EWS 2019 - ENES Winter Symposium
November 27, 2019

Faculté des Sciences, 23 rue Paul Michelon, 42023 Saint-Etienne Cedex 2 Bâtiment J (STAPS) Amphi J108

Schedule

9:15		**Welcome & Introduction**
9:30	Nicolas Mathevon	Signal evolution and information tinkering in an animal communication system
10:00	Gérard Coureaud	Maternal nursing: A way to eat, a way to learn in the newborn
10:30	Livio Favaro	Vocal communication in the African penguin: from structure to Function
10:50	Clément Cornec	Human baby crying, a universal distress signal?
11:10		**Coffee break** (outside Amphi J108)
11:40	Michael Greenfield	Rhythm interaction in social groups: Selective attention and social networks
12:00	Mathilde Massenet	Are there individual differences in dog calls before two months of age?
12:20	David Reby	Physiological and perceptual correlates of masculinity in children's voices
12:40	Arthur Guibard	Analysis of propagation constraints on acoustic communication networks among mountain Galliformes
1:00	Thibaut Marin-Cudraz	Rock ptarmigan spatio-temporal acoustic activity at Arsine's glacier
1:30		**Lunch**
3:00	Kasia Pisanski	Vocal exaggeration of body size in humans: From production to perception
3:20	Lucie Barluet de Beauchesne	Effect of vocal tract modulation on ungulate vocalisations
3:40	Emilie Rojas	Tolerance to anthropogenic noise due to long-term exposure in the invasive pumpkinseed sunfish (*Lepomis gibbosus* sp.)
4:00	Julie Thevenet	The acoustic basis of information coding in crocodile vocalisations
4:20	Elisa Demuru	Body posture as an amplifier of sexual swelling in bonobos
4:40	Léo Papet	Spatial Release from Masking in crocodilians: Experiments from the wild to the lab

ENES Equipe de Neuro-Ethologie Sensorielle

Presenters & Abstracts

Nicolas Mathevon

ENES, Director

Signal evolution and information tinkering in an animal communication system

Whether selection for strong signal divergence between species allows for the structuration of acoustic communities remains an open debate. Using a combination of information calculations and playback experiments, I will show that woodpeckers have evolved a limited number of drumming styles under random drift. Yet, the amount of species identity information remains sufficient to allow species recognition within communities of sympatric woodpeckers due to ecological niche exclusion between closely related species.

Gérard Coureaud

CNRS, Research Director, Centre de Recherche en Neurosciences de Lyon

Maternal nursing: A way to eat, a way to learn in the newborn

Odour-guided behaviours are displayed by animals (including humans) throughout development. In newborns, olfaction plays a crucial role in the vital interaction with the mother, helping to find the *mammae* and suck. In the nursing context, newborns also learn new odour cues useful in the short or longer term. These neonatal perceptual and cognitive abilities are presently studied through behavioural, pharmacological and neurobiological approaches.

Livio Favaro

ENES, Postdoctoral Fellow

Vocal communication in the African penguin: from structure to function

We investigated the anatomical basis of sound production in African penguins using computational models of vocal tracts derived from anatomical data. We show that fundamental frequency and formants (resonant frequencies of the vocal tract) encode acoustic cues to individual identity, modelling how tracheal length affects formant spacing. Our results underscore the importance of combining anatomical and modelling approaches to study vocal communication.

Clément Cornec

ENES, Postdoctoral Fellow

Human baby crying, a universal distress signal?

Crying is an essential and universal survival mechanism used by human preverbal infants to communicate distress and elicit care. Yet, research on the communicative functions of babies' cries has been limited to nuclear families in Western European cities. We thus investigated whether adults' perceptions of babies' cries differ cross-culturally by recording babies' cries and running playback studies on parents of large families living in rural areas of the Democratic Republic of Congo.

Michael Greenfield

ENES & University of Kansas, Prof, Research Associate

Rhythm interaction in social groups: Selective attention and social networks

Most research on signal interactions in behaviour – acoustic or otherwise – focuses on dyads (two individuals). But isolated pairs of individuals may be more the exception than the rule, which begs the question of how signal interactions normally function. Do individuals attend to all neighbours, or do they under certain circumstances focus selectively on only a few individuals, and if so, what are the consequences for signal evolution?

Mathilde Massenet

ENES, PhD student (D. Reby, N. Mathevon)

Are there individual differences in dog calls before two months of age?

