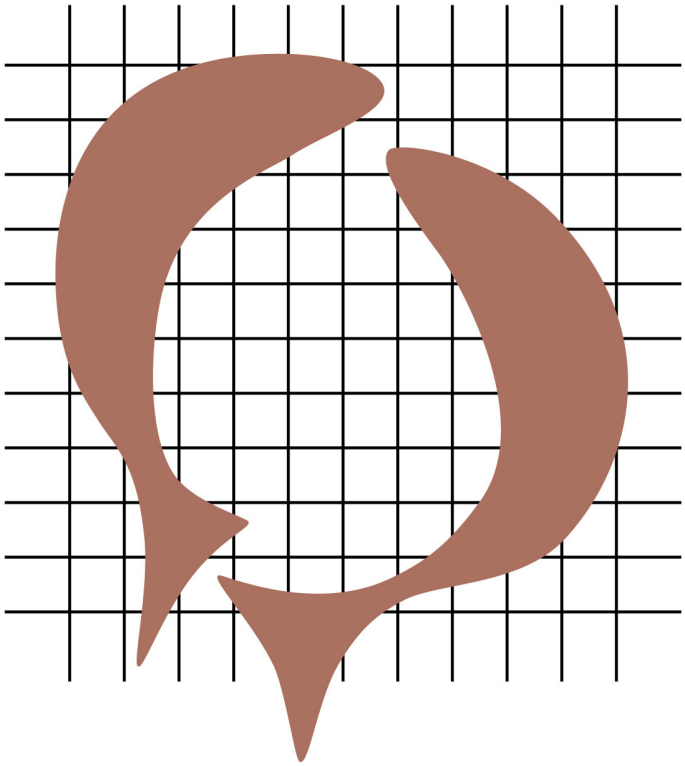
NVG NEWSLETTER

23rd year no. 2, December 2014

Nederlandse Vereniging voor

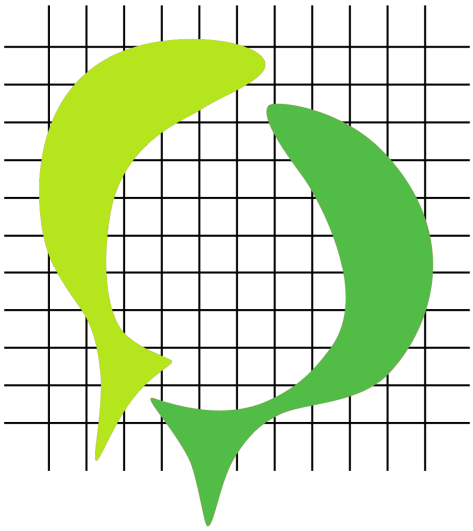
Gedragsbiologie



Contents:

NETHERLANDS SOCIETY FOR BEHAVIOURAL BIOLOGY

The Netherlands Society for Behavioural Biology aims at strengthening behavioural biology in the Netherlands and the direct surroundings. We strive for top quality in all of the behavioural sciences with respect to teaching, research, and public debate. The society organizes a yearly meeting and distributes this biannual newsletter.



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Prof. Dr. Liesbeth Sterck (Chair)

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Dr. Jeroen Stevens (Belgium)

Dr. Kees van Oers (PhD workshop)

Dr. Liesbeth Bolhuis (Treasurer)

Dr. Martine Maan (NVG-meeting)

Dr. Hans Slabbekoorn (Newsletter)

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Membership fee: € 25,- per year for (PhD-)students and biologists in-between-jobs. Others: € 30,-.

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Editorial Preface

This newsletter is filled with women. Three strong female scientists received their PhD-degree and we welcome Prof. dr. Liesbeth Sterck as the new chair of our society (replacing Simon Verhulst). Liesbeth was my supervisor during my MSc-project at Utrecht University on foraging behaviour of primates in the early '90. I am therefore double happy that she will bring in her vision and efforts to lead the NVG into a bright future. We also lost a strong woman in Mariam Honarmand: she had an incredible presence and will remain in our minds for ever. Finally, another 'minority' is also well-presented this time: nice reports from two young (male) Belgian PhD-students! **Hans Slabbekoorn**

SOESTERBERG

~ Report from the last NVG-meeting at the Kontact der Kontinenten by a special reporter.

On the mating behaviour of decapitated *Drosophila* females, matriphagy and harassing chimpanzees: NVG-meeting, 26-28 November 2014, Soesterberg.

By: Arne Iserbyt - University of Antwerp

It has been three years since Prof. Marcel Eens (University of Antwerp) convinced me to join the NVG meeting. Good memories still lingered and this year I registered asap when Prof. Wendt Müller (University of Antwerp), head of our research team, mentioned "*you can go to the NVG meeting and present your controversial results, I'm curious what others think about it*". In fact, with this phrase he captured the essence of the conference. For various reasons the NVG meeting is the perfect opportunity to present and discuss new findings, forge new research directions and to catch up with other research areas in behavioural biology.

I will start off with specifying some of these reasons that mark the success of the NVG meetings. First, the presented research, either by posters or by oral presentations, is usually of outstanding quality. The presentations cover a broad field of behavioural topics, ranging from mating behaviour in decapitated *Drosophila* females, the evolutionary significance of spiders feeding on body fluids of their helper mothers, to chasing wild chimpanzees with a stuffed snake. Some presentations were very entertaining like the after-dinner presentation of Prof. Tom Tregenza (University of Exeter), who showed off with his huge collection of cricket video's.

Second, the audience generally consists of about fifty to seventy interested researchers. This appears to be a suitable group size to keep the presenters' nerves under control and to trigger a dynamic response from the audience.

Third, there are no parallel sessions, so there is no stress to miss out on other talks. Fourth, there is plenty of time for discussion during breaks, lunch or drinks (kindly sponsored by Noldus Information Technology – thanks!). So, also the more-shy or recently started students have plenty of opportunities to receive more private feed-back. Fifth, the friendly

staff of Kontakt der Kontinenten keep high priority to treat their guests as good as possible. The Indian oriented food was just excellent, with several vegetarian options, nice deserts and freshly grained coffee.

