

"Dedicated to caring for animals and the people who care for them"



Abstracts for the 3rd Research training workshop: Animal welfare and evidence-based approaches, Denmark 2020

Workshop Abstract

Promoting optimal animal welfare is one of the goals of professional organisations housing wild and domesticated animals of a variety taxa, whether housed in zoos, aquariums, sanctuaries, research facilities or other. To understand the welfare of animals, we need to use a cross-disciplinary and mixed methods approach in order to try to gain insights in the physiological and psychological welfare, ranging from negative to positive. Some research can be done by observation or by collecting samples, such as hair or faeces. To answer other questions, we might need the cooperation of the animals for them to participate in their care, such as weighing, receiving medicine, blood and breath samples, as well as solving cognitive and physiological challenges posed to them. To be able to collaborate with animals through good human-animal relationships, two-way communication and positive reinforcement are at the core of developing research training programs. This 3rd research training workshop will focus on animal welfare and evidence-based approaches, training that promotes positive welfare while gaining insight into a wide variety of animal welfare related topics. The workshop will also focus on the importance of translating what we know through science into practices and opportunities for animals, and the need for short- and long-term monitoring and evaluation of animal welfare.

Speaker abstracts

Animal welfare and research training

Presented by: Sabrina Brando MSc.

Other animals can help us understand their perspectives, perceptions, capacities and capabilities, and voluntary collaboration in research is key in achieving animal welfare and research goals. Contemporary animal welfare approaches consider psychological and physiological domains, including feelings and thoughts. An animal who has been assigned the role of research may experience many positive challenges and opportunities, as well as interesting and joyful interactions with care staff through training and other types of activities. Training animals with positive reinforcement for a wide variety of research projects can be a positive experience.

To understand the effects of the research role, including e.g. the methods of training, types of sessions, and frequency of trials, an animal's wellbeing should always be monitored and assessed. With available evidence from a cross-disciplinary perspective as well as ethical inquiry, this talk will discuss the roles of animals, different training methods, animal welfare and risk assessments, as well as the need of science into practice.

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Does participation in psychophysical research improve welfare in captive animals? Case study of two grey seals (*Halichoerus grypus*)

Presented by: Kirstin Anderson Hansen PhD

Animal welfare is described as “the state of the animal’s body and mind, and the extent to which its nature (genetic traits manifest in breed and personality) is satisfied”. It is determined by both its physiological and psychological conditions. The variables contributing to animal welfare may vary between individuals, even within the same species, e.g., due to the animal’s age and sex. The word personality can also be used to describe these consistent behavioural reactions to different environmental variables. Ensuring that the lives of animals in human care are properly being enriched has become a key topic over the last few years. Cognitive challenges have shown to induce positive changes in the welfare of animals and scientific studies have the potential to increase our understanding of animals, as well as how to improve their mental and physical stimulation. For animals with complex cognitive skills, such as marine mammals and apes, providing floating objects as enrichment barely caters to their high cognitive abilities, therefore, with the abundance of animal research being conducted in zoos, marine parks, and research facilities, there is a great potential for research to provide meaningful enrichment to the animal participants. Here we investigate if participation in psychophysical research can be considered enrichment for three captive grey seals (*Halichoerus grypus*), who have very different personalities and life experiences.

“Scientific animal training: Benefit or detriment for animal welfare? Examples from the work at the Marine Science Center”

Presented by: Sven Wieskotten PhD

The Marine-Science-Center” in Rostock focuses the research on the orientation of aquatic and semiaquatic animals in their natural environment. Therefore diverse experiments are carried out to examine the sensory and cognitive abilities of these animals. For this purpose, the MSC keeps three different species of seals, 9 harbour seals (*Phoca vitulina*), one South African fur seal (*Arctocephalus pusillus*), two California sea lions (*Zalophus californianus*), as well as different species of fish and different species of cephalopods (e.g. *Octopus vulgaris*). In order to investigate the sensory and cognitive abilities of the animals, mainly behavioural experiments are carried out, following the principles of operant conditioning, as well as classical conditioning to be able to bridge the gap between a correct behaviour and the primary reinforcer. Beside the scientific part, operant conditioning is also used to train the animals on many different behaviour, including husbandry training, trick-training and medical training.

Challenging the animals by using operant conditioning forms the basis of a successful animal keeping and all behavioural experiments. However, challenging an individual does also mean, that we have to talk about stress which can (and does) occur within training situations. This talk gives therefore a short insight in what is stress about and is it always bad for the animal and at the end how we deal with stress in the daily work. Therefore we have

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to ask ourselves at all time, what is possible for the animal, are there better ways to replace some behavioural work and where we set the limits in order to avoid distress. The aim of the training and thus of this talk is not just to challenge an animal, but also to encourage it at all time. This is highly essential for the physical and mental vitality of the animals.

Training wild birds for research

Presented by: Martina Schiestl MSc.

