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# **Food and Thought**

## **What are Visitors Learning During Animal Feeding Time at the Zoo?**



**A thesis submitted in partial fulfillment of the requirements for the degree of  
Master of Science of the Australian National University.**

**S. C. Nelson**

**March 2002**



## Declaration

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This thesis is my own original work. Information from the published and unpublished work of others has been acknowledged.

Signed:

Sasha Charise Nelson

.....

Dated:

.....18 March 2002.....  
18 March 2002



## Acknowledgments

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I would like to express my appreciation to the administrators and staff of the participating zoos and the visitors who kindly took part in this study.

My supervisors Professor Chris Bryant and Dr. Sue Stocklmayer provided guidance. The Australian National University Statistical Consulting Unit advised on quantitative design and analysis.

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All of the Nelsons, my family, and the Gillhams, and other friends, near and far, encouraged me with words and deeds. Stuart Page has kept me smiling.

My heartfelt thanks to all of these special people.



## Abstract

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Feeding times have become popular activities at most zoological, wild animal parks and aquaria in part because they are compatible with pre-existing animal enrichment programs and so cost little to provide. Nothing is known, however, of visitor attitudes towards the animals and the food provided or the learning outcomes, if any, from feeding times and the talks given by keepers during such programs. Therefore, structured interviews were conducted with administrators, staff and visitors at three zoos in regional Australia to understand visitors' attitudes towards feeding live prey or carcasses to zoo animals and the goals and outcomes of public feeding programs.

This was the first Australian study of adult visitor attitudes and learning outcomes from public feeding programs. Over 90% of the 50 Australian visitors interviewed agreed that feeding live invertebrates (insects) to small vertebrates (reptiles and small mammals) was acceptable. In every case approval for feeding live prey significantly increased if done out of public view. Demographic and sociographic factors affected attitudes towards feeding live prey or carcasses.

Zoo personnel are aware of visitor expectations for feeding times and seem to satisfy those expectations, yet zoo administrators' and staff goals for feeding times are greater than visitor expectations and current outcomes. Evidence was obtained to suggest both short and long-term cognitive learning resulted from talks by zoo keepers at feeding times. However, the information learned was not always correct and the level of learning seemed shallow. Analysis of the data suggest enhancements which could be made to facilitate learning outcomes, as well as indicating areas for further research.



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## Glossary and Abbreviations

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**Enrichment** – the addition of stimulus (food, substrate, plants, sensory and kinetic objects, etc.) which will enhance and encourage natural behaviors in captive animals. Includes environmental enrichment, behavioral enrichment, and operant training which fall into two categories -- behavioral engineering (use of devices) and naturalistic (habitat adaptations).

**Informal learning** – defined by the setting. The setting allows the learner to choose the subject of study, a subject that is not dictated by curriculum i.e. free choice learning, non-formal learning, unstructured learning.

**Learning** – the process of cognitive, affective or psychomotor change resulting from some stimuli.

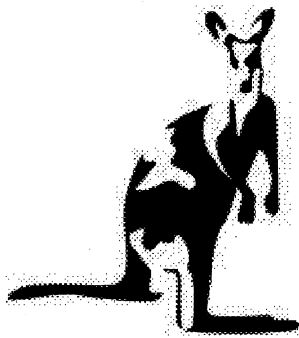
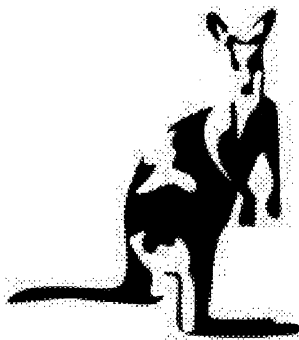
**Public animal feeding programs** – feeding of zoo animals by keepers during hours when the facility is open to the public, for the purpose of entertaining and educating visitors. Usually accompanied by a talk. Abbreviations: feeding times, programs.

**Sociographics** – characteristics of lifestyle (e.g. pet ownership, watches TV, etc.) similar to demographics, i.e. psychographics.

**Zoo** - for simplicity this term includes zoological parks, free-range animal parks, wildlife parks, nature parks, and aquaria.

