International Specialised Skills Institute 2016

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THE GEORGE ALEXANDER FOUNDATION

Global Best Practise in Animal Training in a Zoo Setting: With Emphasis on Primates

Bianca Papadopoulos

An International Specialised Skills Fellowship

funded by The George Alexander Foundation

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i. EXECUTIVE SUMMARY

Zoos have undergone a remarkable transformation in the past century. Zoological parks have evolved from the original 'menageries', assembled to stroke the vanity of the rich, to their present role as conservation/preservation and wildlife education centres. Similarly, during this time, zoos have attained a new way in which they care for the animals.

Animal training is a critical tool in zoos as they strive for excellence in animal care and welfare. High-quality training programs benefit animals by reducing stress and allowing them to assist in their own medical health care.

Animals in captivity deserve the best care that zoos can possibly provide. Training of animals should not be considered a luxury that is only provided if there is time; it is an essential part of good animal care. Just as one would never consider developing an animal care program without a veterinary component, a nutritional component, a social component and an environmental component, nobody should consider caring for an animal without a behavioral management component integrated into the program.

In Australia, there is a critical shortage of highly trained animal trainers and there are insufficient training opportunities for specialised zoo animal trainer para-professionals. This International Specialised Skills Institute (ISS) Fellowship has enabled Bianca Papadopoulos to continue making a high-level contribution to the field of zoo-based animal training in Australia on an ongoing basis.

The report summarises the teachings and new knowledge gained by the Fellow during the overseas research program. Papadopoulos attended the Animal Training Seminar hosted by Ken Ramirez in Chicago, the American Zoological Association (AZA) Animal Training Applications Workshop hosted by several well-known zoo animal trainers in Florida and the Contemporary Animal Training and Management Workshop hosted by Steve Martin and Dr. Susan Friedman. Two of the overseas research visits saw the Fellow undertake training sessions with particular animals under the guidance of her hosts. The Fellow also spent time with research scientists at Lincoln Park Zoo and trainers at Zoo Atlanta to learn about their medical-based animal training programs and Lincoln Park's cognitive bias research with their primates.

The Fellow found that for zoos in the USA, the use of animal training plays an integral role in all aspects of caring for the animals; from exhibit design, to enabling the veterinarians to undertake medical procedures without having to anaesthetise the animals, to allowing keepers help promote positive welfare states and help deliver choices to their animals. The Fellow hopes the material and recommendations provided as part of this Fellowship and the dissemination sessions subsequently provided, will help to positively influence the behavioural management of animals in zoological facilities in Australia.

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ii. ABBREVIATIONS/ACRONYMS

AAZK	American Association of Zookeeping (the peak association for zookeepers in North America)
ABA	Applied Behaviour Analysis
ABMA	The Animal Behaviour Management Alliance
AUS	Australia
AZA	Association of Zoos and Aquariums (the peak zoo Industry association in North America)
EMA	Elephant Managers Association (an international association for those working with elephants)
GAHP	Great Ape Heart Project
IAATE	The International Association of Avian Trainers and Educators
IMATA	International Marine Animal Trainers Association
ISS	International Specialised Skills Institute
MZ	Melbourne Zoo
NEI	Natural Encounters, Inc.
NZ	New Zealand
SD	Discriminative Stimulus
SPIDER	Setting goals, Planning, Implementing, Documenting, Evaluating, Re-adjusting
USA	United States of America
ZAA	Zoo Aquarium Association; the peak industry association for zoos in Australia, New Zealand and Papua New Guinea
ZV	Zoos Victoria (operates Melbourne Zoo, Healesville Sanctuary and Werribee Open Range Zoo)

iii. DEFINITIONS

LRS

Is a two (2) – three (3) second moment in time, where the trainer remains neutral in the position they were in when the animal gave the incorrect response. It is designed as the most positive approach to dealing with unwanted behaviour without frustration.

Discriminative Stimulus

A stimulus which has a specific meaning, in animal training, usually denoting a stimulus which elicits a specific behaviour, or a cue (Ramirez, 1999).

1. ACKNOWLEDGEMENTS

The fellow would like to thank the following individuals and organisations that have generously given of their time and their expertise to assist, advise and guide her through this Fellowship program.

Awarding Body – International Specialised Skills Institute (ISS Institute)

The International Specialised Skills Institute (ISS Institute) is an independent, national organisation. In 2015 it is celebrating twenty-five (25) years working with Australian governments, industry education institutions and individuals to enable them to gain enhanced skills, knowledge and experience in traditional trades, professions and leading edge technologies.

At the heart of the ISS Institute are our individual Fellows. Under the Overseas Applied Research Fellowship Program the Fellows travel overseas. Upon their return, they are required to pass on what they have learnt by:

- Preparing a detailed report for distribution to government departments, industry and educational institutions
- Recommending improvements to accredited educational courses
- Delivering training activities including workshops, conferences and forums.

Over 300 Australians have received Fellowships, across many industry sectors. In addition, recognised experts from overseas conduct training activities and events. To date, 25 leaders in their field have shared their expertise in Australia.

According to Skills Australia's 'Australian Workforce Futures: A National Workforce Development Strategy 2010'.

> *Australia requires a highly skilled population to maintain and improve our economic position in the face of increasing global competition, and to have the skills to adapt to the introduction of new technology and rapid change. International and Australian research indicates we need a deeper level of skills than currently exists in the Australian labour market to lift productivity. We need a workforce in which more people have skills and knowledge, but also multiple and higher level skills and qualifications. Deepening skills and knowledge across all occupations is crucial to achieving long-term productivity growth. It also reflects the recent trend for jobs to become more complex and the consequent increased demand for higher-level skills. This trend is projected to continue regardless of whether we experience strong or weak economic growth in the future. Future environmental challenges will also create demand for more sustainability related skills and knowledge across a range of industries and occupations.*

In this context, the ISS Institute works with our Fellows, industry and government to identify specific skills and knowledge in Australia that require enhancing, where accredited courses are not available through Australian higher education institutions or other Registered Training Organisations. The Fellows' overseas experience sees them broadening and deepening their own professional knowledge, which they then share with their peers, industry and government upon their return. This is the focus of the ISS Institute's work.

For further information on our Fellows and our work see http://www.issinstitute.org.au.

The Fellow also warmly thanks the Previous CEO (Bella Irlicht AM), the current CEO (Lou Ellum) and staff (Ken Greenhill, Paul Sumner, and Danielle Cull, Fiona Waugh) of ISS Institute for their assistance in the planning and development of the Fellowship and completion of this report.

1. ACKNOWLEDGEMENTS

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Papadopoulos sincerely thanks The George Alexander Foundation for providing funding support for the ISS Institute and for this Fellowship.

In 1972, George Alexander AM (1910 - 2008) set up an independent philanthropic Foundation as a way of sharing his wealth and giving back to the community. Today, the main focus of The George Alexander Foundation is access to education for promising young people, particularly students with financial need and those from rural and remote areas.

The George Alexander Foundation (GAF) Scholarship and Fellowship Programs form the core of the foundation's work, operating in partnership with major tertiary institutions, while our Fellowships and other Education grants provide a variety of other unique and challenging educational experiences. George Alexander believed in the notion of 'planting seeds and hoping they grow into pretty big trees'. The programs supported by the Foundation endeavour to support this ideal and as GAF students graduate and go on to contribute to the community, George's legacy and spirit lives on through their achievements. George Alexander came to Australia as a child migrant, and went on to become a mechanic, an entrepreneur and a businessman and later, a generous philanthropist, who held that you do not own the possessions you have, 'you're just minding them'. This philosophy guided him to give during his lifetime and to hope that through his example, he might inspire others to do the same

Supporters

The Fellow received support from various individuals and she has embodied this throughout her work:

- Hans Van Weerd, General Manager of Life Sciences, Zoos Victoria
- Laurie Pond, Programme Development Manager, Australia Zoo
- Amanda Embury, Senior Manager – Life Sciences, Zoos Victoria

Other organisations and individuals who contributed to the planning, preparation and approach to this Fellowship research for their considerable assistance.

1. ACKNOWLEDGEMENTS

Industry

- Disney's Animal Kingdom, Orlando USA
- Dr. Kate Bodley, Senior Veterinarian, Melbourne Zoo – Zoos Victoria, Melbourne AUS
- Dr. Sally Sherwen, Animal Welfare Specialist, Wildlife Conservation and Science – Zoos Victoria, Melbourne AUS
- Dr. Susan Friedman, Psychology Professor at Utah State University and Natural Encounters Inc., Florida USA
- Emily Insalaco, Curator of Behavioural Husbandry and Animal Ambassadors, Denver Zoo, Colorado USA
- Jodi Carrigan, Lead Keeper of Primates, Atlanta Zoo, Atlanta USA
- Ken Ramirez, Vice President of Animal Collections and Animal Training, Shedd Aquarium, Chicago USA
- Lincoln Park Zoo, Chicago USA
- Lydia Hopper, Assistant Director of the Lester E. Fisher Center for the Study & Conservation of Apes, Lincoln Park Zoo, Chicago USA
- Michelle Skurski, Zoological Manager of Behavioural Husbandry, Disney's Animal Kingdom, Florida USA
- Natural Encounters, Inc., Florida USA
- Shedd Aquarium, Chicago USA
- Steve Martin, President of Natural Encounters, Inc., Florida USA
- Tim Sullivan, Curator of Behavioural Husbandry, Chicago Zoological Society -Brookfield Zoo, Chicago USA
- Zoo Atlanta, Atlanta USA
- Zoos Victoria, Melbourne AUS

Professional Associations

- Association of Zoos and Aquariums (AZA)
- Zoo Aquarium Association (ZAA)

2. ABOUT THE FELLOW

Name: Bianca Papadopoulos

Position: Senior Zookeeper – Primate Precinct, Melbourne Zoo – Zoos Victoria

Qualifications:

- Certificate III in Captive Animal Studies – Box Hill Institute of TAFE, 2009
- Certificate IV in Captive Animal Studies – Western Sydney Institute, 2012

Biography:

The Fellow has always had a passion for animals and it was a dream of hers, since she was a little girl, to become an animal trainer. During her senior secondary studies, the Fellow began volunteering with native animals, Asian Elephants and seals at Melbourne Zoo. After completing her Victorian Certificate of Education (VCE) in 2006, the Fellow landed her dream job as a zookeeper at Melbourne Zoo. Since that time, the Fellow has completed her trade certificate in zookeeping and then an advanced certificate in zookeeping.

Over the past ten years, the Fellow has worked as a marine mammal trainer at Underwater World and Sea World, Australia. In 2011, the Fellow returned to Melbourne Zoo for a position within the Primate Precinct.

During the Fellow's career, she has developed a passion for animal training within a captive zoo setting. The Fellow has been able to work with many trainers and developed a set of skills in the animal training field. The Fellow currently oversees all animal training programs on the Primate Precinct at Melbourne Zoo and was successful in acquiring an internal scholarship to disseminate her existing training knowledge to colleagues at Melbourne Zoo through an animal trainer specialist role.

3. AIM OF THE FELLOWSHIP PROGRAM

This Fellowship allowed the Fellow to attend several animal training workshops and shadow leading professionals and institutions in the rapidly developing use of operant conditioning techniques, focusing on using positive reinforcement to form animal training programs to increase animal welfare standards for animals in a captive zoo setting.

This allowed the Fellow to achieve the following aims:

- Grow the skill set of the Fellow, which allowed her to further grow the animal training programs that she oversees.
- Learn alternative methods and developed new skills in the animal training field, to be more effective at teaching her fellow colleagues, furthering their skills and sharing knowledge via participation at conferences and in publications.
- These skills can transfer to share and deploy expertise throughout Zoos Victoria.
- Investigated the new techniques available in voluntary health training programs.
- Learnt training techniques that support positive animal welfare states.
- Developed stronger relationships with the international community of animal trainers/keepers for future partnerships nationally and internationally.

Upon completion of the Fellowship research trip, the Fellow's findings will stimulate the Australian industry of zoological organisations to invest in the up-skilling of their staff in the animal training field, therefore being more equipped to integrate training methods into the daily care of animals to enhance their welfare.

4. THE AUSTRALIAN CONTEXT

Humans have interacted with animals at least as far back as there are historical records. In fact, evidence suggests that people have always been fascinated with animals of all types. Ancient kings and pharaohs maintained large menageries as a sign of their wealth and power.

The Greeks established the first zoos to study animal behavior, charging for admission to view the specimens and setting up an education process. One of the most notable teachers at a Greek zoo was Aristotle, and one of his best-known students was Alexander the Great who collected many animals for the zoos.

British and European exploration of the world in the 18th and 19th centuries led to the discovery of many species of animals that they considered to be unusual. This encouraged the keeping of animals as exotica in Europe and Britain. The idea of zoos as places of entertainment also developed.

The zoological world has changed and developed drastically since that time, to meet the standards of the modern world. Connection, conservation, education and research are the main objectives of zoos in 2015, as they aim to educate their visitors about the living world and ensure that visitors are aware of the importance of nature conservation. The animals in zoos and aquaria serve as ambassadors for animals in the wild and inspire visitors to care for and understand natural ecosystems and the threats that these systems face.

Zoos Victoria's (ZV) vision is to be the world's leading zoo-based conservation organisation. Their mission is to galvanise communities to commit to the conservation of wildlife and wild places. They will achieve this by connecting people and wildlife in the following ways:

- Opening the door by providing exceptional wildlife encounters that reach beyond the boundaries of the ZV campuses
- Leading the way by communicating and demonstrating the role of conservation and research in all that ZV does
- Catalysing action through inspiring experiences that motivate participation, leading to conservation and sustainability outcomes.

So, how do zookeepers ensure that the requirements of animals in their care, which are ambassadors for their wild counterparts, are being meet on a daily basis? How do keepers provide mental stimulation to their animals? How do keepers reduce the potential for stress in their animal's lives? How do keepers provide the animals with opportunity for physical exercise? And how do keepers ensure that visitors have the chance to experience up close and personal encounters with the animals – which provides a crucial opportunity for the visitors to connect with the animals? The answer is through the use of animal training programs as a management tool; it is one of the most crucial tools in allowing zookeepers to enhance the welfare of their animals.

Animal training programs are created using operant conditioning techniques. This is a method of learning that is made through association between behaviour and a consequence that follows that behaviour. B.F. Skinner was the first behavioural psychologist to look at behaviour in this way in 1938. Skinner believed that the best way to understand behaviour is to look at the causes of an action and its consequences. Behavior which is reinforced tends to be repeated (i.e. strengthened); behavior which is not reinforced tends to die out-or be extinguished (i.e. weakened).

High-quality animal training program objectives are to support positive animal welfare states by reducing the need for interventions (e.g. anesthetic immobilisations), providing opportunity for health checks, promoting learning, supporting group stability/cohesion, helping in the development of critical survival skills especially for animals that are part of a captive breed and release program and it also providing the opportunity for visitor experiences.

4. THE AUSTRALIAN CONTEXT

Compared to North America and Europe, Australia has a very small zoological industry and hence the exposure to animal training advances is limited. Zoological facilities around the world are continually making waves in animal husbandry using animal training techniques. Training a 190kg male Western Lowland Gorilla who has a heart condition to sit still whilst he receives a cardiac heart ultrasound, training an orangutan to take part in a cognitive bias study, training a Hyena to participate in a voluntary jugular blood draw, training an African Grey Parrot to free fly around the zoo showing visitors its natural wild behaviours and come back to its trainer and training animals that are part of a captive breed and release program to avoid predators, are all astonishing examples of advances that have been made over the years in animal training in a zoo setting.

As various applications for animal training are being developed and as training methods are being applied to an increasingly diverse number of species, it is important to discover what methods are appropriate and most successful for each species. The benefits in obtaining these skills will ensure that the Australian zoo industry is continuing its effort to provide their animals with a more fulfilling life through the uses of animal training.

As medical behaviour training is one of the most important aspects of a training program, the Fellow met with Melbourne Zoo Senior Veterinarian Kate Bodley, to obtain a veterinarian's perspective on the benefits of animal training in a zoo setting and where she would like to see the future direction of it at Melbourne Zoo. Bodley stated that "training animals for participation in veterinary procedures is an important part of animal care in zoos as such procedures are challenging when performed on large or dangerous exotic animals, as many cannot be safely handled without anaesthesia".

