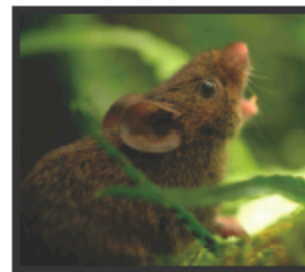


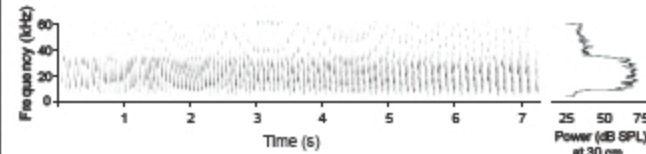
Integrative biology of acoustic communication in Neotropical singing mice

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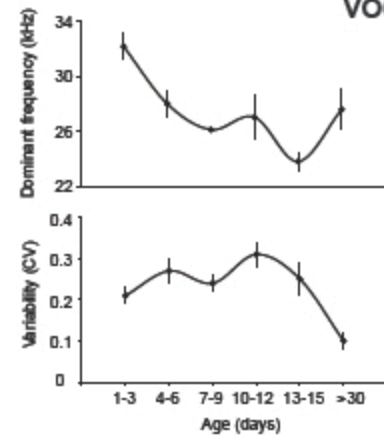


S. teguina

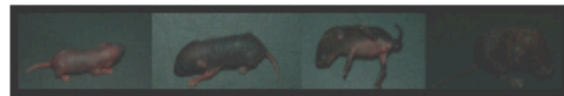


Neotropical singing mice (*Scotinomys*) are diurnal insectivorous rodents that inhabit montane cloud forests throughout Central America. Males commonly emit a series of rapidly repeated notes ("trills") that serve to attract females and repel rival males.

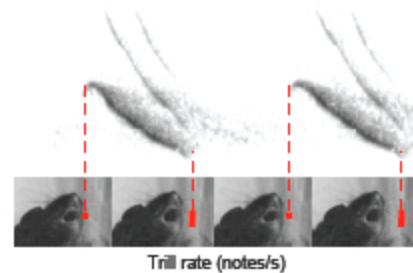
VOCAL ONTOGENY



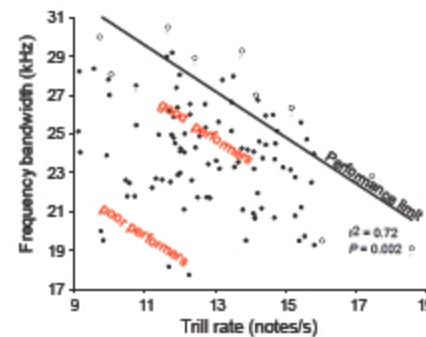
Both male & female pups produce precursors of the adult trill when isolated from their mothers. Vocalizations decrease in dominant frequency & become more stereotyped with age. Compared to males, females rarely vocalize after 45 days.



INDIVIDUAL VARIATION



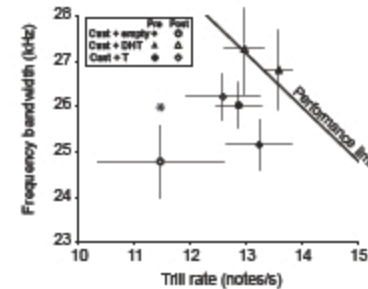
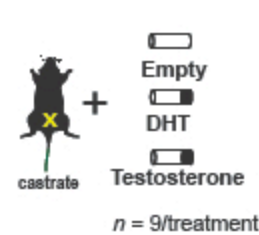
Frequency bandwidth
rs
Gape width



Some males (filled dots) are better performers than others.

As adults, a mechanical trade-off exists between how fast notes are repeated & the frequency bandwidth of each note, resulting in a performance limit.

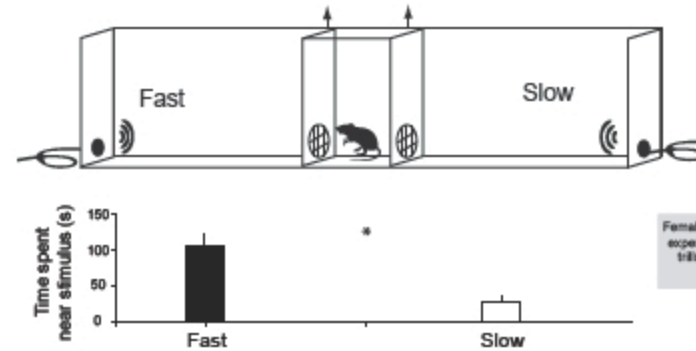
HORMONAL MECHANISMS



Mice with androgen implants maintained vocal performance, whereas empty-implanted males fell away from the limit.