## Chapter 1 Introduction

---



We see them behind bars and we see them separated by glass or watery moats or carefully hidden electrical wire. This may be the only way we will ever see them. As the animals of the earth disappear, their habitats are replaced by cities that increasingly separate us from the natural world.

We learn about them when we are children as we are practicing our ABCs and reading our textbooks. A few continue to study them as a career. After our school years, most of us will garner what we can from television documentaries and visits to zoos. Yet our desire to connect with nature, with the wild, and with animals persists. This desire is called biophilia -- the biological need to connect with nature (Kellert, 1998).

Aquaria, zoological and wild animal parks (referred to here as zoos for simplicity) might be one of the most controversial and obvious manifestations of biophilia. These facilities are highly visible representations of the natural world and as such the messages communicated about nature within may have wide ranging influence on the attitudes visitors develop towards animals. Comprehensive study of the relationship between zoo rhetoric and visitor attitudes is beyond the scope of this project. However, this study does explore some aspects of the relationships between communication and attitudes through the examination of a typical communication event occurring at most zoos – public animal feedings programs.

### **Background to the Study**

International and Australian laws require that zoos contribute to the public awareness of environmental and conservation issues (Australian Nature Conservation Agency, 1994; World Zoo Organization, 2001; European Commission cited in Miller, 2002). Legally, zoos in Australia must engage in

science communication with the general public (Exhibited Animals Protection Regulation (NSW), 1995). Zoos also have an ethical duty to communicate. The prevalence and popularity of zoos means that they have the potential to play a key role in environmental education and in influencing the ways in which people understand animals and animal-related sciences such as conservation, behavior, ecology, and physiology (Mazur, 1998).

In Australia there are over half a million animals in zoos, some of which are extinct in the wild (Australian Bureau of Statistics, 1998). Zoos are often the only contact increasingly urbanized segments of the world's people have with wild animals (Kreger and Mench, 1995; Kidd and Kidd, 1996; Morgan and Hodgkinson, 1999). This is particularly true for Australians since the majority of the country's wildlife is elusive even to those who live in rural areas.

It is estimated that nearly 800 million people worldwide visit zoos (Koebner, 1994). In Australia five million people visit zoos per annum. More than the total that attend Australian Rules football, Rugby League rugby, and horse races (the three most popular Australian sporting events), supporting an industry worth well over \$100 million dollars (Australian Bureau of Statistics, 1997; 1999). Zoos play a significant part in creating public perceptions about nature, in setting policy agendas for wild animals and in designing management strategies for endangered species (Mazur, 2001). They are engaged in a form of science communication with the intention of generating formal and informal cognitive and affective learning outcomes.

### **Problem**

Researchers heavily criticize zoos for their poor science communication and environmental education practices (Sommer, 1972; Jamieson, 1985; Mazur,

2001). The poor performance of zoos as institutions of public education can be attributed to political and managerial causes with the two most common explanations given being the lack of resources and conflicting priorities.

People visit zoos primarily for recreation and not for education (Kreger and Mench, 1995). As with science centers and museums, zoos have developed several strategies attempting to entertain and still educate visitors. Talks by zoo animal keepers, for example, especially during feeding times, have become a popular part of visitor communication strategies. Talks by keepers are discrete communication artifacts that represent a very fundamental type of communication within zoos (with the animal keepers as senders, animals as part of the message, and visitors as receivers). Studies of the process may lead to generalizations that inform communication strategies and increase informal cognitive and affective learning outcomes.

### **Purpose**

The purpose of this study, therefore, is to understand the kind of communication environment zoos create for visitors, to determine their goals for visitors, and to find out how the public responds to animals being fed. This may enable an assessment of the ability of such programs to educate visitors in light of the zoo's goals. The significance of the study is that it fills a gap in our knowledge because little is currently known about the effectiveness of science communication within this context. It is the first Australian study of visitor attitudes to public feeding programs, and informal cognitive and affective learning outcomes from such programs.

### Research Questions

Many of the research questions used to frame this study are exploratory, aiming to fill some gaps in what is known about communication by and outcomes from talks by keepers. Specific questions were framed in order to ascertain public attitudes towards feeding live prey to zoo animals. Other questions focused on informal cognitive and affective learning.