Benefits for veterinary care:

- Anaesthesia is an inherently risky process, even when performed on patients that are healthy. Drugs that are used may result in unavoidable cardiopulmonary compromise. Some species are anaesthetised using narcotic agents that are dangerous for the human handlers.
- The ability to complete non-invasive procedures without anaesthesia will allow them to be performed more frequently. Examples include preventative medicine tasks (vaccination, dental assessments and cleaning), physical examination, and reproductive evaluation. Behaviour training provides the ability to perform these procedures without risk and without significant stress for the patient.
- Animals that are unwell are at significant risk of severe complications during anaesthesia. The ability to obtain diagnostic information under trained behaviour (e.g. blood collection) can facilitate diagnosis and commencement of treatment without any requirement for anaesthesia.
- When anaesthesia is required, drug administration under trained behaviour significantly reduces anaesthetic risk, as drug doses can be reduced and animals are not stressed/excited at the time of administration.
- Restraint (e.g. by netting) is also an extremely stressful procedure that significantly risks trauma and debility for patients, and may be dangerous for zoo staff. Calm hand-injection, using low doses of anaesthetic drugs given under trained behaviour, is frequently less stressful and dangerous than a conscious restraint procedure.
- Voluntary acceptance of injections facilitates long-term medical management of complex conditions that might otherwise be untreatable, for example, animals that are diagnosed with diabetes mellitus. If these animals did not accept injections, development of signs of disease would result in euthanasia.
- Administration of anaesthetic agents may alter the results obtained from procedures, including blood testing and blood pressure monitoring. This can make results difficult to interpret when trying to assess animals that are unwell.
- It is important for a veterinarian to be able to examine an animal without the experience being overwhelmingly negative for the patient. If an animal is unwell, it is difficult to make any assessment

of clinical signs when the patient's response to the veterinarians is to be highly fearful/defensive. Training may be used to desensitise an animal to past negative interactions with the veterinarian, allowing observation of the animal while it is calm.[1]

- Implementation of training programs has associated costs, for example there is substantial commitment of time by trainers and there is increased risk of damage to equipment when animals undergo diagnostic/therapeutic procedures while conscious.[2] However, there are significant benefits when training programs are carefully implemented. For example, the cost of immobilisation of a large mammal is considerable, including anaesthesia drug costs and allocation of staff time in preparation for such procedures. The ability to perform reproductive ultrasound exams during late pregnancy of elephants allows for accurate prediction of delivery date within 72 hours, and this enables efficient, targeted allocation of staff resources for animal supervision during the birth.

Within Melbourne Zoo, there are many cases that have demonstrated the value of behavioural training for medical procedures. Some key examples include:

- White-cheeked Gibbon, 'Vang', developed severe illness due to diabetes mellitus in 2013. Without the ability to inject her daily dose of insulin 'Vang' would quickly deteriorate to the point of requiring euthanasia. Zoo primates are not uncommonly affected by diabetes, and acceptance of insulin injections is a vital part of their ongoing management.[3] [4]
- Repeated ultrasound examinations during late pregnancy have been used to assess foetal health, and to predict delivery date in three female Asian Elephants.
- Annual vaccinations administered to carnivores (Binturong, Tiger) without the need for anaesthesia or darting.
- Administration of long-term eye medications to captive fur-seals, so that there has been complete resolution of chronic eye inflammation in several individuals.
- Veterinarians are no longer required to anaesthetise Melbourne Zoo's apes using induction agents administered by dart. Prior to the implementation of behaviour training, these animals were familiar with the process of being darted, and were highly fearful and aggressive during a darting procedure. This meant that high drug doses were administered to achieve anaesthesia. In addition, the animals appeared traumatised post-anaesthesia, demonstrating behaviours that were suggestive of anxiety and fear towards keepers and veterinarians. All of Melbourne Zoo's apes are now trained for hand-injection.

Future directions:

Male gorillas in captivity have a high incidence of severe, progressive heart disease. Four of Melbourne Zoo's male gorillas have demonstrated clinical signs of cardiac failure. In such animals, exertion associated with anaesthetic darting results in visible exhaustion, panting and sweating, and risks acute collapse and death due to cardiac insufficiency. Anaesthetic drugs affect cardiovascular function and may result in severe compromise. The Great Ape Heart Project, based at Zoo Atlanta, is the first coordinated clinical approach targeting cardiovascular disease across all four great ape taxa. The disease is a primary cause of mortality among gorillas living in zoological settings.

1 Reichard, T.A., (2008), 'Chapter 7: Behavioural Training for Medical procedures', Zoo and Wild Animal Medicine: Current Therapy 6, Saunders Elsevier, St Louis Missouri. pp. 66-67.

2 Ibid.

3 Stringfield, C., and McNary, J.K., (1998), 'Operant conditioning of diabetic primates to accept insulin injections', Proceedings of the Annual Conference of the American Association of Zoo Veterinarians, Omaha Nebraska. pp. 396-397.

4 Kuhar, C.W., Fuller, G.A., and Dennis, P.M., (2013), 'A survey of diabetes prevalence in zoo-housed primates', Zoo Biology, 32(1):63-9.

4. THE AUSTRALIAN CONTEXT

Until very recently, cardiovascular disease in apes has been poorly understood. Assessment requires advanced understanding of diagnosis, treatment and monitoring of affected apes, as well as adaptation of techniques already in use in humans and domestic animals. One key procedure that will allow assessment of cardiovascular function in gorillas is conscious cardiac ultrasound. This procedure is routinely performed on all of the gorillas at Zoo Atlanta.

At present, routine cardiac ultrasound assessments are performed on Zoo Victoria's gorillas while they are under anaesthesia, and therefore may only be performed every one to two years. Training of all gorillas for conscious cardiac ultrasound would enable Zoos Victoria veterinarians to provide constant assessment and directed therapy for these animals.

5. IDENTIFYING THE SKILLS AND KNOWLEDGE ENHANCEMENTS REQUIRED

There are examples of areas in Australian industries where there are weaknesses in innovation, skills, knowledge, experience, policies and/or formal organisational structures to support the ongoing successful development and recognition of individuals and the particular sector.

The focus of all ISS Institute Fellowships is on applied research and investigation overseas by Australians. The main objective is to enable enhancement and improvement in skills and practice not currently available or implemented in Australia, and the subsequent dissemination and sharing of those skills and recommendations throughout the relevant Australian industry, education, government bodies and the community.

Overall, animal training in Australian zoological facilities is a skill that is lacking. The required skill enhancements areas investigated via this Fellowship were the following:

Skills deficiency 1: Investigated the new techniques available in voluntary health training programs

- Given that there are few zoos in Australia, as compared to Europe and America, the region is lacking the skills and techniques needed to offer animals the chance to participate in voluntary health examinations/procedures.
- Analysed voluntary health training programs used in zoos in the USA.
- Reported on the logistics of the program in the animal's zoo environment (e.g. how the keepers are able to establish the health programs with the infrastructure used in the animal's exhibits).

Action: Implemented the above findings and adjusted it into the existing voluntary health training programs on the primate department at Melbourne Zoo.

Action: Helped other departments within the Zoos Victoria to create new health training programs based on what the Fellow learned at the workshops.

Action: Presented the findings at the yearly ASZK conference to disseminate the information to all zoological member facilities.

Skills deficiency 2: The methodology behind large social group training programs and how they are implemented

- Melbourne Zoo has a troop of 20 Hamadryas Baboons for which, due to their social hierarchy, there is a struggle to maintain a consistent training program for them. However, many other zoological institutions have done so.
- Explored the ideologies behind large social group training programs.
- Gathered information needed to implement training programs for large social groups of animals.

Action: Create a systematic training program for Melbourne Zoo's baboon troop.

Action: Replicate the same using the above principles for other social animal groups within Melbourne Zoo.

5. IDENTIFYING THE SKILLS AND KNOWLEDGE ENHANCEMENTS REQUIRED

Skills deficiency 3: Explored how long-standing keepers have changed their mind set on animal training and adapted their keeping style to facilitate daily training sessions

- Animal training using positive reinforcement in Australian zoos has really only been used as a tool in assisting in animal welfare over the past 15 years. Many keepers started working in the industry long before this and struggle with the concept of operant conditioning techniques.
- Analysed how zoos in the USA have shifted the mindset of their long-standing keepers.
- Studied the ways in which the zoo gained their involvement in animal training programs.

Action: Create an environment, which allows long-standing keepers to participate in daily training sessions.

Action: Develop skills in operant conditioning for those keepers, using the above research for the USA.

Skills deficiency 4: Observed how research study training is conducted in conjunction with zookeepers and research scientists

- Research training is where animals require training to participate in a research study. Research training has not yet taken place at Melbourne Zoo.
- Learned how this type of training is facilitated and the research technology used in the study is incorporated into their training.

Action: Facilitate the research training of Melbourne Zoo's orang-utans for a research study on cognitive bias in 2016, which includes training of the staff on the Primate Precinct.

Action: Report back to the Australian zoological industry on the advances in research training and how it has a roll-on effect to other parts of zookeeping, such as exhibit design.

Skills deficiency 5: As animal training is an aspect of behaviour science, it is constantly changing and developing. Discovered the new advances in the science behind the training.

- Learned about the most up to date research on the techniques in use in animal training programs and how they have consequently evolved.
- Collected evidence to support the advances in training.

Action: Apply the findings to the way keepers use the training techniques within the training programs on the Primate Precinct.

Action: Convey the findings to the rest of the animal keeping/training staff at Zoos Victoria.

6. THE INTERNATIONAL EXPERIENCE

This section of the report summarises the teachings and new knowledge gained by the Fellow during the overseas research program. The Fellow attended the Animal Training Seminar hosted by Ken Ramirez in Chicago, the American Zoological Association (AZA) Animal Training Applications Workshop hosted by several well-known zoo animal trainers in Florida and the Contemporary Animal Training and Management Workshop hosted by Steve Martin and Dr. Susan Friedman. Two of the overseas research visits saw the Fellow undertake training sessions with particular animals under the guidance of her hosts. The Fellow also spent time with research scientists at Lincoln Park Zoo and trainers at Zoo Atlanta to learn about their medical-based animal training programs and Lincoln Park's cognitive bias research with their primates.

The Fellow found that for zoos in the USA, the use of animal training plays an integral role in all aspects of caring for the animals; from exhibit design, to enabling the veterinarians to undertake medical procedures without having to anaesthetise the animals, to allowing keepers help promote positive welfare states and help deliver choices to their animals.

The following is an overview of the studies and visits undertaken by the Fellow during her Fellowship and is presented in chronological order.

6.1 Lincoln Park Zoo – Chicago, Illinois, USA

Contact:

Lydia Hopper, Assistant Director of the Lester E. Fisher Center for the Study & Conservation of Apes

Objective:

- To learn about the cognitive bias research studies that they are conducting with their apes and small primates, including the importance and reasons behind the study.
- To understand how the keepers train the animals to use and interact with the research technology.
- To learn how this type of training is facilitated and the research technology used in the study.
- To see how they incorporate technology to facilitate research training into exhibit design.

Outcomes:

Melbourne Zoo are working in conjunction with Lincoln Park Zoo on a cognitive bias research study with primates. Both projects will use the same methodology to measure affective state in great apes, providing a comprehensive study of this technique across species in a zoo environment. This will further help to assess how effective its application would be in the zoo environment more generally.

Lincoln Park are undertaking the study with their Western Lowland Gorilla and Japanese Macaque groups, whilst Melbourne Zoo are undertaking it with their Sumatran and hybrid Orang-utans. The study has not yet began at Melbourne and when it does, it will be the first time that such a study has taken place at Melbourne Zoo and in any zoo in the world for that matter.

How an individual interprets information can give insight into its affective (or emotional) state. These biases of cognition have their basis in human psychology – a person in a positive affective state (contented/happy) will assess ambiguous information more positively or optimistically. Essentially they see the 'glass as half full'. Conversely, a person in a negative affective state (anxious/depressed/fearful) will assess ambiguous information more pessimistically. Individuals in negative affective states will also be more reactive to negative stimuli. These measures are now commonly used in animal welfare research to measure affective states. To date, cognitive biases have been measured in

6. THE INTERNATIONAL EXPERIENCE

Tufted Capuchins,[1] Rhesus Macaques,[2] Grizzly Bears,[3] psittacines[4] and a variety of production and companion species.

The assessment of cognitive biases presents a novel way to assess an animal's welfare state. Common physiological and behavioural indicators of welfare have the ability to either identify or exclude one type of affective state. For example, low cortisol concentrations can be used to deduce that an individual is not stressed, but it cannot conclude that the individual is in a positive welfare state. Cognitive biases present the opportunity to assess both positive and negative welfare in the same test. Due to its extensive use across species and potential to measure different affective states in the same test, this technique is considered one of the most promising ways to assess both positive and negative welfare states in animals.

To date, cognitive biases have not been measured in orang-utans. As indicated above, previous studies suggest that this may be an effective way to assess and promote the welfare of orang-utans in the zoo environment. Specifically, the findings of this study have the potential to provide the zoo and other organisations housing orang-utans with a valuable tool to assess animal welfare on a scale from negative to positive. Furthermore, results from the use of this tool can inform the management of Melbourne Zoo's orang-utans in the future.

The cognitive bias training program is also anticipated to be enriching in its own right for the orang-utans, presenting them with a task that will require their attention and engagement. The value of this method and its enriching properties are recognised by the keepers that work with the animals' daily as well.

The study requires the orang-utans to interact with a software based touch screen computer and to facilitate this, keepers will need to train the orang-utans to do so. The Fellow will be the keeper overseeing all the training with the orang-utans in Melbourne with regards to the cognitive bias study. Prior to the study beginning, Lincoln Park keepers/researchers introduce the computer to the animals to desensitize them to the equipment and then they start training the animals to use the computer through positive reinforcement.

The animals then go through a stage of preference testing. The goal of the preference testing is (a) to determine two reward items that the animals perceive to be of high and low value, and (b) to identify a low value reward for which the animals will be motivated to participate.

The keepers use a continuous reinforcement schedule and pair every correct answer with primary reinforcement whilst training the animals to use the software. A correct response of a positive state from the animals elicits the keepers to provide them with the high value reinforcer, which they determined in the preference testing. A correct response of a negative state from the animals elicits the keepers to provide them with the low value reinforcer. An incorrect response and the keepers provide a least reinforcing stimulus/scenario (LRS).

1 Pomerantz, Ori, et al., (2012) 'Stereotypic head twirls, but not pacing, are related to a 'pessimistic'-like judgment bias among captive tufted capuchins (Cebus apella)', Animal Cognition 15.4: 689-698.

2 Bethell, E. J., et al., (2012), 'Cognitive bias in a non-human primate: husbandry procedures influence cognitive indicators of psychological well-being in captive rhesus macaques', Animal Welfare-The UFAW Journal 21.2: 185.

3 Keen, H.A., et al., (2014), 'Validation of a novel cognitive bias task based on difference in quantity of reinforcement for assessing environmental enrichment', Animal Cognition 17.3: 529-541.

