Articulatory properties of period-doubled voice in Mandarin

Period-doubled phonation is a type of creaky voice that contains two alternating periods. By presenting data from Mandarin Chinese read speech recordings, this study probes the articulatory properties of period-doubled phonation and its tonal distribution based on time-domain measures using electroglottography (EGG). Period doubling (PD) was found across all the tones (T3: 43% > T2 > T4 > T1: 11%), which was more prevalent than vocal fry, found mainly in T3 (48%) and T2 (43%), and only sporadically in T4 (7%) and T1 (2%). We calculated the two alternating glottal periods in PD, and they exhibited a ratio close to 3:2 or 2:1. The two pulses also alternated between higher and lower amplitudes with a mean ratio of 2 or 1.6. Women tended to produce more PD than men. Moreover, the contact quotient of PD, measured via EGG using the hybrid method, was around 0.5, similar to modal voice (0.54) and smaller than that of vocal fry (0.74), implying a more balanced opening and contact phase during phonation. Alternation of contact quotient and symmetry quotient was also seen in a few samples, suggesting that PD is likely articulated through two alternating pulses with distinct voice qualities and pitches.