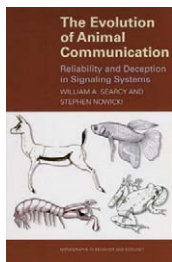


Discriminating customers, honest salesmen

The Evolution of Animal Communication: Reliability and Deception in Signaling Systems by William A. Searcy, Stephen Nowicki. Princeton University Press, 2005. US\$85.00/\$39.50 £55.00/£26.95 hbk/pbk (288 pages) ISBN 0 691 07094 6/0 691 07095 4

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'Truth in advertising' is the subject of this recent monograph and, if the number of publications [1,2] addressing this topic is any indication, honest signaling represents the foremost problem for students of animal communication. Searcy and Nowicki have done an admirable job in gathering, organizing and explaining a complex and expanding array of theory and experimental work. In part, they have

accomplished this by focusing explicitly on the reliability of signals. The authors have also selected a restricted sample of species groups and signals on which to concentrate: avian plumage (especially aspects that appear to be influenced by carotenoid pigments), avian vocalization (in both mating and parent–offspring contexts), frog calls and the appendage displays exhibited by various crustaceans. These are arguably those phenomena that have been probed most deeply, and the various studies provide the authors with the material needed to evaluate the basic hypotheses and their many corollaries. Nonetheless, one could ask whether observations from a more extensive set of animals would have altered any conclusions.

The Evolution of Animal Communication begins by laying out the basic dilemma: if signals are not reliable indications of the state, ability or intention of the transmitter, receivers ought not to attend to them and, because signals are likely to bear some cost in development and/or production, unattended signals should eventually disappear. Thus, a mechanism that ensures honest indication is expected, except in those cases where signalers and receivers have largely overlapping interests. In this situation, the mechanism is intrinsic: it is in the interest of the transmitter to broadcast signals that are by and large truthful. But, elsewhere, it is generally assumed that signals are costly and that inferior individuals (or those with inferior needs) cannot (or should not) bear the economic cost that would be required to send out a false advertisement. With this basic logic, which has been modified by many specifications to suit various social affairs, the question becomes a search for mechanisms that ensure the differential cost. Consequently, much attention is paid to those signals that appear to be honest but do not come with any recognizable cost (e.g. avian badges) and to those cases that involve some measure of deception.

The authors expand upon this framework in three chapters that deal with communication in which the expected level of conflict between the participants is successively

greater. Each begins with a presentation of the relevant theory, followed by treatment of the empirical literature and an assessment of theory as revealed by experimental findings. Recognizing the recent awareness that communication often occurs among networks [3], as well as within pairs, of individuals, a fourth chapter explores the reliability of signals as perceived by third parties and other audiences. I found the writing to be unusually clear and well-balanced throughout. The authors rely on text and simple figures to translate some intricate theory into cogent arguments and hypotheses with definite predictions. That said, several 'mathematics boxes' in addition to the two included might have strengthened some parts. The reporting of the literature is quite fair but not to the exclusion of the authors' (well-informed) opinions where deemed necessary. Appeals for future work in crucial areas are made, and there is an interesting section on the authors' novel work on the reliability factor in the dialects of songbirds.

After reading *The Evolution of Animal Communication*, I felt that my appreciation and understanding of the subject was improved. But I was also left with the feeling, particularly following the section on networks, that behavioral ecologists are masters of generating hypotheses an order of magnitude faster than they can ever be tested. Here, part of the imbalance might reflect what we do not yet know about the perception and cognition side of communication in most species, and the extent to which these factors might constrain reliability. Another issue not touched upon is the potential impact of unpredictable environmental variation, coupled with genotype x environment interactions, on signal reliability [4]: What is the value of signals that indicate reliably when the transmitter has developed in one place and time but not in another, and what sort of signals might be resistant to this dilemma?

That said, *The Evolution of Animal Communication* is a 'must read' for any student of behavioral ecology. It is concise but thorough, and represents our clearest description of a complex area that has seen several major shifts in theory over the past 30 years.

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