

## Appendix II

Once  $d'$  values had been calculated for each stimulus type (by subject), ANOVAs were run in order to determine which factors had significant effects on the variation in the  $d'$  values. The experiment included six basic factors:

1. Volume (Speech reception threshold/Comfortable listening level)
2. Manner (Oral/Nasal)
3. Place (Labial/Coronal/Dorsal)
4. Stress (Stressed/Unstressed)
5. Position (Onset/Coda)
6. Place in adjacent position:
  - a. OnsetPlace (Labial/Coronal/Dorsal)
  - b. CodaPlace (Labial/Coronal/Dorsal)

The last factor was included as a means of investigating Jun's claims about the effects of an adjacent place of articulation on the perceptibility of place in, for example, coda position. Unfortunately, including this factor in a six-factor ANOVA of the results would potentially yield significant but uninterpretable OnsetPlace\*Place\*Position or CodaPlace\*Place\*Position interactions. In order to avoid this problem, the six-factor ANOVA was boiled down to two five-factor ANOVAs and one four-factor ANOVA.

The first two, five-factor ANOVAs examined variance in sensitivity only for one syllabic position at a time--Place (in coda position) was one factor while OnsetPlace served as the adjacent place factor, for example. Table IA shows the results for this analysis of sensitivity for coda stops. In table IB, place in onset position served as a main factor while CodaPlace functioned as the adjacent place factor. In the third ANOVA, place was not considered as a factor at all, but syllabic position was. The results for these ANOVAs can be found in table IC.

In order to follow up on the significant results from the ANOVA testing, two-tailed  $t$ -tests were performed on the averages that were graphed in Figures 3-6. The  $t$ -tests made pairwise comparisons of the  $d'$  scores from which the graphed means had been drawn (for instance, comparing labial and coronals in coda position, Figure 3) and determined the likelihood of the two sets of scores having come from the same population. A probability of less than .01 was taken as signifying that the sets did not arise from the same population. These comparisons are shown in table II.

**Table I:D' ANOVAs**

## A. Significant factors in Coda position

<b>Factor</b>	<b>F</b>	<b>df</b>	<b>p</b>
Volume	119.269	1,23	<.001
OnsetPlace	39.802	2,22	<.001
Stress	43.151	1,23	<.001
Place	39.584	2,22	<.001
Manner*Stress	14.365	1,23	0.001
Volume*Place	21.207	2,22	<.001
Manner*Place	13.610	2,22	<.001
OnsetPlace*Place	24.671	4,20	<.001
Volume*OnsetPlace*Place	6.909	4,20	0.001
Stress*Place	18.282	2,22	<.001
OnsetPlace*Stress*Place	23.705	4,20	<.001

## B. Significant factors in Onset Position

Volume	206.083	1,23	<.001
CodaPlace	11.110	2,22	<.001
Stress	8.563	1,23	0.008
Place	60.579	2,22	<.001
Manner*CodaPlace	6.973	2,22	0.005
Volume*Stress	11.111	1,23	0.003
Volume*Place	38.535	2,22	<.001
Stress*Place	17.242	2,22	<.001
Volume*Stress*Place	7.326	2,22	0.004

## C. Significant factors across Positions

Position	246.709	1,23	<.001
Volume	352.525	1,23	<.001
Manner	8.732	1,23	0.007
Stress	65.409	1,23	<.001
Position*Stress	10.297	1,23	0.004
Volume*Stress	16.208	1,23	0.001
Position*Manner*Stress	7.895	1,23	0.010

**Table II: Probability (two-tailed t-test) that mean  $d'$  values graphed in each of the figures are the same**

<i>Figure 3</i>	Coda	Onset
L-C	<b>0.00</b>	<b>0.00</b>
C-D	<b>0.00</b>	<b>0.00</b>
L-D	<b>0.00</b>	0.08

<i>Figure 4</i>	Orals	Nasals
L-C	<b>0.00</b>	<b>0.00</b>
C-D	0.39	<b>0.00</b>
L-D	<b>0.00</b>	<b>0.00</b>

<i>Figure 5</i>	L	C	D
L-C	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
L-D	<b>0.00</b>	0.49	<b>0.01</b>
C-D	0.63	<b>0.01</b>	<b>0.01</b>

<i>Figure 6</i>	Coda-St	Onset-Un
L-D	<b>0.00</b>	0.18