Chapter 19

Wild Animals in the City: Considering and Connecting with Animals in Zoos and Aquariums

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Abstract Connecting people with nature is a powerful concept that opens doors for relationship building and conservation messaging. The roles of wild animals in the city (e.g., in zoos and aquariums) and how we interact with them—and vice versa—must evolve along with our theoretical discussions and animal management practices in order to advance the field. While taking into consideration the long history of animals in captivity, where we are today, and where we should go in the future, this chapter reviews animal welfare and its ethical frameworks, human-animal interactions and its effect on both animals and people, wildness in zoos and how we perceive different states of origin, compassionate education programs and their efforts to instill empathy and empower people to become agents of change, and the power of modern technology in providing real connections with artificial means. In this ever-changing world, living responsibly together has never been more important.

19.1 Introduction

Professional zoos and aquariums (henceforth zoos) can function as a powerful connection between humans and non-human animals (henceforth animals) and the natural world, as well as playing critical roles in conservation, education, and research programs. These human-animal connections and relationships introduce opportunities to explore the different interactions that can occur and evolve, with the animals in the zoo as well as urban wildlife. Wild animals housed in zoos in cities around the world are the objects of delight, fascination and of criticism, and a topic of

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ongoing debates. Through our combined work of 44 years in zoological facilities, we aim to provide the reader with a behind-the-scenes view of professional zoos and acquaint them with some of the theoretical concepts zoos consider when assessing the opportunities and challenges of connecting people to animals, and we reflect on whether what animals like to do and what we think they ‘should’ be doing might be very different things. This chapter proposes that professional zoos are places where: Animals can experience optimal wellbeing and provide opportunities for a variety of connections with humans and other animals; people, including staff and visitors, can exhibit empathy by considering animals from an individual perspective, including the conflicting or contradicting situations these scenarios might create; and language and procedures used to describe and manage animals should reflect a commitment to the 24/7 across the lifespan approach (Brando and Buchanan-Smith 2018) and consider the dynamic social environments in zoos, including the concept that additional approaches going beyond today’s standard may be needed.

Animal welfare¹ is defined as “an animal’s collective physical, mental, and emotional states over a period of time, and is measured on a continuum from good to poor” (AZA 2020a). When considering the primary components of welfare, the Association of Zoos and Aquariums’ (AZA) Animal Welfare Committee further explains this as “an animal typically experiences good welfare when healthy comfortable, well-nourished, safe, able to develop and express species-typical relationships, behaviours, and cognitive abilities, and not suffering from unpleasant states such as pain, fear, or distress. Because physical, mental, and emotional states may be dependent on one another and can vary from day to day, it is important to consider these states in combination with one another over time to provide an assessment of an animal’s overall welfare status.”

Humans are animals too, but for the purpose of this chapter we will apply the terminology used in animal welfare science when referring to interactions, bond and relationships of humans with other animals as human-animal interactions (HAI) and human-animal relationships (HAR). HAI in zoos can be diverse, including the expectations people have of these interactions, from personal and friendship perceived bonds, to the idea that we should hardly interact with animals we deem ‘wild’. The ways in which people interact and the expectations they have of free-ranging wildlife on zoo grounds sometimes differs from that towards the animals housed within the zoo. These differences highlight opportunities to ask new research questions within the field of HAI. Although HAI research in zoos is relatively new, it has been present in the companion animal and agricultural fields since the 1980s, each with a different focus: companion animal research focuses on its impact on humans whereas agriculturally-based research focuses on the impact to animals (Hosey and Melfi 2014). The need for additional zoo-based research is essential for a better understanding of experiences on both sides of the interaction.

¹The terms “animal welfare” and “animal wellbeing” have both been used over the years (Moberg 2000, 1), to describe the state of the animal, and are used in this chapter interchangeably.

AZA. (2020a). Animal Welfare Committee. https://www.aza.org/animal_welfare_committee. Accessed 29 March 2020.

Zoos also play a crucial role in being a new home and safe haven for confiscated wildlife from the illegal trade and rescue. The roles of zoos today are many, with the increased pressure on the natural world and wild animals and the continuing trend of people migrating to cities and urban areas. The role of zoos can be to provide a place where people can connect with animals and nature, be education and conservation focussed, as well as to consider the lives of other animals and our relationship we have with them.

19.2 Animal Welfare

Zoo professionals and laypersons alike have questions about animal welfare: Can zoos promote optimal welfare for the animals in their care? Are zoos providing opportunities for choice and control over the environment and activities? Those who oppose captivity speculate that animals cannot experience optimal welfare no matter what is done for them. What do we know and what evidence can be provided to address animal welfare concerns? How do we navigate the different ethical frameworks on what animal welfare entails?

