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A network perspective on animal welfare

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Abstract

The scientific study of animal welfare involves measuring physiological, behavioural, and/or cognitive variables to infer the welfare state of animals. Such an approach implies these measures are indicators, or reflect, an unmeasured latent variable of welfare state. Drawing inspiration from recent developments in human psychology and psychiatry, in this paper we propose an alternative perspective in the form of a network theory of animal welfare. This theory posits that there is no latent variable; rather, welfare is a network system of causal interactions between and within behavioural, physiological, and cognitive components. We then describe a statistical network modelling approach motivated by network theory, in which welfare-related response variables are associated with each other after controlling for all other variables measured. In three examples using simulated data, we demonstrate how this approach can be used, and the sort of novel insights it can bring. These examples cover a range of species and research questions, which network analysis is well suited to address. We believe a network approach to animal welfare science holds promise for developing our understanding of the concept of animal welfare, as well as producing practical and meaningful information to improve the welfare of animals.

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