Then there is the remarkably nice setting. The conference center Kontakt der Kontinenten is an old monastery and all talks and posters are presented in the Cecilia chapel. Entering a chapel is a rare occasion for an evolutionary biologist like me. Silhouettes of saints painted on the high walls stare at the audience and admittedly, it is quite intimidating. But the real eye catcher appears to be the holy migratory snow goose, including halo around its head, peeking at us from behind the presentation screen. I was happy to experience the connection between bygone religion and evolutionary biology.

direction of selection between the sexes:	inter-sexual genetic correlation +	inter-sexual genetic correlation −
same	no conflict	same gene: intra-locus sexual conflict different genes: sexual antagonism
opposite	same gene: intra-locus sexual conflict different genes: sexual antagonism	no conflict

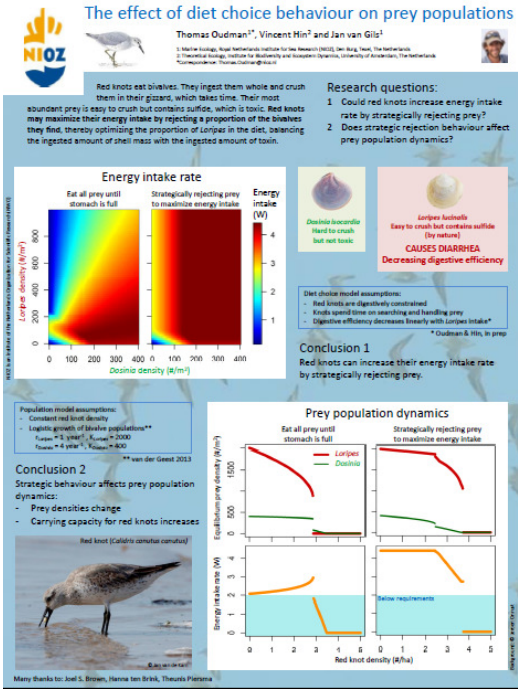
Abbott 2010

Personally, my aims were twofold at the conference and both were satisfied. First, I wanted to hear the opinion of other researchers on my controversial results gathered in the previous breeding season. These results do not stroke with the current hypotheses on intra-locus sexual conflict over optimal testosterone levels. So, I was a bit anxious to have overlooked some major flaws in the statistics or experimental design. In the end, I left the conference with a good feeling. In particular due to the interest in my results by others and the encouraging responses which spurred me to elaborate on these findings. Second, I was looking forward to chat with Prof. Kate Lessells and Prof. Camilla Hinde, both passionate researchers at the University of Wageningen and experts in the field of family conflicts. These conflicts are the conceptual framework of my next grant proposal, so it was utmost relevant to ask their opinion about my current ideas. This was, of course, very inspiring.

To summarize, the NVG meeting gathers a good number of motivated scientists who encourage and stimulate each others research. I highly recommend PhD-students and post-docs in the broad field of behavioural biology to participate this appealing conference. Many thanks to the organizing committee to create this awesome event.

> At the annual open board meeting on Thursday afternoon, Liesbeth Sterck from Utrecht University replaced Simon Verhulst from Groningen University as our chair of the NVG. Many thanks to Simon for all his efforts over the years and good luck to Liesbeth!

> On Friday afternoon, Thomas Oudman – NIOZ, Texel, received the prize for the best poster at the NVG-meeting 2014 from Prof. dr. Theo Bakker – Bonn University. The winning poster was about: "*The effect of diet choice behaviour on prey populations".*



PhD-workshop NVG 2014

By: Michelle Spierings –Leiden University

This years' PhD workshop was again a great success. Like each year, several PhD students presented their plans, ideas and first experiments. This is an excellent opportunity to share thoughts on designs and possible implications of the experiments, which everyone did enthusiastically.


bionieuws

Zorgen over sterkere sturing onderzoek

The specific theme this year was "Societal relevance of your work and how to communicate with the media". Gert van Maanen (science journalist and editor of Bionieuws) was invited to give a lecture on this topic and further discuss societal relevance of science. Together we discussed how we could give societal relevance to our research, but also whether we felt like we had to. Do we need to do research with a clear relevance to society or is it enough if the work is relevant to science? And how are these

considerations influenced by the grant application process? Afterwards, we considered several Do's and Don'ts for talking to the media, which is not something to take lightly.

Do:

- Prepare yourself. Make sure that you know what you want to say and gain as much information as possible in advance on the questions you will receive.
- Make agreements beforehand. Both with your colleagues on the project as with the media.
- Get assistance. You can always contact the PR department of your institute to get assistance with the preparations for an interview. Ask them how they would approach the media and ask for the institutional guidelines.
- Give credits. Always make sure to give credits to the people that deserve it.

Don't:

- Be tempted to answer just to answer. If you don't know the answer to a question, it is best to not answer it.
- Cheat or lie. This is also related to the earlier don't. Only say things that you know are true.
- Use technical language. It is sometimes hard to avoid technical language, but take enough time before an interview to think of non-technical words that bear a similar enough meaning.

IN MEMORIAM

~ Obituaries for investigators that influenced behavioural biology in the Netherlands and Belgium.

Mariam left too early, but will remain on our minds forever

Mariam Honarmand

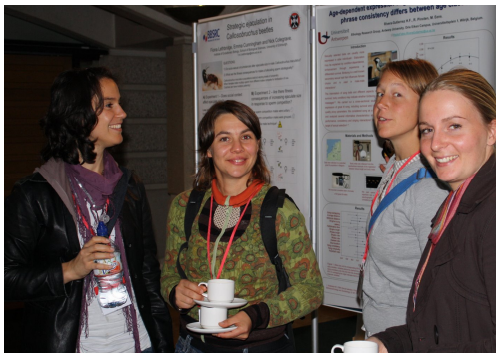
24.4.1977 - 28.9.2014

After many years of fighting cancer, Mariam passed away on the 28th of September 2014.