We have an ethical responsibility to provide animals in zoos with environments that allow them to experience good welfare (Brando and Buchanan-Smith 2018). Zoos have seen a significant evolution, today promoting optimal welfare from “cradle-to-grave”, birth to death (Seidensticker and Doherty 1996) and 24/7 across lifespan (Brando and Buchanan-Smith 2018). This approach is in stark contrast to how zoos started, most as menageries approaching the keeping of animals like a stamp collection, with little understanding and regard for animal welfare and lacking a science, education and conservation approach. The ability to challenge the status quo through the review of emerging scientific evidence and ethical considerations and frameworks (De Mori et al. 2019) remains necessary and forms an important aspect in the process of changing long-held beliefs or practices. Being professional is to continue to ask if this is the best that we can be, if this is what is in the best interest of the animal 24 h a day, seven days a week. Professionalism entails an ‘animal-first’ approach, and striving to achieve the goals of education, research, conservation and recreation goals (Brando and Coe 2020).

Contemporary animal welfare thinking is approached from a holistic perspective and encompasses physical, behavioural and psychological aspects, and is increasingly emphasizing the promotion of positive states and the centrality of the animal feelings (Wemelsfelder et al. 2001; Wemelsfelder 2007; Mellor and Beausoleil 2015; Mellor 2016; Veasey 2017; Brando and Buchanan-Smith 2018). Welfare pertains to the individual; positive or negative welfare is not something we can give to animals, but something they experience based on the circumstances in which they live. Through a holistic approach, professional zoos are responsible for providing care and environments which promote optimal welfare for all animals.

Many accredited facilities such as the Smithsonian’s National Zoo, Lincoln Park Zoo, and Chester Zoo, as well as a few unaccredited but temporarily operating

zoos,² are highly functioning conservation and education organisations, with many *in-* and *ex situ* programs and projects. Change is a dynamic and necessary aspect to the running of a modern zoo, and there is always room to improve, hence the importance of staying up to date with the latest developments in education, conservation and animal welfare. It is important to note that most zoos in the world are not accredited by a one of the major regional accrediting bodies, and therefore many malfunctioning and bad facilities exist.

Different yet collaborative tools for animal welfare assessments, combining natural history and species needs, as well as tailoring programs to individuals advances optimal welfare. Some facilities have also stopped housing certain species, not necessarily because they think it cannot be done well, but also because species needs may outweigh the location parameters or facility resources. A universal animal welfare framework for zoos (Kagan et al. 2015), and an animal welfare risk assessment process (Sherwen et al. 2018) can be used to identify risks and determine priorities.

Professional zoos endeavour to provide animals with meaningful choice and control to meet their own needs and preferences. The potential benefit of choice and control have been well described long ago by Chamove and Anderson (1989) and Snowdon and Savage (1989), later by Brando (2009), and recently by Allard and Bashaw (2019). There is considerable empirical evidence that not having control of one's environment leads to behavioural and physiological problems (e.g., Mineka and Hendersen 1985; Perdue et al. 2014). Thus, a common goal of these approaches is to allow animals far greater control (or agency) over their own lives with less dependence on caregivers (Brando and Buchanan-Smith 2018; Coe 2018; Allard and Bashaw 2019). Several studies show that simply having meaningful choices, whether or not they are acted upon, is rewarding to animals (e.g., Owen et al. 2005; Leotti et al. 2010; Kurtysz et al. 2014).

We can provide many different environmental enrichments, which are planned and designed according to certain goals (e.g., increasing space use, species-specific behaviours such as climbing and jumping) however, we must be OK with the choices the animals make. Some activities such as playing with plastic toys or old telephone books or being trained to sit on a scale for weighing are not natural but can be used to reach behavioural and animal care goals that are still very enjoyable and engaging for animals. Artificially presented habitats and objects are regularly prohibited, based on the argument that these environments and enrichment negatively affect conservation and education efforts. However, considering the data proving this are lacking (e.g., Perdue et al. 2011; Jacobson et al. 2017) and artificial items are often successful in enriching animals' lives (e.g., review of touchscreen activities with apes by Egelkamp and Ross 2019), we believe zoos should focus on the potential benefits for animals and opportunities to help visitors understand the link between behavioural goals reflecting animals' natural histories and their interactions with artificial items. Educators, signs,

²Zoos may opt out of accreditation processes for various reasons, yet still show contemporary practices based on latest science and best practices.

talks by care staff and other means could be used to convey to the public that non-naturalistic activities can promote positive wellbeing, that animals enjoy them and while they do not naturally play with phonebooks in the wild, the message that we should protect and conserve animals should not be jeopardized by a rejection of artificial items.

The natural versus the unnatural is a debate which has been ongoing for decades, and we want to make the argument that all items and activities which are enriching an animals life are suitable for the animal, natural or not, and should not conflict with connecting people to animals and nature. In these circumstances, if we consider animals to be agents (i.e., have agency), we should let the animals decide if something is enriching or not. This is the challenge for professional zoo staff: identify activities that are meaningful for animals that can simultaneously help make connections to other zoo goals. It is our moral obligation to promote optimal welfare for animals in our care for many reasons, but as it relates to HAI, the most important reason might be because we find active and engaging animals the most interesting to watch and easiest to learn about.