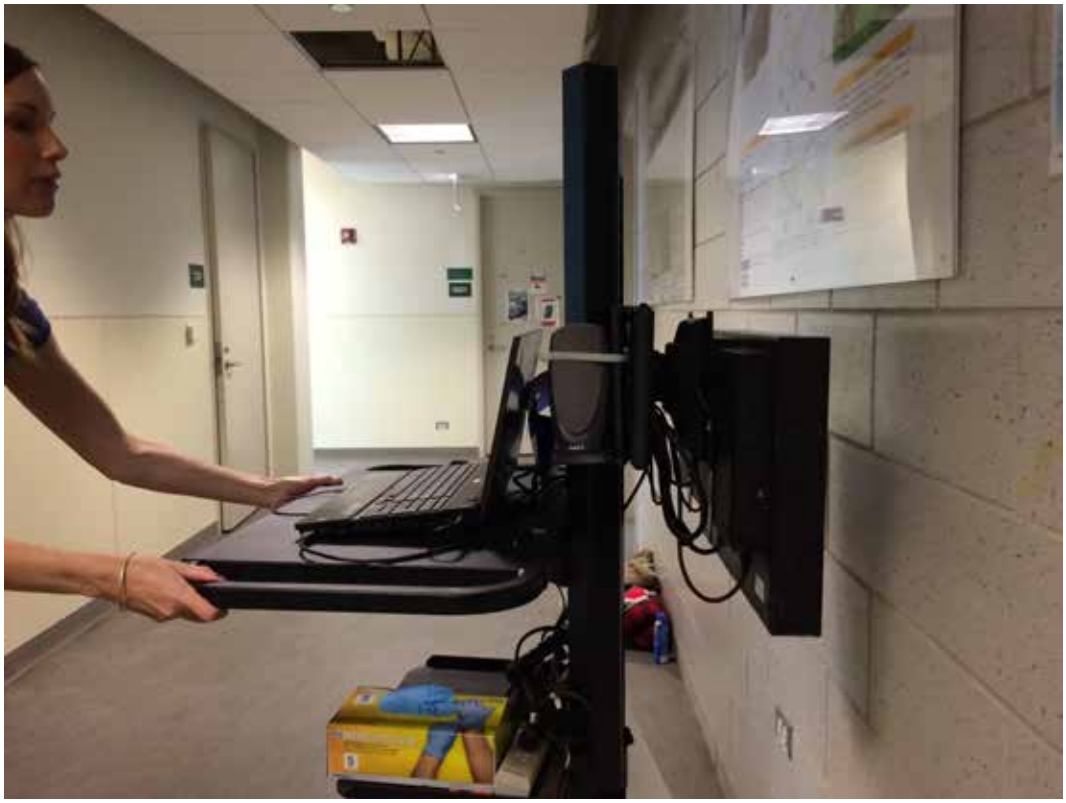
4 Cussen, V.A., and Mench, J.A., (2014), 'Personality predicts cognitive bias in captive psittacines, Amazona amazonica', Animal Behaviour 89: 123-130.

Area in which the Japanese Macaques participate in the study. It is surrounded in a glass box so that visitors can observe the sessions.

At Lincoln Park Zoo, it is the research scientists that carry out the running of the research with the animals and not the keepers. Initially, the keepers initiate the training process by doing all the desensitization work with the animals but then the researchers take over for the reminder of the study. The keepers and the researchers are always working together and thus have good communication skills. To facilitate the study this is a necessity. The keepers communicate several details to the researchers each day. These include; what time of the day the animals will be in the deemed research space (for the researchers to come work with them) and any behavioural/medical observations that the keepers have made that may affect the research study in any way. The communication is done by either two-way radio each day or face-to-face. The primate keepers and the research department share the same office building, which helps a lot when it comes to making face to face communication feasible.

Lincoln Park Zoo's philosophy on exhibit design is to incorporate research technology into the design. This includes touch screens, areas that they can recall the animals into to allow for participation in the study, yet still allows the animals to be on display so that visitors have the opportunity to see the research take place. Most zoos and aquaria focus on the aesthetics of the exhibit and not how to create a space that is mentally stimulating for the animals.

6. THE INTERNATIONAL EXPERIENCE



The touch screen that the gorillas use (in protective contact – from the keeper side of the mesh) for the cognitive bias study.

Building this type of equipment into the exhibit is a much more cost effective way to facilitate research studies which require animal participation. Trying to retro fit these features into an exhibit after its completion is usually very expensive and time consuming and, in some cases, may not be feasible. Planning ahead and building the equipment into exhibits is definitely the most effective method in enabling such research studies.

6.2 Shedd Aquarium – Chicago, Illinois, USA

Contact:

Ken Ramirez, Vice President of Animal Collections and Animal Training at Shedd Aquarium and Executive Vice-President and Chief Training Officer of Karen Pryor Clicker Training

Objective:

5-Day Animal Training Seminar

Key topics included animal intelligence, human emotion and anthropomorphism, basic operant conditioning, informal interactions, husbandry training, social groups, advanced training techniques, aggression, advanced training games, the training of social groups, problem-solving techniques and complex training.

- To explore the ideologies behind large social group training programs.
- To gather information needed to implement training programs for large social groups of animals.
- To learn about the most up-to-date research on the techniques in use in animal training programs and how they have evolved in response to the research.

Outcomes:

Ken Ramirez is a 40+ year veteran of animal care and training, Ramirez is a biologist and animal behaviorist and has acted and continues to act as a consultant to many zoo and aquarium programs throughout the world. Ken has hosted two successful seasons of the pet training television series Talk to the Animals that compared pet training to the important work done with training and caring for animals in zoological facilities. He has also recently worked closely with several search and rescue dog organisations, service dog groups, as well as with bomb and narcotic dogs.

In October 2014, Ken Ramirez began his new role as Executive Vice-President and Chief Training Officer of Karen Pryor Clicker Training where he helps oversee the vision, development and implementation of training education programs for the organisation. This role aligns with Ken's philosophy of helping to bring positive reinforcement training to all corners of the animal training world.

Ken previously served as the Executive Vice-President of animal care and animal training at Chicago's Shedd Aquarium, where he developed and supervised animal care and animal health programs, staff training and development as well as public presentation programs for the entire animal collection of more than 32,000 animals.[5]

Ken and Fellow at training seminar

5 Ramirez Training, <http://kenramireztraining.com/about-ken/>, viewed 20 December 2015

6. THE INTERNATIONAL EXPERIENCE

Below is a summary of Ramirez' presentations during the seminar.

Ramirez states that zoos now recognise there is a need for animal training programs, not just having paperwork that states that they have them but to actually have them implemented on the ground. A lot of people in the industry get overwhelmed when they see the word training but, to simplify it, training is just teaching. It is teaching animals how to live in a human dominated world and their environment, and animals are participating in these training programs willingly - it is a shared process. Trainers could pose the question is it unnatural? The answer is no. Just like a mother teaches its young, it is all a learning process.

Zoos are also now recognising that all animals should have a training program in place. All animals can learn and intelligence is not a representation of their ability to learn, it is irrelevant although this may be true for memory and retention of behaviours, instead it is all a matter of perspective. Currently, in Australia this is not in place, training is often seen as an extra task or a nicety rather than a necessity.

6.2.1 Reasons for an animal training program

Ramirez believes there are four cornerstones for a successful animal training program:

- Health care (veterinary program)
- Nutrition
- Environment (which includes the animals social structure)
- Behaviour management (training and enrichment)

Just like a building foundation, when one is taken away it is not going to stand – it will fall apart. There is not one more important than another.

There are three primary reasons for training:

- Physical Exercise. It doesn't matter how big an animal enclosure/exhibit is in size, it is no substitute for the ocean, the rainforest or any part of the animal's wild environment. Animals are moving for reasons - finding food, finding a mate, or due temperature reasons. Therefore, training can facilitate physical exercise for the animal.
- Mental Stimulation. Life in the wild can be stressful. Worry, worry, worry. In a zoo staff provide all that an animal needs (mate, food, environment) therefore life is less stressful but life can also be boring and that is why there is a need to provide mental stimulation. When the animals have things to do it keeps their brains active, and training provides a high level of mental stimulation for the animal.
- Cooperative Behaviours (Medical Behaviours). Getting animals to actively participate in their own medical care reduces their stress and the stress of the trainers/keepers and veterinarians. Training animals for ultrasounds, injections and x-rays are all examples of cooperative behaviours and is a huge reason behind why training programs for animals are established in zoological facilities.

These three reasons all directly benefit the individual animal and assure that animal welfare is the top priority and that is the key to Ramirez's philosophy on training.

There are also secondary reasons for training, being:

- Education
- Research
- Entertainment
- Conservation

These are all important reasons for the zoo/aquaria being here and the primary existence for the organisation. If zoos don't have the animals, then they are not going to have the opportunity to facilitate these reasons. These secondary reasons cannot take priority over the primary reasons.

Why does this philosophy work? Ramirez states that when trainers put animal's needs first, they are happier and healthier. The animals want to participate in training sessions, they display behaviour that resembles excitement. There cannot be too much pressure on participation of sessions. Welfare comes first. Animals come first.

Ramirez believes that every trainer has to determine the ethical basis for his or her training (and must have it as it guides their training). Primary versus secondary reasons for training, along with the four cornerstones form the basis for Ramirez's training. Having an ethical foundation will inform trainer's decision-making and ensure that animals needs come first.

6.2.2 The human element of training

Ramirez references the 'human element' of animal training and that refers to the people side of it - the trainers. It is very easy for trainers to become anthropomorphic. This is when trainers assign human qualities, characteristics and motivation to anything that is not human. This will be a continuous occurrence in the zoological industry as we are humans and that is what humans do.

When trainers do this in training sessions it can become dangerous. Making excuses for animals during their training is frowned upon. Training works when trainers reinforce good behaviour, and not good thoughts; so even though trainers may think they are doing a good job, they shouldn't let their emotions take over. Instead they should read the animal's behaviour and modify the session according to what they actually see. Compassion and emotion are the most volatile human elements. Compassion is good to have but trainers must keep emotions under control. Humans become emotional because they care and can cloud their decision-making ability.

The use of animal training in a zoological facility can be overwhelming at times for the keepers/trainers involved in it. Animal training is a technology science. The laws of learning always work and one of the only ways to understand these laws is to understand the science.

6.2.3 The terminology

The terminology behind this type of training can scare people. The terminology can be intimidating but it is just scientific terms and, whilst they can be confusing, must be understood and recognised. When talking about training there is always a need to define the audience. Are trainers writing a paper for a journal that will be for a scientific community? Are trainers doing a presentation for industry colleagues? Even within the zoological industry trainers use different terms. Bird trainers use different terms to horse trainers and they use different terms than those used by marine mammal trainers, the only thing that is similar is the scientific terms.

Table 1: Terminology table explaining the difference between scientific terms, industry terms, common terms and slang terms but all have the same meaning.

TERMINOLOGY			
Science	Industry	Common	Slang
Reinforce	Reinforce	Reward	Pay
Discrimative Stimulus	Sd	Cue/Signal	Command
Conditioned Reinforcer	Bridge	Whistle/clicker	

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Animal training is focused on the use of operant conditioning, which is a type of learning in which the frequency of occurrence of behaviour is modified by its consequence. It is also known as instrumental conditioning. B.F. Skinner was an American psychologist/behaviourist that was the first to study operant conditioning.

It is unlike classical conditioning, which is a type of learning in which a conditioned (or neutral) stimulus is paired with an unconditioned stimulus to elicit a reflexive response. Pavolovian conditioning or respondent conditioning is term associated with Pavlov, a Russian physiologist who studied classical conditioning.

Thorndike, an American psychologist, spent his entire career working on comparative psychology and the learning process which led to the theory of connectionism and helped lay the scientific foundation for modern educational psychology. Thorndike's Law of Effect states that in any given situation, the probability of a behaviour occurring is a function of the consequences that behaviour has had in that situation in the past. Simply stated, behaviour is a function of its consequence.

6.2.4 Behaviour change

Behaviour won't change unless trainers focus on consequences. Remember the parental saying "If I've told you once, I've told you a thousand times…."; itself an indication that parents haven't reinforced the behaviour correctly. At times parents will begin to speak louder, to the point of yelling, if the child doesn't do what they are asking the first time they ask their child. The same can occur with trainers when animals do not respond to the first cue.

Consequences always come in pairs:

- Reinforcement vs Punishment – everything that is going on in the environment is either reinforcing or punishing
- Positive vs Negative
- Unconditioned vs Conditioned
- Proximate vs Distal (immediate or sometime in the future).

Consider the business world and how people reinforce good behaviour. An employee receives a Christmas bonus because they performed well on a project back in March. The reinforcement comes nine months later and yes their behaviour was reinforced but won't have changed it. The timing is too late.

Trainers need to be aware of what they think is reinforcing to what is actual reinforcing. A reinforcer is something that actual changes the behaviour. Reinforcement modifies behaviour. There are primary and secondary reinforcers. Primary reinforcers are satisfying biological needs and secondary reinforcers acquire value through association with primary reinforcers. Timing of any reinforcement is the key to success.

6.2.5 Bridging stimulus

A bridging stimulus, which is also a conditioned reinforcer/secondary reinforcer, is the first non-food/primary reinforcer trainers should use. The bridging stimulus was developed in 1940's by the USA Navy Program working with dolphins in the open ocean. It bridged the gap of time between the event marker and the reinforcement coming. When selecting the bridge make sure the animal can perceive it, it is easy to use, it is easy to replicate, unique to the environment and there is no negative association with it. New trainers should practice their bridge before using it in their sessions, there are several games that trainers can play to do so.

People could pose the question is a bridge mandatory? It is a valuable tool that Ramirez encourages people to use one but it is not essential. The advantage to using a bridge is that it assists with precision and it is needed when reinforcement cannot be delivered immediately.

6.2.6 Approximations

In order to train a behaviour, it must go through a shaping stage. Any method trainers use to obtain behaviour is called shaping. This is where a trainer will use successive approximations (small steps) to achieve the desired end result. Each trainer will choose different size approximations. With large approximations trainers run the risk of confusing and frustrating the animal which can lead to not succeeding and aggression. If it is broken down into smaller approximations, this enables trainers to reinforce more often.

There is no scientific answer on how long to stay on one approximation, staying on one for too long can mean the animal is getting a lot of reinforcement history and therefore the trainer will find it hard to move to the next approximation. On the other hand moving too fast can also be too much. It's the artistic part of training. There is no rule on how many times a trainer can reinforce before moving on. Trainers should move as fast as the animal allows.

Consistency in training is the key. The trainer decides the rules but should not keep changing them as the animal will get confused.

6.2.7 Shaping Techniques

All training techniques that shape behaviour can be called shaping. Six of the most common are provided below, although not every technique fits for every behaviour or for every animal.

- Scanning (capturing). It allows the animal to be creative/natural behaviours because they invent it themselves. There are no approximations to rely on.
- Targeting. It allows trainers to guide the animal through the process. Not appropriate all the time, especially if the trainer cannot reach the animal.
- Baiting (luring). Use the food to guide the animal through the process. This way of shaping can be very controversial. If trainers are not careful the animal can get so dependent on performing unless they see the food. This technique can be open to misuse from inexperienced trainers. Majority of the time, the animal wants the trainer to up the ante. If the trainer can't provide food in a session (e.g. for a medical procedure), it is not going to work. It may be useful in new or comfortable spaces, but make sure the trainer gets rid of it quickly.
- Modelling (moulding). Where the trainer takes and shapes the animal's body into position/behaviour.
- Environmental Manipulation. When the trainer sets the environment up to help the animal succeed, when they put barriers in place (e.g. shutting gates, cutting the exhibit in half, block off the other options).
- Mimicry (Social facilitation). This is not the proper term for it anymore. This type of technique is when an animal learns through observation of another animal or human (e.g. an infant dolphin jumping). It is now thought that the infant is not trying to mimic mum but just staying with her, and therefore it is now called social facilitation. It also known as observational learning. An example of this is when groups of animals want to go through a gate but two animals don't want to, however they do so because five others have and they want to be with those animals. In this instance the trainer would heavily reinforce social facilitation as a shaping technique to obtain that behaviour from the group of animals passing through the gate.

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Karen Pyror is an American author who specialised in behavioural psychology. Pyror created '10 Laws of Shaping' guidelines which every trainer should follow, with these being:

1. Raise criteria in small increments
2. Train on criterion at a time
3. Vary reinforcement before moving to next approximation (although Ken Ramirez doesn't agree with this)
4. Relax old criteria when introducing new criteria.
5. Plan ahead (plan training have short and long term goals)
6. Don't change trainers mid-stream
7. If a plan doesn't work, change the plan
8. Don't stop a session
9. Regress when behaviour deteriorates
10. End on a positive note.

6.2.8 Behaviour under stimulus control

Exhibiting a behaviour on cue is putting it under stimulus control. Ramirez's methodology is to not use the cue until the trainer has trained the behaviour. This is due to the fact that when trainers use it too early, before it has any meaning, it becomes associated with all the steps in learning it. The cue becomes associated with every mistake. That way the cue is only associated once the behaviour is complete.