Although it is well established that dog calls encode indexical information, the origins and development of these inter-individual differences remain under-investigated. Here, we recorded puppies to test whether individual differences in their fundamental frequency are already present at three weeks of age, and how these differences would develop during their first two months of life.

David Reby

ENES, Professor

Physiological and perceptual correlates of masculinity in children's voices

The relationships among vocal, physiological, and perceptual dimensions of speakers' masculinity prior to puberty remain unknown. We found that, based on their voices alone, boys who have higher salivary testosterone levels are rated as more masculine, and the relation between testosterone and perceived masculinity is partially mediated by voice pitch (F0). Thus, inter-individual variation in male voices, particularly F0, may advertise hormonal masculinity from a very early age.

Arthur Guibard

ENES, PhD student (F. Sèbe, S. Ollivier)

Analysis of propagation constraints on acoustic communication networks among mountain Galliformes

The study of communication networks in birds is still poorly developed regarding the impact of propagation constraints. However, propagation of an acoustic signal is known to be strongly modified by meteorological and ground effects. We will develop a transversal approach by combining physical data on signal propagation and biological data on the spatial and temporal structure of acoustic networks. I will present how modelling acoustic propagation can provide critical insights into avian communication networks.

Thibaut Marin-Cudraz

ENES, Postdoctoral Fellow

Rock ptarmigan spatio-temporal acoustic activity at Arsine’s glacier

We deployed several autonomous recorders covering a large area around Arsine’s glacier, Southern Alps. Studying the presence of different males at each recorder, we hope to distinguish males who have a very stable territory from those that are recorded in multiple places and thus show high mobility.

ENES Equipe de Neuro-Ethologie Sensorielle

Katarzyna (Kasia) Pisanski

ENES, Postdoctoral Fellow

Vocal exaggeration of body size in humans: From production to perception

Humans possess an unprecedented capacity for vocal control, including the ability the volitionally modulate the fundamental and formant frequencies of their voices. I will present evidence that humans utilise voice modulation when asked to imitate a smaller or larger body size. I will also present new data from playback experiments testing whether listeners can detect such vocal exaggeration of body size, and how this influences their estimates of a speaker's actual height.

Lucie Barluet de Beauchesne

ENES, PhD student (D. Reby, N. Mathevon)

Effect of vocal tract modulation on ungulate vocalisations

Most mammals can modulate their vocal tracts using a variety of movements (e.g. descent of larynx, variation in mouth opening). I will present the preliminary results of my recent studies investigating the relationships among morphology, acoustics, and function in ungulate species and will show how information encoded in vocal signals can be modulated by articulatory movements.

Emilie Rojas

ENES, PhD student (V. Médoc, N. Mathevon)

Tolerance to anthropogenic noise due to long-term exposure in the invasive pumpkinseed sunfish (*Lepomis gibbosus* sp.)

Anthropogenic noise associated with river trade or water-based recreation can disrupt acoustic communication and affect fish behavior. I will characterise the response of an invasive freshwater species when exposed to boat noise, using the functional response approach (FR) to examine the relationship between prey density and predator consumption rate during predation tests. Results suggest that this species can become conditioned to acoustic stress following exposure to boat noise.

Julie Thevenet

ENES, PhD student (N. Mathevon)

The acoustic basis of information coding in crocodile vocalisations

The acoustic features used by animals to communicate vary across species. Young crocodiles appear to rely mainly on pitch (F0) and frequency modulation to recognize other conspecifics. In a series of playback studies, we examined how useful these acoustic features are for effective communication in this species, and, which cues crocodiles use to categorise calls with a similar basic acoustic structure.

Elisa Demuru

ENES, Postdoctoral Fellow

Body posture as an amplifier of sexual swelling in bonobos

We examined two foraging postures in bonobos in relation to age, gender, and swelling cycle. Our results show that adult females extensively adopted a rear-exposing posture, especially during the maximum swelling phase. We propose that this body posture is an *amplifier*, defined as a signal that increases the conspicuousness of another signal with which it interacts during perception.

Léo Papet

ENES, PhD student (N. Grimault, N. Mathevon)

Spatial Release from Masking in crocodilians: Experiments from the wild to the lab

Signal masking induced by environmental noise is an important constraint impairing acoustic communication. Spatial Release from Masking (SRM, the ability to discriminate a target signal from a masking noise) is one strategy to overcome this issue. In three playback experiments, we show that crocodilians use SRM to discriminate signals of interest in several contexts in a noisy environment.