Appendix : Supplementary Material

The summaries of the linear mixed-effects models predicting ED in the five groups (Models 1 to 5) are reported below. Variables were contrast-coded as follows: Prosodic Condition (1 = stressed, -1 = unstressed), Task (1 = repetition, -1 = sentence completion), Vowels (<a> = 1, 0; <e> = 0, 1; <o> = -1, -1). The model formulae were the following: ED ~ (Prosodic Condition + Vowels+ Task)^2 + (Prosodic Condition + Vowels + Task|Participant) + (1|Word).

**Model 1**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | *Fixed effects* | | | | *Random effects* | |
|  |  | | | | Part. | Wrd |
| *Parameters* | Estimate | *SE* | *t* | *p* | *SD* | *SD* |
| Intercept | 3.204 | 0.340 | 9.400 | < .0001 | 0.466 | 0.616 |
| Prosodic Condition1 | 0.769 | 0.368 | 2.087 | .073 | 0.580 | — |
| Vowels1 | 0.232 | 0.443 | 0.523 | .614 | 0.383 | — |
| Vowels2 | -1.241 | 0.581 | -2.13 | .072 | 1.065 | — |
| Task1 | -0.290 | 0.315 | -0.919 | 0.397 | 0.545 | — |
| Prosodic Condition1 x Vowels1 | -1.012 | 0.414 | - 2.441 | 0.038 | — | — |
| Prosodic Condition1 x Vowels2 | -0.831 | 0.385 | -2.15 | 0.065 | — | — |
| Prosodic Condition1 x Task1 | -0.025 | 0.222 | -0.113 | 0.910 | — | — |
| Vowels1 x Task1 | 0.271 | 0.322 | 0.842 | 0.401 | — | — |
| Vowels2 x Task1 | 0.095 | 0.300 | 0.319 | 0.750 | — | — |

<caption>**Supplementary Table 1:** Summary of the linear mixed-effects model predicting ED in L1Eng Group.

**Model 2**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | *Fixed effects* | | | | *Random effects* | |
|  |  | | | | Part. | Wrd |
| *Parameters* | Estimate | *SE* | *t* | *p* | *SD* | *SD* |
| Intercept | 2.536 | 0.292 | 8.668 | < .0001 | 0.423 | 0.272 |
| Prosodic Condition1 | 0.497 | 0.253 | 1.960 | .084 | 0.271 | — |
| Vowels1 | 0.117 | 0.343 | 0.340 | .740 | 0.306 | — |
| Vowels2 | -0.285 | 0.385 | -0.741 | .492 | 0.486 | — |
| Task1 | -0.041 | 0.235 | -0.175 | .863 | 0.171 | — |
| Prosodic Condition1 x Vowels1 | 0.739 | 0.315 | 2.343 | .021 | — | — |
| Prosodic Condition1 x Vowels2 | -0.620 | 0.317 | -1.952 | .053 | — | — |
| Prosodic Condition1 x Task1 | 0.281 | 0.222 | 1.261 | .210 | — | — |
| Vowels1 x Task1 | 0.148 | 0.315 | 0.471 | .638 | — | — |
| Vowels2 x Task1 | -0.051 | 0.317 | -0.162 | .871 | — | — |

<caption> **Supplementary Table 2:** Summary of the linear mixed-effects model predicting ED in L1Rus Group.

**Model 3**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | *Fixed effects* | | | | *Random effects* | |
|  |  | | | | Part. | Wrd |
| *Parameters* | Estimate | *SE* | *t* | *p* | *SD* | *SD* |
| Intercept | 2.105 | 0.189 | 11.124 | < .0001 | 0.253 | 0.431 |
| Prosodic Condition | 0.073 | 0.172 | 0.424 | .684 | 0.167 | — |
| Vowels1 | -0.259 | 0.218 | -1.191 | .279 | 0.030 | — |
| Vowels2 | 0.354 | 0.221 | 1.600 | .157 | 0.157 | — |
| Task1 | 0.108 | 0.106 | 1.022 | .337 | 0.147 | — |
| Prosodic Condition1 x Vowels1 | 0.616 | 0.217 | 2.831 | .030 | — | — |
| Prosodic Condition1 x Vowels2 | -0.140 | 0.211 | -0.664 | 0.530 | — | — |
| Prosodic Condition1 x Task1 | 0.020 | 0.087 | 0.235 | 0.814 | — | — |
| Vowels1 x Task1 | 0.232 | 0.120 | 1.928 | 0.056 | — | — |
| Vowels2 x Task1 | -0.109 | 0.120 | -0.908 | 0.366 | — | — |

<caption>**Supplementary Table 3**: Summary of the linear mixed-effects model predicting ED in L1Spa Group.