Among trainers there should be consistency with cues and all trainers should be using the same cue for the each individual animal. Behavioural drift will start to occur if there is ambiguity of cues. Is it better to use visual or verbal cues, or both? It depends on the species and the individual animal. It is very common for trainers to use both and more often than not trainers believe that the animals understand both. Whether the animals are responding to one more than the other is for the trainer to test the theory.

Along with the '10 Laws of Shaping' Pryor also developed rules for trainers to follow when testing to see if a behaviour that they have been training, is under stimulus control. These rules are:

1. Behaviour occurs when cue is presented
2. Behaviour never occurs in absence of cue (in training session)
3. Behaviour never occurs in response to another cue
4. No other behaviour occurs on that cue.

Unless all conditions are met, the behaviour is not under stimulus control. Ramirez believes there are two additional rules that should be followed:

- Behaviour occurs when cue is presented in any location
- Behaviour will occur when used by anybody.

6.2.9 Dealing with incorrect responses

One of the most widely discussed topics of the training field is how to deal with incorrect responses in a training session, such as when the trainer cues an animal to undertake a behaviour and they either offer the wrong response or nothing at all. What should a trainer do? Ramirez's views are that newer trainers should ignore unwanted behaviour and all others should perform an LRS.

The practical application of an LRS is that it should be brief and immediate. The trainer should be looking for a calm response (acceptance) and there should be an easy opportunity for new reinforcement to follow the incorrect response. Trainers should never re-cue the behaviour after failing, but move onto easier more reliable behaviours that the animals have a 99 per cent correct response rate to and then it is at the trainer's discretion as to when to return to it.

The challenges with the LRS are that it is not a fixed posture in which trainers should stay and people struggle with this concept. People struggle to do absolutely nothing, and they shouldn't be tempted to extend length and reframe from emotional response. It is not about long periods of time because then trainers start to venture into a timeout. Getting frustrated and angry at the animal is an aversive action and is not the answer.

Why does it work? Due to positive history, the rhythm of reinforcement is interrupted. However, there is an opportunity to continue and earn more reinforcement (redirection). Behaviour momentum is then used to work back to obtaining the desired behaviour. Trainers should note that if it's a behaviour that hasn't been trained well, it will not come back by using an LRS. Trainers should follow this diagram:

Diagram 1: The steps taken by a trainer when an incorrect response is given by an animal.

Trainers who do not use a marker signal have one less tool to make LRS effective. Having an animal return to a default behaviour, such as stationing, increases LRS effectiveness. The LRS is designed as a structured way to ignore un-wanted behaviour. The key is to be immediate, brief and have an easy behaviour to follow.

There are other ways to deal with incorrect responses. There are time outs, punishment, negative reinforcers and the use of aversives but these are all responses that trainers should avoid. They can cause frustration and aggression not just towards the trainers but the animals can also displace it towards other animals in their exhibits. Food deprivation is not the answer at all. All animals should have the opportunity to receive all their daily food every day, no matter on how poorly they responded in their training sessions.

6.2.10 Social group training

Social group training is when trainers are dealing with a large group of animals that are in a social group setting in the same exhibit (e.g. A troop of 21 baboons or a troop of 30 lemurs). Unlike other animals that may be in much smaller groupings with enough exhibit space to be separated in order to undertake individual training sessions, this may not be feasible with those large social groupings of animals.

So what is the methodology behind large social group training programs and how is it implemented? Ramirez states that there is not just one answer to that question. It all just depends on the individual situation. Trainers should know their animals, not just the individuals but also about their natural history. The social hierarchy and social interactions are continually changing and are extremely important. Trainers need to understand this and should know the ranking of that social group, and which animal is where in the hierarchy. Social ranking or states are the upmost important thing.

The social reinforcers and social punishers that come from the social group are far more reinforcing and stronger than anything that trainers have to offer. Trainers have to work with them and around them so knowing the individual animal is the key. One way to approach social group training is:

• One-on-one training. This is the ideal training situation and it is where there is one trainer to one animal. This would be unachievable if the exhibit didn't have the spatial requirements and infrastructure to allow the animals to be individually separated. It might be feasible to get one trainer to feed most of the animals whilst the other trainer works and trains one of the animals, but this is very hard to achieve and still it is only one animal receiving training. Individual training may not always be the answer, because even if the individuals could be separated, the animals may become stressed when they are separated. One-on-one training may be a great theoretical ideal, however sometimes with strongly bonded social groups separating the animals just so that trainers can undertake one-on-one training may not make the most sense. If it is going to cause those animals to go into a panic because they don't know where their own species are, trainers may need to review their plan and use a different technique.

Ken training a Beluga Whale.

It is important to consider what to do if separating the animals is not an option; whether it is because there isn't the infrastructure to facilitate this or whether it is because the trainer wants the group to stay together or there may not have enough staff. In that case the only option as a trainer is to work with them as a group. Ramirez suggests that giving the animals structure and a place to go when it is time for a session, is a key tip when dealing with social group training. Ramirez uses the following techniques to approach it:

- Stationing. There are several different types of stationing that can be trained with animals in large social groups. By teaching an animal that there is a place that they are supposed to go where they can gain reinforcement gives structure to a big group of animals. It can help bring order to chaos in the group. There are a number of stationing elements, including the following:

1. Location specific stationing. This is where every animal has a specific location in the training area that they are supposed to go to (e.g. There may be two individuals on a rock, two down by the fence, four on the ledge of the hill etc). To start this training, multiple keepers may be needed to start the sessions and as the animals start to learn where they go, the trainer to animal ratio can increase and then start to approximate the trainers out, until hopefully only one or two trainers can undertake the session. The biggest problem with this type of stationing is that, if the animals were to move to

a different exhibit or area, the training would have to start again. It would be only applicable to that specific area.

2. Position specific stationing. This is where each animal is in a position that is relative to each other (e.g. Seal one is always to the left of seal three, seal two is between seal three and seal four, and seal four is always to the right of seal two). It doesn't matter where the location is, in any particular exhibit wherever the trainer stands the animals should line up in that specific order. Over time the trainer may need to change the order due the social hierarchy changings in the group. With social groups that are constantly changing, position specific stationing may not be the best option. However, animals do learn very quickly when there are changes. Sometimes, the animals may have changed their locations and stayed that way for three sessions and therefore that is an indication to the trainer that something might being going on in the group dynamics and the positions may need to change.
3. Target station. This is where trainers teach every animal to target. Ramirez suggests the use of symbols (e.g. the circle is for one animal, the square another animal, and the triangle another animal etc). By doing that, whichever trainer is holding their symbol is where the animal goes. If one trainer is going to work with two animals in one session, then they hold two target station symbols. The shapes/symbols become like a nametag for the animals, telling the animal where to go. The benefit is that the trainer can change the location of the session or even the trainer, yet the animal will start the session by looking for their symbol to understand where they are supposed to be. It can be a great way of providing variety for the animals.

Ken using a target symbol in a training session with a Pacific white-sided dolphin.

4. Animal choice. This is where the trainers give the animals choice. Sometimes trainers can say it doesn't really matter where the individual animals are. The exhibit may be a mixed species exhibit and then trainers choose that one species of animal gets feed in this location, whilst the second species gets fed in a different location. Therefore, it doesn't matter where the individual's location is in that group, as long as they are in their species group.
5. Shuffle. This is when it doesn't matter where the animals start the session; the trainer then shuffles the animals around to pick out individuals that they are going to undertake a training session with.

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So when undertaking this group training, which animals do the trainer reinforce first? What order does the trainer feed in the hierarchy? Does the trainer feed the dominant animal first? The answer is it all depends, it depends on a lot of variables but it all has to do with fairness. A big part of working with groups of animals is making sure that from an animal's perspective they believe that they are being treated fairly. That they are getting the trainer's undivided attention, and that the animal next to them is not getting more attention than they are - whether that is treats, attention or cued behaviours.

Some people believe that fairness is an anthropomorphic concept; that animals don't know what fairness means. Yes the idea of fairness may be anthropomorphic but whatever people want to call it, animals can definitely recognise when another animal is getting something that they are not getting.

Primatologist Frans de Waal proves this in an experiment[6] he undertook with a pair of capuchin monkeys, housed side by side in glass cages. In return for handing a pebble to a researcher, one monkey receives a bland piece of cucumber, which she's happy to receive until she sees that her partner's reward for the very same task is a tasty grape. The monkey gives it another try, but instead of a grape is given a cucumber again. This time she hurls the cucumber back at the researcher, rattles her cage, pounds the floor in angry protest. It's a tantrum similar, in fact, to that of a human toddler who sees her older brother get a cookie, only to get half herself. During de Waal's experiments, he said, monkeys rewarded equitably rejected the cucumber just five per cent of the time. If their partners received a grape, however, they refused their lower pay at a rate of 50 percent. And when partners were given a grape "for free", without even having to pick up a pebble, rejections soared.

In that experiment, there is an inequality happening that the animal perceives and it changes their behavior; it makes the animal frustrated and it makes them more aggressive. Fairness is an important concept and Ramirez believes that trainers have to be aware of how the animals perceive the work that they do. Even when trainers cue one animal to undertake a behaviour and they have two other animals in the group that are not undertaking a cued behaviour but remaining at their station, trainers must reinforce those two animals as well as the first animal. The animals should all be reinforced equally well.

On the subject of which animal should get reinforced first in a social group training session, it is important to consider that each situation is different and it depends on each individual group and the individuals within that group. The dominant animal may be well trained and can wait to be reinforced last or trainers may need to reinforce that animal first and then the other animals in the group. On the other hand the dominant animal may not be used to training, so the dominant needs to receive reinforcement after any time trainers reinforce another animal. For example, a dominant animal receives a treat, the second animal receives a treat, the dominant animal receives a treat, the third animal receives a treat, the dominant animal receives a treat etc. It is all going to depend on the animal's patience level and the level of ability the trainer has to keep the animals under stimulus control.

Moving the animals and having them station further apart may stop the dominant animal leaving stationing and competing with another animal for food. The trainer should change they strategy depending upon a lot of different factors including on how well the animals get along.

It is a challenge undertaking social group training with animals, and it is an advanced skill. It requires good stationing, it requires patience, and it requires teaching the animals to wait their turn. The goal of working with large groups of animals is to avoid competition and the training should support the group social structure. Trainers do not want them to compete with each other for the food, for the trainer's attention, for enrichment, or for anything. The animals need to know that they have the trainer's undivided attention and with time they will learn to be patient.

Teaching an animal to be patient and wait for reinforcement doesn't come naturally. What is natural for animals in the wild is to compete with each other for their food, and to compete with each other for

6 Brosnan, S.F., and De Waal, F., (2003), 'Monkeys reject unequal pay', Nature 425.6955: 297-299.

the things they want, and as such trainers have to teach them that they don't need to do this in their training session.

The mistake that most trainers make, when first working with a large group of animals, is that the goal of the session should be not to fight. The trainers shouldn't care what else happens but the mistake usually is that they do care. Concentrate on the animals not fighting, not stealing each other's food and teach them that if they do not do that, they are going to get heavily reinforced.

The behaviour that trainers should be working on is getting along and shouldn't be a difficult complex behaviour to start off with. Trainers can worry about how they are going to train more complex behaviours down the track; the importance is getting a group of animals to work together. It is hard work and it needs to be reinforced well, and trainers need to teach them not to compete with each other and this is not something that is going to come naturally.

To wrap up the seminar, Ramirez relayed that he focuses on using the most positive methods of training. He believes that great animal care comes from having well-trained skilled staff. Through zoos focusing their investment in people, the animals under their care benefit the most.

Looking into the future, Ramirez would like to see a certified body that can accredit individuals as a professional animal trainer through a worldwide certification program, which embodies education and practical skills.

6.3 Disney's Animal Kingdom and Lodge – Orlando, Florida, USA

Presenters/Instructors:

- Ken Ramirez, Vice President of Animal Collections and Animal Training at Shedd Aquarium and Executive Vice-President and Chief Training Officer of Karen Pryor Clicker Training – Chicago, USA
- Steve Martin, President of Natural Encounters, Inc. - Winter Haven, USA
- Tim Sullivan, Curator of Behavioural Husbandry at Chicago Zoological Society, Brookfield Zoo – Chicago, USA
- Michelle Skurski, Zoological Manager of Behavioural Husbandry at Disney's Animal Kingdom – Orlando, USA
- Emily Insalaco, Curator of Behavioural Husbandry & Animal Ambassadors, Denver Zoo – Denver, USA

Objective:

AZA Animal Training Applications 5-Day Workshop

Animal Training Applications provided zoo and aquarium staff with a background in training theory and an understanding of the skills necessary to train animals. It included a historical perspective of animal training as well as terminology and an overview of training techniques. Selected training concepts and skills were taught via animal demonstrations, group activities and individual skill development opportunities. The workshop contained 24 students from all different zoological facilities across the USA. The Fellow was the only international student at the workshop.

Outcomes:

- Learn about the most up to date research on the techniques that is in use in animal training programs and how they have evolved due to the research.
- Collect evidence to support the advances in training.

The Animal Training Applications Workshop included several presentations by the instructors. In addition, students attended several animal training sessions, conducted by the trainers at Disney's Animal Kingdom, throughout each day which allowed students to participate in their own animal training sessions. Below is a chronological order of presentations and an overview of each one.

Presentation 1: Animal Welfare Introduction – Michelle Skurski from Disney's Animal Kingdom

The presentation revolved around animal welfare and how training benefits animal welfare.

The AZA definition of animal welfare is that "Animal welfare is an animal's collective physical, mental and emotional states over a period of time, and is measured on a continuum from good to poor".

Within animal welfare there are two main components and they are physical health and psychological wellbeing of animals. It is also known as the Ying and the Yang of animal welfare.

- Physical Health. This is the component that is measurable. Keepers/ veterinarians can usually see if an animal is injured, veterinarians can run diagnostics and therefore have some measures for their physical health. Good physical health is the absence of disease, illness and injury.
- Psychological wellbeing. The more challenging component to monitor is psychological wellbeing. Unlike a human, trainers cannot just ask if an animal is ok and this is why they have to look at using

behavioural measures to assess the animal's wellbeing. At AZA they the following questions are posed:

- Motivational needs. Are trainers able to match the motivational needs of this animal? Is the animal motivated for food, to find a social partners or is it motivated as a predator?
- Providing choices/control. One way to enhance cognitive wellbeing is to provide the animals with choices or control of their environment.
- Matching to natural adaptations. Is the animal looking for a particular substrate or a particular diet, is it being provided?
- Any way to encourage thinking – cognitive abilities. Animals in managed settings are often in situations where they don't have to think as much as their wild counterparts. The keepers bring the food, social partners etc. Therefore, animals in a zoological setting have a lot more time on their hands where they need to be cognitively challenged. Otherwise the animals can become bored and stereotypical behaviours can develop (e.g. Training and research).

The keepers/trainers are not solely people responsible for an animal's welfare. Animal welfare is everyone's job and includes everyone such as the keepers, veterinarians, curators, and researchers.

Keepers/trainers cannot provide animals' good welfare. Staff have to provide the appropriate care and conditions for animals to be able to cope effectively with challenges in their environment.

The benefits of training to an animal's welfare are safety, cognitive stimulation, improved animal/keeper relationship, medical care and research. On the other side, poor training techniques and choices can be a detriment to an animal's welfare. Inappropriate training techniques include: generalisation - one size doesn't fit all (all species are not the same); training that disrupts group hierarchy; the misuse of food (weight problems); unclear communication (frustration); and, unsafe techniques (animal/keeper/guest). Training takes both knowledge and skills.

Presentation 2: Basic Training Skills – Ken Ramirez

During this presentation, Ramirez explored the laws of learning, the basic terminology of operant conditioning, the laws of shaping, stimulus control and LRS practical applications. All of which is mentioned in section 6.2 of this report.

Presentation 3: Importance of Natural History – Michelle Skurski

The importance of natural history presentation was in relation to keeper's investigating and researching the natural history of their animals and the individual animal's history prior to commencing a training program.

The information that is gathered will allow keepers/trainers to apply this information to develop the animal's training program. It will allow trainers to look at the safety aspects that need to be considered, which behaviour trainers should select and for what species, what technique trainers should use to train the animals, what type of reinforcement trainers should use for the program and what type of training environment the training sessions should be conducted in. All of these points are crucial in researching, and before implementing a training program.

