Project: Kin recognition in the grey mouse lemur (*Microcebus murinus*)

Institute of Zoology, University of Veterinary Medicine Hannover
Lab course: Experimental Behavioural Biology
Summer term 2008

Background

Kin recognition is a prerequisite for kin selection. Kin selection has been theorized as a driving force behind the evolution of group-living in primates. Vocal recognition of kin has been observed in haplorhine primates [Rendall, 2004] and in the diurnal, gregarious strepsirrhine, *Lemur catta* [Nunn, 2000]. Much less research has been done on the vocalizations of the nocturnal, solitarily foraging strepsirrhines. Our study is the first to test for vocal recognition of kin in a nongregarious strepsirrhine. Mouse lemurs are small-bodied, nocturnal, solitarily foraging strepsirrhine primates that have dispersed social networks [Braune et al., 2008]. We tested whether *M. murinus* females respond differently to and whistles, an alarm call [Braune et al., 2008], and trills, advertisement calls, given by their father and by unrelated males.

Material & Methods

We used ten adult females, housed at the University of Veterinary Medicine (Institute for Zoology). Subjects were tested in a test cage (80 x 87 x 50 cm) in a sound-attenuated chamber lit with dim red light (<20 lux) using a playback paradigm. Subjects heard four different stimuli: a trill from the father, a whistle sequence from the father, a trill from an unrelated male and a whistle sequence from the same unrelated male. The behaviour of the animal was video-and audiotaped. Videotapes were digitalized. Analyzing the audio trace we located the exact frame during which each playback began. We manually transferred this time point to Interact (Mangold, Arnstorf, Germany version 8.0.1) to conduct a frame-by-frame analysis of the following 30 seconds. Interest in the playback was quantified by duration in the loudspeaker area and latency to enter the loudspeaker area. Withdrawing from the stimulus was quantified by duration in the box area, duration in the box, latency to enter box area, and latency to enter box. During the video analysis, the videos were assigned random numbers and the sound of the computer was switched off, thus we were blind to which animal we were coding and to what stimulus the animal had heard.

Results & Conslusion:

We found no significant differences between the reactions to related and unrelated whistles for any of the parameters. In comparing the responses to related and unrelated trills, we found that females entered the loudspeaker area sooner and spent significantly longer in the loudspeaker area after hearing the trill of their father than after hearing the control trill.

In summary, our first prediction was supported. The females did not react differently to their fathers' whistles and whistles from an unrelated male. This fits with our understanding that whistles have a simpler structure and are less individually-distinctive than trills (pers. com, Leliveld 2008). As whistles are given in alarm contexts [Braune et al., 2008; Scheumann and Zimmermann, 2008], the identity of the sender may be less important to the listener than the understanding that it is an alarm call. In contrast to our second prediction that females would respond more strongly to trills from unrelated males, we found that females spent significantly more time in the loudspeaker area after hearing their fathers' trills. While their reaction was different from our predictions, the results do suggest that the females are able to distinguish paternal kin. This fits with our understanding that the complex structure of the trill call enables it to have individually-specific and colony-specific signatures [Zimmermann and Hafen, 2001].

Literatur

Braune P, Schmidt S, Zimmermann E. 2005. Spacing and group coordination in a nocturnal primate, the golden brown mouse lemur (*Microcebus ravelobensis)*: the role of olfactory and acoustic signals. Behavioral Ecology and Sociobiology 58(6):587-596.

Nunn CL. 2000. Maternal recognition of infant calls in ring-tailed lemurs. Folia Primatologica 71(3):142-146.

Rendall D. 2004. Recognizing kin: mechanisms, media, minds, modules, and muddles. In: Chapais B, Berman CM, editors. Kinship and Behavior in Primates. New York: Oxford University Press. p 295-316.

Scheumann M, Zimmermann E. 2008. Sex-specific asymmetries in communication sound perception are not related to hand preference in an early primate. BMC Biology 6(3).

Zimmermann E, Hafen T. 2001. Colony specificity in a social call of mouse lemurs (*Microcebus* ssp.). American Journal of Primatology 54:129-141.