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Phonation and Aging in White Hmong

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extension of [14]. [11] showed H1*–H2* did not adequately distinguish modal vs. non-modal phonation in connected speech and found CPP to be a better measure.

3. METHODS

3.1. Participants

Forty-five native speakers (20 female, 25 male) of White Hmong were recorded, with ages ranging from 23–71. They were born in Laos, Thailand, or the US, but all resided in the Minneapolis/St. Paul area of Minnesota, US, at the time of recording. The number of participants per age by decade is provided in Table 1.

Number of Participants	Age (by decade)

interactions were also significant: age and time point (x^2=10.7, df=2, p<0.01); age and df=2, p<0.05); and time point and phonation

coefficients) are, however, miniscule. The greatest change is found in creak vowels, but mean over the span of five decades.

Figure 1: Token H1*–H2* (dB) values by participant age at each time point (1 = beginning, 2 = middle, 3= end of vowel) for each phonation type with a regression line and 95% confidence intervals (light gray).

Figure 2: Token CPP (dB) values by participant age at each time point (1 = beginning, 2 = middle, 3= end) for each phonation type with a regression line and 95% confidence intervals (light gray).

The model for CPP (Fig. 2) characterized comparatively more of the variance (conditional r^2=0.475). As with the model of H1*–H2*, age was not a significant main effect (x^2=0.0989, df=1, p<1.0), but there were significant main effects of time point (x^2=2410, df=2, p<0.001) and phonation (x^2=1308, df=2, p<0.001). All two-way interactions were also significant: age and time point (x^2=36.21,

df=4, p<0.001). The effects were similarly small, but minute increases in CPP (less than 3dB over five decades) were seen across phonation types and time points with age, suggesting slightly less noise in

6. REFERE ! CES

[1] Barnes, D. R. 2013. Age-related changes in the production of linguistic prosody [Master's thesis,