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Presentation 4: Training Plans – Emily Insalaco

As Insalaco states, "It all starts with goals". Training plans are vital to a training program and should be completed prior to the commencement of training. Planning is important as it provides clear direction for the trainer, it provides a way to communicate to other staff, it identifies and prioritises necessary resources and it prepares staff to be able to trouble shoot and address challenges. A good training plan will help staff identify potential roadblocks before they occur.

A training plan keeps staff focused, prepared and it provides continuity and consistency. A training plan is a historical document and easy to refer back to if behaviours regresses. It gives the trainer a measure of success and allows staff to celebrate their success

The components of the plan should include:

- Identification of goal behaviour – What does the finished behaviour look like?
- Cues and criteria
- Safety concerns, access to animal
- Key personnel
- Set time frame but be flexible
- Resources needed
- Time needed per day, sessions per day, days per week
- Reinforcement
- Bridge
- Approximations

Ensure the approximations are clear, easy to visualize and that they are flowing easily from one step to the next. They allow staff to better plan their session settings, chosen consequences to encourage and react to the predicted behaviour

The training plan may need to be adjusted along the way. Ensure appropriate documentation is kept and recorded.

Insalaco closes with the statement "Those who fail to plan, plan to fail" (Benjamin Franklin), which was very fitting for this presentation.

Presentation 5: Motivating Operations – Steve Martin

In this presentation Martin explored the construct of motivation and he believes a motivated animal is operationalised as one who engages in the training dialogue with quick response to discriminative stimuli. Historically, force and coercion were the tools used to motivate animals in zoological settings and even some birds performing in shows. Fortunately, those methods are being replaced with more positive approaches. But, even with current ground swell of positive reinforcement training in the zoological field, there is much mythology and poor training practices surrounding the need to motivate animals.

These include putting the blame on the animal, misrepresenting scientific principles, as well as lowering animals' weights to unacceptable levels. Fortunately, there is an emerging technology based on antecedent arrangement and positive reinforcement that allows trainers to successfully work with highly empowered animals. Key components of this technology include sensitive reading of body language, high rates of reinforcement and clear communication of criteria. With these components, welfare is increased as animals learn to use their behaviour more effectively to gain positive reinforcement.

Through thoughtful antecedent and consequence arrangement, skilled trainers create motivation for animals to participate in training sessions. These motivating operations are as important to animal learning as husbandry and veterinary care are to animal health. Clear, honest communication and a high rate of positive reinforcement lead to trusting relationships where animals are motivated to use their behaviour to earn reinforcers from trainers. With best practices that comprise contemporary training technology, animals' skills and abilities to manage their own outcomes will increase, which necessarily increases the welfare of animals in human care.

Motivation and welfare form the foundation for contemporary animal training programs. Some trainers inadvertently weaken one pillar in their attempt to strengthen the other in pursuit of their behavioural goals. Motivation and welfare should work in balance where an adjustment to one should not cause a decrease in the other.

Martin states that the goal, as professional animal trainers, is to find the balance (e.g. to create motivation in ways that protect and enhance an animal's welfare). Through careful use of both secondary and primary reinforcers and skillful application of motivating operations, trainers can motivate animals to learn and participate in training sessions, while creating a more enriching and safe environment for our animals.

Presentation 6: The Right Tool For The Job – Steve Martin

Martin states that recognising that humans and other animals are unique, the right tool for the job needs to be measured on a case-by-case basis, change with current conditions and evaluated using a common benchmark. Practitioners trained in applied behaviour analysis (ABA) are legally held to the least intrusive procedural guideline when changing children's behaviour problems. With both the AZA Animal Welfare Committee and Dr. Susan Friedman's Ethical Hierarch, (adopted from the ABA standards) as guides, this presentation explored animal training and management practices emphasising how trainers choose the right animal trainer and technology for behaviour management programs in zoological facilities.

Martin explored the steps trainers should take when choosing animals and looking at their suitability for interactive programs, educational programs and training programs, and he operationalised what an expert trainer does and went through different training techniques.

Not every animal is the right tool for the job and not every trainer is the right tool for the job either. Not all animals are the same and trainers should treat animals as individuals. Behaviour is the study of one - it is that animal, in that condition, in that moment in time.

When choosing specific animal species for certain programs, research should be done by contacting other facilities that have those animals in those specific programs. If they have a successful program with those animals, they are the experts and will be able to provide valuable information to help zoos make an informed decision on whether or not they should commit to a new program.

Presentation 7: Communication and Partnerships – Emily Insalaco

Unlike all of the other workshop presentations communication and partnerships was in reference to people, all being vital in having a successful animal training program.

Insalaco states that communication matters because effective communication allows people to build and maintain relationships, to work, to be educated, to manage their affairs and, of critical importance, to assert their own free will on the world.

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Partnerships matter because they encourage a cooperative effort toward work, allow for sharing of information, provide support for members during times of challenge, disappointment and accomplishment, and teams often have a synergistic quality that can lead to creativity and innovation.

The reason this can be hard at times is because people must learn to communicate and resolve conflict effectively, they must share ownership with other members, and team members must make a personal commitment to be part of the team. The formation of an effective partnership can often seem to move very slowly, which can cause some to give up on the effort.

In a zoological setting relationships and partnerships can be between the team and managers/ curators, fellow peers and other teams, veterinarians, nutritionist, marketing, and the education officers etc. Indeed the list is endless.

To be successful at communication and partnerships team members should be proactive, over communicate, select communication modes wisely, set up communication tools/processes, expect and not fear conflict and be flexible in the style, as these details will ensure a successful team.

Presentation 8: Reinforcement Strategies – Ken Ramirez

Ramirez explored the advanced concepts of reinforcement strategies in this presentation. He talked about the differences with inexperienced trainers and trainers that have experience. When trainers start talking about a technique that needs experience to apply, everyone talks about experience differently. Science doesn't divide the tools from beginner to immediate to advance. Ramirez states that a gross over simplification of training includes two basic phrases - trainers reinforce desired behaviour and trainers ignore unwanted behaviour. Ramirez believes that a lot of tools should be reserved for advanced/experienced trainers. On the surface, training looks easier but in reality the application of it is difficult.

This is why training is an advanced concept, training is a skill-set that trainers need in order to create the early building blocks and then build up from there. An analogy as to why training is so difficult for some people to wrap their minds around is that it's just like maths. People cannot learn advanced algebra if they don't know how to count. People learn to add and subtract, then multiply and divide, then learn algebra and then calculus. The reality is, unless trainers have those underlying core skills they will never be able to move to the advanced areas.

The problem with training is that when trainers read an article or a book about training it looks, on the surface, to be rather simple. People assume that they understand it and then they jump in and try and do it, but don't necessarily have the foundational building blocks in order to accomplish it. Using the maths analogy again, with algebra if people are given a hard equation they know straight away that they cannot do it. But often with training it is defined as being simple, however people may understand it because they know all the terms but they cannot apply the techniques. Training is deceptive and the application can be very hard. Trainers are teachers, they must understand the theory and terms and know when they are over their head and need to call on their colleagues.

With each behaviour that is being trained, a clear definition of criteria should be established. It is best for young trainers to be told that it is black or it is white. It is either correct or it's wrong, there are no grey areas. There is no middle ground, but the reality is that there is middle ground, and the difference is that young trainers shouldn't be asked to judge middle ground. The young trainer should be thinking it meets all the criteria therefore it is correct or it doesn't meet all the criteria and therefore it is incorrect. It is not because there are areas of grey because there are. When trainers gain experience they realise that there are lots of areas of grey. Whenever trainers have a brand new behaviour in training they are always adjusting the criteria, upping the game, they are constantly requiring more from the animal. Hopefully they have a well-developed plan where they are approximating the animals

learning gradually. If the trainers are too grey in what they are bridging and reinforcing then the animal doesn't learn anything. As soon as the trainers get clear with the bridging the animal starts learning.

In zoological environments staff are never working alone and that means they are sharing the responsibility of training with two other trainers, five other trainers or thirty other trainers depending on the size of the organisation. When there are many trainers, having a shared of version of criteria helps maintain consistency. Often having a set of rules that the animals have to follow for each behaviour doesn't just help the trainers to not make mistakes, it also helps to set the animals up for success. It gives the animals very clear expectations.

Using non-food reinforcements, other conditioned reinforcements (also known as secondary reinforcers) can be very valuable especially when an animal is unwell. Ramirez frequently sees a lot of trainers misusing these reinforcers. By clapping at the animal, telling them that they did a good job, rubbing/touching them, the trainers are thinking that they reinforced their animal. Many animals that have been around keepers/trainers for a long time accept things from their trainers and just because they accept it doesn't mean it is reinforcing. Animals allow their trainers to do it but it doesn't necessarily make behaviour stronger and it doesn't necessarily maintain behaviour. That is the key to making something a reinforcer. It is not about what trainers think the animal likes or wants, it is about what truly changes behaviour. By definition a reinforcer makes behaviour stronger or maintains the strength of the behaviour. If it doesn't maintain the strength of the behaviour, it is not a reinforcer. These reinforcers are learned reinforcers and the animals must be taught that the stimulus is reinforcing by pairing with a primary reinforcer every time.

Just because it is reinforcing from one trainer doesn't mean that it is reinforcing from another trainer. Trainers must develop those non-food reinforcers themselves and they have to develop the relationship. Too often trainers rush to use something, just because they have seen someone else use it. If trainers don't take the time to develop it, it may not have the effect that they want it to have. It's what changes behaviour, not what people think the animals might like.

Presentation 9: Social Groups – Ken Ramirez

Ramirez presented the same information at this course that he did at his seminar that the fellow attended. The information is reported in section 6.2.10 of this report.

The one point that Ramirez continually states is that, the social reinforcers and social punishers that come from the social group are far more reinforcing and stronger than anything trainers have to offer. Trainers need to realise and understand that they have to work with them and around them, and thus knowing the individual animal is the key.

Presentation 10: Animal Training Applications – Michelle Skurski

This presentation explored the different applications that can be applied to animal training programs and included husbandry and management, research and conservation, medical behaviours, enrichment and creating connections with zoo guests.

At Disney when developing a training program they adopt the SPIDER framework, which stands for:

- Setting goals
- Planning
- Implementing
- Documenting
- Evaluating
- Re-adjusting

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Skurski states that setting goals should be based on information from the veterinarians, nutritionists, researchers, animal care staff and operation staff. They include the daily needs of the animals, predisposed medical conditions, an individual's needs/issues, foundation behaviours, preparation for emergencies, guest experiences/messages and research project needs. Keepers/trainers may require the animals to shift locations in their exhibit, station, stand on a scale to obtain a weight or socially separate – these behaviours will help keepers meet those set goals.

A training concept that Skurski talked about was that of emergency training with animals. A weather emergency, a person in an exhibit emergency, an animal in a different exhibit emergency, a fallen tree emergency or an animal to animal aggression emergency – for these reasons an emergency recall is trained at Disney. Disney is not the only zoological facility to have emergency recalls with their animal collection, SeaWorld and Shedd Aquarium are two more examples and it is a concept that is very common throughout Europe and North America.

Much like a normal recall, an emergency recall has the same concept behind it. The only difference is that the criteria for the animals is different. With an emergency recall the criteria is that they must respond and act a lot quicker after the recall has sounded. At Disney, the criteria is set at a response time of a maximum of 30 seconds. The emergency recall has far more high value positive reinforcement history behind it than a normal recall.

Skurski expresses that when training this behaviour, trainers must have to separate audio cues. One cue means come into the building (normal everyday recall) and the other sound cue means get into the building within 30 seconds (emergency recall) - so no matter where the animal is in the exhibit the expectation is to be in the building as quickly as possible.

Skurski used a tiger example. The tigers at Disney are trained for both a normal recall and an emergency recall. The way they trained was every time they sounded the emergency recall it was like a big party when the tigers came into the building, this included enormous amounts of high value items being placed in the building for the cats. There was enrichment, there were huge amounts of food, there were carcasses and bones etc. These items were a mixture of both primary and secondary reinforcers. On a normal recall, the tigers would still get a reinforcer for coming into the building, which usually consisted of a small amount of meat. This is still a primary reinforcer for them but that of low value, compared to what the cats received during an emergency recall.

The emergency recall is so effective with the tigers that Skurski highlighted one particular day where a collection bird, on their free flight team, landed in the tiger exhibit. A keeper saw that the tiger had a macaw in its mouth, they sounded the emergency recall cue and the tiger dropped the bird and came into the building. So why did the tiger do that? That is because the reinforcement history behind that emergency sound was far more reinforcing then the bird in its mouth.

The emergency recall concept should be compulsory behaviour for the majority of animals in zoological facilities. This behaviour is an invaluable tool and is an advanced concept that requires experienced trainers to undertake. At Melbourne Zoo in 2015 a teenage male Orangutan escaped from his exhibit and it is a prime example of where an emergency recall could have been very useful in containing the animal.

Presentation 11: Problem Solving – Tim O'Sullivan

O'Sullivan admits that problems occur all the time in training. Problem solving is a challenge and it requires keepers/trainers to apply their skills to solve. Embrace the problems that occur and the key is to learn from them and be proactive so it doesn't happen again. Spending more time with their animals and training new behaviours is where staff time could be better well spent than having to re-visit problems that they have already solved in the past.

Documentation and communication is the first step in problem solving. In the beginning staff might not think there is a problem but something different or odd might have occurred with an animal, and keepers/trainers should be documenting these moments and communicating them as these odd moments often turn into problems. Don't assume it is just a one off thing - describe it in a detailed fashion so that if someone wasn't there to witness it, the next time they are with the animal they might see it as well. Once staff realise that there is a problem, see if there is a pattern. The more the behaviour is reinforced the stronger the history there is behind that behaviour and then it can be a lot harder to fix.

There are two types of behavioural problems – a decrease/absence of desirable behaviour or an increase/presence of undesirable behaviour. O'Sullivan uses the analogy of animals being behavioural machines and motivation is the fuel. Staff need to understand what the fuel is and the only way to find that out, is to ask the big question of why? Why is the animal doing this? Posing this question will help lead trainers to the motivation and to the answer. When trainers get there they need to understand that all behaviour has function. Just because staff might understand the function, doesn't mean there isn't one. The animal is always looking for something, to acquire something they desire or to avoid something they don't like. The assumption is that they are doing it for a reason and, as trainers, they need to find that reason. Problem solving is all about understanding the whys. Staff must find that root cause and any solutions they come up with must address that root cause not the symptoms of it.

The usual causes of problems in training sessions are poor communication from trainer to trainer and trainer to animal, overwhelming the animal with too much information, being inconsistent, and having a poor training environment.

Poor communication from trainer to trainer can be a common issue. Communication plays a huge role and when it is non-existent, that's when these problems start to creep up. Sometimes communication is there but it may be untimely. The age old excuse is that trainers are always so busy and when they only leave five minutes at the end of the day to write their daily animal records, they give too little detail. The ways in which information is communicating is very important as well. Do not get ready for a training session, stand in front of the animal and then talk for the next 5 – 10 minutes to the other trainers about what they want to achieve in the session. The same goes after the session, the debriefing should occur away from the animals. Doing it in front of them can cause the animals to become worked up – frustration, aggression and superstitious behaviours can all be a roll on consequence of doing this.

Poor communication from trainer to animal is also where problems can occur. Trainers must make sure they are paying attention to the animal and that they are giving the animal as much information as they can, so they can successfully navigate from one approximation to another, one reinforcer to another. If trainers are not doing that, then they are not communicating well enough to be an effective trainer and it can result in the same worked up behaviour from their animals, as noted above.

At the other end of the spectrum, too much information can cause problems as well. Trainers must ensure that they give the animals a chance to think. It is very common for trainers to repeat their cues before the animal undertakes the behaviour. The best thing to do is to give that animal some extra seconds to process the information themselves and allow them to react to the cue.

Being inconsistent with the animal is probably the most common cause of problems. Poor bridging, poor timing of reinforcement, incorrect cueing, different rates of reinforcement and different deliveries of reinforcement, are all areas of training sessions that trainers can be inconsistent with. Inconsistency can cause confusion for the animal and again confusion can lead to undesirable behaviours from the animal. Making sure all trainers are on the same page with these areas in sessions will ensure that there is a consistent approach to the animal's sessions

The training environment plays another crucial role in helping with problems in training sessions. Creating a good environment means the environment is low on distractions. Mobile phones, two-way

radios, blocking off as much external distraction will ensure the animal is more focused on the session at hand then its surrounding environment.

