Supplement to Behavioral Ecology

ISBE International Society for Behavioral Ecology

Newsletter

www.behavecol.com

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Editorial

Society communication

The new ISBE web site has now been up and running for several months and I am very pleased at the response so far. We have had over 20 requests to post conferences and jobs on the website so far and I hope this feature will continue to be used. The website also publishes any media coverage of articles that appeared in *Behavioral Ecology*. So please email me any media piece. Finally, if you think the website could contain additional features, let me know.
For this issue of the newsletter, Ken Otter has provided us with some vintage cartoons from his undergraduate days!

Mariella Herberstein
Newsletter Editor

Contents of this Issue

Contributing to the ISBE Newsletter

The ISBE Newsletter publishes Book Reviews, Conference and Workshop Reviews and Commentary Articles of interest to the *International Society for Behavioral Ecology*. *The ISBE Newsletter will only consider work that is not already published or intended to be submitted for publication elsewhere.*

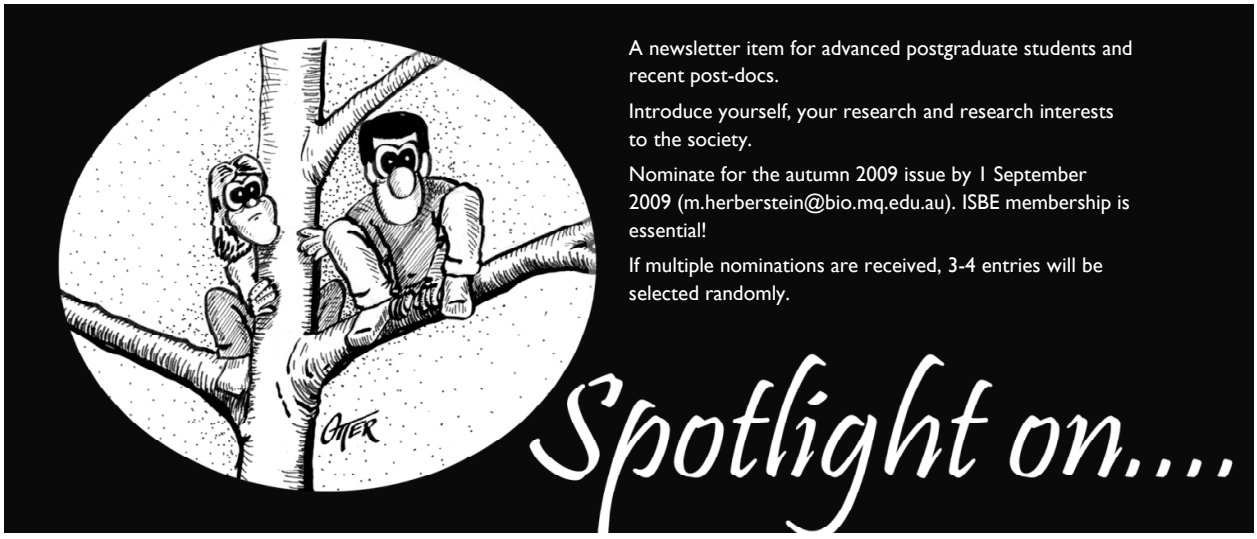
Book Reviews: Reviews are generally solicited by the Editor as new books arrive at the office, and are deemed to be of interest to the society. Persons involved in the publishing of books who would like these to be considered for review in the Newsletter may contact the Editor and arrange for their publisher to forward a review copy to this office. Authors may submit a list of possible reviewers. Alternately, members who wish to review a particular text should contact the Editor. The Editor will provide reviewers with instructions and a style sheet. Reviews are typically 1500-2000 Words.

Workshop/Conference Reviews: Workshop and/or Conference reviews should be prepared in one of the following two formats. ***Brief synopses*** (max 1500 words) may be submitted by either participants or conference organizers at the regular newsletter deadlines. These can include synopses of workshops that will be published in more detailed accounts (book or special journals), and should include information as to where the information will be published. ***Longer reports*** (max 3000 words) will be considered from large workshops/conferences for which other publications are not stemming. The purpose of the latter format is to provide a venue to disseminate information and discussions that would otherwise not be available to non-conference participants. Anyone attending such a workshop and wishing to publish in the Newsletter should contact the Editor at least ***one month*** prior to submission deadlines. Reports should aim at a critical assessment of the conference, as well as a synthesis of the convergent ideas presented. A synopsis of future directions of research that were reached at the end of the conference should also be included. Anyone attending the workshops may submit reports, but preference will be given to submissions not authored by conference organizers. A single application for a workshop will be considered, so it may be appropriate to agree upon a reporter at the conference. Graduate students and postdocs are strongly encouraged to consider contributing to writing these reports.

Commentaries: Responses to commentary articles published in the newsletter or articles eliciting discussion on topics relevant to the society will be considered for publication. Authors of such articles should contact the Editor at least ***one month*** prior to regular submission deadlines to outline the content of the article. The Editor may request submission of the article earlier than regular deadline should outside reviewing be deemed necessary.

Cartoons: Cartoonists and other artists are encouraged to submit artwork, either in hardcopy, or as TIFF or high resolution (300 dpi) GIF files. All cartoons published in the newsletter will be credited to the illustrator, and will appear on the Newsletter's website (*www.isbe.com*).

Deadlines for submission to the Autumn newsletter will be 1 September 2009.



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Society News

Most Society News – workshops, conferences and job postings – are publicised on our website (www.behavecol.com). This allows ads and announcements to be posted shortly after receipt so that deadlines falling between newsletter distributions can be advertised. If you would like to advertise workshops, conferences or job postings of interest to the society, contact Mariella Herberstein

OBITUARY: RICHARD ZANN

Richard Zann, his wife Eileen and daughter Eva died in the bushfires at Kinglake, Victoria, Australia on Saturday 7th February 2009. See page 5.

