**Appendix A**

Below are the results of the baseline mixed effects models and the ANOVAS comparing the baseline and alternative models run on the acoustic ratio data from the prosody experiment.

***Duration Ratio Analysis***

The baseline model for duration ratios. There were significant effects of experiment order and session. These two effects can be interpreted as learning effects, with both suggesting that participants produced smaller ratios over time, that is, relatively longer second syllables. These learning effects are most readily attributable to production practice or increasing familiarity with the experiment.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Fixed Effects | *β* | *SE* | *df* | *t* | *p* |
| **Intercept** | **1.17** | **0.03** | **86.28** | **45.14** | **<.001** |
| **Experiment Order** | **-0.08** | **0.03** | **27.82** | **-2.94** | **.007** |
| Experimental Frequency | 0.01 | 0.01 | 2203.02 | 1.47 | .142 |
| **Stress Pattern** | **-0.70** | **0.01** | **2203.91** | **-67.18** | **<.001** |
| **Session** | **-0.02** | **-.01** | **2231.22** | **-2.00** | **.046** |
| Random Effects | Variance | Standard Deviation |  |  |  |
| Participant (intercept) | .004 | .06 |  |  |  |

ANOVA comparison of the baseline and alternative models for the duration ratios.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Model | *df* | AIC | BIC | deviance | χ2 | *df* | *p* |
| Baseline model | 7 | 159.49 | 199.47 | 145.49 | .25 | 1 | .615 |
| Alternative model | 8 | 161.24 | 206.92 | -72.62 |

***Pitch Ratio Analysis***

The baseline model for pitch ratios.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Fixed Effects | *β* | *SE* | *df* | *t* | *p* |
| **Intercept** | **1.11** | **0.02** | **113.0** | **54.71** | **<.001** |
| Experiment Order | 0.03 | 0.02 | 28.39 | 1.50 | .146 |
| Experimental Frequency | -0.01 | 0.009 | 2037 | -1.64 | .100 |
| **Stress Pattern** | **-0.06** | **0.009** | **2039** | **-7.22** | **<.001** |
| Session | 0.003 | 0.009 | 2065 | 0.37 | .710 |
| Random Effects | Variance | Standard Deviation |  |  |  |
| Participant (intercept) | .002 | .05 |  |  |  |

ANOVA comparison of the baseline and alternative models for the pitch ratios.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Model | *df* | AIC | BIC | deviance | χ2 | *df* | *p* |
| **Baseline model** | **7** | **-728.32** | **-688.89** | **-742.32** | **7.55** | **1** | **.006** |
| Alternative model | 8 | -733.87 | -688.81 | -749.87 |

***Intensity Ratio Analysis***

The baseline model for intensity ratios.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Fixed Effects | *β* | *SE* | *df* | *t* | *p* |
| **Intercept** | **1.1** | **0.008** | **262.0** | **145.03** | **<.001** |
| Experiment Order | -0.003 | 0.005 | 2204 | -0.58 | .567 |
| Experimental Frequency | -0.10 | 0.004 | 2196 | -0.45 | .653 |
| **Stress Pattern** | **-0.10** | **0.004** | **2192** | **-23.91** | **<.001** |
| Session | -0.006 | 0.004 | 2185 | -1.51 | .130 |
| Random Effects | Variance | Standard Deviation |  |  |  |
| Participant (intercept) | 0.009 | 0.09 |  |  |  |

ANOVA comparison of the baseline and alternative models for the intensity ratios.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Model | *df* | AIC | BIC | deviance | χ2 | *df* | *p* |
| Baseline model | 7 | -4142.3 | -4102.3 | -4156.3 | 0.27 | 1 | .607 |
| Alternative model | 8 | -4140.5 | -4094.9 | -4156.5 |

**Appendix B**

Below are the results of the baseline mixed effects model and the ANOVA comparing the baseline and alternative models for the omitted syllable data from the prosody experiment.

The baseline model for omitted syllables

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Fixed Effects | *β* | *SE* | *df* | *t* | *p* (>|*t*|) |
| Intercept | 0.84 | 0.82 | 36.29 | 1.02 | .317 |
| Experiment Order | 0.44 | 0.51 | 5.0 | 0.86 | .432 |
| Experimental Frequency | -0.50 | 0.44 | 35.0 | -1.15 | .260 |
| Stress Pattern | -0.80 | 0.44 | 35.0 | -1.83 | .075 |
| Session | -1.17e-15 | 0.44 | 35.0 | 0.00 | >.999 |
| Random Effects | Variance | Standard Deviation |  |  |  |
| Participant (intercept) | 0.08 | 0.28 |  |  |  |

ANOVA comparison of the baseline and alternative models for omitted syllables.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Model | *df* | AIC | BIC | deviance | χ2 | *df* | *p* |
| Baseline model | 7 | 154.64 | 166.46 | 140.64 | 0.50 | 1 | .481 |
| Alternative model | 8 | 156.14 | 169.65 | 140.14 |

**Appendix C**

Comparisons of the adult and child ratios with age group and stress pattern as factors. When the two factors interacted, simple effects are presented.

