

Book Reviews

Animal Personalities: Behaviour, Physiology, and Evolution

Edited by C Carere and D Maestriperi (2013). Published by The University of Chicago Press, 1427 E 60th Street, Chicago, Illinois 60637, USA. 512 pages Paperback (ISBN 978-0-226-92197-6). Price £29.00, US\$45.00.

The concept of variation in personality types among humans is intuitive. Indeed, when we categorise ourselves and others into different personality types, what we really want to say is that a certain individual displays a specific group of traits, which remain consistent across time and circumstances. Consequently, we can generally predict the behaviour of individuals with different types of personalities across diverse situations. If we share our home with a companion animal, we may attribute a particular type of personality to it as well. But is this really the case? Do non-human animals possess different personalities, as humans do, or is this simply a form of anthropomorphism? It is becoming evident that with the continuing development of research, many of the unique features that were once monopolistically attributed to humans have also been found to occur in other animal species. *Animal Personalities: Behaviour, Physiology, and Evolution*, edited by Claudio Carere and Dario Maestriperi, deals with this phenomenon of ‘personality’. Indeed, despite the discomfort of some researchers in attributing a term that incorporates the word ‘person’ to non-human animals, this book provides data on personalities in a wide variety of animal taxa, ranging from invertebrates, such as flies and spiders, to fish, birds, rodents and primates. The term ‘personality’ is defined throughout the book as constituting consistent individual differences in correlated suites of behaviour within populations, and across multiple contexts. These individual characteristics account for consistent patterns of feeling, cognition and behaving. Consequently, empirical research on animal personality focuses on the study of traits (which are relatively constant behaviours through time and contexts), such as exploration, boldness, fearfulness, aggression, general activity, emotionality, confidence and timidity.

Animal Personalities: Behaviour, Physiology, and Evolution consists of fifteen chapters divided into four parts. Part one focuses on personalities across animal taxa, part two deals with ultimate causation of animal personalities, part three with proximate factors affecting personality, and part four reviews the applications of the study of animal personalities in conservation, welfare and human health.

Although not an easy read, I found the book fascinating, mainly due to the interesting questions that arise from this topic, such as: why is it that individuals from the same population demonstrate such variance in their behaviour, and in whole suites of traits, and how is this variance maintained by natural selection? I additionally found the book to be important to my own research interest, which is animal welfare. In particular, I

found it valuable in promoting our understanding of the specific needs and motivations of different individuals, and consequently to improving their management. I address these welfare-related issues later in this review.

It is suggested that different personalities result from genomic variation and gene-by-environment-interactions. Indeed, quantitative and molecular genetics are central to the understanding of the evolution of animal personality traits. For example, about half of the variance of all five human personality domains (the Five-Factor Model is the principal model in human personality research, representing personality traits at the broadest level of abstraction) was found to be hereditary, while in chimpanzees, of the six identified personality dimensions, only dominance was significantly heritable. Similarly, it has been found that individual differences among rhesus macaques in movement, distress cues, early independence, and exploration of familiar and unfamiliar environments, were heritable. Finally, monkeys that had the two short forms of the allele for the serotonin transporter-linked polymorphic region are shown to have been more anxious than individuals carrying either the two long versions of the allele, or those that were heterozygous.

In addition, research (eg in the three-spine stickleback fish) has shown that ecological factors are also important in determining whether personality occurs, and in what way. Indeed, behavioural ecologists who are interested in the study of personality, generally ask ultimate-type questions that focus on the adaptive value of various personality types under various ecological conditions. In other words, they attempt to evaluate how certain behavioural traits are related to socio-ecological factors. For example, individuals that require a high energy intake would benefit if their personality is characterised by boldness, aggressiveness and tendency for exploration, since these traits are suitable for high foraging rates. Additional questions, referring to proximate factors, such as the ontogeny of the individual, are also addressed in the book. For example, an important question refers to the significance of the rearing environment and parental care in shaping the personality of the offspring in adulthood. This issue appears relevant to several fields of research, including captive animal welfare. Indeed, studies have shown that the behavioural development of mammalian offspring is negatively affected if their mothers experienced stress during gestation. These long-term stable changes in phenotype include neophobia, deficits in social behaviour and impaired cognition. Greater anxiety response is often accompanied by chronic hyperactivity of the hypothalamic-pituitary-adrenal (HPA) axis in both primates and rodents. Thus, the emotional reactivity component of the personality may be affected by glucocorticoid hormones (eg cortisol/corticosterone).

