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Descriptive Stats

My first analysis was comparing the effect of the language group on the VOT (voice onset time) in general.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Lang | count | max | mean | median | min | range | std |
| E | 530 | 0.1587 | 0.0450 | 0.0441 | 0.0030 | 0.1557 | 0.0251 |
| H | 537 | 0.1359 | 0.0393 | 0.03463 | 0.0023 | 0.1335 | 0.0244 |
| S | 511 | 0.1360 | 0.0300 | 0.0251 | 0.0040 | 0.1319 | 0.0203 |

As we can see the English speakers had the greatest VOT across all metrics and the Spanish speakers had the lowest VOT mean and median. As expected the Heritage speakers are generally sitting right in the middle of the English and Spanish speakers.

Next, we add the variable PHON (phoneme) to evaluate the effects of the measured phoneme on the VOT by language.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Lang | PHON | count | max | mean | median | min | range | std |
| E | "k" | 173 | 0.0924 | 0.0482 | 0.0469 | 0.014 | 0.0784 | 0.0187 |
| E | "p" | 168 | 0.1263 | 0.0322 | 0.0265 | 0.0041 | 0.1222 | 0.0245 |
| E | "t" | 189 | 0.1588 | 0.0535 | 0.0508 | 0.003 | 0.1557 | 0.0264 |
| H | "k" | 193 | 0.1074 | 0.0415 | 0.0372 | 0.0024 | 0.1051 | 0.0227 |
| H | "p" | 159 | 0.136 | 0.0277 | 0.0218 | 0.0035 | 0.1324 | 0.0209 |
| H | "t" | 185 | 0.1275 | 0.0472 | 0.047 | 0.0082 | 0.1193 | 0.0254 |
| S | "k" | 158 | 0.1024 | 0.0358 | 0.032 | 0.0073 | 0.095 | 0.0177 |
| S | "p" | 161 | 0.097 | 0.0186 | 0.014 | 0.0041 | 0.093 | 0.0142 |
| S | "t" | 192 | 0.136 | 0.0348 | 0.0278 | 0.0052 | 0.1308 | 0.0227 |

As we can see, the “t” phoneme in English contributes to the high VOT value as it beats the “k” and “p” phonemes in max, mean, and median. However, in Spanish the “t” phoneme only beats the other two in max VOT, while the “k” phoneme has a higher mean, median, and min value.

Next, I simply compared the effect of age on the COG (the center of gravity in Hertz of the phoneme).

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| age | count | max | mean | median | min | range | std |
| less\_than\_30 | 1167 | 7538.8012 | 1453.7128 | 966.8341 | 10.5118 | 7528.2894 | 1418.9175 |
| older\_than\_30 | 411 | 6083.148 | 1123.6425 | 771.2848 | 20.8461 | 6062.3019 | 1083.1061 |

It is not surprising to me that those who were less than 30 years old had a much higher COG than those who are older. The overall range of the age of speakers was only from 19-40 years old. But those 20 year olds overall had a much higher frequency than the 30 year olds. This leads me to believe that the frequency and COG depends less on the phoneme or language and more on the age.