

Low tone bias during perception of period doubling

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Period-doubled voice consists of two alternating periods with multiple frequencies and is often perceived as rough with an indeterminate pitch. Past pitch-matching studies in period-doubled voice found that the perceived pitch was lower as the degree of amplitude and frequency modulation between the two alternating periods increased. The perceptual outcome also differed across f_0 s and modulation types: a lower f_0 prompted earlier identification of a lower pitch, and the matched pitch dropped more quickly in frequency- than amplitude-modulated tokens (Sun & Xu, 2002; Bergan & Titze, 2001). However, it is unclear how listeners perceive period doubling when identifying linguistic tones. In an artificial language learning paradigm, this study used resynthesized stimuli with alternating amplitudes and/or frequencies of varying degrees, based on a production study of period-doubled voice (Huang, 2022). Listeners were native speakers of English and Mandarin. We confirm the positive relationship between the modulation degree and the proportion of low tones heard, and find that frequency modulation biased listeners to choose more low-tone options than amplitude modulation. However, a higher f_0 (300 Hz) leads to a low-tone percept in more amplitude-modulated tokens than a lower f_0 (200 Hz). Both English and Mandarin listeners behaved similarly, suggesting that pitch perception during period doubling is not language-specific. Furthermore, period doubling is predicted to signal low tones in languages, even when the f_0 is high.