NEW ISBE WEBSITE

The new ISBE website is now live on www.behavecol.com. Please contact Mariella Herberstein (m.herberstein@bio.mq.edu.au) if you want to post jobs or PhD positions or advertise a conference or meeting.

ISBE 2010 CONGRESS

The thirteenth congress of the International Society for Behavioral Ecology will be held in Perth, Australia, September 26th to October 1st 2010. http://isbeperth2010.com

WORKSHOPS AND MEETINGS

Conferences of other societies or workshops that may be of interest to the Society's members can be advertised on the Newsletter website (contact Mariella Herberstein for posting). Titles and dates of conferences are listed on page 18 and will be posted on the webpage (www.behavecol.com).

MEMBERSHIP AND SUBSCRIPTION OPTIONS

Subscription to *Behavioral Ecology* is no longer required to be a member of the *International Society for Behavioral Ecology*. Everyone now has the option to join the society without taking a subscription to the journal. Such memberships will receive the Newsletter and announcements for the biennial conference. For those who wish to continue their subscription to *Behavioral Ecology* as well as be a member of the society, this option is also available. Information on how to join the ISBE can be found on the ISBE website (www.behavecol.com) and Oxford University Press' *Behavioral Ecology* webpage (beheco.oupjournals.org).

DONATED SUBSCRIPTION PROGRAMME

Please help colleagues in need. Every donation will help increase scientific contacts across the world. For details, see the advertisement on the inside back cover of *Behavioral Ecology* volume 12(4).

JOB AND STUDENTSHIP POSTINGS

As the newsletter is only published twice a year, it is unsuitable to publish current job or student postings. Instead, these are published on the society's webpage: **www.behavecol.com**

If you wish to post an advertisement for faculty, postdoc, graduate student, or field assistant positions please email Mariella Herberstein (m.herberstein@bio.mq.edu.au).

In Memoriam Richard Zann

With great sadness we must report the premature and tragic death of our friend and colleague Associate Professor Richard Zann (64) who was killed along with his wife Eileen (62) and daughter Eva (25) in the Victorian bushfires at his home in Kinglake, Victoria, Australia on Saturday 7th February 2009.

Richard completed his PhD in 1972 studying the evolution and behaviour of grassfinches in Northern Australia under the mentorship of Jiro Kikkawa at the University of Queensland. He moved to La Trobe University (Melbourne) in 1972 and remained there for the rest of his career.

Richard Zann is best known internationally for his work on the zebra finch *Taeniopygia guttata*, one of the most widely used captive models in vertebrate behavioral ecology. Richard initiated long-term studies of this species in Victoria and the deserts of the Australian centre, in an effort to understand 'how the zebra finch worked' in its natural environment. Richard's research provided vital context for those conducting the high profile experimental work on captive and domesticated birds in Europe and North America that have made this species of wider importance to the field of behavioral ecology.

Richard was always very welcoming of collaboration on this species and freely provided time, advice, samples, and birds, to others around the world. In addition, over the past 30 years he has hosted generations of scientists, at La Trobe, in the field, and at his home.

The importance of the zebra finch as a model system today is largely due to Richard's generosity and enthusiasm and his comprehensive monograph on the species 'The zebra finch: a synthesis of Field and Laboratory Studies' published in 1996 by Oxford University Press.

In 1998 Richard was awarded the D.L. Serventy Medal of Birds Australia for his outstanding contribution to ornithology.

As a final tribute to Richard's legacy La Trobe University is establishing an undergraduate scholarship for a top student from a rural background interested in pursuing a career in Zoology. Colleagues wishing to contribute to this important memorial in Richard's honour should visit (http://webpay.latrobe.edu.au/onestop/tranform.cgi?TRAN-NO=816) and fill out the form, ensuring that in the Donation Information section of the form under "Other" they specify their donation is towards the Richard Zann Memorial.

Richard set us an example not just as a scientist but also as a family man who managed to balance the demands of an academic life with devotion to his wife and children, whom he clearly adored and who clearly adored him. One could not ask for a finer colleague, mentor and friend.

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Selected papers:

Mäntylä E, Alessio GA, Blande JB, Heijari J, Holopainen JK, Laaksonen T, Piirtola P, Klemola T. 2008. From plants to birds: higher avian predation rates in trees responding to insect herbivory. PLoS ONE 3(7): e2832

Mäntylä E, Klemola T, Sirkiä P, Laaksonen T. 2008. Low light reflectance at the visible range may explain the attraction of birds to defoliated trees. Behav Ecol. 19: 325–330

Mäntylä E, Klemola T, Haukioja E. 2004. Attraction of willow warblers to sawfly-damaged mountain birches: novel function of inducible plant defences? Ecol Lett. 7(10): 915–918

Name: Frederic B Muratori
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Research interests: host/parasitoid interactions, optimal foraging, host defense, group living
Selected papers:

Muratori FB, Damiens D, Hance T, Boivin G. 2008. Bad housekeeping: why do aphids leave their exuviae inside the colony? BMC Evol Biol. 2008, 8:338

Muratori F, Boivin G, Hance T. 2008. The impact of patch encounter rate on patch residence time of female parasitoids increases with patch quality. Ecol Entomol. 33: 422-427.

Muratori F, Le Ralec A, Lognay G, Hance T. 2006. Epicuticular factors involved in host recognition for the aphid parasitoid *Aphidius rhopalosiphi*. J Chem Ecol. 32:579-593.