This is not to say that choice and control is an all or nothing concept that could be used to rationalize omitting tasks that optimal well-being is reliant upon (e.g., vaccinations and medications). The concept should be used proactively, yet judiciously. When a choice is provided, it should be meaningful to the animal, and the animal care staff must be ready to accept whatever choice the animal selects. If we provide an animal with a choice of two non-preferred social partners, does it really count as a meaningful choice to improve their welfare experience? Yes, it would mean they have an opportunity to control this segment in time, but if both choices potentially lead to negative outcomes, does that feel like control? If an animal is not feeling well and the option is to take medication or not, how long would not choosing to take the medication serve an animal's welfare before it becomes a significant problem?

Professional animal welfare programs today strive to operate on an evidence-based approach as set out by Maple and Lindburg (2008) for the "empirical zoo" and include evidence-based animal welfare programs (Melfi 2009). These programs reflect best practice processes of care and conducting research, including the importance of good human-animal relationships and interactions (Hosey and Melfi 2012). Choice and control should also revolve around human-animal interactions and relationships, including staff, the general public and others who interact or are in the direct or indirect space of the animals.

19.3 Human-Animal Interactions

Zoo professionals and laypersons alike have questions about HAI: What types of interactions and relationships do we find at the zoo? What do animals think about staff and/or visitors? How well do visitors deal with choices animals make, such as not interacting with or looking at them? What is the effect of the human gaze or demand on the animals? What type of

relationships with animals do zoo staff want? What do animals want from the people around them?

There are many formal and informal ways to discuss HAI and HAR, from the more formal evidence-based to the idiosyncratic, from the animals', staff members' or individual visitor's perspective. HAI and HAR can be viewed from exchanges that people directly have with animals, such as during a feeding session in the children's farm between children and goats, the play bout between a young chimpanzee and the person on the other side of the window, or the relationship between the care staff and the animals, engaging in hide and seek, and voluntary care behaviours like weighing and shifting from one area to another.

In the book *Animals in the Age of Humans* (2016), Brando discussed the concept described by Gruen as 'wild dignity', and that our making animals look ridiculous or our portraying them as something different than what they are, violates this dignity. According to Gruen animal dignity needs to be dynamic, i.e., adapted to the individual animal, and is only valuable when it is expressed and recognized as contributing to the well-being or flourishing of that individual. Giving animals more choice and control through environmental complexity, enrichment and animal training, as well as interactions with people might not be 'natural' but might serve a meaningful function in restoring some of the individual's agency and therefore 'wild dignity'.

'Wild dignity' only comes into play when animals are taken out of their wild context and put into the human context. It appears, then, that for Gruen, the basis of the attribution of wild animal dignity rests in our own attitude: When we change animals' species-specific behaviours and take away the control of their own lives, we dominate them and thereby we violate their dignity. The challenge here is that this is assumed without regard to what the animal in question experiences. Therefore, when housing captive wild animals, we need to consider and respect their needs and preferences, and what contributes to and interferes the least with their 'wild dignity'. This can concern behaviours that we might find off-putting and consider indecent from a human perspective, for example, masturbation or aggression that animals engage in (killing prey) or are important to maintaining social relationships. It is important to note that an animal can have good welfare, but still his or her 'wild dignity' can be violated, to acknowledge that meeting both welfare needs of animals and respect their wild dignity creates tension and might not be possible.

This concept also has relevance for how wild animals are portrayed to the public, housed, or used in the various activities offered by zoos, such as shows, presentations, and interactions. Gruen writes, In contrast we dignify the wildness of other animals when we respect their behaviours as meaningful to them and recognize that their lives are theirs to live. Although there will be restrictions to life in captivity, the concept of 'wild dignity' can serve to identify conflicts between human expectations versus animal needs and preferences and to propose ways to mitigate them (Brando 2016). Should contemporary zoos focus more efforts on facilitating agency and less on how we think animals should behave, to enquire what it means to be, or to be 'truly wild'? If animals can never be returned to the wild, to what extent should captive wild animals have agency over their life?

Professional zoos consider the wide variety of HAR from the animal's perspective. Braverman (2012) notes that at the zoo, direct physical contact is prevented between the animals and visiting public using moats and fences. Many of the barriers are not only in the interest of the visitor, but many actually exist to protect animals from inappropriate feeding, touching, and other harmful behaviour. Physical barriers should not only be seen as protecting staff and the visiting public but can also as a form of privacy and barrier for the animals to use to their liking.