Important considerations need to be taken into account when trying to find the root cause and solve the problem. Trainers need to rule out any medical problems - is the problem occurring due to a medical issue? Trainers should work in conjunction with their veterinarians to ensure that the behavioural problem is not a result of a medical condition. Time should be spent researching records and natural history of the animal, to see if this problem had occurred in the past with this animal. Trainers need to keep an open mid to all possible causes.

The solution must be based on sound operant conditioning principles and sound techniques. Trainers may want to go back to fundamentals and look at the timing/rate of reinforcement and antecedent arrangement. It is good to have a clear and measurable goal to see if the problem is strengthening or weakening. Most importantly the solution, whatever it is, has to be practical and can be sustained until the problem is solved.

Some problems take a long time to solve and in some cases may never been solved. A problem that has twenty years of reinforcement history behind it may be solved but trainers must have a solution that they can maintain until it is. Staff buy-in is very important and managers will find that staff are more likely to stick to the agreed plan if they have been involved in the planning process. Ensure to include documentation and regular assessment of the progress. Invest enough time and expertise into developing a systematic and technically correct plan. Failed plans can strengthen the undesired behaviour and make subsequent attempts harder.

There should be a formal problem solving method in place when coming up with solutions in a team environment. The value of this facilitates objective examination of the problem, focuses on the tangible/operationalised, challenges common assumptions/perceptions, improves communication/input/buy-in, treats the cause and not the symptoms, helps to shape how people think (solution oriented) and documents the thought process.

O'Sullivan states that the problem solving method should incorporate the following:

- Define the Problem - What does it look like?
- Define the Goal – What do trainers want to achieve?
- Define the Facts – What do trainers know to be true through general knowledge and experience?
  - » Environment
  - » The animal (natural and individual history)
  - » Staff routines
  - » Observable behaviour
- Learning Issues – What do trainers need to find out?
- Hypotheses – What do trainers think is happening? Their best educated guesses.
  - » What can trainers test or fix?
  - » What's the animal's motivation?
  - » What pieces could be related?
  - » Where do trainers see cause and effect?
  - » Are the trainers using the best tools at their disposal?
- Define an Action Plan – In writing, who does what by when to implement solutions to the problem?"

Points to keep in mind are that people see the problem in different ways and thoroughly defining the problem using operationalised terms and observable, measurable phenomena, leads to the best solution.

O'Sullivan concluded by saying that having an effective facilitator during the problem-solving task can help the team stay on track, keep the team moving through the processes, encourage input from all critical players and will help the team walk away with tangible results.

Presentation 12: Common Challenges and Hurdles – Ken Ramirez

Ramirez tackled the common challenges and hurdles that frequently occur within training programs, training sessions and training teams.

The basics of training are easy to understand:

- Reinforce desired behaviour
- Ignore unwanted behavior.

The common husbandry mistakes are when there is pressure and urgency to have behaviours trained which can force many mistakes. Novice and experienced trainers can fall into this error-trap. The twelve common husbandry mistakes are:

- Looking for the quick fix
- Forgetting that learning is always taking place
- Using voluntary medical behaviours before they are completely trained
- Not using a conditioned reinforcer
- Assuming that desensitization is complete
- Using too many trainers to train one task
- Making assumptions about what an animal likes
- Taking approximations that are too large
- Forgetting the importance of a calm response
- Trying just one more time or pushing for a few extra seconds
- Lack of communication
- Assuming that training can be done by everyone.

The last mistake is one that management of zoological facilities make all the time. The general obstacles and problems are that there are many different people that want program buy-in, resource shortage, incorrect problem solving methods, prioritisation challenges and lack of skilled guidance.

Program buy-in might consist of co-workers not interested in training, managers or veterinarians not being supportive and a lack of consistency. The possible solutions Ramirez suggests are to develop partnerships within the facility, build trust with all involved, accept small approximations and practice and develop skills.

Resource shortage is a very common hurdle and can include staff saying they don't have the time to train, there are not enough staff, there isn't enough in the budget to resource the program and that the facility is not designed for training. The possible solutions Ramirez suggests are to remind staff that excuses stifle their ability to achieve and that great things can be accomplished in small steps.

Common challenges with problem solving methods are that identifying the problem is not always easy, the desire for a quick solution creates added difficulty and the debate over the use of aversive or punishers. The possible solutions Ramirez suggests is to use a problem-solving tool (such as the one O'Sullivan presented in presentation 11), have a team approach and understand operant tools.

When setting priorities staff need to pose the questions:

- Where does the issue lie on the priority list and does the list represent the institutional list?
- If the problem is low on the priority list it may not be easily solved – is the team willing to sacrifice something to fix the problem?

The possible solutions Ramirez suggests is to use the problem solving tool again, build partnerships and have good communication.

Lack of skilled guidance can be a hurdle when there is inexperienced staff, no teachers, support lacking due to not understanding, it is hard to maintain motivation and species differences pose challenges. The possible solutions Ramirez suggests is to use professional organizations (AZA, ABMA, IMATA, IAATE, EMA, AAZK etc), find a mentor and talk to trainers at sister facilities.

Ramirez wrapped up the presentation reviewing general thoughts on the issue of common challenges and hurdles. Ramirez concluded by noting that:

- Basic operant principles always work, with both animals and people
- Plan ahead before starting a new task
- Discuss challenges or hurdles with entire team, using the team and involving everyone
- Look at the motivation of the animals or staff that are causing the challenge as that is always the bottom line for behaviour
- Small gains are huge.

Presentation 13: The Art of Training – Steve Martin

In Martin's presentation he focused on the artistic component of training rather than the science. Martin described what he believes an artistic trainer does as comprising the following:

- Takes responsibility for an animal's behaviour and avoids blaming or labeling animals
- Empowers animals with choice and control
- Demonstrates understanding that motivation need not include force or starvation
- Uses clear, honest, two-way communication
- Constantly adjusts what they do in relation to animal behaviour
- Fades prompts quickly
- Uses appropriate bridging stimulus
- Focuses on positive reinforcement and avoids using aversive strategies whenever possible
- Skillfully arranges antecedents and consequences to promote desirable behaviour
- Seeks other people's ideas
- Trains at the animal's pace, faster than most are aware of
- Builds a strong trust account
- Uses continuous reinforcement to shape behaviour and only shifts intermittent/variable schedule with a purpose and a plan

- Trains one behaviour at a time
- Relaxes criteria when making a big step – move back to move forward
- Repetition builds confidence - behavioural fluency
- Uses a wide range of reinforcers
- Prepares training plan but is flexible to change.

Martin notes that with an artistic trainer the training plan is not a roadmap, it is a set of hypotheses and predictions about how to move the animal from point A to point B. The animal's behaviour provides feedback that confirms or disconfirms those predictions and leads the trainer to revise what she/he does to accomplish the training goal.

There are a lot of artistic trainers that have helped zoos evolve over the years. The role of zoos and aquariums have changed from:

Martin stated that artistic training is dynamic. Behaviour is the study of one – one individual animal in specific current conditions that change from minute to minute. No matter how much skill and knowledge trainers bring to the session, there is always missing information that the animal provides.

In summary, Martin stated that artistic trainers take responsibility. The first step toward becoming the best trainer possible is to take responsibility for the animal's behaviour. There is no question an animal can learn behaviours. The most important question concerns our ability to teach them. The best animal trainers and caregivers avoid blaming their animals for their inability to train them and understand that they are responsible for the animal's every need.

Workshop Summary

Not only did the animal training applications workshop consist of presentations by various instructors but throughout the week the students and instructors attended several animal training sessions conducted by Disney's Animal Kingdom's keepers and trainers. One session included a Mandrill husbandry training session conducted in their off-limit facility, where there were over twenty Mandrills and seven keepers. Keepers separated animals into 4 groups and undertook their sessions. The sessions were a one keeper to one animal ratio.

Another session was conducted at Disney's Animal Lodge, which is one of the hotels onsite at Disney's Animal Kingdom. Each area of the lodge contains several different paddocks/savannahs, which are extremely large and include over 20 different species of animal and numerous individuals of each species in each savannah. Every day keepers use a sound recall to get all the animals to shift off the savannah and into their barn area. This allows keepers to clean the savannah, have a close look at individuals and check each one. Each savannah has a different recall sound to mitigate confusion amongst the savannahs. Watching the recall session it was evident how much work Disney's staff had put into their sessions and, when asked, they admitted that it took 12 – 18 months and still requires a consistent approach. Much like a clip out of Noah's Ark, one by one the animals moved into their barn and by far one of the most impressive pieces of training that the Fellow has seen with such a large group of mixed species of animals.

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Lodge savannah recall session

Lodge session

During the week, the students were allocated one animal out of four different groups of animals to train for the week. The groups were alligators, sheep, goats and rats and each group had an instructor that oversaw the training and helped guide the students. The Disney trainers had given a list of behaviours that they wanted trained by the students, which helped the students decide which behaviour to work on for the week.

The students were required to develop a behaviour to train their allocated animal in the week, write a training plan and were given two training sessions a day with their animal to train the behaviour. The Fellow was in the goat group, which was led by Steve Martin. The goal of the behaviour that the Fellow chose to train was to get the goat to jump onto a platform, on cue (by pointing at the platform), remain on the platform until bridged and then return to the Fellow to receive food reinforcement. The Fellow was able to complete the behaviour by the end of the week of the workshop.

This practical activity was incredibly beneficial, as it allowed for feedback from not only the instructors but also other students in the workshop. Having some of the best animal trainers in the world watch and critique the animal training sessions was a very valuable tool. It also allowed the students to put the knowledge that they were learning and studying in the classroom into practical use. The practical application of training is a lot harder than the theoretical application, thus making the activity very useful.

Another valuable aspect of this workshop was that there were many different instructors from a variety of zoological organisations, and thus provided many different perspectives on animal training. The long lasting contacts, relationships and networks that the Fellow made during the workshop was invaluable and will continue to help in the future.

However, the most beneficial aspect of the workshop for the Fellow was watching the instructors teach the students. Watching how instructors spoke about training, how they presented the information, the way in which they answered student's questions and their overall interactions was by far the most valuable part of the workshop. For the Fellow to pursue her future career goals in teaching the zoological industry about the importance of animal training programs (and how to run a successful one at that) with the best practices that promote a positive welfare state for the animals, the Fellow must learn how to teach and inspire the industry.

6.4 Zoo Atlanta – Atlanta, Georgia, USA

Contact:

Jodi Carrigan, Lead Keeper of Primates, Zoo Atlanta

Objective:

- To visit and shadow Carrigan at Zoo Atlanta for three days.
- To investigate the new techniques available in voluntary health training programs for primates.
- To analyse Zoo Atlanta's Great Ape voluntary health training programs, including blood draws and cardiac ultrasounds.
- To report on the logistics of the program in the animal's zoo environment (e.g. how the keepers are able to establish the health programs with the infrastructure used in the animal's exhibits).

Outcomes:

Zoo Atlanta was the first zoo to train gorillas for awake blood pressure and the second to draw blood from an awake gorilla. Zoo Atlanta currently houses the largest gorilla collection in the United States, housing 11 western lowland gorillas. The outstanding training program that Zoo Atlanta has established with their gorilla group is one of the best in the world. The keepers proactively train the gorillas for preventative methods, and the gorillas willingly participate in voluntary health examinations and procedures.

Cardiac disease is the leading cause of mortality and morbidity of western lowland gorillas.[7] Monitoring disease remains a challenge to veterinarians across all species of animals. Blood pressure monitoring, blood sampling and cardiac ultrasounds can aid in early diagnosis of cardiac disease, all of which Zoo Atlanta has trained their gorillas to do whilst being awake in a training session.

Prior to the voluntary medical training program at Zoo Atlanta, zoo veterinarians would have to anesthetise the gorillas to obtain a blood sample, blood pressure readings and views of the gorilla's heart through cardiac ultrasounds. Each gorilla would be anesthetised every three years to provide samples; a long time between samples, particularly if an animal had cardiac disease and was on medication. Adjusting medication is extremely difficult to do without the above samples. Therefore, training the animals for these procedures enables the veterinarians to collect regular data/samples and adjust medications as needed.

7 Kutinsky, I., Devlin, W., and Barrie, M., (2007), Cardiovacular Disease Management in Great Apes: Current Status and Recommendations.

Jodi undertaking a cardiac ultrasound with a male gorilla.

The primate department and the veterinary department at Zoo Atlanta teamed up with a human sonographer. The keepers start off by training a gorilla to present its chest to the cage mesh. The keepers then train the gorillas to present two different chest positions against the mesh – firstly, the chest straight against the mesh and secondly the left side flush against the mesh. During these positions they train for left hand up and left hand down. The keepers desensitize the gorillas to a mock ultrasound probe, which is made up of a capped PVC pipe. They apply pressure to the chest, moving in and rotating movements with the probe that mimic how it would be used, whilst using a continuous reinforcement schedule. They use slow gradual movements.

Next the keepers introduce the ultrasound gel for desensitization. This takes a lot of getting used to by the apes and Carrigan suggests that it is usually one of the hardest steps in the cardiac training. Training continues with the movements as stated above whilst using the gel. The keepers use a fetal Doppler during training for various reasons to obtain voluntary heart beats. Heart rate variability is in indicator of heart disease in humans and, as Carrigan noted, it is possible that it could also be an indicator in gorilla's states. Obtaining voluntary heart rate regularly may help diagnose heart disease. At Zoo Atlanta, their goal is to obtain voluntary heart rates once a month. Having an idea of what normal is for an individual is important, bearing in mind that there is no established normal values for a resting heart rate in gorillas, and this is a means by which staff can have a better understanding of what is going on with each individual gorilla.

Once the gorillas are comfortable with the mock probe and gel they begin using the real probe with the sonographer. There are three ways in which they obtain images – through the mesh of the enclosure, using a modified porthole slide and through using a reserve sleeve that help with pigeon-chested animals. Staff use two different training methods for holding. Firstly they hold the behaviour, keepers bridge the behaviour after a specific amount of time and then reinforce the behavior. Secondly, the technique is continuous feed using juice or food reinforcement for the duration of the hold which can also be a great distraction method to keep gorillas from picking at the gel and probe.

Keepers practice with the Doppler and the sonographer three times before they actually start using the machine. On the third day of working together, the veterinarians at Zoo Atlanta watch the session with

the machine and clear staff to work together unsupervised. This is to ensure that the keeper and the sonographer have a good and safe working relationship when working with the animals.

Carrigan states that since the gorillas are used to working with specific keepers, and because the keepers are more in tune with subtle behavioural variations in their apes, they use the keeper to hold the ultrasound probe in position while the sonographer communicates where they want the probe and collects the data needed. Keepers should be able to pick when an animal might be aggressive. Carrigan advises that communication between the sonographer and the keeper remain simple, for example use the terms “angle up” and “angle down”.

All cardiac information is sent to the Great Ape Heart Project (GAHP). Based at Zoo Atlanta, GAHP addresses a critical need within the zoo community to investigate and understand cardiovascular disease in great apes. The project was established with the goal of creating and maintaining a centralised database that can help analyze cardiac data, generate reports, and coordinate cardiac-related research activities, while vastly improving communication among zoos, research facilities and sanctuaries where apes are housed. The data collected will help individual animals, as well as enhance a body of knowledge that will benefit zoos internationally.

Organising partners are Zoo Atlanta, the Emerging Diseases Research Group of the University of Georgia’s College of Veterinary Medicine, the UC Davis College of Veterinary Medicine and the Cleveland Metroparks Zoo. The project now involves more than 70 institutions, including veterinarians, cardiologists, geneticists, epidemiologists, nutritionists, animal managers, ape specialists and research pathologists.[8]

The GAHP developed a standard “submission form” as a guideline for ideal cardiac examinations and to streamline the process of forwarding cardiac exam records to the GAHP. The GAHP collects, reviews and archives cardiac ultrasound exams (echocardiograms) in an international database for gorillas, orangutans, bonobos and chimpanzees. They accept cardiac exams done on anesthetized apes so long as both a submission form and a copy of the echocardiogram are submitted. Exams are reviewed by their cardiac advisors and feedback is returned to submitting institutions within 6 weeks.