**Model 4**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | *Fixed effects* | | | | *Random effects* | |
|  |  | | | | Part. | Wrd |
| *Parameters* | Estimate | *SE* | *t* | *p* | *SD* | *SD* |
| Intercept | 2.912 | 0.206 | 14.112 | < .0001 | 0.687 | 0.664 |
| Prosodic Condition1 | 0.883 | 0.161 | 5.470 | < .0001 | 0.420 | — |
| Vowels1 | -0.241 | 0.237 | -1.018 | .318 | 0.631 | — |
| Vowels2 | -0.763 | 0.215 | -3.539 | .001 | 0.535 | — |
| Task1 | -0.026 | 0.151 | -0.173 | .864 | 0.346 | — |
| Prosodic Condition1 x Vowels1 | 0.510 | 0.184 | 2.774 | .005 | — | — |
| Prosodic Condition1 x Vowels2 | -0.604 | 0.175 | -3.444 | < .0001 | — | — |
| Prosodic Condition1 x Task1 | -0.322 | 0.127 | -2.534 | .011 | — | — |
| Vowels1 x Task1 | 0.218 | 0.184 | 1.186 | .236 | — | — |
| Vowels2 x Task1 | -0.121 | 0.174 | -0.698 | .485 | — | — |

<caption>**Supplementary Table 4:** Summary of the linear mixed-effects model predicting ED in L2Eng Group.

**Model 5**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | *Fixed effects* | | | | *Random effects* | |
|  |  | | | | Part. | Wrd |
| *Parameters* | Estimate | *SE* | *t* | *p* | *SD* | *SD* |
| Intercept | 2.898 | 0.324 | 8.945 | < .0001 | 0.506 | 0.379 |
| Prosodic Condition1 | 0.458 | 0.353 | 1.297 | .209 | 0.786 | 1.058 |
| Vowels1 | 0.244 | 0.384 | 0.636 | .531 | 0.856 | — |
| Vowels2 | -0.202 | 0.352 | -0.576 | .570 | 0.527 | — |
| Task1 | -0.255 | 0.190 | -1.338 | .202 | 0.165 | — |
| Prosodic Condition1 x Vowels1 | 0.193 | 0.398 | 0.485 | .635 | — | — |
| Prosodic Condition1 x Vowels2 | -0.902 | 0.399 | -2.260 | .041 | — | — |
| Prosodic Condition1 x Task1 | -0.135 | 0.186 | -0.724 | .481 | — | — |
| Vowels1 x Task1 | -0.186 | 0.257 | -0.724 | .482 | — | — |
| Vowels2 x Task1 | 0.080 | 0.261 | 0.308 | .763 | — | — |

<caption>**Supplementary Table 5:** Summary of the linear mixed-effects model predicting ED in L3Rus Group.

The summaries of the linear mixed-effects models predicting Duration in the five groups (Models 6 to 10) are offered below. Variables were contrast coded as follows: Prosodic Condition (1 = stressed, -1 = unstressed), Task (1 = repetition, -1 = sentence completion), Vowels (<a> = 1, 0; <e> = 0, 1; <o> = -1, -1). The model formulae were the following: Duration ~ (Prosodic Condition + Vowels+ Task)^2 + (Prosodic Condition + Vowels + Task|Participant) + (1|Word)

**Model 6**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | *Fixed effects* | | | | *Random effects* | |
|  |  | | | | Part. | Wrd |
| *Parameters* | Estimate | *SE* | *t* | *p* | *SD* | *SD* |
| Intercept | 62.025 | 4.460 | 13.906 | < .0001 | 4.710 | 13.775 |
| Prosodic Condition1 | 15.863 | 4.118 | 3.852 | .005 | 2.142 | — |
| Vowels1 | -1.072 | 6.088 | -0.176 | .864 | 4.566 | — |
| Vowels2 | -2.577 | 5.588 | -0.461 | .658 | 2.228 | — |
| Task1 | -1.968 | 1.825 | -1.078 | .321 | 3.568 | — |
| Prosodic Condition1 x Vowels1 | -0.004 | 5.794 | -0.001 | .999 | — | — |
| Prosodic Condition1 x Vowels2 | -6.791 | 5.512 | -1.232 | .259 | — | — |
| Prosodic Condition1 x Task1 | 3.367 | 1.100 | 3.061 | .002 | — | — |
| Vowels1 x Task1 | 3.239 | 1.587 | 2.041 | .043 | — | — |
| Vowels2 x Task1 | -1.515 | 1.494 | -1.014 | .312 | — | — |

<caption>**Supplementary Table 6:** Summary of the linear mixed-effects model predicting Duration in L1Eng Group.