Many members of the NVG will have known Mariam despite her young age as she was regularly visiting Leiden and Wageningen. She will not be easily forgotten: Mariam was a very special person and her positive and bright personality is unforgettable. She inspired her friends, colleagues and

students with her enthusiasm and she was a personal and scientific enrichment for all of us. We have not only lost a much appreciated colleague but also a very special and close friend. It is difficult now to realize that life goes on without her being around. Mariam worked at different universities and left bereaved friends and colleagues at all of them: Mariam had studied biology at the Freie Universität Berlin in Germany with the research subject of her diploma thesis on *DNA "Amplification in follicle cells of Drosophila melanogaster"*. Yet, her main interest during her study had been animal behaviour, and she took several courses studying communication of birds and primates.

For her PhD-research she moved to the Department of Animal Behaviour at Bielefeld University. Here, she investigated short- and long-term effects of early developmental stress on behaviour and life history traits using zebra finches as model. Much of this project was in cooperation with the Behavioural Biology group at Leiden University in the Netherlands, where she spent a substantial part of her time and made many friends. Also after her PhD she continued to regularly visit her friends and colleagues in Leiden and Wageningen. In her dissertation she showed that different periods of low-quality food had strong short-term effects on growth and physiology but also that the birds could compensate for this in their later life. However, her main interest in this project was on how nutrition would affect male song and female mating preferences. The experiments for this part were conducted at Leiden University. Most previous studies that used feeding manipulations in birds had just used treatments that lasted throughout the period of dependence from parents. However, Mariam experimentally manipulated these periods in a more ecological way, by providing food limitations during part of the developmental period. This better reflected natural conditions when birds would miss peaks of food abundance when they hatch too early or too late, or when they have problems in finding food when just becoming independent from their parents during adolescence.



Her PhD thesis, "*Eating like a bird: long term effects of nutritional stress*", was completed and successfully defended in 2009 in Bielefeld. From there she moved back to Berlin, where she continued her work on the effects of developmental stress as post-doc at the Animal Behaviour Group of the

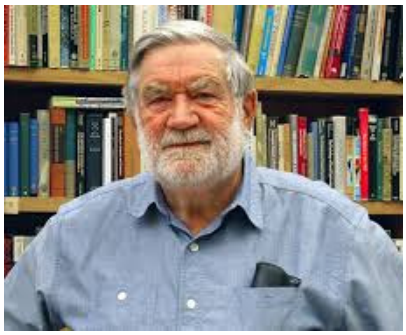
Freie Universität Berlin. She also became engaged in a Europe-wide project on the effects of noise pollution on bird vocal communication and was a guest researcher at the Museo Nacional de Ciencias Naturales in Madrid.

While up to here, this may read like the account of a normal early career in our field, it was not: Mariam was exceptional in deciding for herself that no matter what fate had thrown her way, that if you wanted to, everything could be done, even when being a terminally ill, single parent. She left us impressed and humble by her strength and perseverance: Only shortly after Mariam started her PhD in Bielefeld, her son Lino was born and it was during the first months as a young mother that she was diagnosed with cancer, a shocking fact not only for her but also for all of us around her. Her strong character and positive way of approaching the difficult challenges resulted in her taking as much advantage as possible from the positive sides of life. Mariam knew that it would be difficult to win the struggle but her way of keeping the spirit up, sharing the downs but also many ups over the years to come, sharing her feelings and condition, was admirable to all who knew her.

Mariam left us much too early, but will remain on our minds forever.

By: Marc Naguib, Katharina Riebel, Tobias Krause, Silke Kipper, Diego Gil - *Wageningen, Leiden, Bielefeld, Berlin, Madrid*

Peter Marler: Pioneer of outdoor and indoor studies on Acoustic Communication and Avian Vocal Learning.



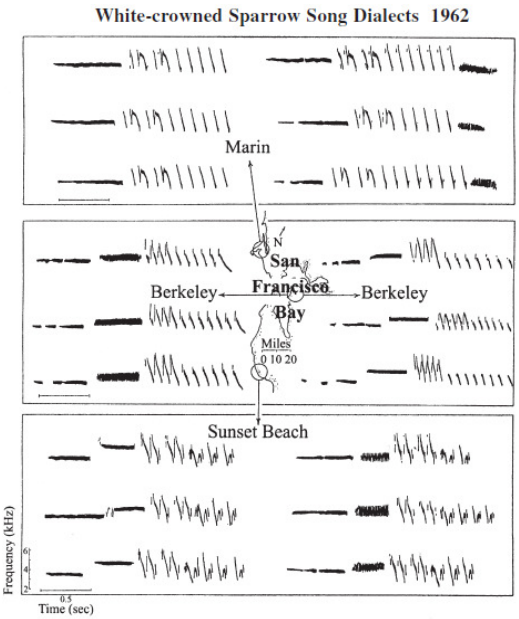
Peter Marler was born in February 1928 in Slough, Berkshire (30 km west of London) and passed away in July 2014 in his home town of Winters, California (100 km north of San Francisco).