Name: Katherine L. Barry
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Selected papers:

Barry KL, Holwell GI & Herberstein ME. 2008. Female praying mantids use sexual cannibalism as a foraging strategy to increase fecundity. Behav Ecol. 19:710-715

Barry KL, Holwell GI & Herberstein ME. 2009. Male mating behaviour reduces the risk of sexual cannibalism in an Australian praying mantid. J Etho. 27(2): in press

Holwell GI, Barry KL & Herberstein, ME. 2007. Mate location, antennal morphology and ecology in two praying mantids (Insecta: Mantodea). Biol J Linn Soc. 91:307-313

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Research interests: animal group behaviour, human social behaviour, fish social behaviour, social organization, animal navigation, collective intelligence.
Selected papers:

Thomas POR, Croft DP, Morrell LJ, Davis A, Faria JJ, Dyer JRG, Piyapong C, Ramnarine I, Ruxton GD & Krause J. 2007. Does defection during predator inspection affect social structure in wild shoals of guppies? Anim Behav. 75:43-53

Alternative careers in behavioral ecology

Are research and academia the only avenues following a PhD in behavioral ecology? To answer this question, I ran a quick poll of 54 ISBE members asking them which jobs their graduate students pursued after their doctorate qualifications. Of those members that replied, employment details were given for 87 behavioral ecologists. Approximately 84% stayed in academia or are working in research organizations and the remaining 16% chose alternative careers (Table 1). Similarly, a poll run by Claudia Fichtel (unpublished data) in Germany showed that, two years after their PhD graduation, the greatest proportion of behavioral ecologists had remained in academia, though fewer than in this survey. Consequently, a greater proportion of graduates had changed careers (Table 1).

Clearly, many PhD students remain in academia, but for those that do not, the ability to identify core skills that are applicable in a wider job market is essential. When trying to identify a new career path, career advisors encourage prospective job seekers to identify their motivations and key strengths. PhDs typically comprise a core set of skills (Table 2), including scientific writing and data analytical skills. However, in any list of skills, there are some that are less common (Table 2), and for employers (academic and non-academic) these ones may make the prospective job seeker stand out from the crowd. They also provide him/her with wider opportunities to pursue varied careers.

The opportunity for developing certain skills may not always be there, such as the financial management of a project. However, others skills can be developed and the opportunity to do so exists already. Most universities run postgraduate development programs that offer many courses but, from personal experience, uptake from postgraduates can be poor. Some universities and research centres also run *ad hoc* courses that provide training for particular statistical programs or specialist software. The *Centre of Excellence* program of the European Union identifies key organizations that provide training for postgraduate students and early stage researchers.

In conclusion, career paths after a PhD are diverse and a PhD offers a good skill base to pursue a diversity of careers. The emphasis however should be on increasing skills outside the norm, thereby maximizing your options to build a career outside of academia.

Graziella Iossa is a postdoctoral scientist, but is also a freelance scientific editor and translator:
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Acknowledgments
I would like to thank Dr Claudia Fichtel for providing her questionnaire data and all the respondents to my poll.

Further information

Websites

www.jobs.ac.uk/careers
www.prospects.ac.uk
www.vitae.ac.uk

Books

Borchardt JK. 2000. *Career management for scientists and engineers*. Oxford: Oxford University Press

Ali L, Graham B. 2000. Moving on in your career: a guide for academic researchers. London: Routledge.

Table 1: Summary of jobs PhD students have gone on to have.

	This poll (*n*=87)	**Claudia Fichtel (*n*=202)**
Academia	84%	39%
Teaching	4%	11%
Economics	0	11%
Analytical (data analysis, report writing, consultancy)	8%	Not clear
Journalism	0	5%
Other	4%	16%
Unemployed/parental leave/unknown	0	18%

Table 2: Summary of some skills acquired during the course of the PhD based on www.prospects.ac.uk

Skills	**Most PhDs**	**Some PhDs**	**Less common skills**
Scientific writing	×		
Data analytical skills	×		
IT skills	×		
Presentation and interpersonal skills		×	
Project management		×	
Financial management			×
Foreign languages			×
Website design and setup			×

ISBE Conference Research

Cultural transmission of modified name taggery

Communication is a regular theme at our ISBE meetings. For example, at the 2002 ISBE meeting in Montreal, Louis Lefebvre (McGill University) described how communication, intentional or scrounged, can lead to the phenomenon of cultural transmission. The classic story is that of European parids learning to puncture foil caps that historically graced the tops of milk bottles. (The senior author points out: "Yes, youngsters: milk did not always come in bags or cartons.").

The topics of communication and cultural transmission resurfaced at the recent (and excellent) ISBE meeting at Cornell in August 2008. Early in the meeting, many of us independently perceived that participants were frequently engaged in modified name taggery (MNT). An opportunity presented itself to study cultural transmission of MNT. We thank Marty Leonard and Andy Horn (Dalhousie University) who catalyzed a summit wherein the authors laid down plans for data collection, and Sandy Vehrencamp (Cornell University) for feedback on our Nobel-worthy contribution.

Beginning on Sunday 10 August, on each evening, we randomly assessed whether passersby had nametags that were modified or not. We apologize if ventral areas of ISBE participant were scrutinized too closely during poster sessions; scrutiny was particularly intense by YV who had forgotten his glasses at home. Some individuals were probably multiply-sampled, but we doubt that this would be biased for one group.

At one extreme, the senior author has long been a proponent of an easily-read name tag, and arrived with a tag that is the outcome of years of runaway selection on ever-deteriorating senses (Fig. 1). Deteriorating senses can lead to increasing injury if one peers too closely at name tags, and the senior author was tired of slapping peering peers. A less extreme improvisation was to take the name tag out of the bag that was provided at the conference, and put that over the top of the badge (Fig. 2). Other improvisations included using a highlighter, darkening the name under "ISBE", rewriting the name in the white space above ISBE, taping a brightly coloured name above the badge, or a combination of these. We did not generate sufficient data to analyze all of the forms of MNT, and so restrict ourselves to the question of how the frequency of all MNT changed over time. Proportions of MNT for the population as a whole increased early in the conference, and then asymptoted (Fig. 3). However, females appeared to continue to modify their badges as the conference wore on (Fig. 4).

Why did an asymptote occur at approximately 40% of participants? We provide a partial set of hypotheses. First, participants were too lazy or did not care. Second, participants could not conceive of sufficiently novel MNT and did not want to be perceived as unoriginal sheep (whatever those are). Third, participants did not crave attention, or perceived themselves as already being too easy to recognise, or hoped that they would be mistaken as someone recognisable (which is a bit circular). Fourth, participants did not believe in, or were incapable of, social learning (which would be a bit troubling for our society). Multiple hypotheses could apply to individuals, and direct questioning of participants should be a future research avenue.

