**Enhanced coarticulatory labialization of /ts/ in Argentine Danish**

**Supplementary materials**

Table A1. Mean CoG value (Hz) for all levels in the factor Context, with standard deviation and number of tokens for all levels. Dotted line = mean CoG. Data: Argentine Danish dataset.

| Level (phoneme) | Mean CoG (Hz) | Standard deviation | Tokens |
| --- | --- | --- | --- |
| ɔ | 4,118 | 695.7 | 13 |
| ø | 4,209 | 898.8 | 29 |
| y | 4,245 | 941.5 | 189 |
| o | 4,367 | 1,026.7 | 237 |
| u | 4,424 | 1,006.2 | 108 |
| œ | 4,605 | 1,111.6 | 28 |
| ʌ | 4,690 | 1,040.2 | 104 |
| ɑ | 4,915 | 1,001.5 | 96 |
| ʁ | 5,164 | 1,149.2 | 336 |
| e | 5,270 | 1,083.3 | 226 |
| i | 5,310 | 1,001.4 | 356 |
| ɑ | 5,367 | 1,135.4 | 315 |
| ɛ | 5,445 | 1,036.0 | 245 |
| Total | 5,005 |  | 2,282 |

Mean for rounded vowels /ɔ ø y o u œ ʌ/: 4,389 Hz (*N* = 708); mean for not rounded vowels /ɑ e i a ɛ/: 5,313 (*N* = 1,238).

Table A2. Mean CoG value (Hz) for both levels in the factor Gender. *N* = 2,282; mean CoG value = 5.005 Hz (dotted line). Data: Argentine Danish dataset.

|  |  |  |  |
| --- | --- | --- | --- |
| Level | Mean CoG (Hz) | Standard deviation | Tokens |
| Man | 4,830 | 1,170.1 | 955 |
| Woman | 5,131 | 1,097.6 | 1,327 |
| Total | 5,005 |  | 2,282 |

Table A3. Mean CoG value (Hz) for all three levels in the factor Location. *N* = 2,282; mean CoG value = 5,005 Hz (dotted line). Data: Argentine Danish dataset.

|  |  |  |  |
| --- | --- | --- | --- |
| Level | Mean CoG (Hz) | Standard deviation | Tokens |
| Eldorado | 4,701 | 1,265.5 | 383 |
| Pampas | 5,013 | 1,131.1 | 1,358 |
| Buenos Aires | 5,198 | 1,009.5 | 541 |
| Total | 5,005 |  | 2,282 |

Table A4. Mean CoG value (Hz) for six age groups, with number of tokens for each group. Data: Argentine Danish dataset. (Context /ʁ/ excluded.)

|  |  |  |  |
| --- | --- | --- | --- |
| Age group | Number of speakers | CoG | Tokens |
| 62–69 | 5 | 4,892 | 264 |
| 70–74 | 16 | 4,858 | 673 |
| 75–79 | 9 | 5,195 | 395 |
| 80–84 | 4 | 5,510 | 221 |
| 85–89 | 7 | 4,821 | 329 |
| 90–94 | 1 | 4,189 | 64 |
| Total | 42 | 5,005 | 1,946 |

Table A5. Argentine Danish men’s mean CoG value; mean CoG value = 4,830 Hz (dotted line), range 2,729 Hz. (One-way Anova: *F* = 32.68, *p* < 0.001, df = 15.)

| Speaker | Location | Mean CoG (Hz) | Standard deviation | N |
| --- | --- | --- | --- | --- |
| ROB | Eldorado | 3,824 | 935.4 | 45 |
| CRA | Eldorado | 3,988 | 960.3 | 41 |
| JOU | Pampas | 4,038 | 832.4 | 57 |
| COM | Pampas | 4,101 | 952.5 | 70 |
| CSO | Pampas | 4,196 | 482.3 | 50 |
| ADH | Pampas | 4,351 | 1,209.4 | 45 |
| HPJ | Eldorado | 4,680 | 1,179.3 | 56 |
| EJS | Buenos Aires | 4,695 | 936.6 | 55 |
| GDO | Buenos Aires | 4,824 | 785.9 | 97 |
| OTB | Pampas | 4,858 | 1,018.5 | 72 |
| ARL | Pampas | 4,952 | 979.1 | 83 |
| REJ | Buenos Aires | 5,163 | 1,258.1 | 70 |
| EST | Pampas | 5,256 | 663.6 | 52 |
| EKA | Pampas | 5,576 | 1,138.2 | 41 |
| ABO | Buenos Aires | 5,701 | 965.0 | 60 |
| HWJ | Pampas | 6,553 | 728.7 | 61 |
| Total |  | 4,830 |  | 955 |