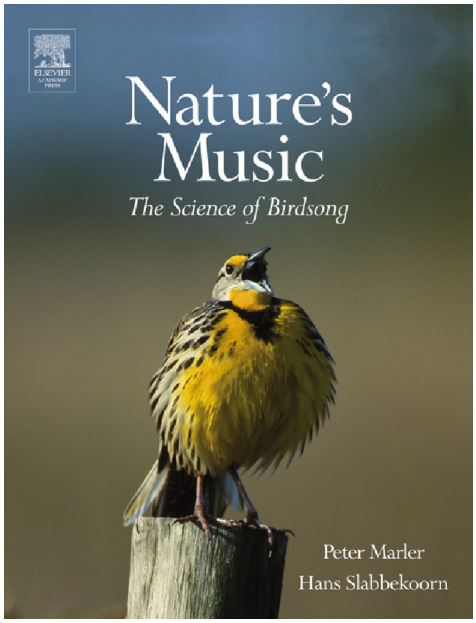
He did a PhD-project in Botany at the University College London, but the intriguing variety in chaffinch song lured him into a second PhD-project in Zoology at the University of Cambridge. He finished the latter in 1954 and left England in 1957 for an appointment at UC Berkeley, California. Subsequently, he went to Rockefeller University in New York in 1966 to become the director of the Center for Field Research in Ecology and Ethology in Millbrook, in 1972. He moved back to California in 1989 to work as a professor at UC Davis until he retired in 1994.

At the times that Tinbergen, Lorenz, and von Frisch were active in Europe and Skinner in the US, Marler focused on communication and language. He worked most on birds throughout his career, but he also went to Uganda to study colobus monkeys and to Tanzania

to study chimpanzees with Jane Goodall. He exploited two major technological breakthroughs at the time: the portable tape recorder and the spectrograph, a device developed in World War II for recording and graphing the acoustic signatures of hostile submarines. He used these bioacoustic tools to report observational patterns in the field followed up by experimental investigations on the underlying processes. He took major steps in disentangling the contributions of nature and nurture in the production, perception and function of vocal repertoires (stressing what he referred to as a 'false dichotomy').

His work is published in many publications. Remarkably, he has a solo-authored one in Nature in 1955 on "Characteristics of some animal calls" and one on which he is the senior author in Nature in 2005 on "Prey plumage adaptation against falcon attack". Fifty years





apart… Maybe his most influential series of publications concerns the many papers on avian vocal learning and song development, with several co-authors among which long-term collaborator Susan Peters. Among many things, he will also be remembered for his work on referential signalling in alarm calls of vervet monkeys (with Dorothy Cheney and Robert Seyfarth), the signalling function of chicken calls (with Chris Evans), the work on vocal dialects in white-crowned sparrows (together with Douglas Nelson and Jill Soha) and female and male responsiveness to repertoires and dialects (with William Searcy), the papers on sound transmission in temperate and tropical environments (with Ken Marten), and more recently the work on the multi-modal nature of animal signals (with Sarah Partan). His influence also extends well into the field of avian neurobiology, a field shaped by his students Fernando Nottebohm and Mazakasu Konishi.

Personally, I was also lucky to be able to collaborate with Peter for some time between 2000 and 2004 on the organization of a symposium and while editing a book. We regularly met at the California Academy of Sciences in San Francisco during the organization of Nature's Music: The Science of Birdsong, a symposium in memory of Luis Felipe Baptista, another remarkable character and amiable scientist of avian acoustics. We seized the opportunity of this special occasion to compose an extraordinary overview book on the research field. We enthousiastically spoke through many years of research and invited many contributors. Most of which immediately accepted because of the honourable context and the extensive network of former students and colleagues of Peter.

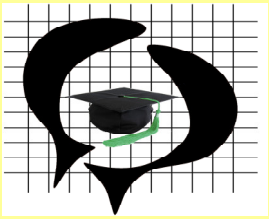
CALIFORNIA ACADEMY OF SCIENCES

Peter's wife Judith some times came along to the academy and we also once came together at their home in Winters. There, we received a warm welcome by the whole family of the house, including a giant ridgeback dog and a yellow-billed magpie as a pet in the kitchen (his interest in birds had started with a pet rook at the age of eight). I still remember the beautiful view of their large valley garden: colourful as a painting in red, orange, yellow and brown from autumn leaves and rotting fruits in warm rays of California sunshine. This had been the scenery of his comfortable home

for long, but the threat of a nearby wildfire on the fifth of July, not unusual for the area, forced the family to evacuate the place and move to a local nursing home on what turned out to be the last day of Peter's life.

By: Hans Slabbekoorn, Leiden University

NVG MASTERS CLASSES



~ Reports from 2-day theme meetings, NVG-sponsored and aimed at PhD- and MSc-students.

"Zebrafish brain and behaviour: from gene to ecology" *20-21 Nov 2014*

By: Simon Bette, Free University Brussels

I started a PhD in October 2014 at the Free University of Brussels

(ULB). I investigate the aggregation dynamics of fish groups around floating objects. I have not much background in fish science yet; I mainly studied physics during my education, even though I made a brief foray in biology. Nevertheless, I am very motivated to learn all I need to about all aspects of fish.

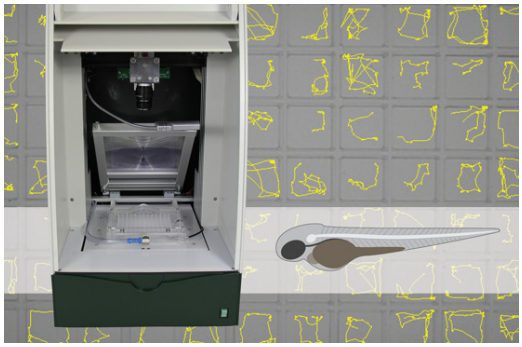
Radboud Universiteit Nijmegen

As I use the zebrafish as a model species in my PhD project, I was delighted to learn that a NVG-Masterclass about this specific species was planned in November in Nijmegen. It was a great opportunity to improve my knowledge about the zebrafish and to meet researchers working on the different facets of this fish. My expectations have been fully met during the masterclass.

Researchers studying different aspects of zebrafish were present around the table and shared their personal knowledge.The different speakers fully handled their subject and pointed out the important issues related to it. Gert Flik gave an important introductory lecture about the evolution and physiology of fish in general which served as a basis for the rest of the meeting. His broad knowledge allowed a better understanding of many intriguing aspects of fish biology. Ruud van den Bos spoke during several presentations about zebrafish specificities and reviewed many physiological, neurological and behavioural studies. These lectures highlighted the zebrafish potential and taught me many new aspects about behavioural studies on captive fish. Finally, Marnix Gorissen presented us the last results of the Nijmegen lab.

