

The Science Underlying Semi-Occluded Vocal Tract Phonation

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The purpose of semi-occluding the airway while producing moderate to high lung pressures is to (1) create an overall widening of the airways from trachea to lips, (2) lower the glottal resistance by spreading the top of the vocal folds, (3) reduce the phonation threshold pressure with an optimal vocal fold posture and optimal TA/CT ratio, (4) train the larynx canal (epilaryngeal airway) and the pharyngeal airway for maximum power transfer, and (5) lower the resonance frequencies so that higher harmonics can gain energy with increased vocal tract inertance. Not all of these effects are experienced all the time. Different semi-occlusions (e.g., thin straws, lip trills, resonance tubes, voiced consonants, tubes submerged in liquid) produce different oral pressures and different oral impedances, which then favor some of the phenomena more than others. Which effects are likely to be maintained when the mouth is opened will also be discussed.