These are the research questions addressed in this study:

- What are visitor attitudes towards feeding live prey to zoo animals?
- How do selected demographic and sociographic characteristics of visitors influence their attitudes?
- What goals do zoo administrators and staff have for public animal feeding times?
- What motivates visitors to attend?
- Are goals and motivations in agreement?
- What messages are conveyed and what messages are received by the participants during public feedings?
- How do zoo messages affect visitors?
- Do visitors learn any factual information about animals?
- Do visitors retain any facts that they have learned?

### Overview of Methods

To understand visitor attitudes towards the proposition of feeding live prey to zoo animals, quantitative data were collected using closed-ended questioning techniques. Qualitative data, using structured interviews primarily of open-ended questions, were collected to answer all other research questions.

#### **Vignette 1    Window on the Researcher**

Design, planning, pre-trialing, and initial data collection occurred concurrently with my introduction to the theory and practice of social science research. Early on, during the initial discussions about strategy and decisions that balanced methods chosen against time and resources, it seemed acceptable to limit data collection.

Only after months of work, completion of the data collection and reading at least half a dozen books on research methods was it apparent how much richer the results might have been with the addition of detailed observational field notes and/or transcribed recordings of the numerous feeding sessions I attended. Of course if I had tried to collect data from all possible sources using all possible methodologies this would be a Ph.D. dissertation and not a sub-thesis.

To regain some of the flavor of the field work, vignettes like this one are scattered throughout the thesis in an attempt to capture some of the richness of the research experience. They are windows into the most speculative aspects of the project. They are not necessarily balanced. They are not necessarily scientific. They are a way of including “self” into the study (King, 1996) as they allow me the freedom to tell the story of this study.

### Overview of the Thesis

This has been a brief introduction to the obligations zoos have to engage in science communication, the purpose of the study and the research questions used to guide it. A review of the literature on the topics of communication theory, science communication theory and practice, and zoo communication strategies are provided in chapter 2. A discussion of the methodological decisions made for the study is the subject of chapter 3. Chapters 4 and 5 contain the research procedures, results, discussion, and conclusions for the data collected. Chapter 6 is a summary of the primary conclusions, areas for future research, and a few final words.

## **Chapter 2    Literature Review**

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This chapter contains a review of the literature. Although extensive, the literature selected for inclusion provides the background to the multiple disciplines underlying the study and an understanding of zoos.

### Communication

Communication is a basic part of human behavior (Shepherd, 1975). Such an integral part of humanness, communication is easy to recognize and yet hard to define (Fiske, 1990). Communication occurs within particular social and cultural contexts that assist in perception and understanding of the message (Mohan, McGregor and Strano, 1992). So the study of communication is also the study of context and culture (Fiske, 1990), which can define responses to the messages being communicated (Jensen and Pauly, 1997).

Communication occurs when information is exchanged via a code (words, gestures, symbols, etc.) between at least one source or sender (which does not have transmit verbally, e.g., signs and symbols) and one receiver. Language is arguably the most powerful code through which information is exchanged; however, communication often includes non-verbal signals (Shepherd, 1975; Lacey, 1998).

There are two schools of thought about the way messages are exchanged. The *transmission theory* (Fiske, 1990) describes communication as the transformation of information which originated from some source via a coded channel created by a sender and transmitted to a receiver at some destination via a channel (see Figure 1). The message might be interrupted or altered during the course of the transmission and according to the model such an interruption would occur as a result of “noise” or external interference. Receivers might try to reduce

the effect of any interference caused by “noise.” For example a lecturer might instruct students by verbally delivering to the students information derived from the lecturers own research. In this example the research is the information source, the transmitter or sender is the lecturer, the channel is the spoken word, the receiver is the student, the destination could be the student’s notebook or mind. The lecturer’s message maybe distorted by noise such as actual noise in the lecture theater or anything else which distracts the students including the students’ thought process. Students might ask the lecture questions to better understand information which they were unable to hear or absorb.

The *meanings theory* (Fiske, 1990) describes the act of communication as the construction of meaning from codes passed between senders and receivers (see Figure 2). *Meanings theory* assumes that senders and receivers both begin with their own understandings of the message and together create meanings throughout the exchange. In this model the communication process is interactive. So using the earlier example of a lecture, a lecturer using a *meanings* communication construct would request feedback by encouraging discussion from the students. Simple question and answer sessions would not necessarily fit the meanings model if those questions were designed only to assist the receiver in clarifying parts of the message which were interrupted by noise.

