**Table 1.** Descriptive statistics for the measures of interest across the three conditions.

|  | | **Segment** | **Conversational,**  **Mask-off** | |  | **Conversational,**  **Mask-on** | |  | **Clear,**  **Mask-on** | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **M** | **SD** |  | **M** | **SD** |  | **M** | **SD** |
| **Intelligibility** |  |  |  |  |  |  |  |  |  |  |
| Sentence (VAS) | | - | 90.73 | 14.70 |  | 85.85 | 18.31 |  | 90.49 | 15.73 |
| Word Transcription (%) | | - | 69.27 | 15.90 |  | 57.86 | 19.31 |  | 66.26 | 18.68 |
| **Vowels** | |  |  |  |  |  |  |  |  |  |
| Duration (ms) | | /a/ | 238.65 | 53.62 |  | 228.96 | 49.83 |  | 217.30 | 64.65 |
|  | | /æ/ | 221.11 | 41.65 |  | 214.34 | 38.81 |  | 208.76 | 52.95 |
|  | | /i/ | 186.05 | 36.09 |  | 184.43 | 31.41 |  | 181.50 | 44.09 |
|  | | /u/ | 196.38 | 35.32 |  | 197.40 | 36.47 |  | 187.78 | 40.93 |
| F1 (Hz) | | /a/ | 831.07 | 107.39 |  | 773.88 | 112.51 |  | 832.46 | 117.28 |
|  | | /æ/ | 942.11 | 150.27 |  | 911.62 | 118.42 |  | 955.68 | 175.01 |
|  | | /i/ | 392.82 | 57.82 |  | 383.57 | 64.43 |  | 395.66 | 69.88 |
|  | | /u/ | 413.61 | 39.22 |  | 426.61 | 37.36 |  | 419.57 | 39.08 |
| F2 (Hz) | | /a/ | 1,334.45 | 125.68 |  | 1,235.50 | 130.52 |  | 1,324.48 | 307.25 |
|  | | /æ/ | 1,725.43 | 156.35 |  | 1,684.41 | 160.58 |  | 1,678.68 | 195.66 |
|  | | /i/ | 2,926.95 | 195.41 |  | 2,931.11 | 205.40 |  | 2,933.86 | 431.05 |
|  | | /u/ | 1,672.50 | 214.06 |  | 1,583.54 | 302.02 |  | 1,639.68 | 331.30 |
| F1/F2 Intensity Ratio | | /a/ | 0.89 | 0.11 |  | 0.93 | 0.15 |  | 0.93 | 0.16 |
|  | | /æ/ | 0.96 | 0.32 |  | 0.97 | 0.18 |  | 0.97 | 0.20 |
|  | | /i/ | 1.06 | 0.16 |  | 0.95 | 0.19 |  | 0.96 | 0.41 |
|  | | /u/ | 0.76 | 0.17 |  | 0.74 | 0.15 |  | 0.77 | 0.14 |
| **Consonants** | |  |  |  |  |  |  |  |  |  |
| M1 | | Fricative | 6.19 | 1.73 |  | 6.06 | 1.87 |  | 6.48 | 1.98 |
|  | | Stop | 5.68 | 1.59 |  | 5.34 | 1.71 |  | 5.70 | 1.66 |
| M2 | | Fricative | 1.26 | 0.37 |  | 1.27 | 0.46 |  | 1.28 | 0.43 |
|  | | Stop | 1.48 | 0.64 |  | 1.40 | 0.63 |  | 1.54 | 0.67 |
| M3 | | Fricative | 0.43 | 1.13 |  | 0.36 | 1.17 |  | 0.19 | 1.13 |
|  | | Stop | 0.38 | 1.39 |  | 0.42 | 1.31 |  | 0.19 | 1.13 |
| M4 | | Fricative | 2.06 | 4.77 |  | 2.17 | 3.74 |  | 2.45 | 3.43 |
|  | | Stop | 3.72 | 8.99 |  | 4.59 | 8.31 |  | 2.65 | 4.26 |
| C/V Intensity Ratio | | Fricative | 1.96 | 0.80 |  | 1.82 | 0.46 |  | 2.84 | 2.47 |
|  | | Stop | 1.52 | 0.40 |  | 1.52 | 0.26 |  | 1.84 | 0.55 |