Although the patterns are interesting, we do not have much evidence for social facilitation (which would produce a function with a positive second derivative, because each modified tag should elicit more modifications and thereby accelerate rates of modification). Whereas further study is needed, publication of this note will taint the work of future researchers because the enormous audience we will reach will now have heightened awareness of the potential for covert scrutiny.

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Department of Zoology, Tel Aviv University, Israel

Fig. 1. Runaway selection on name taggery in the visually challenged senior author.

Fig. 2. One of the common patterns of modified name taggery and that used by the second author.

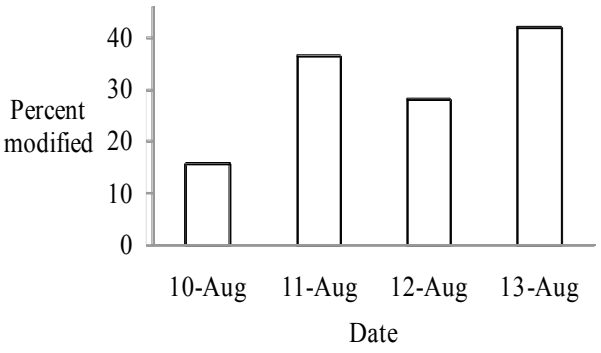

Fig. 3. Overall pattern of modified name taggery for 4 days of the 2008 ISBE conference. Sample sizes are 148, 219, 25, and 212, respectively.

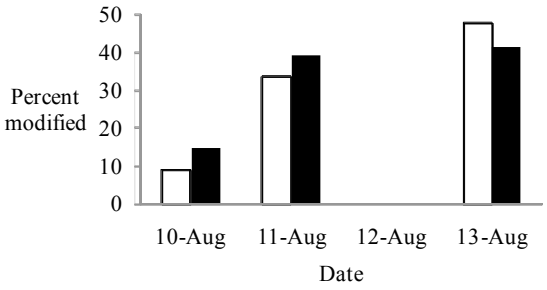

Fig. 4. Pattern of modified name taggery by sex (females open bars, males filled bars) for the 2008 ISBE conference. Sample sizes are 54, 88, 0, and 67, respectively for females, and 66, 99, 0, and 82 for males.

Workshop review of: Gender perspectives on the development of sexual selection theory, Uppsala, October 2008

"Despite, or perhaps just because, of my initial skepticism towards gender-issues, I found the workshop extremely fruitful. I feel that my view of sexual selection and reproductive biology in general has undergone a massive paradigm change that is bound to result in better understanding of these phenomena. I doubt I would have ever reached this insight without the workshop." (Feedback from a workshop participant)

What is a gender perspective? Our colleagues have asked whether only women were expected at the workshop, which may reflect the confusion around the term. Gender perspectives in biology are multifaceted. They can be about discrimination of women in academia, whether women and men do science differently, how we apply human stereotypes of femaleness and maleness on nature, or how to be gender-neutral in theory and research practice. By aiming for gender-neutrality, we do not mean to be blind to differences between the sexes or assume that there are no differences. We merely want to keep our scientific work open to what sex means in our study systems.

Sexual selection is a vivid field of science. The perspective of female choice and male-male competition is, however, often taken for granted. How come? Basically we know that a less constrained and more dynamic perspective will emerge if we face up to the fact that both sexes are choosy and competitive. We want to highlight the variation found in nature, instead of imposing a norm on sexual selection and labeling everything outside this norm as exceptions. We are convinced that we will obtain more objective research (and thus better, in every sense of the word) if we can move beyond our own biases.

A one-day workshop on "Gender perspectives on the development of sexual selection theory" in Uppsala, Sweden, at the Evolutionary Biology Centre in October 2008 gathered about 20 scientists. The participants represented a high diversity, in terms of academic level, research organisms, and the kind of questions in sexual selection they worked on. Distinguished Prof. Patty Gowaty was keynote speaker providing us with *A historical perspective on the development of sexual selection theory*. She reviewed the theory development with some emphasis on how research on females has been neglected, but also pointing out that neutral models have been missed out. Further, Gowaty built a tree of the field of sexual selection, with Darwin (1859), Bateman (1948) and Trivers (1972) growing as the main stem from which important branches could be identified.

Darwin (1859) emphasised that the within-sex variation in reproductive success is what matters (the very definition of sexual selection) and Darwin himself held the broader view that sexual selection is actually more than just male-male competition and female choice. For a long period, narrow sense sexual selection has focused on sexual selection acting on males (male competitive traits and female preferences for ornamental traits), implying the evolution of *genes for* coy passive females resulting in low variance in number of mates and *genes for* ardent competitive males with high variance in number of mates. We now know that sexual selection on females is not an exception; rather it appears in any system. Females compete for access to mating; both when sex-roles are conventional and reversed, males perform mate choice, females fight over maternity assurance etc. It is of great general interest to explore all these processes and under what circumstances different processes predominate in one or the other sex.

In the organized group discussions that ensued we debated whether it would be possible to reach gender neutrality in sexual selection theory, where we do not have biased assumptions about what being female or male implies. We agreed, of course, that the definition of the sexes (anisogamy) in itself incorporates an initial inequality. The question of whether it is possible to de-couple effects of sexual selection and anisogamy lead us to the interesting idea of studying sexual selection in isogametic species.

