Title: Use of stimulus mixing to synthesize a continuum of nasality in natural speech
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Existing approaches to studying the perception of nasality often rely on synthesized stimuli to produce the required gradience in nasality. To test the perception of nasality in natural speech, a method was developed wherein a series of CVC (or NVC) and NVN words matching for vowel are recorded by the same speaker and annotated. After stripping consonantal context and matching the two vowels for amplitude, duration and pitch contour, the two tokens are overlaid sample-by-sample according to a specified ratio of donor to recipient, and the vowel is reinserted into NVC context. By repeating this process with a variety of ratios, a continuum of natural-sounding tokens with varying vowel nasalities can be created. Nasality of these output tokens was then measured using the A1-P0 nasality measurement (as discussed in Chen 1997), and increasing the ratio of donor to recipient was confirmed to increase the nasality of the resulting word (up to the donor's degree of nasality). The stimuli were then used in a perception experiment (Scarborough, Styler and Zellou 2011), where the change was perceived by listeners, but a lack of reaction time slowdown in processed tokens indicated no intelligibility difficulties in the nasality-altered stimuli.