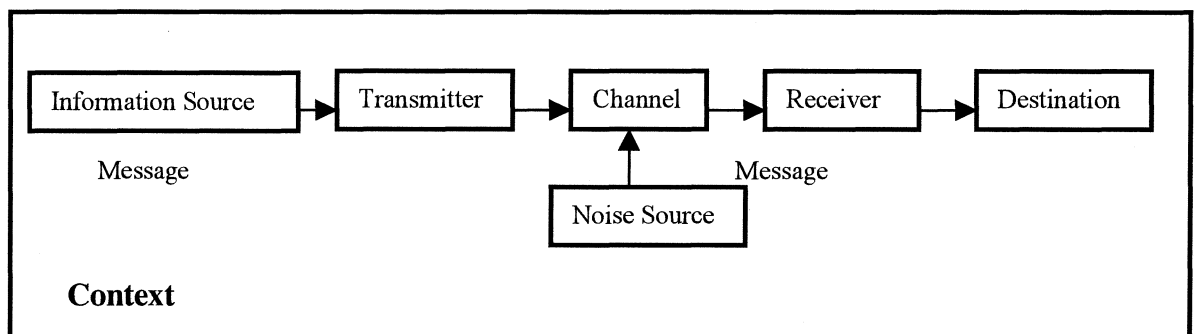


Figure 1: Transmission model of communication (adapted from Shannon and Weaver, in Mohan et al., 1992).

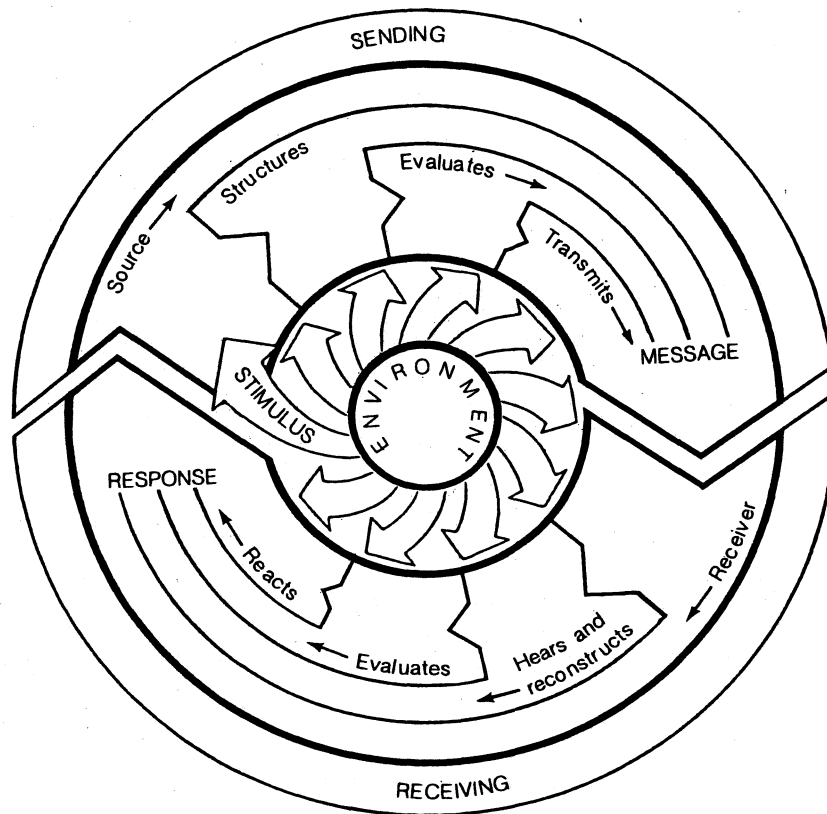


Figure 2: Meanings model of communication (adapted Mohan et al., 1992).

Both models take into account the idea that communication occurs within particular environments or contexts. Context is understood to be the juxtaposition of a focal event and a field of action within which that event is embedded. To describe context is to describe part or all of four dimensions — the setting, behavioral environment, language, and extra situational factors (Goodwin and Duranti, 1992; Lacey, 1998).