The issue of personality has additional welfare implications: are there personality types that might predict less suffering in captivity? Are there specific environmental enrichments

that are better fitted to the needs or coping strategies of certain personality types? Should the personality of the individual be taken into account when forming new social groups of captive animals? Since personality type is a product of gene-environment interaction, can (and should) we provide certain stimuli in order to promote the expression of personalities that are expected to cope better with the adversities of the captive environment? Can exposure to particular rearing conditions promote the emergence of personalities that differ in their likelihood of survival in the wild following reintroduction? The welfare angle is indeed addressed (to some extent) in the book. For example, it is shown that the chances of wild populations in disturbed habitats of successfully adapting to new environments may be related to the levels of personality variation within the populations, since these are related to the degree of genetic variation. Moreover, personality-based screening prior to the adoption of animals from shelters has resulted in improved rates of successful adoptions. This resembles a recent preliminary study that was conducted at an Israeli primate breeding facility for biomedical research (BFC). In that study, long-tailed macaques that were evaluated for specific behavioural traits, such as boldness and exploration, prior to their arrival at the biomedical facility, were reported to be better suited for participating in experiments, compared to unscreened animals. This anecdotal evidence demonstrates how such screening can reduce the number of animals needed for research, and also lower the costs of research. In addition, variation in personality is evident in the ability of individuals to cope with stressors. This coping ability corresponds to basic personality types, and has implications for the individual's health and diseases, and therefore for its welfare. A "proactive coping strategy" is characterised by high aggressiveness, boldness, inflexibility and high emotional activation. These types of individuals have been found to have an enhanced sympathetic and noradrenergic response to stress. On the other hand, a "reactive coping strategy" consists in low levels of aggression, risk aversion and flexibility to changes. Reactive animals show an enhanced parasympathetic activation, and high HPA response. These few examples demonstrate the relevance of the study of animal personalities to many aspects of applied animal welfare, and animal welfare research.

In conclusion, I found the book both interesting (especially parts three and four) and useful. I also enjoyed the interdisciplinary approach to this topic, of integrating behavioural ecology with genetics and psychology. However, I do not consider it to be intended for those who are seeking to learn about the basis of animal personality research. Rather, in order for the reader to gain maximum benefits from reading it, I find it more suitable for those readers who already possess some relevant scientific background.

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Improving Farm Animal Welfare. Science and Society Working Together: The Welfare Quality Approach

Edited by H Blokhuis, M Miele, I Veissier and B Jones (2013). Published by Wageningen Academic Publishers, PO Box 220, 6700 AE Wageningen, The Netherlands. 232 pages Paperback (ISBN 978-90-8686-216-0). Price €54.00, US\$81.00.

Improving Farm Animal Welfare is an edited book based on the findings of the large, six-year EU-funded Welfare Quality project. The ten chapters provide a wide overview of workings and findings of the project. The book aims to provide a "brief but comprehensive" overview of the project, and despite the tendency for this to sound like an oxymoron, succeeds in this aim quite admirably.

Chapter 3 provides a fascinating synopsis of how ethical and societal concerns for animal welfare can stimulate a thriving livestock industry. Chapters 4–7 cover the Welfare Quality vision (chapter 4), principles and criteria (chapter 5), protocols (chapter 6) and assessment (chapter 7). Chapter 8 covers the associated research on improving animal welfare on farms. Chapter 9 covers the implementation of the Welfare Quality assessment protocol. Chapters 1 and 2 offer an introduction which although important for contributing to the entirety of this book, would not appear to cater for the animal welfare scientist readership. Readers needing such a general introduction to animal welfare may find the concise factsheets on the Welfare Quality website more beneficial. Admittedly, though, readers new to the topic who want more information than is available in the factsheets will almost certainly find this book helpful, and may enjoy the basic introductory chapters. It is clear that the editors have focused on rigour in this publication, and the last chapter on "the way forward" is understandably brief and non-speculative, and does not add much to the book.

The Welfare Quality project disseminated its information in a large number of scientific papers, 19 detailed reports, factsheets, popular press releases and conferences. In light of this, the question arises about why an additional book is needed. The Welfare Quality website, in particular, is detailed and so far appears to not suffer from the usual ephemeral nature of this form of publication. Surprisingly, I found the fact that there are so many other sources of information on this project to support the need for a book such as this. The book brings together all of the main findings of the project and recommendations, and instils a confidence in the reader that they have not 'missed' an important aspect. This is aided by the book being relatively brief (210 or so pages) and clearly structured which makes it a fast and user-friendly source of information. Should a reader want to explore topics further, the referencing is excellent and interested readers can easily follow suggestions for obtaining more in-depth information.

In short, the value of this "brief but comprehensive" book is that it provides readers unfamiliar with the Welfare Quality