the homework used the same stimuli as the first part, but this time the sounds were presented as a sequence of 48 triplets (A B X). The third sound was identical to either the first or second sound, and the difference in VOT between the first two sounds was always 20 milliseconds. The following key identifies the VOT of the sounds in each triplet:

1.	10 - 30 - 10	25.	60 - 40 - 60
2.	70 - 50 - 50	26.	10 - 30 - 30
3.	30 - 10 - 30	27.	70 - 50 - 70
4.	0 - 20 - 0	28.	40 - 20 - 40
5.	60 - 40 - 40	29.	30 - 50 - 30
6.	50 - 70 - 50	30.	0 - 20 - 20
7.	20 - 40 - 20	31.	50 - 70 - 50
8.	50 - 30 - 30	32.	30 - 10 - 30
9.	20 - 0 - 0	33.	50 - 30 - 50
10.	40 - 20 - 40	34.	40 - 60 - 40
11.	30 - 50 - 50	35.	20 - 40 - 40
12.	40 - 60 - 60	36.	20 - 0 - 0
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13.	40 - 20 - 20	37.	50 - 30 - 30
14.	0 - 20 - 20	38.	60 - 40 - 60
15.	30 - 50 - 50	39.	0 - 20 - 0
16.	60 - 40 - 40	40.	20 - 40 - 40
17.	70 - 50 - 50	41.	40 - 20 - 20
18.	10 - 30 - 30	42.	30 - 50 - 30
19.	50 - 30 - 50	43.	40 - 60 - 60
20.	20 - 0 - 20	44.	70 - 50 - 70
21.	50 - 70 - 70	45.	10 - 30 - 10
22.	20 - 40 - 20	46.	20 - 0 - 20
23.	40 - 60 - 40	47.	30 - 10 - 10
24.	30 - 10 - 10	48.	50 - 70 - 70

Calculate and graph the percentage of times that you correctly matched the third sound to the preceding sound for each A B pair of VOTs (e.g., 0 and 20, 10 and 30, 20 and 40, 30 and 50, 40 and 60, 50 and 70). Again, you will turn in your graph.

- Notice that 0 and 20 (e.g., number 4) also occurred as 20 and 0 (e.g., number 46). Group these responses together.
- The identity of the VOT pairs should be plotted on the x-axis, and the percentage of correct responses should be plotted on the y-axis.
- Remember to label the axes and to title the graph with the name of the task.
- You may draw the graph by hand or by computer. If you choose to graph by hand, write clearly and legibly.

**Due Monday, 4/15 (15 points)**

Using your two graphs, answer the following questions in a typed, mini-essay (i.e., connect your answers into a coherent set of **concise** paragraphs--longer is not necessarily better):

1. Is there a distinct boundary between the category for /g/ and /k/ in your identification graph?
2. What do the two graphs show when you consider them together?

To answer Q2, consider the following subquestions:

- What is the relationship between the pairs you discriminated most accurately and how you responded to those VOTs during the identification task?
- How did you identify the VOTs of a pair that you could not discriminate accurately?
- Are there any pairs that probably should have been discriminated more accurately than they actually were?

**Please remember:**

- Graphs must be legible and on separate pieces of paper when you turn them in with this assignment.
- Always support your answers by referring to the data in the graphs.
- Proofread! Assignments that contain more than three grammatical errors (i.e., typos, run-ons, fragments, spelling errors, etc.) may be returned without credit. They can be reworked and resubmitted under the late policy.