**Table 2.** Fixed effect estimates for the most parsimonious intelligibility models.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Model | | *B* | *CI* | *t-value* | *p-value* |
| Sentence Intelligibility (VAS) | | | | | |
|  | (Intercept) | 90.95 | 86.26 – 95.91 | 167.01 | **<0.001** |
|  | Conversational, Mask-off | Reference |  |  |  |
|  | Conversational, Mask-on | 0.94 | 0.91 – 0.98 | -3.02 | **0.003** |
|  | Clear, Mask-on | 0.99 | 0.95 – 1.03 | -0.47 | 0.639 |
| Word Transcription (% Accuracy) | | | | | |
|  | (Intercept) | 66.81 | 58.81 – 74.81 | 16.40 | **<0.001** |
|  | Conversational, Mask-off | Reference |  |  |  |
|  | Conversational, Mask-on | -11.45 | -13.57 – -9.33 | -10.61 | **<0.001** |
|  | Clear, Mask-on | -3.42 | -5.54 – -1.30 | -3.17 | **0.002** |

**Table 3.** Fixed effect estimates for the most parsimonious vowel models.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Model | | *B* | *CI* | *t-value* | *p-value* |
| Duration (ms) | | | | | |
|  | (Intercept) | 212.57 | 196.12 – 229.02 | 25.33 | **<0.001** |
|  | Conversational, Mask-off | Reference |  |  |  |
|  | Conversational, Mask-on | -5.02 | -12.88 – 2.84 | -1.25 | 0.211 |
|  | Clear, Mask-on | -12.15 | -20.02 – -4.29 | -3.03 | **0.002** |
| F1 (Hz) | | | | | |
|  | (Intercept) | 819.10 | 784.96 – 853.24 | 47.02 | **<0.001** |
|  | Conversational, Mask-off | Reference |  |  |  |
|  | Conversational, Mask-on | -25.84 | -44.10 – -7.57 | -2.77 | **0.006** |
|  | Clear, Mask-on | 5.94 | -12.32 – 24.20 | 0.64 | 0.524 |
|  | /a/ | Reference |  |  |  |
|  | /æ/ | 124.00 | 104.27 – 143.73 | 12.32 | **<0.001** |
|  | /i/ | -421.79 | -441.51 – 402.06 | -41.91 | **<0.001** |
|  | /u/ | -392.54 | -416.70 – -368.38 | -31.85 | **<0.001** |
| F2 (Hz) | | | | | |
|  | (Intercept) | 1298.14 | 1247.16 – 1349.12 | 49.91 | **<0.001** |
|  | /a/ | Reference |  |  |  |
|  | /æ/ | 398.03 | 348.82 – 447.24 | 15.85 | **<0.001** |
|  | /i/ | 1632.49 | 1583.28 – 1681.71 | 65.02 | **<0.001** |
|  | /u/ | 333.76 | 273.49 – 394.03 | 10.85 | **<0.001** |
| F1/F2 Intensity Ratio | | | | | |
|  | (Intercept) | 0.92 | 0.86 – 0.97 | 33.04 | **<0.001** |
|  | /a/ | Reference |  |  |  |
|  | /æ/ | 0.05 | 0.01 – 0.09 | 2.29 | **0.022** |
|  | /i/ | 0.07 | 0.03 – 0.12 | 3.37 | **0.001** |
|  | /u/ | -0.16 | -0.21 – -0.11 | -5.91 | **<0.001** |

**Table 4.** Fixed effect estimates for the most parsimonious consonant models.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Model | | *B* | *CI* | *t-value* | *p-value* |
| Spectral Moment Analysis (M1-M4) | | | | | |
|  | (Intercept) | 6.24 | 5.86 – 6.62 | 32.30 | **<0.001** |
|  | M1 | Reference |  |  |  |
|  | M2 | -4.97 | -5.46 – -4.49 | -20.09 | **<0.001** |
|  | M3 | -5.92 | -6.40 – -5.43 | -23.90 | **<0.001** |
|  | M4 | -4.02 | -4.50 – -3.53 | -16.22 | **<0.001** |
|  | Fricative | Reference |  |  |  |
|  | Stop | -0.67 | -1.15 – -0.18 | -2.71 | **0.007** |
|  | M2:Stop | 0.87 | 0.19 – 1.56 | 2.50 | **0.013** |
|  | M3:Stop | 0.67 | -0.01 – 1.36 | 1.93 | 0.054 |
|  | M4:Stop | 2.09 | 1.41 – 2.78 | 5.99 | **<0.001** |
| **Consonant/Vowel Intensity Ratio** | | | | | |
|  | (Intercept) | 2.01 | 1.76 – 2.26 | 15.58 | **<0.001** |
|  | Conversational, Mask-off | Reference |  |  |  |
|  | Conversational, Mask-on | -0.09 | -0.36 – 0.17 | -0.69 | 0.491 |
|  | Clear, Mask-on | 0.69 | 0.42 – 0.96 | 5.05 | **<0.001** |
|  | Fricative | Reference |  |  |  |
|  | Stop | -0.58 | -0.81 – -0.35 | -4.98 | **<0.001** |