***Adult Versus Child Duration Ratios***

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Fixed Effects | *β* | *SE* | *df* | *t* | *p* |
| **Intercept** | **0.32** | **0.04** | **94.47** | **7.78** | **<.001** |
| Age Group | 0.06 | 0.05 | 81.72 | 1.32 | .191 |
| **Stress Pattern** | **0.81** | **0.04** | **2417.14** | **20.12** | **<.001** |
| Age Group × Stress Pattern | -0.06 | 0.04 | 2418.49 | -1.42 | .157 |
| Random Effects | Variance | Standard Deviation |  |  |  |
| Participant (intercept) | 0.008 | 0.09 |  |  |  |

***Adult Versus Child Pitch Ratios***

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Fixed Effects | *β* | *SE* | *df* | *t* | *p* |
| **Intercept** | **1.14** | **0.03** | **177.64** | **41.08** | **<.001** |
| **Age Group** | **-0.07** | **0.03** | **140.77** | **-2.21** | **.029** |
| **Stress Pattern** | **0.18** | **0.03** | **1966.22** | **5.19** | **<.001** |
| **Age Group × Stress Pattern** | **-0.12** | **0.04** | **1970.41** | **-3.34** | **<.001** |
| Random Effects | Variance | Std. Dev. |  |  |  |
| Participant (intercept) | 0.002 | 0.04 |  |  |  |

To interpret the age group by stress pattern interaction, separate mixed effects analyses were conducted for the adult and child pitch ratios. Those analyses are presented below. The interaction was driven by the relative strength of the stress pattern effect across age groups, with a larger effect in adults (*β*adults = -0.19) compared to children (*β*children = -0.06).

Analysis of adult pitch ratios.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Fixed Effects | *β* | *SE* | *df* | *t* | *p* |
| **Intercept** | **1.32** | **0.04** | **214** | **35.89** | **<.001** |
| **Stress Pattern** | **-0.19** | **0.05** | **214** | **-3.62** | **<.001** |
| Random Effects | Variance | Std. Dev. |  |  |  |
| Participant (intercept) | 0.00 | 0.00 |  |  |  |

Analysis of child pitch ratios.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Fixed Effects | *β* | *SE* | *df* | *t* | *p* |
| **Intercept** | **1.13** | **0.01** | **42.47** | **102.2** | **<.001** |
| **Stress Pattern** | **-0.06** | **0.009** | **2040** | **-7.21** | **<.001** |
| Random Effects | Variance | Std. Dev. |  |  |  |
| Participant (intercept) | 0.002 | 0.05 |  |  |  |

***Adult Versus Child Intensity Ratios***

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Fixed Effects | *β* | *SE* | *df* | *t* | *p* |
| **Intercept** | **0.97** | **0.01** | **119.05** | **91.63** | **<.001** |
| **Age Group** | **0.02** | **0.01** | **95.85** | **2.05** | **.043** |
| **Stress Pattern** | **0.13** | **0.01** | **2089.93** | **10.74** | **<.001** |
| **Age Group × Stress Pattern** | **-0.04** | **0.01** | **2094.55** | **-3.37** | **<.001** |
| Random Effects | Variance | Std. Dev. |  |  |  |
| Participant (intercept) | 0.0003 | 0.02 |  |  |  |

To interpret the age group by stress pattern interaction, separate mixed effects analyses were conducted for the adult and child intensity ratios. The age group by stress pattern interaction was primarily driven by more extreme intensity values for the adults. Children had ratios closer to 1.0 for both the SW stress patterns (*β*SW = -0.02, child ratios are slightly smaller) and for the WS stress patterns (*β*WS = 0.001, child ratios are very slightly larger).

SW ratios

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Fixed Effects | *β* | *SE* | *df* | *t* | *p* |
| **Intercept** | **1.11** | **0.01** | **68.22** | **82.17** | **<.001** |
| Age Group | -0.02 | 0.01 | 57.79 | -1.42 | 0.141 |
| Random Effects | Variance | Std. Dev. |  |  |  |
| Participant (intercept) | 0.0007 | 0.02 |  |  |  |

WS Ratios

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Fixed Effects | *β* | *SE* | *df* | *t* | *p* |
| **Intercept** | **1.04** | **0.01** | **47.46** | **100.56** | **<.001** |
| Age Group | 0.001 | 0.01 | 41.43 | 0.09 | .928 |
| Random Effects | Variance | Std. Dev. |  |  |  |
| Participant (intercept) | 0.0005 | 0.02 |  |  |  |