Information about the submission of GAHP Cardiac Examinations can be found at:

https://greatapeheartproject.org/projects/forms/

A copy of the GAHP Cardiovascular Examination Form can be found at: https://greatapeheartproject.files.wordpress.com/2011/11/gahp_cardiacexamform20153.pdf

8 GAHP, <http://greatapeheartproject.org/about/>, viewed 15 January 2016.

Blood pressure cuff setup.

Being able to conduct voluntary blood draws is a big step forward in monitoring and managing gorilla health. Voluntary blood draws complement physical examinations and also help veterinarians make diagnostic decisions. The combination of physical examination and diagnostic testing provides for a thorough evaluation of health status without the requirement for general anaesthetics. This approach removes risks associated with anaesthesia. Furthermore, early detection of conditions can occur before signs are evident and this allows for treatment to commence earlier.

A couple of years ago, Zoo Atlanta keepers and veterinarians were able to detect the early stages of renal failure via a voluntary blood draw from an Orang-utan. The veterinarians commented that they probably wouldn't have anaesthetized the animal until she was showing signs of renal failure. In this case, they were able to treat her before she reached the end stage and are now able to provide her a better quality of life.

6. THE INTERNATIONAL EXPERIENCE

Blood draws

Great apes have been trained for these procedures at over twenty zoos in North America. The three trained health procedures – awake blood pressure, awake blood draws and awake cardiac ultrasounds have never been trained on any Great Ape at Melbourne Zoo. These procedures are not common practice in zoological facilities in the Australasian region that house Great Apes. With cardiac disease prevalent with male gorillas in the region, all samples must be taken whilst the animal is under anesthetic, which is not the most practical and ideal way to obtain the samples. All facilities should be aiming to train these three health procedures with all of their Great Apes.

Zoo Atlanta, in conjunction with university students and zoo staff, have designed several pieces of equipment that assist keepers in obtaining the samples. To obtain a blood draw, they have designed and created a blood sleeve and a blood pressure arm cuff to obtain blood pressure readings.

(left) Blood sleeve, (right) Inside the blood sleeve.

The works department at the zoo has retro fitted several portholes in the ape dens to allow for keepers to securely attach the blood sleeve or the blood pressure cuff to the den mesh structure. The portholes have a removable slide that is locked into place when the sleeve and cuff are not attached.

Den porthole

As there are no slides on the sleeve and the cuff where they attach to the den porthole, keepers must ensure no animals have access to the den whilst attaching the equipment to the portholes. This ensures animals do not reach their arms out through the porthole when the slide is removed. Keepers commented if they were to remodel the cuff and sleeve, they would attach a slide on the end of them and this would provide keepers with the flexibility to safely attach the equipment whilst animals have access to that particular den.

Carrigan has been the keeper driving the training program with the apes and discussed the use of continuous positive reinforcement with primary reinforcement (food) throughout each approximation of the behaviour and, even once the behaviour has been established, keepers continue to use continuous reinforcement. This ensures the three medical behaviour sessions are very positive as they have strong positive reinforcement history behind them and therefore the apes willingly participates in the sessions. Keepers must have a very strong rapport with the individual animals, as a lot of trust must be present between the animal and the keeper for the animals to allow the keepers to undertake such procedures.

The gorilla house contains eleven male gorillas and nine female gorillas and it is staffed with one and a half keepers on a daily basis. The Fellow did pose the question - how do the keepers manage to have enough time in their day to facilitate training sessions with every ape to establish these advanced medical behaviours?

6. THE INTERNATIONAL EXPERIENCE

Carrigan pointed out that Zoo Atlanta have a zookeeping internship program which means every day the gorilla house gets allocated one – two interns to assist the keepers in their daily duties (e.g. cleaning of exhibits and dens). Daily food preparation for the animals is undertaken by designated zoo employees and not the keepers. These employees also deliver the food to each area every morning. These two elements assist the keepers immensely. Whilst Carrigan is the main trainer, it is definitely a team effort.

The gorilla team have set training goals, such as the cardiac ultrasounds and blood draws, and they work together to achieve these goals. Whether it is one keeper training whilst the other keeper is cleaning, or both keepers training and then working together to undertake the cleaning duties, they work collaboratively to achieve the desired goals. Carrigan has the skill-set to deliver the program goals and zoo management does support the team in doing so. Carrigan passes on her knowledge to other staff, however doing so is a matter of when time and staff resource permit.

Training for and obtaining these medical samples/procedures is definitely a team effort. It requires the veterinary, primate and the works/trade departments to work together, and it also requires collaboration with local universities and medical practitioners (like sonographers) to reach their training goals. With these teams and the support of zoo management, Zoo Atlanta are providing their apes with a training program that offers the animals choice to participate in their medical health care, which is one of the highest forms of good welfare in zoos today.

6.5 Natural Encounters Inc. at The Ranch – Winter Haven, Florida, USA

Contact:

Steve Martin, President of Natural Encounters, Inc. - Winter Haven, USA

Presenter:

Dr. Susan Friedman, a Psychology Professor at Utah State University who has pioneered the application of Applied Behavior Analysis (ABA) to captive and companion animals.

Objective:

Participate in Steve Martin and Susan Friedman's Contemporary Animal Training and Management 5-Day Workshop.

- Animal training in Australian zoos has really only been used as an assistance tool in animal welfare over the past 15 years. Many keepers started working in the industry long before this and struggle with the concept of operant conditioning techniques.
- Analyse how zoos in the USA have shifted the mindset of their long-standing keepers.
- Study the ways in which the zoo gained their involvement in animal training programs.
- Learn about the most up-to-date research on the techniques that are in use in animal training programs and how they have evolved as a result of this research.

Outcomes:

Steve Martin is a well-known animal trainer. In 1976 he established the first bird show of its kind at the San Diego Wild Animal Park. His use of non-traditional, free flight birds combined with an inspiring conservation message sets this show apart from all other animal shows. Four years later, Martin left the Wild Animal Park to establish Natural Encounters, Inc. (NEI) and present his programs at zoos across the United States. The direction and goals of the company are to engage, inspire and empower people at their shows through the exhibition of animals demonstrating natural behaviours, using carefully designed dialogue and entertaining choreography. These shows now entertain and educate millions of people each year.

NEI quickly grew from a bird show provider to a company specialising in animal behavior and visitor experience. In 1988, NEI began consulting on zoo-wide animal behavior issues and teaching keepers the art and science of animal training. Steve and his staff at NEI have now trained hundreds of species, from marmosets and elephants to reptiles and fish, and have taught their animal training techniques to hundreds of people around the world.

Throughout the zoological community, demand for establishing behavior management programs has increased. In response, NEI has brought together the most experienced, cross-disciplinary behavior management training and program development team available.[9]

Dr. Susan Friedman is a Psychology Professor at Utah State University who has pioneered the application of Applied Behaviour Analysis (ABA) to captive and companion animals. ABA, with its roots in human learning, offers a scientifically sound teaching technology and ethical standard that can improve the lives of all learners.[10]

9 NEI, <http://naturalencounters.com/about-us/our-history/>, viewed 5 February 2016.

10 Behaviour Works, <http://www.behaviorworks.org>, viewed 6 February 2016.

6. THE INTERNATIONAL EXPERIENCE

The Contemporary Animal Training and Management workshop consisted of Martin and Friedman undertaking several presentations/lectures over the five days. It also saw students attend several animal training sessions throughout each day and students were able to participate in their own animal training sessions with Macaws and Crows/Ravens.

The students were separated into groups of four to five students and each student was given an individual Macaw to train a behaviour with throughout the week, with a NEI employee overseeing their training. The group was also given one Corvidae to train as a group. Much like Disney, this was very beneficial as it allowed for immediate feedback regarding the training techniques that the Fellow was using. Working to train the Corvidae was another valuable opportunity as students were able to work as a team to train the behaviour.

A summary of the presentations and lectures that Martin and Friedman conducted during the five-day workshop is provided below.

Fellow training Macaw

The Science Behind Training

Friedman undertook the first presentation of the seminar on the science behind the training. Friedman began with the scientific analysis of behaviour. Behaviour is a natural phenomenon, and part of the physical world. It should be studied like any other natural science. Like all natural sciences, explaining a phenomenon means identifying the physical events that produce it. Applied behaviour analysis is the application of the science (technology) to solve practical behaviour problems. The primary intervention goal is to change conditions, including what trainers do. Redesign the environment so that problem behaviours are irrelevant, inefficient and ineffective and new skills are learned. The behaviour level of analysis is the study of one - one individual, in one environment, given one set of trainers, and one set of conditions.

Behaviour comes from genetic history, individual history and current conditions. It starts with random movement, within the limits of biology and is refined with the natural process of differential reinforcement. When there is an issue with behaviour there is an over-reliance on labels. Friedman states that it is a defect. Trainers can't teach animals what to be but they can teach them what to do and when. Trainers can train an animal to approach people, relax while being touched and take food from their hands. When an animal is observed undertaking these behaviours, then people call it friendly.

The working definition of behaviour is that behaviour is not what an animal is or has; behaviour is what an animal does under certain conditions that can be measured. The ability to learn allows humans and animals to adapt to the demands of an ever-changing environment, throughout each individual's lifetime. The ability to learn is humans and animals nature; their biological inheritance. Behaviour is

selected by consequences. Behaviours that produce valued outcomes are repeated; behaviours that produce aversive outcomes are modified or suppressed. Changing conditions can change observable behaviour.

Friedman continually uses the following three term contingency as an analytical tool:

- Antecedents – (A)
- Behaviour – (B)
- Consequences – (C)

The functional assessment is as follows:

- Antecedents – distant and immediate predictors/signals
- Behaviour – unambiguous and observable
- Consequences – purpose, outcome, feedback.

Friedman presented a number of problem behaviours with animals and the students had to use the ABC tool to assess the problem behaviour.

Friedman concluded the presentation by providing the students with the following key questions to ask themselves when trying to solve problem behaviour:

- What does the problem look like in terms of actual behaviour (e.g. what do the trainers see)?
- Under what conditions does the animal do this behaviour (e.g. what events predict it)?
- What does the animal get or get away from by emitting this behaviour?
- Under what conditions does the animal not do this behaviour (e.g. when is it successful)?
- What does the trainer want the animal to do instead?
- What's the Motivation?

Much like the presentation that Martin conducted at Disney (see 6.3 presentation 5), in this lecture, Martin explored the reasons behind animal behaviour motivation in more depth. Martin describes an animal as being motivated when it engages in the training dialogue with quick response to discriminative stimuli (e.g. It looks to the trainer for information about how to operate on the environment for reinforcers).

Historically, force and coercion were the tools used to motivate animals in zoological settings and even some birds performing in shows. Fortunately, those methods are being replaced with more positive approaches. But, even with the current ground swell of positive reinforcement training in the zoological field, there is much mythology and poor training practices surrounding the need to motivate animals. These include putting the blame on the animal, misrepresenting scientific principals, as well as lowering animals' weights to unacceptable levels.

Fortunately, there is an emerging technology based on antecedent arrangement and positive reinforcement that allows trainers to successfully work with highly empowered animals. Key components of this technology include sensitive reading of body language, high rates of reinforcement and clear communication of criteria. With these components, welfare is increased as animals learn to use their behaviour more effectively to gain positive reinforcement.

At the heart of all training is motivation. Motivation is created by a history of consequences, outcomes and effects that give animals reason to behave. Creating motivation in a training environment is a skill needed by all trainers and practiced at varying levels in the zoological world. There are countless motivating operations that affect the behavioural choices of the animals that trainers train, with the most significant ones being relationship, ability, learning history, environmental influences, clear honest two-way communication, bringing stimuli and food reinforcers.

6. THE INTERNATIONAL EXPERIENCE

A trusting relationship between animal and trainer is an important influence on motivation. Trust is a level of certainty that interactions will result in good outcomes so interaction increases.[11] One of the best ways to build trust is through a high rate of positive reinforcement. With each positive reinforcement experience trainers make deposits in the trust account between the trainer and animal. When a person uses aversive stimuli – negative reinforcement or punishment – to influence behaviour there is often a withdrawal from the trust account. The goal should be to build the highest trust account possible through a high rate of reinforcement, thus improving training relationships and performance. A high trust account can withstand the occasional withdrawals that might occur in emergency situations, routine medical procedures or unexpected conditions.

Animals build skill and behavioural fluency through practice. Some behaviours require more effort than others and are therefore more difficult for the animal to earn and perform.

Past consequences become antecedent influences on motivation for future behaviour. If the consequence of landing on a gloved hand involves the same small piece of meat every flight, the motivation for a hawk to make the flight in the future may decrease. However, if a trainer offers a variety of food items in varying sizes and qualities the motivation for the bird to fly to the glove in the future should increase. Food reinforcers are just one of many consequences that increase behaviour.

Training sessions occur in a variety of locations, from the relative quiet of indoor holding facilities to the noisy unpredictability of on-stage venues. No matter where the training occurs there will be opportunities for a wide variety of stimuli in the environment to interrupt training sessions and impact an animal's motivation to participate. Quiet settings are helpful in establishing new behaviour, but once an animal has learned to perform a behaviour without hesitation in response to a cue, the next step should be to generalise that behaviour to novel environments.

Through careful observation of an animal's body language a trainer can empower the animal with a level of control in its environment where its 'voice' (through its body language) is as meaningful as the trainer's voice.

A trainer gives a cue for the animal to perform a specific behaviour, then the animal's body language feeds back information to let the trainer know whether it is motivated to participate or not. If the body language shows the animal is not motivated, the trainer can change the antecedents to encourage the animal or stop the training session and try again later. When cues and criteria for behaviour are clear, animals learn quicker, rates of reinforcement go up and motivation increases.

Martin and Friedman state that an animal's relationship with its trainer can be characterised by the construct trust. It is the trainer's assertion that when trust is established, animals are more motivated to control the trainer's reinforcers with their behaviour. A useful way to operationalise trust is a level of certainty that interaction will result in good outcomes and so interaction increases. Trusting animals use their behaviour to confidently approach, rather than escape, opportunities to interact with people. They not only accept invitations to interact with their trainers, trusting animals create interaction opportunities for their trainers as well.

Martin and Friedman go on to state that there are many levels of trust, and that makes the bank account metaphor very useful. The goal with all our relationships is to build enough trust account to withstand withdrawals that inevitably occur with our animals and each other.

Dishonest communication can lead to withdrawals from the trust account. A trainer is honest with an animal when he or she acts in ways the animal expects, given the animal's learning history with the given situation.

11 Martin, S., and Friedman, S.G., (2012), 'The Power of Trust', Animal Behaviour Management Alliance, paper presentation, 2012.

Martin presented a controversial topic on event markers/bridging stimuli. Martin stated that for some reason trainers around the world often thin the pairing of the bridge with the back-up reinforcer by surrounding the bridging stimulus after each correct performance of a behaviour but only providing a back-up reinforcer for some of the behaviours. For instance, the animal may perform three behaviours at the desired criteria and receive a bridging stimulus for each behaviour but receive food only after the third behaviour. This is a very common reinforcement strategy in the zoological field, and it is also one of the most confusing reinforcement strategies for the animals.

Animals trained with this type of inconsistent pairing of bridge and back-up reinforcer often lose motivation to participate in the training session, exhibit a high level of incorrect responses to cues, and even show frustration-induced aggression. When this happens trainers often blame the animal for the poor performance, labelling the animal as distracted, aloof, messing with their minds, obstinate and more. By placing the blame on the animal, trainers relieve themselves of responsibility, but miss valuable information about how to increase motivation through clear communication and high rates of reinforcement.

Some trainers believe that since the bridge is a reinforcer for behaviour they don't have to provide a back-up reinforcer. They incorrectly call this a 'variable schedule of reinforcement'. However, if the bridge is truly a secondary reinforcer, the trainer is using a continuous schedule of reinforcement. The inconsistent pairing of the bridge and back-up reinforcer can result in respondent extinction trial.

