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Book review

REZNIKOVA, Z. 2007: Animal intelligence. From individual to social cognition

Cambridge University Press, 472 pp., ISBN 9780521532020 (paperback), Price: Pound Sterling 31.99; ISBN 9780521825047, Price: Pound Sterling 70.00

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This book provides a comprehensive review of the evolutionary approach to intelligence. It is perfectly suited for a broad readership, biologists interested in cognition, psychologists interested in the behaviour of animals in their natural environment and, of course, laypersons interested in an easy-to-read compendium of the state of art of cognition research in non-human animals. Zhanna Reznikova is a well-known scientist who has experienced the traditional schools in ethology and psychology, the cognitive revolution and the current attempts to put cognition into context, from an ecological and evolutionary perspective. In this book, she demonstrates her firm knowledge of various theories and a good hand in illustrating her points with lively examples.

The value of the book lies in its integrative nature. Firstly, it not only lists old and new approaches of different disciplines in behavioural biology and psychology but it tries to combine them and/or to reconcile contrasting views, e. g., the debate between innateness and learning. Secondly, it adds relevant studies from Eastern (Russian) scientists to the more widely known Western literature. Thirdly, and probably most importantly, it provides examples from various taxonomic groups, referring to studies on invertebrates such as ants and bees in the same way as to studies on primates, dolphins, pigeons, and parrots. Hence, the book is one of its first to totally avoid the fallacy of a "scala naturae" thinking (humans are the most intelligence creatures, then come apes, other primates, other mammals, other vertebrates and finally the invertebrates). Instead, it puts the emphasis on the notion that cognition is driven by a complex environment, either in the social or physical domain.

One of the consequences of interpreting cognitive abilities as adaptations to specific environments is that sophisticated traits are likely to be bound to the very context in

which they have evolved. The book clearly points out the context-dependency of many cognitive abilities in non-human animals, which stands in quite some contrast to our human idea of intelligence as flexible usage of knowledge. However, the book also stresses that certain environments, such as living in social groups, are likely to select for traits that can be flexibly used across contexts, at least to some extent.

Another point that arises with the evolutionary view of cognition is that, because of similar selection pressures, cognitive abilities of (very) different species may look the same. However, being functionally similar does not mean that the skills in question are based on the same mechanism. Studies on ants, for instance, reveal enormously precise information transmission about the location of food. No question that there is a form of high-level processing going on and indeed the system appears to be functionally similar to those of bees, chimpanzees and even humans. Yet it remains speculative whether or not the skill to inform others about a food source rests on the same type of mental representations in these species. Zhanna Reznikova appears generally cautious with her interpretations; still she applies terms like counting, language, and learning through observation to her ants, which might raise suspicion in some readers. But here we would have the "scala naturae"-type of thinking again: the closer animals are related to us humans, the more willing we are to accept using our (human) terminology for mental processes; thus, "counting" might be acceptable for apes but not for ants. Being well aware of this problem, the author sometimes sarcastically comments on alternatives. Indeed, we do face a dilemma with our terminology: adopted from human psychology, most of the terms are loaded, implying a certain (i.e., our) type of mental representation. Hence, it is critical to bear in mind that functional similarity could, but does not have to, have the same mental basis.

Taken together, Reznikova's book provides a good overview of the field on animal cognition. Its outstanding feature is its integrative nature, conceptually, methodologically and taxonomically. The chapters on invertebrates may stimulate discussions, instigate further experiments and lead to conceptual improvements.