Interesting group discussions, as well as coffee and lunch breaks, permitted to chat with the other participants. These were very rewarding and allowed me to become aware of the different ongoing projects. I also received precious advices for my own PhD-research.

This was the first research meeting I attended to as a PhD student and this was such a rewarding experience for me. I feel like I added a substantial piece to my knowledge about zebrafish. The network of relations initiated during this masterclass will certainly be beneficial to all of us.



DanioVision is the Noldus system designed for high-throughput tracking of zebrafish larvae (demonstrated at the meeting).

FINANCIAL SUPPORT OPPORTUNITY FOR MEETINGS AND SYMPOSIA IN BEHAVIOURAL BIOLOGY

AIM: The NVG wants to support small events with financial contributions if they yield a significant spread of interest, increase the understanding, or stimulate research ideas and collaborations in Behavioural Biology in the Netherlands or Flanders.

Guidelines follow below for applying and receiving financial support from the NVG for Behavioural Biology events (as approved by the board on the 29th of June, 2012).

Budget & Decision Process:

1) A total of maximally €750 is available per budget year (Adjustments can only be determined at the annual meeting);
2) The possibility of support is advertised at the annual meeting and in the newsletter;
3) A board majority is required to award a support request;
4) Board members involved in a request are excluded from the decision making process;
5) Support decisions are communicated through a letter from the treasurer.

Eligibility & Applications:

1) Only NVG-members can apply;
2) Support requests need to be submitted at least six weeks before the event;
3) The application involves a brief explanation of how the event matches our aim;
4) The application should include a budget with costs, benefits and other co-sponsors.

Obligations & Reimbursement:

1) The applicant is obliged to inform NVG-members at least two weeks in advance about the NVG-supported event;
2) The applicant is obliged to write a brief report for the next newsletter about the event;
3) Payment takes place after the event, based on actual receipts, and after having received a newsletter report;
4) All documents will be provided to the audit committee for the annual financial report.

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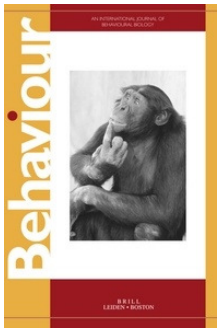


BRILL is publisher of Behaviour and sponsor of the BRILL Baerends Lecture at the NVG-meeting

THESIS DEFENSE

~ Recently defended PhD-theses on animal behaviour. Target is to provide some background and to highlight an interesting finding in a single figure.

Inonge Reimert defended her thesis '*(Em)pathetic pigs? The impact of social interactions on welfare, health and productivity*' on the 4th of July 2014. The PhD-study was conducted at the Adaptation Physiology Group of Wageningen University.

http://library.wur.nl/WebQuery/wda/2060874

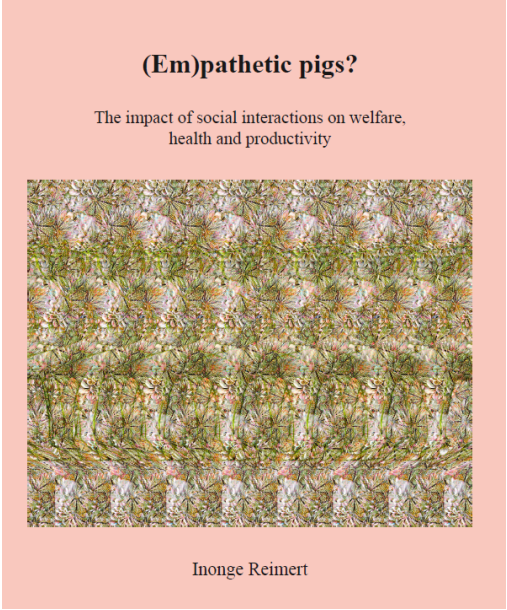
WAGENINGEN UR
For quality of life

By: Inonge Reimert

The welfare, health and productivity of intensively raised pigs may be affected by routine management procedures such as castration and relocation, but also by the social interactions between pen mates. In this thesis, I investigated the effect of social interactions on pig welfare, health and productivity in several ways. I studied a new breeding method based on interactions, i.e. heritable effects on the performance of pen mates during the finishing period (25 to 110 kg slaughter weight). The effect on pig behaviour and physiology was studied for divergent selection for a relatively positive +SBV (Social Breeding Value) or a negative indirect genetic effect on growth of pen mates (–SBV).

The results suggest that +SBV pigs are less easily stressed or less fearful than –SBV pigs, because they were faster to touch a novel object in a novel object test in the home pen at one week of age (object: feeder) and at six weeks of age (object: rope). They were also more frequently present near a person in a human approach test in the home pen at 2.5 weeks of age compared to –SBV pigs. In addition, +SBV pigs showed less locomotion than –SBV pigs after a bucket was introduced in an individual novel environment test at 13 weeks of age. Moreover, +SBV pigs also had overall lower leukocyte, lymphocyte and haptoglobin concentrations than –SBV pigs.

These results imply that the welfare of pigs may be improved through breeding. However, this experiment entailed a single generation of divergent selection for SBV on growth only. Therefore more research is needed to confirm this.



I also investigated whether pigs can be affected by (the emotional state of) their pen mates on the basis of two social processes, emotional contagion (a simple form of empathy) and social support. Emotional contagion was studied during anticipation and during experience of a positive and negative situation. Two pigs per pen were trained to associate one cue with a positive situation (i.e. pair-wise access to a relatively large compartment filled with straw and peat in which chocolate raisins were hidden) and another cue with a negative situation in a test room (i.e. social isolation in a relatively small compartment combined with unpredictable negative handlings such as restraint with a nose sling). Thereafter, two of their pen mates, habituated to the cues and test room but naive with respect to the situations, joined the training pigs in the test room. From the behaviours expressed by the training and naive pigs, it may be concluded that emotional contagion had occurred which was most clear during the positive and negative situation.Two new behavioural indicators for emotional state in pigs were found with tail wagging indicative for a positive and ears back for a negative emotional state.