Moreover, we all agreed on the importance of language and how we use words, because it forms our thoughts. Theoretical phrasings could, for example, benefit from avoiding sex labels; the terms should be mating competition (not male competition), mate choice (not female choice), gamete competition (not sperm competition), etc. when discussing general phenomena. It may also be noted in this regard that, for instance, Trivers (1972) used "in one sex" and "in the other sex" in his writings. Some participants argued that ignoring the definition of sex would render it difficult to identify cases where anisogamy is responsible for secondary sexual characteristics. Other participants stated that the gamete size difference defines the male and female sexes, and thus should not be ignored, but that in principle all other traits are variable and flexible within as well as between the sexes. Also, the generality of the causality implied in Triver's (1972) parental investment

argument, that sexual selection is a consequence of sexual differences in parental investment, should be questioned as it may very well be the other way around, that sexual selection results in differences in parental investment. This has been recently suggested, both based on theoretical arguments (Kokko and Jennions 2008), and on results from a phylogenetic study on cichlids (Gonzalez-Voyer et al. 2008).

There were also discussions on whether sex and gender mean the same or embrace different contexts. Most biologists were happy to continue using sex as a term of definition. However, whether gender, being different from sex, has a place in biology was a question that was vividly discussed and is open for further input. Differences and similarities between the cultural and natural sciences in the use of *gender* and *gender perspectives* would also be interesting to explore further. Though, the discussion groups agreed that the question of gender awareness is important. Male and female researchers sometimes choose different questions and we all carry biases that may or may not constrain our views.

Prof. Gowaty gave a second presentation where she presented a model of how differences between the sexes can emerge from primarily ecological decisions. In contrast to classical models in sexual selection that use specific assumptions for males and females, the presented model focused on individuals and not on assumed sex differences. The model indicated that it all can come down to three variables – survival, latency and encounter probabilities – as well as underlying fitness distributions (Gowaty and Hubbell 2005). These variables induce choosy or indiscriminate behaviors. By using this model it would be possible to separate between variance in fitness due to chance effects and variance due to sexual selection. The fact that chance effects can have an important impact and that individuals in many cases are constrained in their decisions/choices were highlighted. Thus, compensatory reproductive behaviours/allocations or rejections, when individuals are left to mate with less preferred partners, can also be expected (Gowaty 2008). The fact that individuals are flexible in their behaviour may thus matter in sexual selection more than is usually acknowledged.

Discussions also centred on the historical pathway of how a female perspective in sexual selection has entered and increased in empirical work and theory from the 1970‘s to today. The insights that females may control and confuse paternity (Hrdy 1977) have been important, and research on what is termed cryptic female choice has been vivid the last years. Thus, focusing on females has become more important and has shown that females may fight over mates or maternity assurance. This has broadened our perspectives to give a more resolved view on the variation in the sexual selection processes.

In the workshop it was argued that it is now time to approach sexual selection in a more gender-neutral way. This may result in finding sexual selection in the sex where it initially may not have been expected. We discussed the importance of making observations of individuals, not sexes, without an *a priori* expectation that the observations should aggregate into two groups. Any experimental/observational study on mate choice, mating competition, gamete competition should preferably be mirrored and thus carried out for both sexes. At the very least, the options open to both sexes should be considered initially and the rationale for why it is only interesting to investigate one sex should be clarified. Consequently, differences as well as similarities among individuals of both sexes should be investigated with awareness on how gender views may influence both science and scientists.

Finally, we were all given the opportunity to summarize what the workshop had given us. Comments ranged from recommendations of study systems (hermaphrodites allow quantitative studies of sex) and experimental design (mirror all experiments and observations of the two sexes), to political considerations of the importance of being gender neutral when designing and implementing research, to happiness over being part of a stimulating future. It was a highly stimulating and mind-boggling workshop with many interesting discussions, ideas and directions for future work.

Acknowledgements

We gratefully acknowledge the GenNa-project (www.genna.gender.uu.se/Animals/Events/Sexual_selection/) for funding the workshop and promoting transgressive encounters. P. Gowaty and S. Hubbell, in particular, contributed to stimulating broad perspectives, and all participants contributed by providing different perspectives and expectations on what a gender perspective is and how to implement it.

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References

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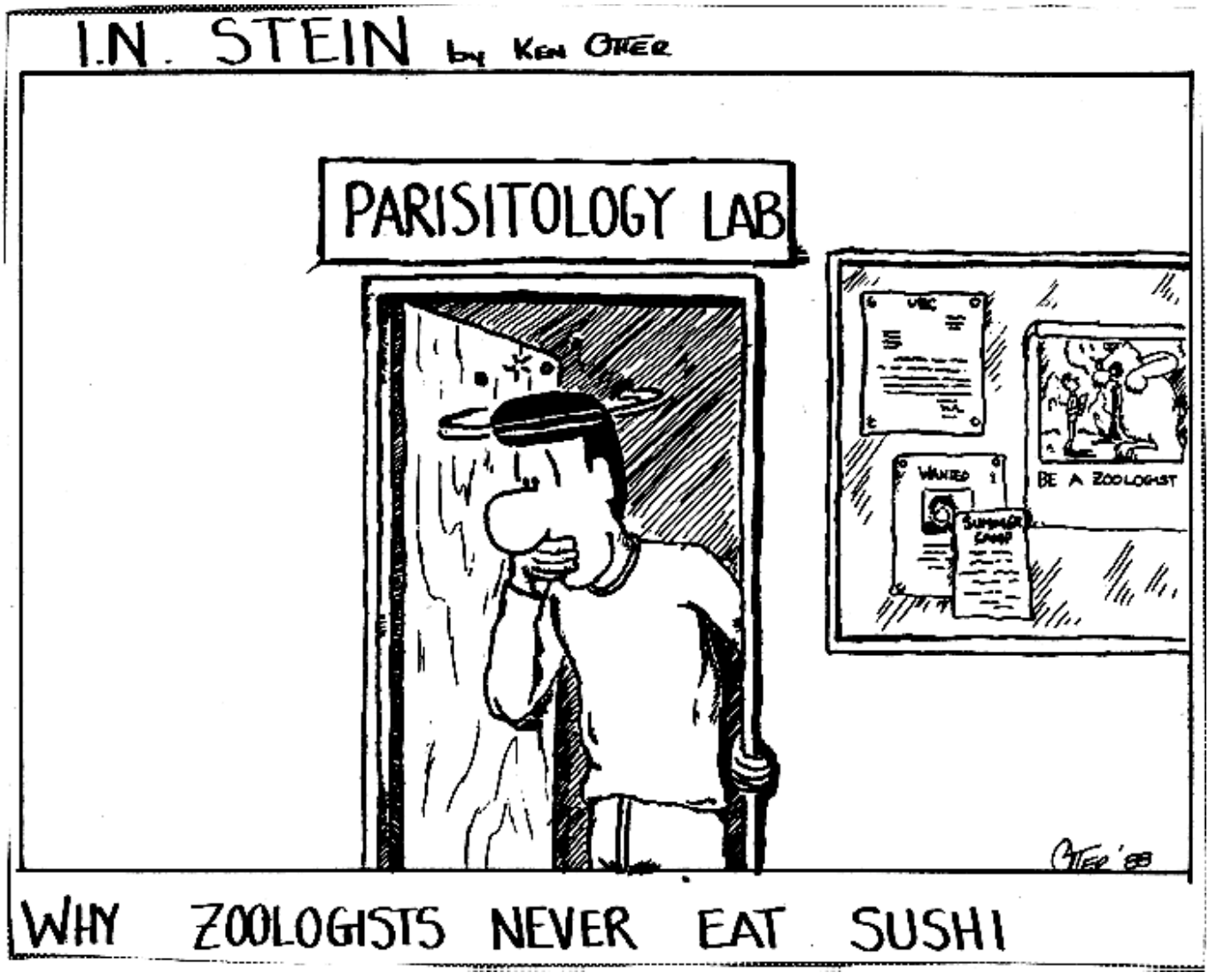