Caregivers who are sensitive to the possible impacts of insufficient flight distance, or few or no opportunities to view someone approaching around a corner or in the surrounding area, will interact in ways that try to offer animal choice and control. Developing positive HAI and clear ways of communication are needed for new and well-designed environments, and urgently needed in circumstances where animals have limited agency, such as in smaller spaces and/or social groups, when they do not have access to complex environments, choice or control. While these circumstances should be avoided where possible, sometimes for reasons of law, weather, health and safety reasons, smaller areas may be part of an animal's environment. Well-designed habitats provide different micro-environments with complexity, with choices for animals to decide where they want to be, what they want to do, and who they want to do it with (e.g., Herrelko et al. 2015). This includes different fixed and flexible structures, vistas, different climatic zones to sun, bathe or be in the shade, species-appropriate social groups as well as opportunities to hide and find shelter or quiet areas. Designing environments in ways that animals have choice and control and allow for visitors to observe the animals without disturbance and disruption are key factors in professional habitat design (Bonnie et al. 2016; Brando and Buchanan-Smith 2018). Well-designed habitats can also allow animals to watch humans, to interact with them in a safe manner, and for the animals to disappear out of sight.

While some animals actively avoid eye contact with visitors, others may seek it out. Some zoos provide information on how to behave in these different scenarios, e.g., when a gorilla looks your way, with content such as “nod and lower your head, glance away [and] don't stare! Crouch or kneel down, so the gorilla is above or across from you, this posture puts them at ease” (Braverman 2012, 79). Animals who do not look for visitor or staff visual interaction, might not feel comfortable doing so from a species perspective, like many primates avoiding the human gaze as they also avoid gaze between group members depending on hierarchy. Or even when these behaviours can be learned, they might just not be interested in connecting with you in this way. Some animals are very interested in visual contact and looking at you or others, positioning themselves so they can see better, or actively trying to get in your field of vision.

Even when animals cannot see visitors, but visitors can see them, people are interested and concerned about the implications for animals. This concept of ‘big brother is watching you’ is an interesting discussion to have with staff and public, with many people understanding that none of us want to be watched all the time. Even the discussion on whether if animals disappear out of sight, it is OK to then watch them on camera and screens is engaging as some members of the public mention that they feel like they are spying on the animals, while other think it is OK as the

animals do not know that we are watching. In a sense this falls in the same category of animals performing in shows behaviours like dancing or being a pirate. Some think this is fine, as the animals do not know, while others say we should not ridicule animals (Brando 2016; Brando et al. 2018). These thoughts and feelings towards animals point to people being interested and concerned what we do to and ask of animals, regardless of the welfare impact it has on the animals.

From a welfare perspective it is fundamental to understand how other animals see us (Hosey 2013; Hosey and Melfi 2012). The ability to behave and interact appropriately in relation to a variety of species is crucial for navigating captivity and the field. For animal care professionals, their ability to provide safe and productive management practices relies on the relationships built with animals. If they are not seen as a benefit to the animals (e.g., as food provider, someone who appropriately responds to their behavioural cues), the ability to create opportunities for optimal welfare decreases. Creating positive relationships and engaging in positive interactions can also elicit inter-species play and communication (for a review and examples on animal play see Brando and Burghardt 2019). In the book *Smiling Bears*, Else Poulsen tells a story of the specific nesting behaviour of one of the polar bears she cared for; when preparing his sleeping place, he separated some materials out from others and left it next to his nest. She would only remove what he put aside, and it seemed these interactions created a form of mutual understanding and communication between her and the bear.

Of course, scientific evidence-based understanding of the effects of interactions on animals are important in order to behave appropriately and effectively towards the animals promoting choice, control, and positive wellbeing. However, relationships and interactions can be subtle and complex with regards to individual preferences of the animals and the people who care for them. To date little attention has been given to the qualitative aspect of these interactions, including the thoughts and feelings people have towards the animals, and perceived friendship or bond, a topic which is still controversial in zoos. While many zoos will acknowledge the bond that exists between staff and animals, some may consider this to be anthropomorphic and inappropriate between humans and wild animals.

HAI opportunities such as touch tanks and animal feeding demonstrations are other, low-tech immersion techniques where visitors physically share the same space as an animal, even if just with their hands. Immersion, and specifically hands-on activities, are wildly sought after by the public, e.g., Shedd Aquarium's Stingray Touch exhibit, an exhibit that is only open five months out of the year, reaches 400,000 visitors annually (Ruppenthal 2018; Shedd 2019), and has been linked to increased knowledge about aquatic life and perceived likelihood that participants would make an effort to protect aquatic species (Ogle 2016). While these activities are very popular with the general public, the challenges zoos face are safeguarding animal welfare for fragile animals such as sea stars and small fishes. As one of many of the activities offered in zoos, the touch tank is an example that revolves around something we do to animals (i.e., entering their space) and behavioural and health assessments should be made to help facilitate an optimal welfare experience for the animal. Research on human health parameters shows that the touch tank is similar to

nature experiences; mental stress decreased, but similarly to an exciting event, heart rate increased (Sahrman et al. 2016). Beetz et al. (2012) suggests that animal contact plays a role in reducing perceived stress in humans because it activates the oxytocin system, informally referred to as the “cuddle hormone” (see Shamay-Tsoory and Young 2016 for commentary on advances in the study of oxytocin).