### What is Science Communication?

Science communication describes the communication that occurs between scientists and science popularization, which is communication by scientists to the general public often via journalists (Sapp, 1995; Scanlon, Whitelegg, and Yates,

1999). This study is concerned with the former — the processes of disseminating science to the general public.

The practice of science communication developed in the eighteenth century (Bryant, 2002). In contrast, the academic study of science communication is relatively new. As the name “science communication” implies, there is a necessary mixing of disciplines in the formation of this relatively new area of academic pursuit. Theorists in the field tend to emphasize practical and applied approaches, which means that the academic study of science communication places an importance on the product of recommendations. When science is communicated to the public it must be clear and accurate to be effective (Sapp, 1995).

### **Learning in Museums and Science Centers**

Often the motivation for communication is the transfer of information — teaching and learning. Learning is not only about acquiring facts. It also involves creating new links in prior knowledge and developing attitudes, values and beliefs. Learning is broadly defined as cognitive, affective and social change.

Communication can occur without learning, but learning cannot occur without communication (Garry and Kingsley, 1970). Thus any study of learning is also a study of communication. This is particularly true for this study because the artifact under investigation is a type of talk, and the study evaluates the effectiveness of talks in producing cognitive and affective learning outcomes.

As with the two schools of communication theory, there are currently two primary schools of thought as to how information is learned — positivism and constructivism. Positivism is a model of learning based on the idea that the learner has a deficit of knowledge that might be filled with instruction. The instructor

engages primarily in uni-directional transmission communication to transfer their knowledge to the learner. Constructivism on the other hand is the idea that the learner is actively involved in constructing meaning (Yager, 1991; Riegler, 2001). This model of learning acknowledges the important influence of the learners' prior knowledge on how and what they learn from new experiences. It also assumes a rich feedback loop between learning and facilitator similar to the meanings model of communication.

In the literature learning is often defined by the setting in which it occurs. Formal learning occurs in some sort of classroom, is structured, facilitated by someone other than the learner, and usually follows curriculum guidelines (Wellington, 1990). Learning that is not necessarily linked to a standardized curriculum (Merriam and Rosemary, 1999) is called informal learning (also called free choice, non-formal or self-directed learning) can occur within museums, science centers, and zoos or any setting that the learner chooses. Informal learning is the type of learning adults are engaged when visiting zoos (review in Heimlich, 1996).

Learning theorists currently favor constructivism as the most representative model of how learning occurs (Stocklmayer, in press); however, strategies used to promote informal cognitive and affective learning at zoos do not yet conform to this trend. Most communication strategies employed by zoos are a form of transmission — as a result many informal cognitive and affective learning experiences in the zoo setting are positivist. That is why this study attempts to understand the dynamics at work by utilizing oral communication transmission theories.

Today's museums and science centers often use “understanding” or “awareness” to describe the learning outcomes they hope to influence

(Stocklmayer, in press). The words “education” and “learning” have been removed from the museum and science center lexicon partly because cognitive learning, while relatively easy to measure, is difficult to achieve and affective learning, while relatively easy to achieve, is difficult to measure.

Research indicates that leisure-time activities have six attributes that are assigned various levels of importance by visitors. They — offer new experiences, learning, something worthwhile, social interaction, comfortable surroundings, and active participation (Hood, 1994; Packer, in press). These six attributes complement the six factors motivating visitors – curiosity, confidence, challenge, control, play, and communication (Perry, 1994; Schiele and Koster, 2000).

For learning to occur visitors must desire one of the attributes and have at least one factor cultivated. Physical, social, and individual needs should be fulfilled and when unfulfilled, may inhibit learning (Rosenfeld, 1980; Anderson, Lucas, Piscitelli, and Faulk, in press). The depth and accuracy of what is learned relies upon the visitor’s prior knowledge (Khow, Honeyman, Jackson, and Bauman, in press).