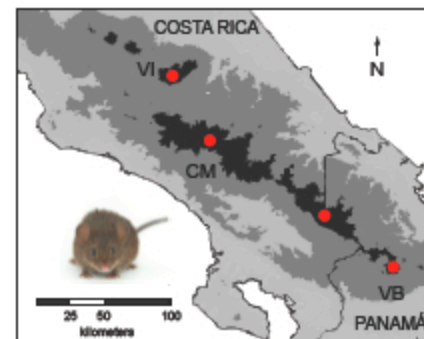
Androgens modulate the production of physically challenging vocal displays.

FEMALE PREFERENCE



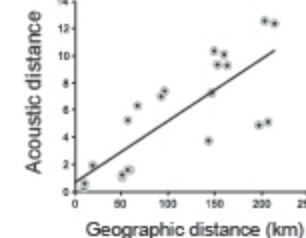
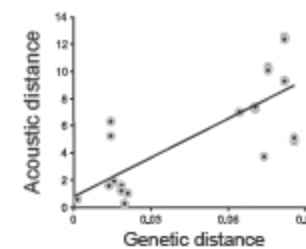
The ability of females to perceive variation in male motor performance is likely a common mechanism underlying mate choice in animals.

GEOGRAPHIC VARIATION



• sampling localities

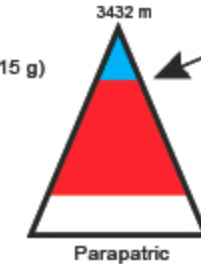
Acoustic, genetic, & geographic distances are highly correlated, suggesting that population differentiation in vocalizations is largely shaped by genetic drift.



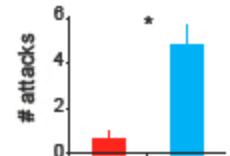
INTERSPECIFIC COMMUNICATION

2 species come into contact on the highest mountains of Costa Rica & Panamá

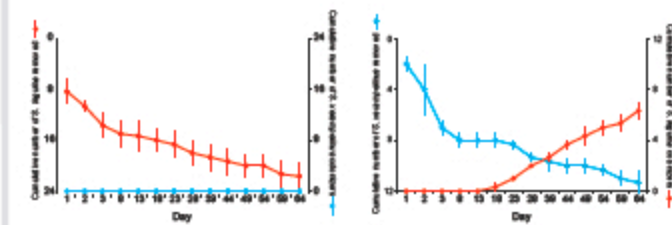
- *S. teguina* (9-12 g)
- *S. xerampelinus* (13-15 g)



Here, the larger *S. xerampelinus* is behaviorally dominant.

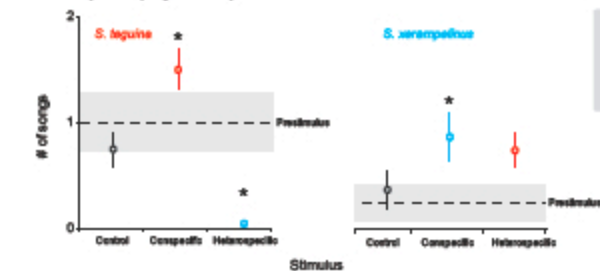


Reciprocal removal experiment



S. xerampelinus does not respond to removal of *S. teguina*.
S. teguina shows competitive release in response to removal of *S. xerampelinus*.

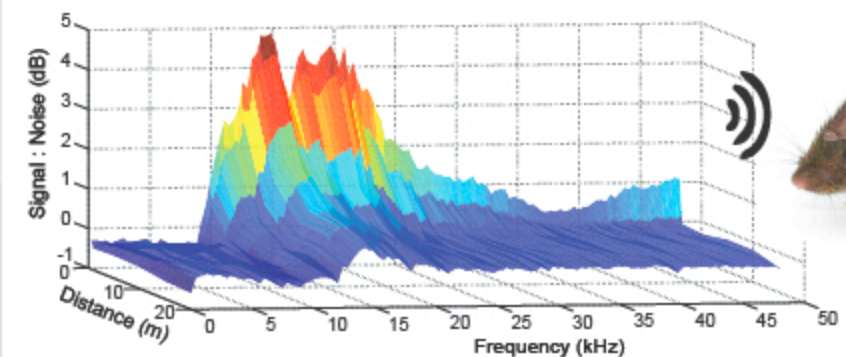
Reciprocal playback experiment



S. teguina responds to conspecific but not heterospecific song.
S. xerampelinus responds to both conspecific & heterospecific song.

Asymmetries in interspecific communication reflect underlying dominance & contribute to spatial segregation at the range edge.

SOUND PROPAGATION & PERCEPTION



We are currently investigating how animals perceive vocalizations that are severely degraded after traveling through the cloud forest understory.

Please visit <http://people.biology.ufl.edu/bpasch/> for audio & video.
Major funding provided by NSF & The American Society of Mammalogists.