Most contemporary animal training involves the use of food items to reinforce behaviour. By adjusting the amount and type of food, and method of feeding, a trainer can increase or decrease the level of motivation for the animal to participate in training. As with any reinforcer, some level of reduced access to the item is usually required to maintain its strong reinforcing properties.

Hunger should be the very last thing that is considered when trying to motivate animals. Creating motivation is not about making an animal hungry or forcing it to comply with command, instead creating motivation is about the artful application of scientific principles. Skilled trainers have an endless palate of antecedent arrangement that promote animals that choose to engage in the training. By arranging the antecedent environment trainers make the right behaviour easier to do, so by arranging the consequent environment trainers make the right behaviour worth doing again.

Martin concluded that by doing better and creating motivation for animals, it must involve using the most positive and least intrusive training methods. When trainers use positive reinforcement they create more highly motivated animals that want to participate in the sessions more willingly and for longer periods of time. Trainers that empower the animals with choice and control will have more motivated animals. In the continued search for ways to motivate animals by providing high welfare, trainers have to know that no matter how much they know there is always more to learn.

During the workshop, there was a lot of time to network with students from a range of zoos around the USA. Students ranged from interns, to keepers, to zoo directors to CEOs. Martin and Friedman also showed considerable video footage of training sessions that they had attended at several different zoos. It was clear from those videos that there were several zoos far more advanced than others in terms of training.

One of the most beneficial fellowship conversations occurred at this workshop and it came from students posing the question to Martin and Friedman about why some zoos managed to have a training mentality across all their keepers and other zoos had not? Cheyenne Mountain Zoo in Colorado, USA, was one of those zoos that have changed the mindset of their keepers to incorporate training in their daily routine.

6. THE INTERNATIONAL EXPERIENCE

Bob Chastain, President and CEO of Cheyenne Mountain Zoo, was one of the students in the workshop and he described how his zoo had become one of the leaders in the animal training field. “If I want people to do amazing things it has to be their ideas, I lead them along the way,” said Chastain. As a CEO he felt it was his job to create the environment so that they could be successful, and Martin and Friedman were brought into the zoo to work directly with the staff if they desired.

Chastain admitted that it started slowly. Staff were not forced to participate in the training as he believed that he didn’t have that kind of influence. He shared that not all keepers got on board immediately, but enough of them got on board that it worked. Other keepers started seeing that those successful keepers that had gotten on board had organisational influence and were getting some benefits and reward time with their animals and as a result gradually other keepers got on board.

Now there are enough keepers in Cheyenne Mountain Zoo with a training mindset that the keepers that aren’t on board don’t fit very well in the team anymore. It took a long time and it was a long process. The culture shift happened due to open mind-set organisation-wide and through keepers wanting to learn. Keepers had a commitment to welfare of their animals, and as that culture was already established within the zoo it provided for sound foundation for positive change.

Chastain now employs an animal behaviour programs manager that oversees all the animal training in the zoo. There are over 50 zoos that have behavioural managers/curators in these positions across the USA, as those zoos have made a commitment to the psychological welfare of their animals. These zoos have seen the benefits and continue to be leaders in animal training as a result of having these successful positions who not only help the animals but also the keeping staff. Cheyenne Mountain Zoo, Shedd Aquarium, Disney’s Animal Kingdom, Denver Zoo and Chicago Zoological Society Brookfield Zoo are all examples of zoos that employ behavioural managers.

Chastain believes that management need to recognise what is going on. Matrin believes that by empowering staff, using clear and open communication and using positive reinforcement instead of aversive stimuli to promote behaviour is the means by which staff and organisational culture and mindset can be positively changed. Zoos have to take a top-down approach, with leaders who understand how to empower and support staff. In doing so, it initiates a culture that creates support and open minds.

Fellow and group at presentation ceremony with Bob Chastain, Susan Friedman and Steve Martin

6.6 Behavioural managers/curators in North American zoos

In the USA, the zoo industry has placed a huge emphasis on behavioural management and welfare of their animals. In the past it was assumed that good health care and husbandry was enough to sustain good welfare. An animal's psychological wellbeing are now being taken into account. So much so, that over 50 AZA facilities now employ husbandry managers/curators who ensure all animals' psychological needs are being met through the use of enrichment and training, something they have been doing for over 15 years.

Behavioural management is a comprehensive, pro-active approach to managing animal behaviour. Its primary technical elements are environmental enrichment and positive reinforcement training. Both environmental enrichment and training are now recognised as valuable tools in animal care. It is believed that they are complementary processes whose individual strengths are greatly enhanced by integrating them into one comprehensive system.

The following is a position description for a behavioural manager position, found to be extremely beneficial in zoos across the USA.

Behavioural managers are responsible for:

- All aspects of management, planning, execution and evaluation of the zoo's operant conditioning and enrichment programs.
- The development, planning, management, execution and evaluation of operant conditioning efforts and behavioral husbandry management in all areas of the zoo.
- Writing, reviewing and approving behavioral training plans as well as supervising their successful implementation and assisting in the operant conditioning programs.
- Consultation with the veterinary staff and the zoo's nutritionist to prioritise and address all behavioral husbandry needs.
- Assisting in continuous goal setting and prioritisation for training projects.
- Assisting in the design of fun, educational programs and activities that enhances the guest experience; implement positive, professional programs and activities and informal, interactive learning opportunities for zoo guests of all ages.
- Working with other departments to develop and implement strategies that will create the best guest experience.
- Training, coaching, mentoring and assessing area staff as it pertains to behavioural husbandry; providing ongoing, on-the-job training for zookeepers by providing written and oral constructive criticism and positive feedback to keepers in the development of their operant conditioning skills.

The behavioural manager position guarantees that keepers/trainers are using the correct techniques and training with the use of positive reinforcement. It also ensures that staff are receiving the right training to better equip themselves with skills needed to allow animals the opportunity to participate in their training programs, such as their own medical health care.

Currently, to my knowledge, no such position is held within zoos in Australia. All of the successful training programs that the Fellow witnessed on her international experience in the USA employed a behavioural manager/curator. It was clear to see, through the work being undertaken by those zoos, that the role is crucial in having a world class zoo animal training program.

7. KNOWLEDGE TRANSFER: APPLYING THE OUTCOMES

Attending the animal training workshops/seminars and other zoo site visits, gave the Fellow unique opportunities to network professionally with leaders in animal training in a zoological setting, as well as discover innovative projects, technologies, ideas and training programs. It allowed the Fellow to become inspired by professionals from a range of generations and professions all working on the common task of improving animal welfare through the use of animal training programs for animals in zoological facilities.

As result of this Fellowship, the Fellow will be disseminating the information she has gained to strengthen the skills and capabilities of those involved in animal training in a zoological setting.

The Fellow is scheduled to offer a number of half-day animal training workshops throughout June and July 2016, to animal keepers and trainers across the three Zoos Victoria properties – Melbourne Zoo, Werribee Open Range Zoo and Healesville Sanctuary. These workshops will include a summary and overview of the workshops/seminars that the Fellow attended.

The Fellow will also be presenting to students that are enrolled in the Certificate III in Captive Animals program at Box Hill TAFE, as one unit in the course is on Animal Training. This trade course is undertaken by all new keepers/trainers that are working in the Australian region. At publication of this report, a date is yet to be set for these presentations.

In May of 2016, the Fellow travelled to Adelaide in South Australia to present on her animal training findings at the 2016 Australian Society of Zookeeping (ASZK) conference. The ASZK is the professional association for zookeepers in Australasia. Their focus is the professional development of zookeepers, through the provision of animal husbandry information, as well as training, development and networking opportunities.

In to the future, the Fellow will continue to publicise her learnings and experiences gained and take any opportunity to spread them throughout her profession.

8. RECOMMENDATIONS

Government – Federal, State, Local

In Australia, each state and territory has implemented legislation for the management of animals in captivity. Each is different from the other, although there are some similarities in their approach. It would be beneficial if there were national standards and guidelines for exhibited animals. This would ensure a consistent approach to caring for animals in captivity. At the time of publication, there are national draft standards, however these have been in draft form since March 2014. The draft standards have a small section on training, however the Fellow would recommend a more depth version, stating that:

- All mammals and birds should be involved in a training program
- The basis of training programs should be done through positive reinforcement
- A continuous schedule of reinforcement should be used.

In Victoria, the Code of Practice for the Public Display of Exhibition Animals has been implemented by the Bureau of Animal Welfare and provides guidelines that zoos should follow in maintaining the health and welfare of animals. It provides a framework for a wide range of animals to be kept and displayed under acceptable levels of care and husbandry.[1] Whilst the Code provides general guidelines on the minimum standards for the maintenance of health, husbandry, housing and display for animals in captivity, there is no mention of animal training and no mention of an animal's psychological welfare state. An addition of a psychological welfare component on behaviour and animal training within the standards should be included. This would state the importance and necessity of animal training through the use of positive reinforcement, which would guarantee that the animal's psychological needs are being met.

The Code of Practice for the Public Display of Exhibition Animals does state that the health and welfare of animals in captivity is totally dependent upon both the physical environment and the standard of human care. The relationship between captive animals and their keepers is usually instrumental in maintaining optimum health and wellbeing. This is where the Code should be modified to include regulations about undertaking training with animals in captivity for mental stimulation, to assist with physical exercise and allow the animals to assist in their own medical care.

By adopting regulations around training, Victoria and/or Australia would be taking direct action to ensure the psychological wellbeing and positive welfare states of all animals in captivity.

Industry

Currently, to my knowledge, the zoo industry in Australia is yet to employ a behavioural manager/curator. This position is a crucial and integral part of ensuring that training is occurring on a daily basis. From 2007 – 2010 Zoos Victoria did employ such a position, however it now remains unfilled and has done so since 2010. Zoos in Australia, including Zoos Victoria, should be prioritising the need for this position within their organisation and should allocate resources to support it. This could include setting aside funding to staff the position and/or a re-shuffle of staff to ensure the position is filled.

Animals are constantly being moved between zoos in the region and internationally, with regional moves more common than international ones. Having national consistency in practices and approaches in training would be immensely beneficial. A standardised training program could lead to the nurturing of an animal has been part of a training program its whole life and who participates in a program that provides immense mental stimulation that the animal willingly participates in on a daily basis. If the animal was to be moved to another facility in the region, the animal's training program would be able to be continued regardless of the environment and the change of keepers. A standardised training

1 Agriculture Victoria, <http://agriculture.vic.gov.au/agriculture/animal-health-and-welfare/animal-welfare/animal-welfare-legislation/victorian-codes-of-practice-for-animal-welfare/code-of-practice-for-the-public-display-of-exhibition-of-animals>, viewed 18 March 2016.

approach would facilitate:

- Using positive reinforcement to train
- Using the same schedule of reinforcement
- Using the same cues for behaviour for the same species of animal.

The animal would continue to be provided with that stimulation even after the move. This approach would also ensure that animal shipments could occur on scheduled dates using positive reinforcement methods rather than having to physically or chemically restrain animals to place them into shipment crates.

The industry in Australia should be working closely with zoo veterinarians around voluntary health programs via the use of positive reinforcement training that the animals choose to participate in. This could assist in regional breeding programs by training the animals to allow keepers to collect samples such as sperm that could be used by another facility to breed an endangered animal.

The recommendations for Zoos Victoria are:

- Staff a behavioural manager that would oversee the three properties' animal training programs
- Undertake an animal training program audit and review, potentially via an external contracted auditor, to obtain a realistic view on how many animals in the collection have a training program.
- Mandate emergency recall training for Great Apes and big cat carnivore animals.
- Support infrastructure that allow training goals to be achieved.

Professional Associations

For decades, AZA has provided in-person classroom-based professional training courses taught by some of the premier subject matter experts in the field. These courses offer valuable training and networking experiences for AZA members.

AZA's professional training courses are team-taught by experienced and knowledgeable professionals from the zoo and aquarium industry. Students are presented the unique chance to learn about the latest techniques, information and tools available, and are afforded an unequaled opportunity to network with industry leaders. Courses include managing animal training programs, animal training applications in a zoo and aquarium setting and many other animal training workshops and courses.

AZA continue to be committed to offering these intensive training experiences, but they also realize that their members need more professional development opportunities in a variety of subject areas and in more flexible formats. Additionally, due to feedback from their membership, students have said that they want to be recognised for the breadth and depth of their professional training. The AZA have now developed a professional development certificate program which is completed by choosing from an array of electives. These electives include workshops, webinars and courses offered by AZA, AZA Animal Programs and like-minded partner organisations. These Learning Partners offer high quality training in areas that complement and build on the foundation AZA courses create. Earning an AZA professional development certificate demonstrates that keepers have completed more than 100 hours of training in a particular concentration. It represents not only a commitment to AZA's high standards and policies, but also to experiencing a breadth of training that expands industry members perspectives on zoo and aquarium practices via learning from our partners.[2]

Zoo Aquarium Association (ZAA) does not currently have such professional training courses and/or programs but should adopt AZA's professional development outlook, something that would be advantageous for ZAA's members and their staff.

2 AZA, <https://www.aza.org/certificate.aspx>, viewed 10 March 2016.

ZAA could also adopt an Animal Training Specialist Advisory Group (SAG) to their already existing SAGs.

Education and Training

The move toward more positive and less intrusive forms of animal training has empowered caregivers with management and health care tools that improve the welfare of their animals. However, the skill level of practitioners in this relatively young field of training in the zoological world varies greatly. To keep pace with the evolving technology, keepers and trainers should increase their knowledge.

As Ramirez outlined in his Chicago presentation, a body certifying trainers as a professional trainers would be very valuable in the industry. Unfortunately all certification processes come with challenges, such as politics and various baggage. Ramirez doesn't have the answer around the challenges of certification and accreditation. His only plea to the zookeeping/animal training community is that we not fight against it so hard because ultimately, until we can agree on some method for certifying good trainers, we will always be judged by the lowest common dominator in the zookeeping/animal training community. Often being a trainer is not given considerable credibility, with many people saying that anyone can learn to click a clicker and reinforce, but it takes significant skills to be an outstanding trainer and professional trainer who can genuinely perform the job well.

Ramirez believes that he will always keep trying to find a way to better educate trainers and improve training. Whether trainers get certified or not, if they could at least be better caregivers for their animals to enable their animals to have a better life, then that is worthwhile. Ramirez hopes that trainers can find a way to infuse that message into society and educate pet owners before they get a pet. Ramirez believes that the training of professionals it is a fight worth fighting and hopes that more and more trainers will believe that, carry it forward, teach others to train and help spread the word about the importance of training.

What makes someone a professional trainer is a combination of knowledge and practice because it is the two together that make for the greatest level of experience. Ramirez is particularly bothered by the fact that all it takes to be called a professional is that trainers receive a paycheck to do the job. He believes that being a professional requires far more than trainers earn a living for. Being a professional is about ethics, being a professional is about trainers carrying themselves in a way that they can be proud and it is about integrity. The training community is a huge and diverse one, from the dog training world, the horse training world to the zoo training world to many other professional training groups. It is important to encourage further education on training and support staff to embrace it because trainers shouldn't be in a position where they haven't learned this practice at all.

In Australia 'Certificate III in Captive Animals' is offered, which provides students with pre-trade level expertise to work in zoos, wildlife parks and many other captive animal facilities. It is a pre-requisite for a trade level zookeeping position. At some zoos, for entry-level zookeeping positions it is a requirement to undertake this course when gaining employment. At Zoos Victoria this is the case. Within this certificate one elective unit is 'assist with conditioning animals'. This unit of competency covers the process of conditioning animals in order to modify their behaviour through assisting with formulating and demonstrating a conditioning plan based on operant conditioning techniques. The unit is quite basic and covers only a simple understanding of conditioning animals however, given that training is such an effective tool in supporting positive welfare states, this should be changed from an elective to a core unit of work. The unit should be reviewed and updated to resemble the latest science around training.

8. RECOMMENDATIONS

International Specialised Skills Institute

ISS Institute could facilitate the bringing together of other Fellows with appropriate and relevant skill-sets to present workshops and seminars that would promote continuing learning, the sharing of experiences, and the development of new skills and knowledge. In addition, ISS Institute could offer future fellowships specifically for zoo-based trainers that would allow them to expand upon their skills and ever-evolving science that is animal training.

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