## **Zoos**

Historically, menageries provided powerful rulers with a way of displaying their wealth, animals for use in religious ceremonies, and as symbols of their dominion over the natural world (Koebner, 1994; Young, 1998a). Most kingdoms kept at least a few exotic animals and at times exchanged these with other nations as acts of good will (Cherfas, 1984; Hoage and Deiss, 1996). The rise of a middle-class willing to pay to see unusual spectacles meant that private menageries were made public for anyone willing to pay a fee (Burkhardt, 2001). In 1826 the London Zoo was opened and operated as a living natural history museum with the

animals kept exclusively for scientific study until 1846 when the zoo was opened to the public (Young, 1998a). The Melbourne Zoo founded in 1857 was the first Australian zoo and had origins different from most zoos because it was established as a way-station for the acclimatization of species meant for introduction into the bush (Gillbank, 1996; Australian Bureau of Statistics, 2002).

In 1907 the first zoo without bars opened in Hamburg, Germany (Young, 1998a). The designers of the Hamburg Zoo are credited with creating the first modern zoo. The naturalistic design achieved in Hamburg was atypical. The design created aesthetically pleasing scenery for visitors, unlike most zoos that had developed a tradition of keeping animals in sterile concrete pits and iron cages. The concrete was easy to clean, providing good hygiene for the animals and allowing unhindered views of the animals (Koebner, 1994; Young 1998a). In contrast, naturalistic designs might not have been the easiest exhibits to clean but they did appear to improve animal welfare (Young, 1998a). Modern zoos are rapidly eliminating cages to develop naturalistic exhibitry because they are now making animal welfare a priority.

The first scientific investigations into captive animal welfare were conducted in the 1950s and 1960s (Young, 1998a). In the 1970s, television documentaries of wild animals were widely watched by the public (Koebner, 1994). Comparisons of the behavior of zoo animals to that of wild animals in documentaries led to zoo visitor recognition that the behaviors of zoo animals were highly aberrant and caused public concern for the conditions in which animals were held (Koebner, 1994). Scientific studies confirmed that captive behavior differed from wild behavior (Coulton, Waran, and Young, 1997; Hohn, Kronschnabi, and Ganslober, 2000), providing support for the increasing public pressure on zoos to improve the welfare of their animals. Scientific research

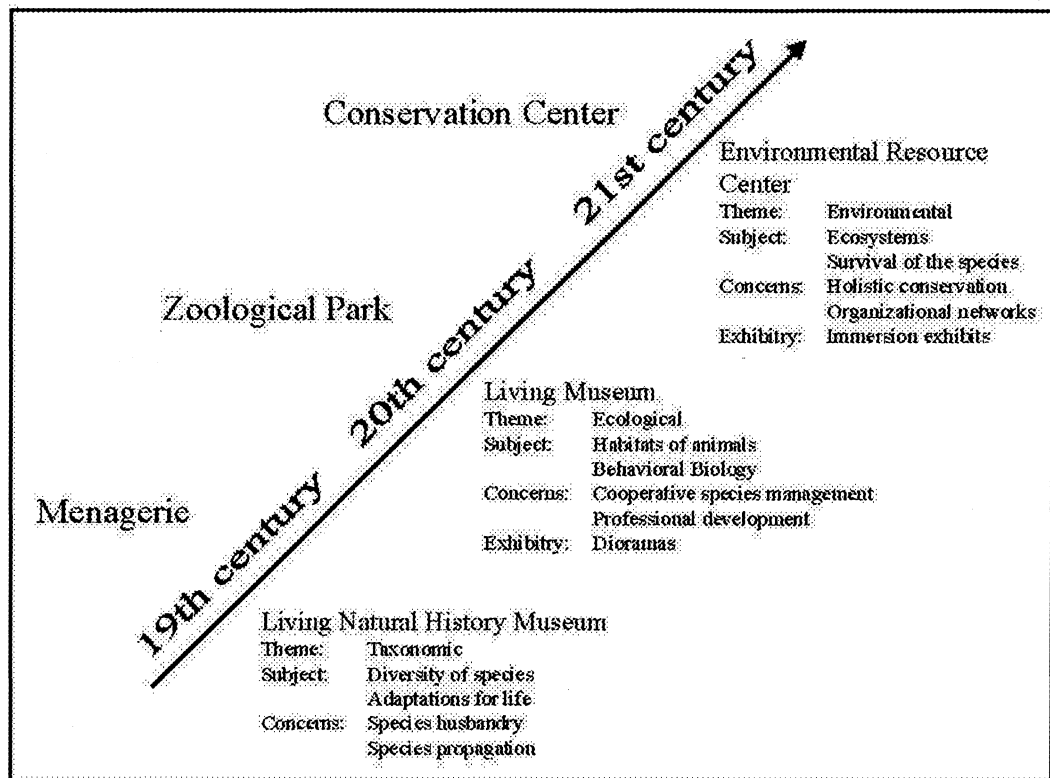


Figure 3: Evolution of zoos (adapted from Dr. Rabb, in Koebner, 1994).

continues to improve our understanding of animal needs as zoos continually evolve from the menageries into conservation centers (see Figure 3).

