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The analysis of social bonds in feral horses

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In many social mammals, individuals preferentially affiliate with a small subset of available partners instead of distributing their social behaviors equally among all group members. The resulting social bonds have been investigated in several mammalian taxa, especially in primate societies, but also in other taxa such as birds, dolphins, rodents and ungulates. In feral horses, a great number of studies on social bonds can be found, but with a huge variety between methods for the analysis. There seems to be a lack of a clear and common definition of social bonds in horses and of comparable analyses. For example, there are irregularities between the studies regarding the research designs, the selection of recording methods and the interpretation of the measurements. Mutual grooming is used most often for the analysis of social relationships in many species. As mutual grooming is rare in horses, especially measurements of spatial proximity are commonly used for the analysis of social bonds in addition to other behavioral patterns. However, the combination of mutual grooming and nearest neighborhood analyses for the analysis of social bond is debatable, as in contrast to mutual grooming, which must occur deliberately by both grooming partners, the spatial distribution can be influenced by one partner alone, which may even force the other horse to keep a certain distance or to stay in close proximity.

In this study, we investigated the comparability of mutual grooming and nearest neighborhood data for social bond analyses in feral horses. Therefore, we observed five groups of semi-wild living Przewalski's horses and six groups of feral horses.

We analysed the horses' social ranks by applying an Average Dominance Index, we recorded the distances between the animals and observed the number of mutual grooming events as well as friendly approaches.

Our results show that there was only a weak correlation between the frequency of staying in nearest neighborhood and mutual grooming in all observed horse groups. In contrast to this, the correlation between the number of friendly approaches and mutual grooming events was higher in most groups.

Hierarchies did not affect social bonds, as mutual grooming was similarly induced by higher and lower ranking animals and the social rank did not affect the choice of the grooming partner. Similarly, likelihoods of staying in the neighborhood of particular animals were not affected by the animals' social rank.

The grooming frequencies differed between the different horse groups and between the individual horses living in the particular groups. They seem to be effected by individual predisposition.

Altogether we suggest that the ratio of mutual grooming seems to be a better indicator for social bonds in feral horses than the frequency of staying in the nearest neighborhood. Mutual grooming occurs deliberately and is bidirectional, whereas nearest neighborhoods could be enforced and unidirectional. For the calculation of social bonds in horses, we consider it to be more reliable to combine the frequency of mutual grooming with the frequency of friendly approaches.

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