

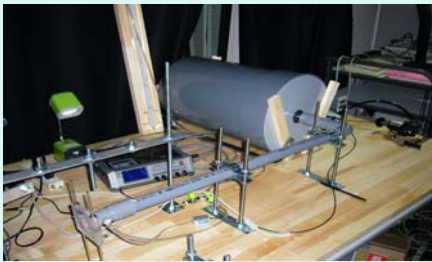
**Motivation**

- Presence of air sac in nonhumans, but absence in human.
- Acoustical function? Why lost during human evolution?



Air Sac of Siamang

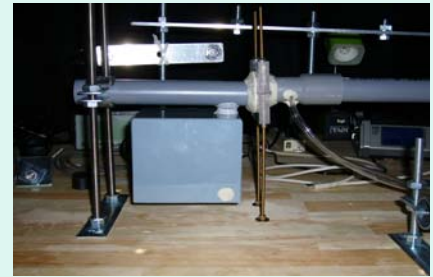
**Experimental Setup**



Subglottal vocal tract and lung

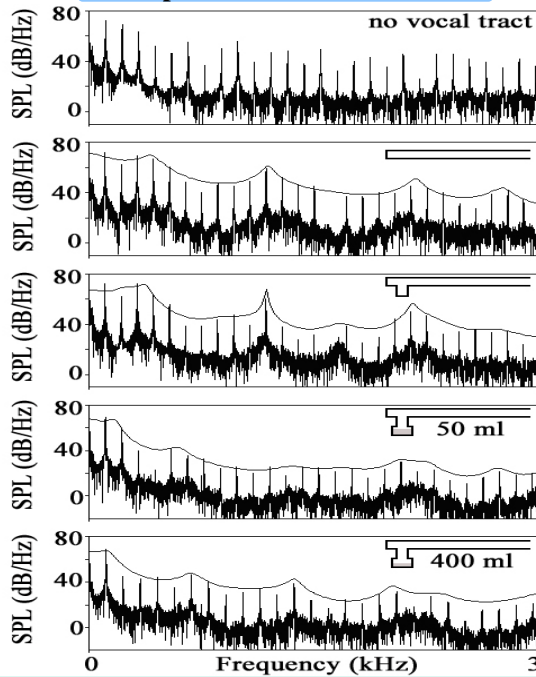


Physical model of vocal volds

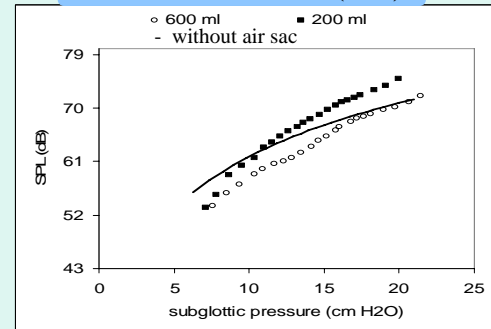


Supraglottal vocal tract and rigid air sac

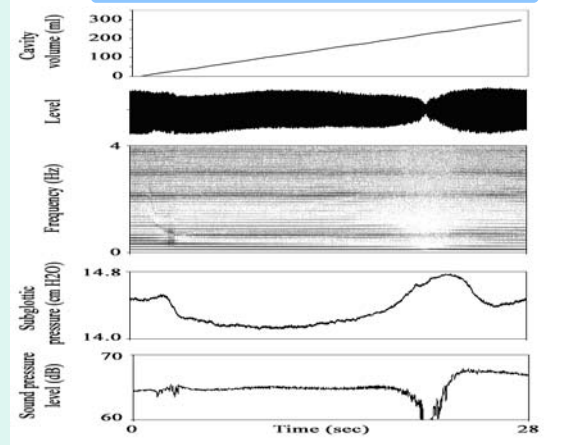
**Spectral Characteristics**



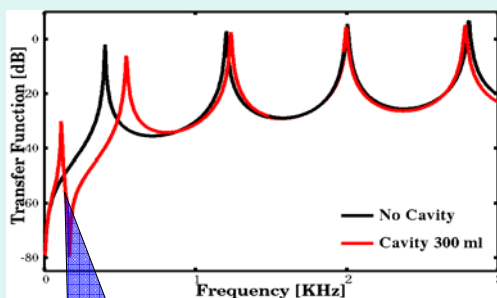
**Sound Pressure Level (SPL)**



**Nonlinear Source-Tract Interaction**



**Transfer Function computed by Transmission Line Model**



Pole/Zero Pair

**Conclusions & Discussions**

- Slight effect on spectral characteristics.
- Louder under certain conditions.
- Instability induced by source-tract coupling at pole/zero frequency.
- Lost in human because of unstable phonation