Table A6. Argentine Danish, women’s mean CoG value; mean CoG value = 5,131 Hz (dotted line), range 3,017 Hz. (One-way Anova: *F* = 32.17, *p* < 0.001, df = 25.)

| Speaker | Location | Mean CoG (Hz) | Standard deviation | N |
| --- | --- | --- | --- | --- |
| EDS | Pampas | 3,808 | 635.8 | 54 |
| AMO | Eldorado | 3,824 | 985.0 | 20 |
| NOK | Pampas | 4,056 | 689.1 | 40 |
| DOB | Eldorado | 4,159 | 676.4 | 71 |
| IMM | Pampas | 4,383 | 718.6 | 37 |
| NRA | Pampas | 4,608 | 1,076.8 | 51 |
| EPN | Buenos Aires | 4,635 | 589.5 | 80 |
| AIK | Pampas | 4,674 | 640.8 | 61 |
| IGM | Pampas | 4,736 | 740.6 | 40 |
| LSN | Pampas | 5,057 | 694.6 | 64 |
| KPA | Buenos Aires | 5,102 | 636.6 | 70 |
| EMD | Pampas | 5,116 | 1,069.1 | 74 |
| DBU | Pampas | 5,194 | 743.3 | 58 |
| CMK | Pampas | 5,231 | 868.5 | 68 |
| SOO | Pampas | 5,247 | 837.3 | 39 |
| MSK | Pampas | 5,373 | 1,093.2 | 42 |
| GEJ | Eldorado | 5,375 | 1,079.7 | 46 |
| AEA | Eldorado | 5,519 | 1,225.9 | 44 |
| IEL | Pampas | 5,576 | 1,033.4 | 55 |
| EON | Eldorado | 5,682 | 1,252.8 | 60 |
| MUL | Pampas | 5,802 | 697.4 | 37 |
| MEP | Buenos Aires | 5,957 | 908.4 | 48 |
| BEB | Buenos Aires | 6,040 | 872.3 | 61 |
| EEA | Pampas | 6,074 | 1,010.6 | 54 |
| AKA | Pampas | 6,236 | 849.8 | 29 |
| AHF | Pampas | 6,825 | 398.3 | 24 |
| Total |  | 5,131 |  | 1,327 |

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| Figure A1. Boxplot of mean of CoG for men in the Argentine Danish dataset; range 2,729 Hz; mean 4,830 Hz; 955 tokens. |
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| Figure A2. Boxplot of mean CoG women in the Argentine Danish dataset; range 3,017 Hz; mean 5,131 Hz; 1,327 tokens. |

Table A7. Modern Danish dataset broken down into gender, location, and age. 34 speakers, 1,950 tokens.

|  | Copenhagen | East Jutland | West Jutland | Zealand |
| --- | --- | --- | --- | --- |
| Man | 3 | 7 | 1 | 5 |
| Woman | 3 | 7 | 2 | 6 |
| Total speakers | 6 | 14 | 3 | 11 |
| Average age and age span | 55 (52–60) | 60 (40–70) | 42 (42) | 56 (39–63) |
| Tokens | 496 | 714 | 85 | 655 |

Table A8. Modern Danish. Mean CoG value (Hz) for all levels in the factor Context, with standard deviation and number of tokens for all levels.[[1]](#endnote-1) Dotted line = mean CoG. (Anova: *F* = 23.16, *p* < 0.001, df = 12). See Figure 1 for boxplot. Data: Modern Danish dataset.

|  |  |  |  |
| --- | --- | --- | --- |
| Context | Mean CoG (Hz) | Standard deviation | N |
| u | 4,550 | 933.0 | x |
| ʌ | 4,563 | 778.3 | 117 |
| o | 4,573 | 792.1 | 236 |
| ɔ | 4,589 | 800.5 | 43 |
| y | 4,615 | 811.0 | 176 |
| œ | 4,722 | 858.9 | 50 |
| ø | 4,995 | 1,007.4 | 46 |
| ɑ | 5,139 | 857.9 | 141 |
| a | 5,179 | 875.8 | 240 |
| e | 5,195 | 890.6 | 254 |
| ɛ | 5,232 | 920.7 | 234 |
| i | 5,362 | 786.5 | 278 |
| Total | 4,981 |  | 1,931 |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | | | | |
|  | a | e | ɛ | i | o | ɔ | u | y | ø | œ | ɑ | ʌ |  |
| Figure A3. Boxplot of mean CoG for phonological context in Modern Denmark Danish; total no. 1,931; total mean 4,981 Hz. Data: Modern Danish dataset. | | | | | | | | | | | | | |

