

Appendix C: Voice quality model summaries

Summaries of best voice quality models. Degrees of freedom estimated via Satterthwaite approximations (Satterthwaite, 1946). Significance: * $p < .05$, ** $p < .01$

H* model

| | Estimate | SE | d.f. | t | p | |
|--------------------------------|----------|---------|------|--------|--------|---|
| (Intercept) | -0.04264 | 0.10094 | 9 | -0.422 | 0.6824 | |
| Step2 | -0.01384 | 0.06200 | 15 | -0.223 | 0.8263 | |
| Step3 | 0.00391 | 0.08191 | 96 | 0.048 | 0.9620 | |
| Step4 | 0.02375 | 0.07963 | 76 | 0.298 | 0.7663 | |
| PhraseSpeechRate | 0.30251 | 0.09724 | 9 | 3.111 | 0.0130 | * |
| PeakDelay | 0.16524 | 0.07814 | 8 | 2.115 | 0.0674 | |
| F0MaxMinRatio | -0.01603 | 0.06143 | 15 | -0.261 | 0.7978 | |
| HNR | 0.03338 | 0.08659 | 31 | 0.385 | 0.7026 | |
| IntensityAvg | 0.04998 | 0.07501 | 36 | 0.666 | 0.5095 | |
| Shimmer | -0.12396 | 0.08625 | 89 | -1.437 | 0.1541 | |
| Jitter | -0.04170 | 0.26870 | 43 | -0.155 | 0.8774 | |
| F0MaxMinRatio:IntensityAvg | -0.05717 | 0.05623 | 123 | -1.017 | 0.3112 | |
| HNR:Shimmer | -0.04834 | 0.06018 | 71 | -0.803 | 0.4245 | |
| HNR:Jitter | -0.34288 | 0.24926 | 47 | -1.376 | 0.1755 | |
| Shimmer:Jitter | -0.29307 | 0.21616 | 46 | -1.356 | 0.1818 | |
| PhraseSpeechRate:PeakDelay | 0.05487 | 0.12858 | 20 | 0.427 | 0.6742 | |
| PhraseSpeechRate:HNR | -0.01881 | 0.09032 | 17 | -0.208 | 0.8375 | |
| PeakDelay:HNR | 0.14400 | 0.06135 | 11 | 2.347 | 0.0386 | * |
| HNR:Shimmer:Jitter | -0.14666 | 0.15808 | 43 | -0.928 | 0.3587 | |
| PhraseSpeechRate:PeakDelay:HNR | 0.05467 | 0.10443 | 70 | 0.523 | 0.6023 | |

L + H* model

| | Estimate | SE | d.f. | t | p | |
|----------------------------|----------|---------|------|--------|---------|----|
| (Intercept) | -0.05621 | 0.15695 | 6 | -0.358 | 0.73308 | |
| Step2 | 0.03809 | 0.05775 | 153 | 0.660 | 0.51055 | |
| Step3 | 0.18091 | 0.08506 | 153 | 2.127 | 0.03503 | * |
| Step4 | 0.27258 | 0.11034 | 71 | 2.470 | 0.01589 | * |
| PhraseSpeechRate | -0.13044 | 0.15722 | 4 | -0.830 | 0.45905 | |
| PeakDelay | 0.14106 | 0.15194 | 6 | 0.928 | 0.38926 | |
| F0MaxMinRatio | -0.03072 | 0.08124 | 34 | -0.378 | 0.70767 | |
| HNR | 0.04435 | 0.09559 | 31 | 0.464 | 0.64588 | |
| IntensityAvg | -0.00571 | 0.12789 | 6 | -0.045 | 0.96594 | |
| Shimmer | 0.00323 | 0.03001 | 237 | 0.108 | 0.91435 | |
| Jitter | -0.11759 | 0.04272 | 355 | -2.753 | 0.00621 | ** |
| F0MaxMinRatio:IntensityAvg | -0.01623 | 0.08225 | 20 | -0.197 | 0.84556 | |
| HNR:Shimmer | -0.00445 | 0.03396 | 132 | -0.131 | 0.89605 | |
| HNR:Jitter | -0.05121 | 0.03073 | 200 | -1.667 | 0.09717 | |
| Shimmer:Jitter | -0.09620 | 0.05559 | 808 | -1.731 | 0.08390 | |
| PhraseSpeechRate:PeakDelay | 0.08886 | 0.13454 | 5 | 0.660 | 0.53829 | |

| | | | | | |
|----------------------------------|----------|---------|----|--------|---------|
| PhraseSpeechRate: HNR | 0.14259 | 0.06880 | 19 | 2.073 | 0.05199 |
| PeakDelay: HNR | 0.05704 | 0.07884 | 49 | 0.723 | 0.47281 |
| HNR: Shimmer: Jitter | -0.02198 | 0.07402 | 86 | -0.297 | 0.76727 |
| PhraseSpeechRate: PeakDelay: HNR | -0.00312 | 0.07019 | 24 | -0.044 | 0.96491 |