

## Amotz Zahavi (1928–2017)



Amotz Zahavi studying Arabian babblers *Turdoides squamiceps*. Photograph by Yossi Leshem. [Colour figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com)]

With the death of Amotz Zahavi on May 12, 2017, we have lost a scientist larger than life. He could fill a room and make attendants listen to his ideas. He received the prestigious Fyssen Prize in 2011 for his contributions to research in the behavioral sciences. Amotz kindly asked my wife and myself to accompany him and Avishag to the front row for prize ceremony in Paris. He was not very fond of dressing up for such events. I still remember that he introduced me to one of the panel members as an “ornithologist just as myself.” In that sense, he was proud of his achievements and for his interests in animals. This was not only words, but also action as he had an active and keen interest in conservation. Without wild animals, there was nothing to study.

I had the opportunity to follow Zahavi in the field a couple of times. Most clear in my memory is Avishag and Amotz's visit to Hoya de Guadix in the plains surrounding the Sierra Nevada Mountains in Spain in 1990. The idea was to discuss our recent evidence consistent with an avian mafia as proposed by Zahavi (1979). We discussed great spotted cuckoos *Clamator glandarius* for several days, but also went to the field. While we were mainly interested in parasitism of corvids in particular magpies *Pica pica* and its determinants, Amotz was wondering why the cuckoos were so noisy and why they vocalized so much. The question of frequent and loud vocalizations and their role in communication between parasites and hosts is still not resolved. Eventually, we published our mafia paper influenced by our discussions with Amotz (Soler, Soler, Martínez, & Møller, 1995). However,

the most memorable event was not the cuckoos but that we were all sleeping in caves in the mountains. The rooms are dug out of the soft rock and connected with a door to the outside. Unknown to us Amotz produced the loudest snoring noises any of us had ever heard reverberating between the rooms. Nobody slept except for Amotz and perhaps Avishag during three days. However, we spent days talking about the signaling value of snoring, and how to account for the clear fitness costs.

Darwin distinguished between natural and sexual selection with the latter accounting for the evolution of extravagant characters such as the train of the peacock *Pavo cristatus*. Zahavi (1975) suggested that such traits may evolve as handicaps with individuals in prime condition developing the largest traits, but still paying the smallest viability costs. That was the basis for the handicap principle which attracted considerable debate and discussion in the scientific community. Amotz was not known to be impressed by the abilities or the value of theoreticians. He relied on logic, simple arguments and examples. John Maynard Smith stated in a plenary lecture at the International Behavioral Ecology Congress in Uppsala, Sweden, in 1990 that he now considered the handicap principle to be a valid mechanism. Amotz famously said in a rebuttal: “I still do not think you understand”!

The ideas about sexual signals as handicaps were part of a general theory about signals and their reliability of information content. This hypothesis could apply to potentially all signals, and Avishag Zahavi and Amotz Zahavi published the guide to handicaps in animals and humans in 1997. This idea was subsequently extended by classifying selection as natural or signal selection, thereby relegating sexual selection to a category of signal selection (Zahavi, 1981).

Amotz was doing research on many subjects well before anybody else. A prime example is his ideas about information and information transfer. This was a famous component of the theory of information centers formulated by Ward and Zahavi (1972). In current jargon, public information could be exploited by animals in social roosts to facilitate localization of sites with abundant food the following day. Just like many of Amotz' ideas, this one created considerable controversy, and by doing so it generated significant scientific progress. In addition, studies corroborating the hypothesis were eventually published in the most prestigious journals.

Amotz Zahavi spent the last years thinking about the role of hormones and physiology for signaling and how the design of these molecules could help enforce reliability in signals. Interestingly these ideas can be seen as the next boundary for signal selection (Weiss & Zahavi 2012; Zahavi & Perel, 2011). Importantly, this approach can be used in Darwinian medicine and for investigating the role of signaling in development of diseases such as cancer (Krakauer & Pagel, 1996).

Zahavi was always surrounded by students who mostly listened or added a comment every now and then. I have only once seen somebody live up to Amotz' way of discussion—Manuel Soler in Spain was able to maintain a dialog with Amotz in a phenomenal exchange of ideas.

Amotz Zahavi will be sorely missed by family, colleagues and friends alike because he is no longer there to present his clear arguments.

Anders Pape Møller

*Ecologie Systématique Evolution, Université Paris-*

*Sud, CNRS, AgroParisTech, Université Paris-Saclay, Orsay Cedex, France*

*Email: anders.moller@u-psud.fr*

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