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How whisper and croak phonation affect vocal tract resonances

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The whisper and croak modes of phonation provide convenient broad band excitation of the vocal tract and thus give relatively precise information about tract resonances. How closely do the measured resonances for these mechanisms approximate those of normal speech?
We measured the frequencies of the first four resonances (R1-R4) in normal, whisper and croak phonation. Subjects produced pairs of these phonations in the same vocal gesture. Formants were used to measure the frequencies (R1-R4) for the non-periodic phonations and broad band excitation at the mouth was used to measure them with similar precision in normal speech.
For R1 to R4 respectively, whispering raised the resonant frequencies by 255±90 Hz (92)*, 115±105 Hz (119)*, 125±125 Hz (109)* and 75±120 Hz (118)*, (mean ± standard deviation (n), asterisks show significance at the 5% level).
These values, and their decrease with increasing frequency, are consistent with the effect of the increased glottal opening in whispering only if the increased opening is large. A supra-glottal narrowing in the tract could also help raise the frequencies of resonance. Croak phonation raises the resonant frequencies respectively by 45±50 Hz (121)*, 10±60 Hz (124), 65±120 Hz (109)* and 15±110 Hz (108).