While the purpose of outreach, education and interactive programs with hands-on experiences may be laudable and enjoyable for visitors, it has the potential to present a conflict (i.e., animals may not enjoy the interaction) or a contradiction (i.e., people touching and taking photos with animals in the zoo, which would be discouraged in nature). For these reasons, professional zoo staff are trained to select animals who exhibit traits that thrive in these environments (e.g., have a personality which is open and inquisitive, who tolerate being touched and handled, and stay calm with loud noises and sudden events). It is not always easy to manage how people interact and handle animals, and while most animals are purposefully desensitized to these types of interactions and people are informed on proper etiquette prior to the encounters, there is the potential for the unknown. This is why staff must be trained to identify signs of stress and empowered to end encounters when animals signal it is time through their behaviour.

Animal welfare scientists are exploring the program animal³ world to identify best practices. An evidence-based approach will help clarify needs for standard operating procedures related to program animals that spend extended periods in environments that may limit their range of movement, provide them limited choice and control, and require them to live in species-atypical social groups. Animals typically selected as program animals tend to be small and easy to handle, such as guinea pigs, tarantulas, bearded dragons and chameleons, which does not necessarily make them the best candidates as they are often considered prey species, as they might need more habituation and safe havens, or less manual handling.

While there is much research showing that being in nature and interacting with animals is positive for human wellbeing, there is little empirical evidence on whether touch tanks and interactive programs (Brando and Buchanan-Smith 2018) also have a positive influence on animals; and existing publications largely focus on physical health. For example, a study of the physical health of cownose rays showed that health parameters were comparable for individuals in a visitor accessible touch tank or in an off-exhibit system with minimal human interaction (Johnson et al. 2017). Some complementary behavioural research exists for similar human-animal interaction experiences (for a detailed review, see Sherwen and Hemsworth 2019). Research suggests visitor-feeding programs with captive giraffes serve as enrichment for animals that could lessen the foraging needs linked to oral stereotypies (Orban et al. 2016) and more recently in a penguin-visitor experience, researchers found that encounters did not disrupt colony behaviour, particularly when it came to affiliative or aggressive behaviours (Saiyed et al. 2019). Of course, in these scenarios,

³A program animal (or ambassador animal) is defined by the Association of Zoos and Aquariums as “an animal whose role includes handling and/or training by staff or volunteers for interactions with the public and in support of institutional education and conservation goals” (AZA 2020b).

management plans surrounding the activities are likely to play a significant role; not all touch tanks and visitor-interaction programs are equal. Even with safety and welfare protocols in place, if visitors do not follow the instruction well-being could be compromised (a review of concerns and recommendations, specific to aquatic animal touch tanks, is available online: see Dogu et al. [2011]).

We believe this area of research greatly deserves attention so that we can have additional quantitative data to support policy development. Multiple zoos have introduced animal-first approaches to welfare; each with their own perspective: (1) NZP/SCBI (Moore et al. 2013) presented their Animal First approach as a proactive take on communication channels to provide a safe environment in which animal care staff may identify and address welfare concerns. (2) Lincoln Park Zoo (LPZ) (2019) introduced their “animal-first” philosophy with changes in programming for ambassador animals. Programs are only deemed to be an “animal-first” program if animals are deemed to have choice and control in participating in an activity, can remain in the comfort of their habitat, and the program is to the benefit of the animal.

Zoos want to avoid that visitors freely feed animals (unsupervised) because it is deemed not good for the animal’s welfare. However, the animal might actually enjoy or encourage it.” Kisora and Driessen (in this volume) describe the content of a video of an orangutan interacting with a member of the public, and while the person and the animal ‘know’ that this is not acceptable behaviour, the video clearly shows that both parties have an interest in the continued interaction.

Big cats in zoos can be seen to ‘hunt’ smaller children along the window, or ambushing them, a behaviour which is sometimes discouraged by zoo staff (as it could scare the public or potentially hurt the animal if they run into the glass window), sometimes it is encouraged, however, as both parties run and seem enjoy the activity. Chimpanzees have been seen to ask visitor or staff what is in a bag by pointing at it, others sit with their back to the window steeling glances while others sit up high and away. Orangutans clean the windows with a cloth and scoop nesting materials in a bucket like they see the care staff do. What animals like to do versus what we think they ‘should’ be doing might be very different things.

19.4 Wildness in Zoos

When considering how well people translate information from the screen to the world in which they live, we put forward another concept: Is it important to be truly wild? If an emotional connection to an animal in a zoo is real, does the location of their birth (e.g., in situ, ex situ) matter and or affect perceptions? Public perception can be split based on experience versus perceived notions. Reade and Waran (1996) discovered that zoo visitors had positive perceptions as well as a greater awareness of key topics within animal care science than the general public.