It has been discovered that the quality rather than the quantity of space allowed to an animal has the greatest positive impact on animal welfare (Young, 1998b; Stark, 1999). Quality of the exhibit can be improved with changes to its environment. This is called environmental enrichment and its ability to enhance animal well-being means that it has been incorporated into normal husbandry practices (Newbery, 1995; Brigham, 1997; Field, 1998; Shepherdson, Mellen, and Hutchins, 1998; Stark, 1999; and Mellen and MacPhee, 2001). Introduction of enrichment items into animal enclosures affects the perception of visitors (Kreger, Hutchins and Fascione, 1998; Wood, 1998). Concern about visitor reaction and

the introduction of animal welfare laws means that the practice of enrichment is limited to introducing only positive aspects of the wild. Enrichment thus does not fully replicate the wild, and so does not prepare animals for reintroduction into the wild — the ultimate goal of many conservation breeding programs (Young, 1997b).

Concern for animal welfare, the environment, species extinctions, biodiversity, habitat loss, and other conservation issues have caused people to rethink human treatment of the natural world and animals under human care. Today, keeping animals in small concrete bunkers for the sake of paying voyeurs is no longer acceptable (Hutchins, Handcock and Crockett, 1984; Miller, 2002). What *is* acceptable is developing conservation centers that provide quality space for animals and visitors. Today's zoos are responsible for conservation, education, and research and continue to be a source of entertainment for visitors.

#### Who Visits Zoos?

Nearly half of the Australian population annually visits aquaria, zoological, and wild animal parks (Australian Bureau of Statistics, 1998). Visitors to large Australian zoos are more likely to be locals rather than tourists (Mazur, 1997). Visits may be part of a family's traditions (Holzer and Scott, 1997; Schiele and Koster, 2000). Visitors tend to be well-educated family groups (Kreger and Mench, 1995). Adults, not children initiate the majority of visits (Morgan and Hodgkinson, 1999). Adult visitors seek recreation, education for themselves or others (especially children), and a sense of connection with the natural world (Kreger and Mench, 1995; Morgan and Hodgkinson, 1999; Packer, in press).

Visitors are becoming increasingly selective of the zoos they support. The

Humane Society of the United States has developed a checklist (see Table 1), which particularly conscientious visitors are using to choose the zoos they visit. Over half of the questions relate to the educational experience provided.

Table 1: Questions Asked by Concerned Visitors When Choosing a Zoo to Support  
(adapted from the Humane Society of America, in Koebner, 1994).

|                                                                                                                                                                                                                       |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Did you learn anything about the wildlife or habitat from your visit?                                                                                                                                                 |
| Does the zoo provide special educational programs for visitors who wish to learn more about animals?                                                                                                                  |
| Is there a zoo society you can join to help see that improvements are made and educational programs developed?                                                                                                        |
| Were the keepers or other zoo staff members or volunteer workers close by to answer your questions and insure that visitors did nothing to harm the animals? Did they seem knowledgeable and concerned about animals? |

Most visitors seek close contact with animals in action (Taylor, 1986; Kreger and Mench, 1995) and 63% expect to learn something about environmental issues during their zoo visit (Broad, 1996; Packer, in press). It should be noted that exactly what visitors learn and their attitudes towards animals seem to be affected by demographic, social and cultural backgrounds (Broad, 1996; Kellert, 1998).

In Australia, zoos receive 60% of their funding from entry fees, 26% from the government, and the remainder from sponsorships (Australian Bureau of Statistics, 1998). With visitor entry fees providing such a large percentage of income zoos are under increasing pressure to improve their role in education (Miller, 2002). Zoos rely on the continued patronage of adult visitors to justify continued government funding and sponsorship (Heinrich and Birney, 1992).