**Model 7**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | *Fixed effects* | | | | *Random effects* | |
|  |  | | | | Part. | Wrd |
| *Parameters* | Estimate | *SE* | *t* | *p* | *SD* | *SD* |
| Intercept | 103.620 | 8.166 | 12.688 | < .0001 | 13.804 | 15.654 |
| Prosodic Condition1 | 24.281 | 6.743 | 3.601 | .007 | 9.189 | — |
| Vowels1 | 17.257 | 9.825 | 1.756 | .119 | 14.026 | — |
| Vowels2 | -7.842 | 8.623 | -0.909 | .392 | 9.209 | — |
| Task1 | 0.607 | 5.522 | 0.110 | .917 | 10.564 | — |
| Prosodic Condition1 x Vowels1 | -16.579 | 7.562 | -2.192 | .070 | — | — |
| Prosodic Condition1 x Vowels2 | 9.130 | 7.576 | 1.205 | .272 | — | — |
| Prosodic Condition1 x Task1 | 5.117 | 2.859 | 1.790 | .076 | — | — |
| Vowels1 x Task1 | -8.124 | 4.042 | -2.010 | .047 | — | — |
| Vowels2 x Task1 | 7.196 | 4.070 | 1.768 | .080 | — | — |

<caption>**Supplementary Table 7:** Summary of the linear mixed-effects model predicting Duration in L1Rus Group.

**Model 8**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | *Fixed effects* | | | | *Random effects* | |
|  |  | | | | Part. | Wrd |
| *Parameters* | Estimate | *SE* | *t* | *p* | *SD* | *SD* |
| Intercept | 103.164 | 2.909 | 35.452 | < .0001 | 4.310 | 6.056 |
| Prosodic Condition1 | 15.963 | 2.597 | 6.147 | < .0001 | 2.871 | — |
| Vowels1 | 7.267 | 4.403 | 1.650 | .138 | 7.457 | — |
| Vowels2 | -2.163 | 3.286 | -0.658 | .531 | 2.679 | — |
| Task1 | 4.755 | 2.484 | 1.914 | .109 | 5.052 | — |
| Prosodic Condition1 x Vowels1 | -4.344 | 3.182 | -1.365 | .221 | — | — |
| Prosodic Condition1 x Vowels2 | 2.598 | 3.099 | 0.838 | .432 | — | — |
| Prosodic Condition1 x Task1 | 0.122 | 1.385 | 0.088 | .929 | — | — |
| Vowels1 x Task1 | 1.496 | 1.901 | 0.787 | .432 | — | — |
| Vowels2 x Task1 | -2.842 | 1.906 | -1.491 | .138 | — | — |

<caption>**Supplementary Table 8:** Summary for the linear mixed-effects model predicting Duration in L1Spa Group.

**Model 9**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | *Fixed effects* | | | | *Random effects* | |
|  |  | | | | Part. | Wrd |
| *Parameters* | Estimate | *SE* | *t* | *p* | *SD* | *SD* |
| Intercept | 86.646 | 3.329 | 26.022 | < .0001 | 8.793 | 6.717 |
| Prosodic Condition1 | 13.068 | 2.916 | 4.481 | .003 | 5.592 | 6.168 |
| Vowels1 | -0.846 | 3.724 | -0.227 | 0.828 | 3.436 | — |
| Vowels2 | 1.513 | 3.457 | 0.438 | 0.677 | 4.506 | — |
| Task1 | 3.092 | 1.725 | 1.793 | 0.090 | 5.718 | — |
| Prosodic Condition1 x Vowels1 | -0.091 | 3.642 | -0.025 | 0.980 | — | — |
| Prosodic Condition1 x Vowels2 | 2.097 | 3.244 | 0.646 | 0.546 | — | — |
| Prosodic Condition1 x Task1 | 2.741 | 1.052 | 2.606 | 0.020 | — | — |
| Vowels1 x Task1 | -1.775 | 1.543 | -1.150 | 0.273 | — | — |
| Vowels2 x Task1 | 1.145 | 1.500 | 0.763 | 0.461 | — | — |

<caption>**Supplementary Table 9:** Summary of the linear mixed-effects model predicting Duration in L2Eng Group.