The fear of wild animals becoming ‘less wild’ in zoos is a concern raised by the zoo and conservation field, when considering a potential loss of behavioural diversity necessary for survival in the wild (Rabin 2003) and a potential decrease of

reintroduction success. Many wild animals in zoos today do not encounter stimuli relevant to life in the wild, however, most zoos do not reintroduce their animals to the wild. As such, the debate on what stimuli these animals should be exposed to in order to maintain species-specific behaviours is complex and ongoing. One particularly relevant example that should be discussed is when stimuli could cause a temporary decrease of wellbeing, e.g., exposure to a predator to maintain social cohesion and hiding behaviour.

What does wildness mean in a zoo context? In general, zoos speak of wild animals as animals who are not domesticated. They probably make the distinction between wild and domesticated animals because many zoos also house domesticated animals such as horses, cows, goats, sheep, and rabbits, and feed domesticated farm animals to the wild animals. Some zoos will not formally train the animals to participate in their daily care as they advocate a 'hands off' approach as 'wild animals should stay wild and not have too close interactions with people'. Zoo professionals knowledgeable of animal learning and training know that animals learn all the time, and that there is no such thing as a 'hands off' approach. However, how the animals are habituated and desensitized to people, situations and objects, what type of behaviours they engage in, and how much room there is for the animals to choose what they want to do differs between zoos and their philosophies on what is acceptable and appropriate.

As described above, HAI and HAR might create conflicts between the goals of different programs within a zoo, such as animal welfare, education and conservation. Relationships might be experienced by the animal as desirable and positive, while from an education and conservation perspective it might be undesirable seeing a wild animal interact with a member of the public or staff member, including e.g., hand feeding, as the educational and conservation message likely revolved around wild animals being wild, to respect them in the wild, and to refrain from interacting and handfeeding them. Animals who are in conservation programs with the aim of reintroduction are in a different role than exhibit animals who will live their lives in the zoo. Our relationships with them can be fundamentally different than with animals who will not be exposed to direct human contact. Nevertheless, we must remember the importance of visual context for endangered species. As Ross et al. (2011) discovered, even showing pictures of chimpanzees alone versus near a human or in a typical human environment (e.g., office) negatively influences peoples' perceptions of their endangered status and their appeal as a pet.

When animals are not to be reintroduced but have an endangered status it may be important from the point of view of the conservation message to still portray them as wild which may create a tension between 'being or looking wild' versus the impression of 'being domesticated'.

Summing up, animals with different roles (e.g., program animals) have different relationships with humans and requirements we should consider, e.g., they should not live in fear or anxiety of humans and they should have choice and control over their environment and what happens to them. Animals who are truly going to be released need to maintain their fear for humans, and to be fit and independent for life in the wild and will have a different program and trajectory.

Whether for release or to serve as ambassadors for their species, it is clear that roles are assigned by people, it is not the animals who have chosen their role. This is a responsibility that contemporary zoos take seriously, outlining specific criteria for each role. In the past, an animal which did not have a suitable social group might have ended up in the ambassador animal or education area, but today staff make these decisions with careful consideration of each animal's personality and capacities.

Interactive programs such as ambassador and education programs, as well as shows and presentations have evolved to include more choice and control for the animal, with bird presentations having birds fly into a larger arena (or not if they do not want to), and goats and dolphins having areas to retreat to if they do not want to interact with the public. At any given moment in a program, or when animals do not 'show up' or 'have left the building', care staff and educators take the opportunity to highlight the relationship the care staff has with the animals. It is the animal's choice to participate or not, and they have some control over the activity as such that they can leave if they are bored, not interested, or tired. It is a moment to talk about how we build relationships through play, positive reinforcement, varied activities, and the intrinsic value of choice and control. Most people understand, find it funny, and pretty cool that animals are choosing what they want to do, that they have their own individual ways and decisions. It sheds another light on the animals than the standard information of weight, distribution range and scientific name, and also opens up opportunities for visitors to experience empathy to better understand animal perspectives.

Cultural effects may dictate how care staff interact with, train, and manage animals. For example, with a long history of Asian elephants employed as working animals, many may utilize the traditional range-country management tool of an ankus or bull hook. A different cultural approach is the movement in professional zoos to work in protected contact, where care staff are separated from elephants by barriers. In these scenarios their tools of the trade are different, relying mainly on relationship-building and positive reinforcement-based animals training techniques.

For a long time and in many environments, Asian elephants were chained overnight in outdoor yards due to a lack of funds and elephant-proof housing. Now with better materials, a deeper understanding of sleeping behaviour and social dynamics, and a change in housing conditions, one might propose that elephants who are under less pressure and control of humans and voluntarily participate in their own care (e.g., protective contact), and gain more agency and 'wild dignity'.