Research in animal labs has the reputation of being associated with sterile housing and questionable testing methods. My personal approach to study behaviour and cognition of birds and other animals involves the opposite: making life as rich as possible. Keeping animals in their natural setting, means either in social groups or breeding pairs - depending on the age and social needs of each individual. All of the training and experimental set ups have to involve positive reinforcement techniques and voluntary participation, since I believe the motivation of our animals should come from a positive experience with us. A main training aim is to be able to temporarily separate the animals from their social group, without causing distress. I feel that it is vital to pay attention to both the needs and emotions of animals during research, which not only provides scientists with more reliable data, but also makes it more fun for both parties. I will give some examples and insight into how all of this happened on the remote island of New Caledonia, training wild New Caledonia crows for cognitive research and to re-release them back into the wild.

Training pet dogs to investigate their cognitive abilities by using different methods

Presented by: Sabrina Karl MSc.

Non-human animal cognition research is mainly based on behavioural studies. However, these methods are limited in their outcome and interpretation, especially regarding unknown underlying mechanisms. Thus, training non-human animals to use more sophisticated methodologies to investigate their cognitive abilities is a growing field. Lately, various well-developed methods to study visual perception, brain processes and effects of hormones, e.g. oxytocin, in humans have been successively applied to dogs. We trained pet dogs to conduct accurate eye-tracking (N=40) and awake, non-invasive functional magnetic resonance imaging (fMRI; N=20). Additionally, they learned to put their snout reliably in a spraying vaporizer mask (N=20). All these methods require dogs to stay motionless but attentive for a certain time and demand effective dog training. During the entire dog training process, we used a clicker as a secondary reinforcer and worked with positive reinforcement of the correct behaviour.

Creative trainers and their contribution to cognitive research in animals

Presented by: Sara Torres Ortiz MSc.

Cognition can be defined as every mental process used to better understand the environment. The study of cognition is related to learning,

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thinking, communication and many other facets. When humans try to understand cognitive abilities in animals, we tend to develop anthropocentric methods. This often leads to animals failing during experiments, not necessarily because they do not possess certain abilities to complete tasks, but possibly because the methodology is not relevant for the ecology and natural history of the taxa being tested. Currently, the field of cognition is expanding both in the number of studies and the number of tested species. While historically most of the cognitive studies have been performed on primates, in recent years enhanced communication between researchers and zoo facilities have helped to develop our understanding of many additional taxa.

Dolphin Adventure is a good example to illustrate this. Dolphin Adventure is a facility who is hosting a group of bottlenose dolphins and South American sea lions. In an attempt to improve the welfare and motivation of these animals during swimming programs, they established "innovate training". Their innovative training methods kept their animals engaged by mentally challenging them. Their methods are now part of a fully funded PhD program and in preparation to be published in relevant scientific journals. Their contribution is not only improving the welfare of their animals but also increasing our knowledge on these species.

Measuring cognitive-affective appraisal processes. One approach to assess the subjective perception of welfare in farm animals.

Presented by: Jenny Stracke PhD

Understanding cognitive-affective appraisal processes is of elemental interest, not only for fundamental research but for applied science as well. They provide the potential to judge the affective state as one essential part of animal welfare objectively. The awareness of such affective (subjective) abilities may shift the current perception of farm animals from being simple products to being complex individuals, with each having their own individual needs. Therefore, it is of significant importance to both current and future animal welfare studies as knowledge on animals' affective abilities may reveal new perspectives to improve and to judge husbandry systems. However, these processes are complex and flexible. They are not only originating in the brain, which itself is characterised by

highly connected structures, circuits and networks, but its phenotype is multifaceted, comprising physiological, behavioural and subjective components.

The 'cognitive bias' approach offers a promising tool to provide answers in this complex field. Originally developed in human psychiatric research, this test is recently used in various (farm) animal species to measure the valence of affective states based on optimistic (positive valence) or pessimistic (negative valence) evaluations of ambivalent stimuli. The talk will introduce the test design(s) used in research, will give examples of results in different farm animal species but as well will highlight pitfalls and limitations.

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Research as tool for animal and trainer enrichment

Presented by: Magnus Wahlberg PhD

Trained animals are used in many biological studies to answer questions about e.g., animal behaviour, physiology, ecotoxicology, as well as in sensory and conservation biology. Scientists and animal trainers need to work closely together to produce scientific valid data without exhausting neither trainers nor animals. Scientists and trainers usually have different perspectives on how to proceed with the actual details of the work, due to their different backgrounds. Sometimes, the fusion the different perspectives and needs is best accomplished by the scientist being the trainer (and vice versa), but very often this is not possible. Instead, the scientist and trainer need to be in close communication to avoid misunderstandings. The scientist need to understand the limitations and challenges of training, and the trainer need to understand the requirements for producing valid scientific data.

Assessing welfare through behavioral diversity in captive grey seals

Presented by: Christina Kaas Nordholt Andersen

Natural behavior in animals under human care is believed to be hindered by stereotypical behavior, which can be used as an indicator for a distressed animal, and thereby decreasing the animals' welfare. Before we begin training animals for e.g. research, it is important to understand the day to day behavior they exhibit in order to better assess their welfare. Different studies on pinnipeds indicate specific behaviors, such as constant swimming in the same pattern, to be of concern since it can represent stereotypical behavior. In this study, we investigated the time budgets and analyzed the different behaviors observed in five captive grey seals and compared the results to published studies on wild grey seal behavior. The results showed that the grey seals, which were housed at two different facilities, exhibited the same types of behaviors. The amount of time spent on the different behaviors differed between sexes but correlated with behaviors seen in the wild.