Book Reviews

Sociobiology of communication: An interdisciplinary approach

Edited by: Patrizia d'Ettorre and David P. Hughes 2008. Oxford University Press. 320 pp.
ISBN 978-0-19-921683-3 (Hardcover) ISBN 978-0-19-921684-0 (Paperback)

This book has an impressive and worthy aim, to identify the underlining principles of communication, both within and between individuals, over a broad array of taxa. There is a need for a book of this kind, as researchers can all too easily become insular with their research focus, particularly as the sheer volume of results being published rises each year. Thankfully, this book largely accomplishes its aim. The broad array of taxa covered ranges from examples assessing intra-genomic conflict through to communication in the super-organisms formed by colonial eusocial invertebrates. In many cases examples of communication are highlighted that are not always obvious, such as that between bacteria or within organisms.

Chapter 1 (Zahavi) examines the handicap principle as it relates to communication, investigating via first principles how communication systems generate insight into the paradox of altruism within societies. Admirably, this is achieved in two systems that are just about as diverse as one can get: slime moulds and Arabian babblers. Unfortunately the work on babblers suffers from a lack of new data investigating this area, instead relying on results that have been difficult to replicate and unpublished M.Sc theses. Zahavi concludes this section by suggesting that the evolution of altruism via cooperative acts indicating quality is so simple that verbal models are sufficient for its acceptance. I lack Zahavi's conviction here, several lines of evidence suggest that signal-based helping is not necessarily straight-forward, particularly in family-based groups where kin-directed helping could cloud signals of quality (e.g. Wright 2007). Dominance hierarchies further obscure any potential for signaling quality, issues modelers would do well to investigate.

Chapter 2 (Diggle *et al.*) examines chemical signaling via quorum sensing (QS) in bacteria. QS is a process whereby an accumulation of signaling molecules in the environment allows the density of other bacteria in the medium to be assessed, thereby making coordinated responses possible. Informative examples are provided with reference to work on bioluminescence in squid. The chapter covers intraspecific, interspecific and even inter-kingdom communication. Chapter 3 (Matessi and colleagues) has the feel of a textbook chapter, introducing social and communication networks as important tools for understanding communication. This chapter highlights the important point that communication over a network can occur in multiple modalities (i.e. visual, acoustic, chemical and so forth). They further describe the rainbow networks model, where a time element and also different forms of activity can be visually displayed for further analysis. This helps to introduce the reader (with accompanying mathematical arguments) to the complexity of communication, and highlight important tools for researchers in this field.

Chapter 4 (Nash and Boomsma) examines how primarily insect societies are able to resist both external and internal attempts at parasitism of societal benefits, essentially discussing how communication channels are (or might be) hijacked. The next two chapters examine chemically-based communication, first in insects via pheromones (d'Ettorre and Moore) and then scent-marking in rodents (Hurst and Beynon). These chapters enforce the assertion that chemical communication is likely to be as complex as that found in any other signaling modality. To round out this chemical/olfactory section, Chapter 7 (de Brito-Sanchez) provides an interesting synopsis of the neurobiology of honeybee olfactory-based communication.

Chapter 8 (Zuk and Tinghitella) changes focus to suggest that we can anticipate rapid evolution of behavior, despite few pertinent identified examples to date and the potential constraint of both receiver and signaler evolution being required. Importantly, signals provide an ideal testing ground for Balwin effects (where phenotypic plasticity becomes incorporated into genetic repertoires), an area of research the authors point out may assume increasing importance given the rapid changes forecast by many climate change models. Chapter 9 (Roberts) is the first concentrating primarily on humans, and is one of the more entertaining reads in the book. The focus is upon physical features as signals of individual quality, with discussion of kinesic-based information as an area that could provide a useful source of information in the future. Some of the presented data I found to be personally alarming, not least of which was the revelation that dancing ability in males is a reliable indicator of individual quality (ability is correlated with body symmetry and thus attractiveness to females). In addition, this gem of a chapter also introduces work from a team that perhaps

should run workshops on grant writing techniques: successfully funding a project where public bars became their 'field sites'. Truly admirable work!