19.5 Compassionate Education Programs

Education programs which aim to encourage and instil compassion, empathy and kindness, and to empower younger (and older) people to become active agents for animals and the environment, can be called Compassionate Education Programs. An example of such programs in zoos is showing people how to help animals in their neighbourhoods by drawing comparisons on zoo grounds, such as building safe

frog crossings in their community for similar frog species to those kept in the zoo, or for native frog species living around the zoo as (urban) wildlife. Education of caring for and connecting to animals does not have to be for exotic animals only, some zoos house rabbits, a common companion animal in households today and another animal in the city. They have housing and information which models good rabbit environments that allow the animals to perform species-typical behaviours, e.g., hop, stretch, and socialise. Compassion education programs thrive within and outside of zoos to connect people to nature. Roots and Shoots, for example, is a non-zoo-based program which envisions “a healthy planet where people live sustainably and in harmony with animals and our shared environment”.⁴

Compassionate education programs can also teach children to break away from animal stereotypes. For example, snakes are not slimy, and spiders are not scary but should be admired and protected. Studies report that having animals in the classroom improves children’s learning outcomes (Trainin et al. 2005) and participation in interactive programs and petting zoos produces positive cognitive and/or emotional impacts on the welfare of humans (e.g., DebRoy and Roberts 2006; Sahrmann et al. 2016).

The types of interactions experienced in a zoo can shape how people interact with animals outside of a zoo. For example, a structured program which informs people how to behave around a type of animal they are not familiar with may set the tone for animal interactions outside of that program. People who learn to observe and respect animals tend to interact differently and are more understanding of the choices animals make (e.g., approaching a stranger or not), than those unaware of behavioural cues.

Structured programs aiming to safeguard the safety of the animals, staff and public might miss out on the flexibility, free interpretation and space of unplanned or orchestrated activities. This tends to arise from a risk-averse perspective and inhibits activities such as spontaneous play. An example of this is in creativity and play sessions with animals in training, where animals are asked to create something new, invent a game, or choose what to do, where to go, or identify food and item preferences. These activities can even surprise the care staff, as what they think animals want and prefer does not always align with what animals choose when given the opportunity.

It is important to note that animals are not the only ones with preferences, visitors have preferences, too. How visitors choose to experience environments or types of programs and activities differs from person to person. They can choose to go alone, with the family, or only have the opportunity to go in the weekend or school holidays. These choices can affect the type of experience they will have, either quiet or busy. The visitors of a zoo are many and each differs in interest, attitude, and conduct. Some are quiet and interested in watching animals, volunteer at the zoo for enrichment and behavioural observations, and help with education programs. Others will come for quick entertainment and picnics on the lawn. Some are zoo members who frequently visit and feel a personal connection to their favourite animals, while others come

⁴See <https://rootsandshoots.global>. Retrieved online February 23, 2020.

once or twice a year without much connection. We mention this not only to posit that people experience zoos as connection points with the natural world in different ways, but also as a parallel to help the reader identify and compare their own interests and needs with that of other species.

19.6 Real Connections with Artificial Means

The various ways in which people connect with animals prompt us to wonder if the type of connection matters. In the age of the Anthropocene, where many species are going extinct, will connecting people to nature help in the conservation and protection of animals? Could computer simulations and ‘experiences’ through video or other artificial means, replace our in-person connection to nature? If the emotion associated with a connection is real, does it matter if the content was real (i.e., living animal versus computer-generated imagery, CGI)? Digging deeper, does it matter if the connection with a real animal happened to be an individual not born in the wild? Based on what we know about the long-term impact of atypical life histories on animals such as performer chimpanzees (Freeman and Ross 2014), we are fortunate to live in a period when films rely on CGI animals instead of animal actors. Recent movies, as well as holograms used in circuses and some zoos created lifelike experiences which may provide another opportunity for people to view, learn, and enjoy animals and their stories (e.g. Guangzhou Zoo’s virtual reality exhibit in China).

In films we become emotionally invested in non-human animals in a variety of forms, even when not real or remotely realistic. From fearing a devious octopus-humansque sea witch in the *Little Mermaid* (cartoon), to admiring the wisdom and optimism of Falkor, the Luckdragon, from the *Neverending Story* (animatronic puppet), and cheering for Aslan, the talking lion, to come back to life in the *Chronicles of Narnia* (CGI), we easily experience a range of emotions. Our minds appear to cross the barrier of reality and still remain emotionally invested the concept of believing in the stories told by animals, represented by fictional characters, the mission of the film and storyline.