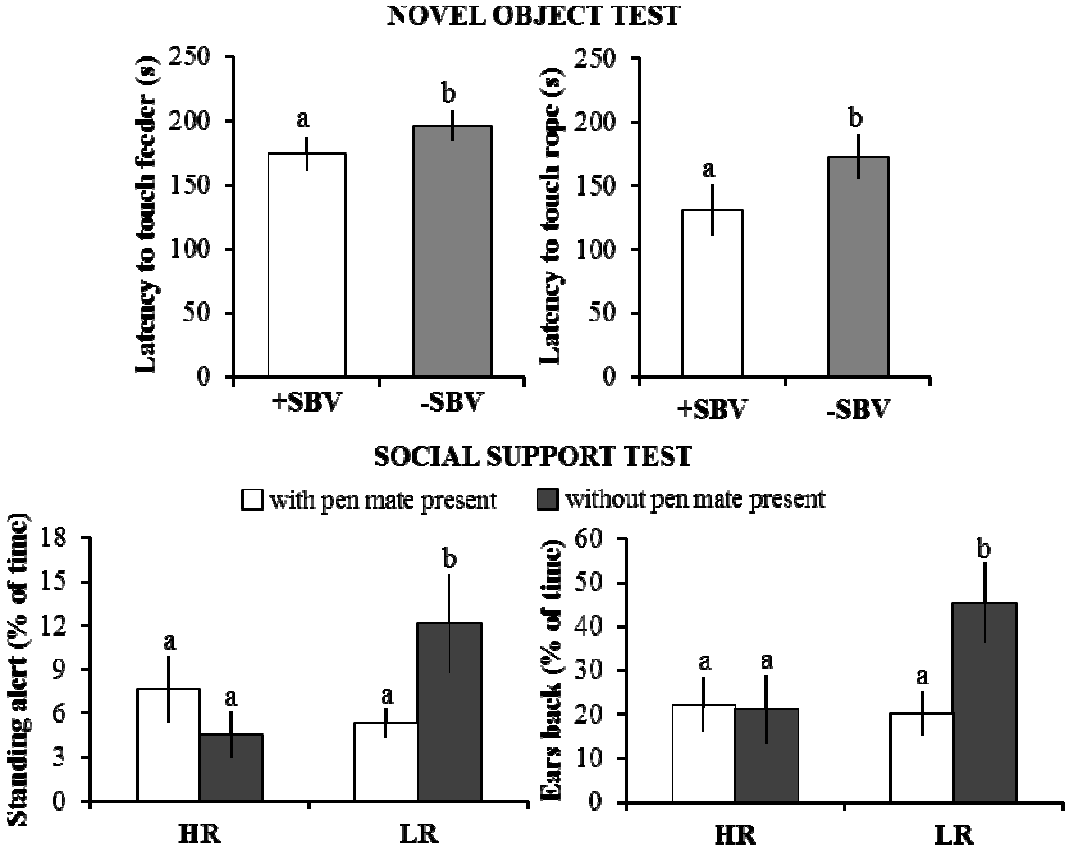
For the social support experiment, pigs were individually restrained in a weighing cage in a test room for 15 min to induce acute stress. Half of these pigs were tested alone, whereas the other half was accompanied by a pen mate. The coping style of these pigs was also determined from their response to a back-test. From the results it was evident that restraint induced acute stress in all pigs (e.g. pigs vocalized much and had an increased heart rate and increased salivary cortisol response), but pigs with a proactive coping style (high-resisting (HR) pigs in the back-test) expressed this acute stress more actively (e.g. more escape attempts and more vocalizations) and pigs with a reactive coping style (low-resisting (LR) pigs in the back-test) more passively (e.g. more standing alert and ears back). Moreover, LR pigs seemed to have benefitted more from social support than HR pigs as LR pigs had a lower stress response when a pen mate was present during the test than when tested alone. The welfare, health and productivity of pigs may thus not only depend on their own emotional state, but also on the emotional state of their pen mates.

References

Reimert I., Bolhuis J.E., Kemp B., Rodenburg T.B. 2013 Indicators of positive and negative emotions and emotional contagion in pigs. *Physiology & Behavior*, 109, 42-50.

Reimert I., Rodenburg T.B., Ursinus W.W., Duijvesteijn N., Camerlink I., Kemp B., Bolhuis J.E. 2014 Backtest and novelty behavior of female and castrated male piglets, with diverging social breeding values for growth. *Journal of Animal Science,* 91, 4589-4597.

Reimert I., Rodenburg T.B., Ursinus W.W., Kemp B., Bolhuis J.E. 2014 Responses to novel situations of female and castrated male pigs with divergent social breeding values and different backtest classifications in barren and straw-enriched housing. *Applied Animal Behaviour Science*, 151, 24-35.



Above: Latency to touch the feeder (s) at one week of age (left graph) and latency to touch a rope at six weeks of age (right graph) during the novel object test for pigs with a positive (+) or negative (–) social breeding value (SBV) for growth. Below: Standing alert behaviour (left graph) and ears back (right graph) of the restrained pigs with a high-resisting (HR) or low-resisting (LR) backtest classification during the 15 min restraint test and with an accompanying pen mate present (open bars) and without a pen mate present (grey bars). Differences between means are indicated by small letters (a/b, $P < 0.05$).