Chapter 10 (Hughes) discusses the extended phenotype (Dawkins 1982) and refreshingly takes a look at various levels at which colonial interactions might be occurring (e.g. individuals, colony and so forth). Moreover the point is made that it is just as important to examine which individuals refrain from helping as those contributing aid. The super organism theme is continued in Chapter 11 (Sumpter and Brännström) that focuses upon the feats accomplished by colonies that individuals cannot replicate. Rather than becoming bogged down in the current levels of selection debate, this chapter concentrates on the costs and benefits of cooperation to generate testable predictions. Using data on the foraging success of honeybees and in particular ants laying pheromone trials the authors highlight that success is not a linear function of group size. Chapter 12 (Haig) examines intriguing questions regarding internal conflict, such as whether deceptive signals are possible *within* an individual via a fractious genome. The book returns to humans in Chapter 13 (Crespi), intriguingly discussing the advances that can be made in the study of language by focusing on individuals afflicted with autism or schizophrenia. Chapter 14 (Hurford) investigates some of the more important differences and similarities between human and non-human communication systems. Unfortunately this chapter suffers from a patronizing tone by consistently stating that human systems are superior. This was irksome and a matter of perspective, for example those working on eusocial systems might challenge the expressed view that a human level of cooperation is the pinnacle. Further, the evolutionary view of linguistics presented is flawed; hybridization of languages leads to increased diversity *within* but not *between* languages as is suggested.

The penultimate chapter (Riboli-Sasco *et al*.) discusses a question many academics may well be asking themselves at this time of year: Why teach? The chapter takes a refreshing modeling-based approach that broadly defines teaching as information transfer. The final chapter (de Sousa) is perhaps misplaced, as it essentially is a philosophical examination of the definition of communication, signals, cues and so forth. This chapter would have been better presented initially. While heavy going in places, it is entertaining and insightful.

The book contains a good mixture of new data that is presented and review-type chapters. Throughout the focus is primarily upon invertebrates and, in particular, eusocial insects, which presumably is an extension of the editors biases. Coupled with several chapters on humans, these biases tend to reduce the spread of hypotheses examined concerning how communication might underpin cooperation. Many chapters deal predominately with kin selection (primarily important to eusocial insects) and reciprocal/reputation-based hypotheses (often observed in humans), with little attention given to equally important pathways, particularly for vertebrate societies, such as group augmentation theory. The exception here is Chapter 11: 'When group success increases more than linearly with group size, co-operative signaling can evolve without kin selection or reciprocity', a statement other authors would have benefited from considering.

There are other small problems throughout the book, such as confusion over what are levels of selection versus pathways by which selection acts (Concluding remarks). However, on the whole the book contains an admirable combination of theory and empirical data examining both the ultimate and proximate mechanisms that shape communication. It contributes to the growing body of work that emphasizes the advantages of integrative approaches and the flow of ideas across disciplines. This is perhaps the book's most important contribution to the field. I would thoroughly recommend it as an important read for postgraduates and academics in this field, particularly lending itself to postgraduate discussion forums. Now, if I can just improve my dancing 'skills'…

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Alternative Reproductive Tactics (ARTs) – An integrative approach

Edited by Rui. F. Olivierea, Michael Taborsky & H. Jane Brockmann. Cambridge University Press, 2008. 507Pp.
ISBN 0521832438, 9780521832434

Alternative Reproductive Tactics or ARTs – referring to alternative ways of obtaining fertilizations in both males and females, remains a fascinating topic in behavioral ecology. ARTs encompass traits that are selected to maximize fitness in two or more alternative ways. These traits are studied in the context of intraspecific and intersexual reproductive competition and include behavioral alternatives, dimorphic morphological structures, size dimorphisms, or color polymorphisms. Importantly, the alternative phenotypes should be discontinuous and hence mutually exclusive. This book provides a detailed and comprehensive review of variation in such discontinuous traits and their underlying selective forces with the aim of understanding proximate and ultimate explanations that result in alternative ways of achieving similar functions.

Most frequently, ARTs involve males (although females also exhibit alternative reproductive tactics), and encompass bizarre traits such as female mimicry, forceful copulations versus courtship, or sneaker strategies versus territory holding. The latter is for example common when there is also intra-sexual size dimorphism and large males defend territories and gain copulations by winning male-male interactions. Under these scenarios small males adopt a sneaking strategy and attempt to steal copulations rather than engage in combat. One striking feature is that one strategy often appears to be less successful than the other, outlining the core of the problem: How is large and consistent variation in reproductive behavior maintained within one population? What maintains particular frequencies of alternative tactics in the population when competing strategies experience differential success, since we would expect the winning strategy to outcompete the less successful strategy through natural selection?

The book consists of four main themes featuring 20 contributed chapters from experts in the field covering some 500 pages. The first part explores ultimate causes and origins of ARTs. Understanding the evolution of two or more alternative phenotypes within a population, requires knowledge about decisions of phenotype allocation, and how these decisions are shaped by natural selection. Of particular interest is the degree of flexibility and rigidity of alternative phenotypes, and whether the expression of a phenotype is condition-dependent, under frequency dependent selection, or shaped by gene-environment interactions. Alternative traits evolve when there is disruptive selection, or when the environment is heterogeneous with more than one adaptive peak. Phylogenetic analysis suggests that ARTs are unstable over evolutionary time, and rarely become incorporated as fixed traits of a lineage, although recurrent similar forms of ARTs are common. The persistence of multiple ARTs within a population, when alternative tactics are mainly environmentally determined, clearly presents a challenge for theoretical understanding. This challenge is met in dynamic game-theory modelling of behaviorally regulated traits to develop ARTs theory. Such modelling requires integration of properties of physiological state, environmental and temporal conditions, and frequency- and density-dependent effects of pay-offs from each tactic, for the understanding of the evolutionary trade-offs associated with the choice among alternative mating tactics. The attempt to establish a link between theory and data and address the concordance between model predictions and empirical patterns is a general theme of the book.