Table A9. Mean CoG value (Hz) for both levels in the factor Gender, with standard deviation and number of tokens for each level. (*F* = 140.2, *p* < 0.001, df = 1). See Figure 2 for boxplot. Data: Modern Danish dataset.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Mean CoG (Hz) | Standard deviation | N |
| Man | 4,737 | 849.4 | 934 |
| Woman | 5,210 | 902.3 | 997 |
| Total | 4,981 |  | 1,931 |

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| Figure A4. Boxplot of mean CoG (Hz) for gender in Modern Danish; total no. 1,931; total mean 4,981 Hz. Data: Modern Danish dataset. |

Table A10. Mean CoG value (Hz) for all three levels in the factor Location, with standard deviation and number of tokens for each level. Dotted line = mean CoG value. (Anova: *F* = 1.737, *p* = 0.157, df = 3.) Data: Modern Danish dataset.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Mean CoG (Hz) | Standard deviation | N |
| Copenhagen | 4,947 | 832.9 | 489 |
| East Jutland | 4,985 | 1,003.5 | 710 |
| West Jutland | 4,810 | 748.5 | 85 |
| Zealand | 5,025 | 869.2 | 647 |
| Total | 4,981 |  | 1,931 |

Table A11. Modern Danish, men’s mean CoG value; CoG range 2,285 Hz; mean CoG 4,737 Hz (dotted line). (Anova: *F* = 27.74, *p* < 0.001, df = 15.) See Figure 4 for boxplot. Data: Modern Danish dataset.

|  |  |  |  |
| --- | --- | --- | --- |
| Speaker | Mean CoG (Hz) | Standard deviation | N |
| FAN | 3,190 | 407.3 | 2 |
| HJL | 4,152 | 381.7 | 67 |
| KRO | 4,176 | 807.5 | 79 |
| PNI | 4,203 | 624.3 | 54 |
| TNI | 4,395 | 588.8 | 95 |
| TCH | 4,518 | 730.3 | 51 |
| SKA | 4,550 | 951.2 | 79 |
| PTK | 4,567 | 689.7 | 65 |
| FJE | 4,680 | 707.3 | 54 |
| CNL | 4,829 | 465.8 | 30 |
| ENI | 4,858 | 684.6 | 66 |
| NGH | 4,960 | 1,128.3 | 22 |
| ANN | 5,099 | 658.3 | 22 |
| FRK | 5,143 | 911.7 | 54 |
| NLI | 5,466 | 777.6 | 96 |
| ASA | 5,475 | 520.9 | 98 |
| Total | 4,737 |  | 934 |

Table A12. Modern Danish, women’s mean CoG value; CoG range 2,303 Hz; mean CoG 5,210 Hz (dotted line). (Anova: *F* = 17.96, *p* < 0.001, df = 17.) See Figure 4 for boxplot. Data: Modern Danish dataset.

|  |  |  |  |
| --- | --- | --- | --- |
| Speaker | Mean CoG (Hz) | Standard deviation | N |
| AMJ | 3,843 | 626.0 | 27 |
| UDA | 4,577 | 765.8 | 26 |
| IMN | 4,702 | 279.0 | 14 |
| BML | 4,805 | 627.4 | 61 |
| ALH | 4,879 | 768.3 | 69 |
| LAL | 4,917 | 872.8 | 64 |
| MKC | 4,963 | 742.6 | 77 |
| RFR | 4,986 | 707.6 | 76 |
| GAN | 5,118 | 825.7 | 70 |
| GKR | 5,220 | 826.1 | 40 |
| VGR | 5,236 | 983.4 | 90 |
| AJO | 5,398 | 876.2 | 84 |
| LNL | 5,480 | 461.4 | 28 |
| HKA | 5,514 | 875.7 | 52 |
| MLA | 5,575 | 763.7 | 88 |
| GSH | 5,624 | 988.8 | 28 |
| HSI | 5,850 | 862.1 | 44 |
| DDI | 6,146 | 639.1 | 59 |
| Total | 5,210 |  | 997 |

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| Figure A5. Inter-speaker variation among men in the Modern Danish dataset. |
|  |
| Figure A6. Inter-speaker variation among women in the Modern Danish dataset. |

1. /ɒ/: CoG = 4,382 Hz; st.dev. = 499.6, *N* = 19. /ʁ/: CoG = 4881 Hz, st.dev. = 844.0, *N* = 257. [↑](#endnote-ref-1)