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Testing for the presence of coping styles in a wild mammal Animal Behaviour

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Coping styles represent alternative response patterns in reaction to a stressor. The coping style model provides a set of predictions on the correlations between behavioural and neurophysiological reactions to a stressful situation. According to this model we expect that risk taking should be correlated to fast exploration, high aggressiveness, and high activity, at the behavioural level and to a high sympathetic reactivity and a low parasympathetic reactivity (characterised by a high heart rate), and a low hypothalamus-pituitary-adrenocortical (HPA) axis reactivity (characterised by a low production of glucocorticoids). The coping style model has been mainly tested on artificially selected or inbred lines in laboratory settings. However, this situation restricts its generalisation to a larger number of species and there is a need for studies testing it in the wild, under less controlled situations. In this paper we test the predictions of the coping style model in a wild Alpine marmot (Marmota marmota) population. We show that several behaviour (i.e. exploration in an open field, impulsivity, and docility) and neurophysiological traits (i.e. heart rate, breathing rate, and cortisol production) assumed to represent individual differences in coping style, were significantly repeatable. Not all the correlations between traits predicted by the coping style model were found in marmots. Furthermore, most of the correlations were observed at the between-individual level and the within-individual correlations (i.e. phenotypic plasticity) were weaker. However, overall our results support the prediction of the coping style model, but highlight the fact that the association between traits found in artificial conditions may be weaker in a more natural setting.