Given what we know about perceptions of conservation status for primates (Ross et al. 2011; Leighty et al. 2015), context is important. Do these characters, even when exhibiting limited species-typical behaviour, trigger misinformed judgements? Do the emotional connections we make with realistic characters transition into caring about animal welfare and conservation? What is the impact of digitally simulated wilderness? Natural history documentaries delve into the animal world in ways some of us can only dream: Following the sardine run along the South African coast (*Nature’s Most Amazing Events: The Great Tide*, 2009), witnessing Darwin’s beetles lock horns in competition for mates (*Life: Insects*, 2009), or experiencing an extremely close encounter with playful mountain gorillas (*Life on Earth: Life in the Trees*, 1979). Mike Bossley suggests that the ‘Attenborough effect’ (Bulbeck 2005), may influence viewers, where incredible films like these set a tone and expectation

for tourists in terms of how close they may get to animals or how active animals will be when they see them. The effect reaches beyond the *in situ* environment; it affects expectations in zoos as well, ranging from realistic to unrealistic, e.g., how close one can get to an animal, or how many different behaviours can be seen in a short period of time. There is scant literature on the topic, but Silk et al. (2017) reviews the risks and benefits of harnessing the power of Hollywood to positively affect conservation challenges. They propose a framework to mitigate negative impacts by focusing on biodiversity conservation impact, behaviour change, engagement with film industry, and raising audience interest and awareness. We also recommend an impact assessment. Without incorporating metrics to identify the success or failure of these endeavours, the questions will still exist.

Zoos strategically collaborate with each other to maintain genetic diversity and population sustainability for at least one hundred years. These animals represent the same species as their wild conspecifics, but behavioural differences are present. No matter how much skill has gone into training zoo animals (e.g., to voluntarily participate in their own healthcare by sitting for radiographs or receiving voluntary blood draws), their connection with a human should not be confused with domestication. We consider these animals to fit somewhere in the middle of the continuum from wild to domesticated (e.g., Swart and Keulartz's specific care model, 2011). The ambiguity of where most zoo animals fall on the continuum raises questions about assessing welfare. We often rely on comparing zoo animal behaviour to that of wild conspecifics, but is a wild animal the appropriate measuring stick to identify "normal"? We are reminded again that context is important. Zoos provide carefully crafted programs for each individual to address medical, nutritional, environmental, and behavioural needs. For example, if food is provisioned, they do not need to hunt or forage, and if that means they do not need to patrol miles and miles of land in search of their next meal, they will likely walk less in zoos. If there is a difference in the behaviour between a zoo animal and a wild animal, it does not specifically mean there is a compromise in welfare (Veasey et al. 1996). Behavioural flexibility plays a significant role in an animal's ability to thrive in differing environments, including zoos. Their innate ability to adapt is strengthened when professional zoos can support their needs with care staff who exhibit the patience, knowledge and capability to build relationships, identify preferences and appropriately respond to each individual's needs.

19.7 Conclusion

In this chapter we provided examples and insights into how animals in zoos are cared for, not just focusing on how humans interact with animals, but also on how animals interact with humans. We highlighted historic changes in approaches to care and choice and control, as well as in the complexity of animal habitats. We discussed evidence-based animal welfare programs to understand how animals see us and how we promote, monitor and assess well-being, as well as elude to more elusive bonds

and interactions animals and humans have with each other, and the conflicting or contradicting situations or views to which this can lead.

Insight from conservation psychologists indicates that visitors want to know two things when visiting a zoo: How are the animals taken care of in the zoo and what are we doing in the wild to save them (Fraser, personal communication)? More importantly, they identified that if visitors do not think we take good care of our animals, they are not willing to listen to our conservation stories. Animal welfare is the key determining factor to connecting with zoo visitors and potentially inspiring behaviour change. In order to make this happen, professional zoos today need to have advanced animal care and welfare programs, incorporating the latest best practice, rooted in science and evidence-based approaches.

An indicator of peoples' connections with animals is how they respond to news of the death of a beloved zoo animal. When Inuka, the only polar bear in Singapore Zoo was euthanised due to age-related ailments, the zoo communicated information about this difficult decision to their visitors ahead of time. This allowed an opportunity for visitors to say their goodbyes and hundreds of people came to see Inuka one last time. He died surrounded by the people who cared for him.⁵ Terrible tragedies such as the recent fire in a zoo in Germany killing many primates highlighted the public's sadness for the animals who lost their lives, and concern for the staff who had to deal with this dreadful accident. Hundreds of candles, flowers, cards, and messages were left on social media, through the mail, and at the gates of the zoo. There is no shortage of stories zoo staff can tell of zebras running to them when they walk over, the chimpanzees who line up to be groomed with a soft brush through the fence, or the fishes who gather in front of the window when feeling the vibrations of the footsteps of their carer. There are many examples of care staff creating remembrance gardens for those who have passed, have photo collages in their lockers, and buy treats and toys with their own money to spoil the animals in their care. These examples above of joys and sorrows give us insights into the relationships care staff and the public feel they have with the animals in the zoo. In this ever-changing world where people and animals are living closer to one another, and interacting more and more, inspiring a world to live responsibly together has never been more important.

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⁵See <https://www.straitstimes.com/singapore/inuka-died-surrounded-by-his-keepers-singapore-zoo-releases-photos-of-polar-bears-last>. Retrieved February 23, 2020.

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