**Model 10**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | *Fixed effects* | | | | *Random effects* | |
|  |  | | | | Part. | Wrd |
| *Parameters* | Estimate | *SE* | *t* | *p* | *SD* | *SD* |
| Intercept | 130.764 | 10.119 | 12.923 | 0.003 | 15.54 | 10.22 |
| Prosodic Condition1 | 20.844 | 9.806 | 2.126 | .168 | 11.29 | 27.03 |
| Vowels1 | -14.454 | 7.948 | -1.819 | .211 | 13.38 | — |
| Vowels2 | -9.859 | 8.005 | -1.232 | .344 | 12.49 | — |
| Task1 | 12.864 | 6.093 | -2.111 | .050 | 17.17 | — |
| Prosodic Condition1 x Vowels1 | -36.590 | 11.945 | -3.063 | .085 | — | — |
| Prosodic Condition1 x Vowels2 | 13.660 | 11.965 | 1.142 | .365 | — | — |
| Prosodic Condition1 x Task1 | 16.760 | 4.557 | 3.677 | .007 | — | — |
| Vowels1 x Task1 | -14.016 | 6.240 | -2.246 | .059 | — | — |
| Vowels2 x Task1 | 6.911 | 6.282 | 1.100 | .306 | — | — |

<caption>**Supplementary Table 10:** Summary of the linear mixed-effects model predicting Duration in L3Rus Group

The stimuli used in the sentence completion and the delayed repetition tasks can be found below. Stressed vowels are in bold. The vowels analysed in each stimulus are underlined.

**Stimulus Table 1**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Language | Phoneme | Grapheme | Prosodic Condition | Stimulus | Phonetic Transcription | Translation in English |
| Spanish | /e/ | e | Stressed | vid**e**nte | [biˈðente] | clairvoyant |
| el**e**nco | [eˈleŋko] | cast |
| Unstressed | hel**a**do | [eˈlaðo] | ice cream |
| tes**o**ro | [teˈsoɾo] | treasure |
| /o/ | o | Stressed | m**o**no | [ˈmono] | monkey |
| n**o**ble | [ˈnoβle] | noble |
| Unstressed | pol**a**co | [poˈlako] | Polish |
| pot**a**ble | [poˈtaβle] | drinkable |
| /a/ | a | Stressed | c**a**nto | [ˈkanto] | singing |
| p**a**rto | [ˈpaɾto] | labour |
| Unstressed | lag**a**rto | [laˈɣaɾto] | lizard |
| panfl**e**to | [paɱˈfleto] | pamphlet |
| Russian | /e/ | э | Stressed | м**э́**рия | [ˈmɛɾʲja] | city hall |
| **э́**пос | [ˈɛpəs] | epic poem |
| Unstressed | эшел**о́**н | [əʃɨ̞ˈɫon] | echelon |
| экип**а́**ж | [əkʲiˈpaʃ] | crew |
| /o/ | o | Stressed | **о́**бщество | [ˈɔpʃʲːəstv̥ə] | society |
| прир**о́**да | [pɾʲɪˈrodə] | nature |
| Unstressed | госуд**а́**рство | [gəsʊˈdarstv̥ə] | state |
| реб**ё́**нок | [ɾʲɪˈbʲonək] | child |
| /a/ | a | Stressed | к**а́**мень | [ˈkamʲɪ̈nʲ] | rock |
| пис**а́**тель | [pʲɪˈsatʲɪ̈lʲ] | writer |
| Unstressed | поб**е́**да | [pɐˈbʲɛdə] | victory |
| мужч**и́**на | [mʊˈʃʲːinə] | man |
| English | /ɛ/ | e | Stressed | sh**e**lter | ['ʃeɫtɚ] | \_ |
| h**e**lper | ['heɫpɚ] | \_ |
| Unstressed | l**ea**ther | ['ɫeðɚ] | \_ |
| t**e**ller | ['teɫɚ] | \_ |
| /ɔ:/ | o | Stressed | h**o**rnet | ['hɔ˞ɹnət] | \_ |
| b**o**redom | ['bɔ˞dəm] | \_ |
| Unstressed | t**ai**lor | ['teɪɫɚ] | \_ |
| m**a**nor | ['mænɚ] | \_ |
| /ɑ:/ | a | Stressed | f**a**rmer | ['fɑ˞mɚ] | \_ |
| h**a**rbor | ['hɑ˞bɚ] | \_ |
| Unstressed | b**e**ggar | ['begɚ] | \_ |
| s**u**gar | ['ʃʊgɚ] | \_ |

<caption>**Supplementary Table 11:** Stimuli used in the experiment