

Estimation of psychological welfare: Let's ask the animal's point of view

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Animal welfare is a general term, and there is no perfect approach to measure it by particular parameters. When animal welfare is being assessed using various characteristics of health, behaviour, reproduction, expected longevity, stress and environment, we face the problem that most of the parameters are not compatible or contradict each other. How can we compare, in welfare terms, chicken and old hen, stallion and gelding, highly-stressed dominant African wild dogs (*Lycaon pictus*) with priority access to food and females and little-stressed subordinate ones? Moreover, there is much evidence that different individuals of the same species cope with the environment using individual coping strategies. Zoo visitors may represent positive stimuli to some animals and negative ones for others. Therefore, the same environment and social conditions are not identical for different individuals both within and between species. So, welfare has to be assessed for a particular animal in a particular environment.

One way to estimate an individual's psychological welfare is to ask the animal's point of view concerning its feelings, i.e., to find indicators of the animal's self-esteem. We revealed some of the indicators from acoustic and kinematic characteristics of rodent behaviour.

Video analysis of interactions in great gerbils (*Rhombomys opimus*) revealed indicators of current self-esteem expressed through relations between acoustic characteristics and parameters of attention concentration and interindividual distance. Sound features of losers in intraspecies agonistic conflicts among two combatants were compared in terms of two parameters: 1) whether the loser looks to the winner or does not; 2) whether the loser is close to or distant from the winner. Significantly more calls, Fmax, depth of inflection and overall longer duration of calling occurred in the more expressive situations ("look", "close") than in the less expressive ("do not look" and "distant").

Video analysis of dyad encounters of conspecific males of Mongolian (*Meriones unguiculatus*) and midday (*M. meridianus*) gerbils showed that kinematic parameters were also highly informative concerning animal self-esteem. We compared alternatives in five contexts (aggression - defense; contact - out of contact; peaceful - agonistic contact; approach - increase of distance; approach during attack - increase of distance during withdrawal). First alternatives were supposed to be less expressive for participants. Comparison between contexts showed that in both species the more expressive features were associated with higher velocities of movement and slower acceleration. So, the velocity of movement was always higher in animals with less self-esteem.