The second part examines proximate mechanisms of ARTs. In many populations, ARTs are shaped primarily by the environment and show strong condition dependence, and only occasionally are ARTs determined by specific alleles. High sensitivity to the environment including abiotic conditions, population density and the relative frequency of expressed alternatives in rival individuals is indicative of high phenotypic plasticity and facultative expression of ARTs. Insights into neural and endocrine mechanisms underlying reproductive tactics are derived from detailed studies of vertebrates. The great diversity of alternative tactics and context-dependent expression of ARTs leaves a more general framework of underlying proximate mechanisms open for further investigations.

The third section contains a comprehensive taxonomic review of ARTs, with a wealth of fascinating examples in insects, crustaceans, fish, reptiles, amphibians, birds and mammals. This section comprises a major part of the book featuring eight chapters, many of which contain detailed tables of case studies providing excellent overviews. The section is somewhat heterogeneous, as the various taxonomic groups are differentially represented in the breadth of taxa and level of detail. Fish as a prevailing model system is given considerable space while reptiles and birds are presented in much less detail. While this is likely to reflect both biology and differences in the level and

intensity of research received among taxonomic groups, the approach of various authors also differs. Some chapters represent broad taxonomic reviews, while others, in particular that on reptiles, primarily presents work on a single study species – side-blotched lizards.

It is clear that ARTs are extraordinarily common and take on highly different forms, and therefore it is particularly fascinating to learn how alternative tactics between different species show striking similarities and astonishing convergence.

The final part of the book (Part IV) brings together emerging perspectives on ARTs, however in somewhat different frameworks. One is the application of concepts derived from communication network theory for understanding signal evolution in species with ARTs. The role of paternal care and trade-offs with indirect genetic benefits for the maintenance of alternative tactics is analysed in a modelling approach. The role of intersexual interactions for the evolution of ARTs are further discussed, examining how ARTs can lead to intersexual conflict, and also how conflict between the sexes can lead to alternative reproductive tactics within a sex. The penultimate chapter considers cooperative breeding in birds as an ART, promoting analysis of reproductive tactics in cooperative breeders using the theoretical framework provided by ART theory. Examples include polygyny and joint nesting by females, and also sneaking by males and parasitic egg laying by females as direct reproductive tactics, while cooperative courtship and helping at the nest represent alternative tactics leading to indirect reproduction by kin.

It is clear that ARTs provide a useful framework to investigate a variety of current topics in evolutionary biology. Alternative reproductive strategies maintained within a population in shared time and space are ideal for comparative studies by the quantification of fitness pay-offs for each phenotype. The study of ARTs may thus offer valuable opportunities for gaining insights into a wide range of topics such as adaptive competitive tactics, the importance of frequency dependence, and trade-offs in the allocation of resources.

In conclusion, the book is highly successful in reviewing the intriguing and entertaining variety of alternative reproductive tactics that are ubiquitous across the animal kingdom, and in documenting an active and highly integrative area of research of the origin and maintenance of ARTs.

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Conferences and Workshops 2009

Human Behaviour and Evolution Society
May 27-31, 2009, Fullerton, CA
www.hbes.com

International Behavioral Neuroscience Society
June 9-14, 2009, Manzanillo, Mexico
http://www.ibnshomepage.org/

Fish Swimming Workshop
June 15-July 17, 2009, University of Washington, USA
www.mbl.ku.dk/JFSteffensen/fhl/

Animal Behavior Society Annual Meeting of 2009
June 22-26, 2009, Pirenópolis, Brazil
www.animalbehavior.org

The 89th Annual Meeting of the American Society of Mammalogists
24-28 June, 2009, University of Alaska Fairbanks, Fairbanks, Alaska.
www.mammalsociety.org

The 5th Snake Ecology Group Meeting
18-20 July 2009 Donnelly, Idaho, USA
http://cascadelake4hcamp.com/

27th Stated Meeting of the American Ornithologists' Union
12-15 August 2009, Philadelphia, USA
www.birdmeetings.org/aou2009

WoodStoich 2009 ~ A Unique Workshop on Ecological/Biological Stoichiometry for Young Scientists
August 17-21, 2009, Sendai, Japan
meme.biology.tohoku.ac.jp/woodstoich/

XXXI International Ethological Conference
19-24 August 2009, Rennes, Brittany, France
iec2009.univ-rennes1.fr

12th European Society for Evolutionary Biology Congress
20-25 August 2009, Torino, Italy
www.eseb2009.it/uk/

7th Conference of the European Ornithologists' Union
21-26 August 2009, Zurich, Switzerland
www.eou2009.ch/

10th International Congress of Ecology
16-21 August 2009, Brisbane, Australia
www.intecol10.org/default.asp

ASAB Summer meeting: The Descent of Man and Selection in Relation to Sex
2-5 September 2009, Oxford, UK
www.darwin200.org/index.html

Biology of Spermatozoa (BoS.10) Meeting
7-11 September 2009, Losehill Hall, near Sheffield UK
www.shef.ac.uk/aps/staff/acadstaff/bos.html

7th International Conference on Behaviour, Physiology and Genetics of Wildlife
21-24 September 2009, Berlin, Germany
www.izw-berlin.de/de/veranstaltungen/7th-IZW-Conference/7th_izw_conference.html

DARWIN 200: Evolution and Biodiversity
The Combined Australian Entomological Society's 40th AGM & Scientific Conference / Society of Australian Systematic Biologists / 9th Invertebrate Biodiversity & Conservation Conference
25-28 September 2009, Darwin, Australia
evolutionaustralia.org.au

Australasian Evolution Society Meeting
29 Sep-1 Oct 2009, Canberra, Australia
www.evolutionau.org

International Union for the Study of Social Insects
9-11 October 2009, Chiemsee, Germany
foitzik@biologie.uni-muenchen.de

Darwin 2009: 150 Years of Evolutionary Biology
5-8 November 2009, Stony Brook Univ, NY, USA
http://darwin09.org/

VII. Göttinger Freilandtage
"Long-term field studies of primates"
8-11 December 2009, Göttingen, Germany
www.soziobio.uni-goettingen.de/welcome.html