Elske de Haas defended her thesis "The fearful feather pecker. Applying the principles to practice to prevent feather pecking in laying hens" on the 29th of August 2014. The PhD project, as part of NWO's programme the value of Animal Welfare, was conducted at the Adaptation Physiology Group of Wageningen Univerisity in collaboration with the Behaviour Biology Group, Rijksuniversiteit Groningen.

http://www.wageningenur.nl/nl/Publicatie-details.htm?publicationId=publication-way-343536323539

WAGENINGEN UR
For quality of life

By: Elske de Haas

A major behavioural problem in laying hens is severe feather pecking (SFP), where hens peck and pull at feathers of flock-mates causing plumage and tissue damage. As SFP inflicts pain in the victims, it reduces the welfare of victim birds but also indicates welfare problems in the perpetrators. The current preventive measure to reduce the consequences of SFP is to beak-trim the chickens. However, this measure raises ethical questions in its own right and is therefore going to be banned from 2018 onwards in the Netherlands. In this PhD project, therefore, we sought to find the risk factors of this behaviour by use of on-farm studies and lab experiments.

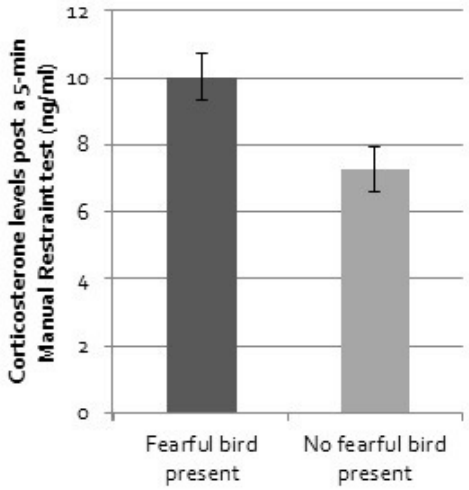
Previous studies indicate that SFP relates to high fearfulness, stress sensitivity and low serotonin levels on an individual level, and is partly dependent on the genetic of the bird. We compared two commercial strains under farm conditions and found differences in fearfulness at a young age and peripheral serotonin levels. Under lab conditions, we were also able to show that hens of

lines differing in induced mortality due to SFP, differ in fearfulness as young and adult, and in dopamine levels in the arcopallium (a brain area involved in fear and motor control).

As high levels of fearfulness could be influenced by maternal stress levels, we also assessed maternal effects on development of SFP. Chicks deriving from flocks in which maternal hens had high levels of feather damage, basal corticosterone and serotonin levels, showed heightened fearfulness and SFP at one week of age. There were indications that maternal yolk-hormones were involved in these effects.

The genetic predisposition for SFP, however, appeared to depend on the environmental conditions for hens of a brown origin. Specifically, disruption in substrate availability in early life influenced SFP which had long-term effects until adulthood. For the white hens, the internal state of heightened fearfulness and stress sensitivity played a larger role. These results indicate a different approach is needed to prevent the development of SFP for hens of brown and white origin.

Unexpectedly we also recorded that within a group of hens, a fearful hen can increase the stress sensitivity of the whole group (see Figure). This indicates that group differences in stress sensitivity may derive from certain individuals. These effects may have derived from high activity by fearful hens. Under farm conditions, where hens live in large groups, it is important to reduce fearfulness in the whole flock, especially as high fear for humans was one of the risk factors for SFP at a young and adult age. As SFP seems a redirected foraging behaviour, substrate for foraging should be available at all times to reduce the risk of SFP to occur.



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Elske de Haas works now together with Dr. Aline Bertin at the Physiologie de la Reproduction et des Comportements (INRA) in Nouzilly, France on maternal stress on behavioural development of laying hen chickens.

Jiani Chen defended her thesis "Linguistic birds : exploring cognitive abilities in zebra finches by using artificial grammars" on the 16th of October 2014. She did her PhD-project at the Behavioural Biology Group at Leiden University.

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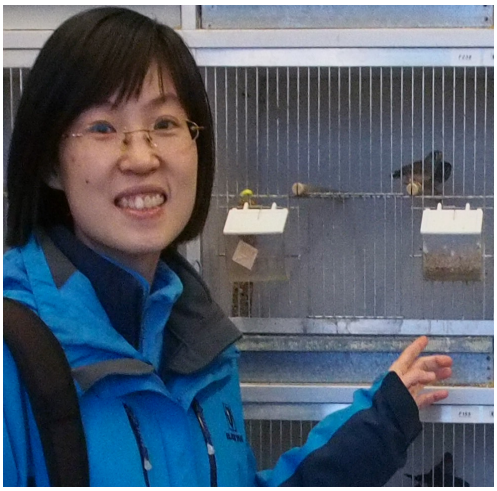
By: Jiani Chen

Cognitive and learning abilities are essential to complex behaviors, such as abstracting regularities for problem solving, communicating in languages. Some complex behaviors found in humans can also be present in non-human animals. Studying the cognitive and learning



abilities that are shared between humans and non-human animals can therefore not only reveal what other animals can do but can also provide insights into the evolution of complex human behaviors.

Human language is one of the most complex behaviors known to date. The aim of this thesis is to shed light on whether some capacities that are linked to, or characteristic for, language are shared between humans and nonhuman animals. The focus was on pattern cognition in a non-human species, the zebra finch. By using artificial grammars, I explored the questions from the domains of sequential learning rule generalization.

The capacity to learn and encode sequences is basic to many actions. A sequence can be memorized by at least two mechanisms, one is using positional information of the elements in the sequence and the other is using transitional information between the elements. When trained and tested with sequences differing in transitional and positional information, zebra finches were found to attend to both transitional and positional cues and that their sequential coding strategies can be biased depending on the learning context.

Rule abstraction is considered to be a hallmark of human linguistic abilities. However, the degree to which the abilities that are shared between human and non-human animals is still by no means clear. In this thesis, I addressed whether zebra finches are able to discriminate between, and generalize among, affixation patterns. I also dealt with a controversial topic that recently received a lot of attention: the capability of non-human species of learning 'algebraic' rules. Finally, I examined the ability of zebra finches to learn nonadjacent dependencies between items in a string of vocal elements.

