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The occurrence of different call types in different behavioural contexts in captive cheetahs *(Acinonyx jubatus)*

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Vocalisations indicate intentions, social relationships, emotions and physiological states of animals, thus representing a tool for monitoring different aspects of animal life. This study investigates call types in behavioural contexts in captive cheetahs to reveal the functions of different vocalisations. Calls of three male and three female adult cheetahs were recorded between the 21st of May and the 1st of August 2012 in Volokolamsk Zoo Brooder (Russia, Moscow region). A total of 3,611 calls were subdivided according to three structural classes: tonal, pulsed and noisy. Tonal calls included meow, chirp and howl; pulsed calls included growl, chirr and purr; noisy calls included hiss. These seven call types were subdivided by eight behavioural contexts: aggression/attack, aggression/defence, friendly close-distant interactions with conspecifics, friendly far-distant interactions with conspecifics, friendly interactions with a human, soliciting from a human, anticipation of food and courting behaviour. We calculated the occurrence of each call type in each context. Then, we established the random distribution of the total call sample according to the eight contexts and compared the observed and random values of the occurrence of calls of each type with chi-square test. Certain call types were related to particular contexts. Growl, hiss and howl were specifically related to aggression: 74.09 % growls, 77.11 % hisses and 67.13 % howls were emitted during attack. Also, 20.95 % growls, 16.52 % hisses and 9.79 % howls were emitted during defence. Purr was specifically related to friendly interactions with a human (62.06 % of purrs occurred in this context). Chirp specifically attended friendly far-distant interactions with conspecifics (26.38 % of chirps occurred in this context). Meow attended soliciting and food anticipation contexts (41.71 % and 29.36 % of meows occurred in these two contexts respectively). The most tight relation occurred between chirr and the courting context (99.58 % of chirrs occurred in this context). In discomfort-related or in frustrating contexts (aggression, anticipation of food, or soliciting), the subjects were very vocal, whereas in comfort-related contexts they were mostly silent (as in friendly interactions with conspecifics) or produced only purrs (as in friendly interactions with humans). These results are in accordance with hypothesis that mammals vocalise mostly in response to discomfort. The frequent use of meows in soliciting context suggests that emission of this call type may be conditioned by operant stimuli from keepers, allowing the animals to use meows for manipulating the behaviour of their keepers.
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