The results of my experiments provided evidence for similarities between humans and songbirds in generalizing surface transformations of human affixation patterns. Moreover, we conducted experiments on 'algebraic' rule learning in both zebra finches and humans. In a series of discrimination experiments, we presented zebra finches and human adults with comparable training and tests with the same artificial stimuli, from which some 'algebraic' grammars could be generalized. Different from the human adults, who readily categorized stimuli according to the underlying grammars, birds showed evidence of simple rule abstraction related to positional learning. However, we found no evidence for a more abstract rule generalization (see

figure). The limited abilities for rule abstraction in zebra finches may indicate a precursor of more complex abstractions.

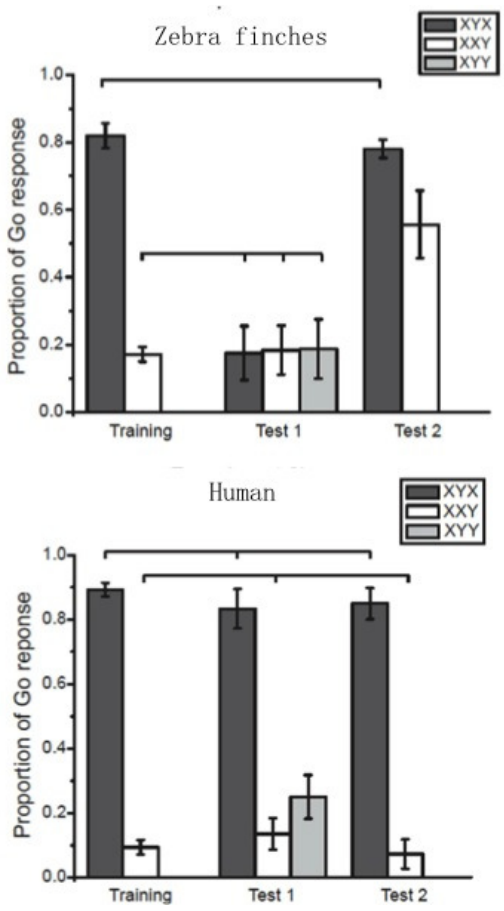


Figure: Mean (± SEM) proportion of Go responses to training and test stimuli in zebra finches and humans. Stimuli in Test 1 consisted of novel elements not present in training. Stimuli in Test 2 consisted of familiar elements from training but with novel combinations. Lines above the bars indicate homogenous responses (no significant differences) to different stimuli sets.

Last but not least, my results showed that zebrafinches can not only learn non-adjacent dependencies, at an arbitrary distance and over novel intervening items, but can also learn non-adjacent dependencies at arbitrary positions of a sequence. Our findings show an ability for detecting a grammatical pattern thus far not demonstrated for a non-human animal.

The presence of the similarities between zebra finches and humans that shared a common ancestor some 300 million years ago may indicate that either such abilities are rooted in a deep past, or, more likely, that they evolved independently.

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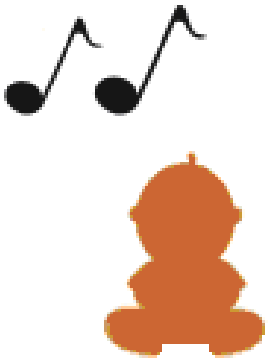

Conferences & Meetings

- **NAEM–2015,** Netherlands Annual Ecology Meeting of the Netherlands Ecological Research Network (NERN) and the Dutch - Flemish Ecological Society (NecoV), 10-11 February, Lunteren, the Netherlands: http://www.nern.nl/ NAEM-2015

- **EG-2015**, 10th topical meeting of the Ethologische Gesellschaft (on Causes and consequences of social behaviour), 11-14 February, Hamburg, Germany*: http://www.ethol-ges.org/meetings.aspx*

- **EHBEA–2015,** Annual meeting of the European Human Behaviour and Evolution Association, 29 March-1 April, University of Helsinki, Finland: http://ehbea.com/

- **DN-2015**, Dutch Neuroscience Meeting (formerly ENP meeting), 11-12 June, Lunteren, the Netherlands: http://neuroscience meeting.nl/2015/

- **ABS-2015**, 52nd Annual Conference of the Animal Behavior Society, 10-14 June, Anchorage, Alaska, USA: http://animal behaviorsociety.org

- **BGA–2015,** 45th Annual Meeting of the Behavior Genetics Association, 18-21 June, San Diego, CA, USA: http://bga.org/meetings/

- **Evolution-2015,** Joint Annual Meeting, 19-23 June, Sao Paulo Brazil: http://evolutionsociety.org/

- **Behaviour 2015,** Joint meeting of the International Ethological Conference (IEC), the Australasian Society for the Study of Animal Behaviour (ASSAB), and the Australasian Evolution Society (AES), 9-14 August, Cairns, Australia: http://www.behaviour2015.org/

- **EBBS/EBPS-2015**, Joint meeting of the European Brain and Behaviour Society and the European Behavioural Pharmacology Society, 12-15 September, Verona, Italy: http://ebbsebpsverona2015jointmeeting.info/symposium-proposal/

- **ISAE–2015**, 49th Congress of the International Society for Applied Ethology, 14 - 17 September, Sapporo Hokkaido, Japan: http://www. applied-ethology.org/isaemeetings

- **NVG–2015**, Annual Meeting of the Netherlands Society for Behavioural Biology, 25-27 November, Soesterberg, the Netherlands: www.gedragsbiologie.nl

- **ASAB Winter meeting-2015,** annual meeting of the Association for the study of Animal Behaviour (on Animal Social Learning and Culture), 3-4 December, St Andrews, UK: http://asab.nottingham.ac.uk/meetings/index.php

- **IOC-2018**, 27th International Ornithological Congress August, Vancouver, British Columbia, Canada: http://int-ornith-union.org/