### How Zoos Communicate

“Nothing is as complex as animal exhibition” (Ehmke, 2001, p. 122) because zoos must balance the interests of multiple stakeholders, internal bureaucracy, conflicting priorities (e.g., animal husbandry versus visitor needs), and constraints on funding, staff, and time.

Zoos are engaged in many types of communication activities each with particular target audiences and expected outcomes. Organizational communication strategies are employed within zoos for purposes of administration, and outside of zoos for purposes of coordination, collaboration, and cooperation with similar facilities. Public relations and/or mass-mediated communication serve to generate interest and support for zoos and their programs. Ultimately this type of communication is concerned with the raising of funds for zoo operations. Science communication is employed in the education of visitors about the animals. Communication about animal-related sciences such as ecology, behavior, physiology, and husbandry occurs in the media, at museums, science centers and zoos.

In most of the literature museums, science centers and zoos are grouped together and the media is separated into its own category for study. Due to the way in which the study of zoos has been linked to museums and science centers, several primary differences have not yet received attention. Zoos are distinct from museums and science centers because they did not originate as places of learning; exhibitry is live and unpredictable; interactive display techniques are not usually adapted for use by zoos; and most mission statements emphasize education (Morgan and Hodgkinson, 1999) rather than aiming to create public interest as is the case with many of today's museums and science centers (see Table 2).

Table 2: Mission Statements of Zoos Compared to those of Museums and Science Centers. [The first three taken from the facilities visited for this study.]

| Zoo Mission Statements                                                                                                                                                                                                                                                                                                                                                                                            | Museum and Science Center Mission Statements                                                                                                                                                                                                                   |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| "Fun and educational. Our aim is to educate our visitors about the beauty of the animal kingdom, and hope that they can become aware of the need for conservation of the animals of the world and their natural habitat."                                                                                                                                                                                         | "Improving an understanding of ourselves and the world in which we live" (Museums Victoria, 2002).                                                                                                                                                             |
| "To ensure the preservation of all endangered animals and their environment through a holistic approach to conservation and education."                                                                                                                                                                                                                                                                           | "Exploring the past, illuminating the present and imagining the future" (National Museum of Australia, 2002).                                                                                                                                                  |
| "To provide conservation of natural and cultural heritage values, research into threatened and locally extinct plants and animals, education with... guided activities and interactive visitor centre, and recreation providing visitors with plenty to see and do."                                                                                                                                              | "To be a world class centre that raises national awareness, fosters understanding and instills positive attitudes to science and technology" (Questacon – The National Science and Technology Centre, 2002).                                                   |
| "Our zoos will be world-leading centres for wildlife and environmental education, conservation and research; on-site, off-site, on-line" (Zoological Parks and Gardens Board Victoria, 2001).                                                                                                                                                                                                                     | "Sustainable environments and cultures for future generations, achieved through documenting and understanding the past and the present" (Australian Museum, Natural History 2002).                                                                             |
| "We will demonstrate a meaningful and urgent commitment to wildlife... We will inspire active and enjoyable learning experiences and be a catalyst in creating understanding and wonderment of our natural world... our zoos will lead individuals and communities in the wise and sustainable use of natural resources for the benefit of future generations" (Zoological Parks Board of New South Wales, 2000). | "To establish and maintain a center of excellence which will facilitate a spirit of scientific inquiry to strengthen the technological and engineering capability and understanding of the community" (The Investigator, Science and Technology Centre, 2002). |

Recent research might suggest that differences between museums, science centers and zoos are important (Packer, in press). The current trend is for researchers to generalize museum and science center research to fit zoos. If, as some believe, zoo education is growing into a discipline in its own right (Fifeld, 2001) and as differences in context seem important (Packer, in press) perhaps separate studies of zoos should be encouraged.

Cross-cultural communication occurs between administrative divisions within the zoo, during cooperative efforts with other zoos (nationally and internationally), and with visitors who come from a diverse range of ages, socio-economic backgrounds, ethnicity and cultures. Communication tools must appeal to the widest demographic audience including very young children, the intellectually challenged, the elderly, scientists, pet owners, non-pet owners, repeat visitors, foreign visitors, and many others. To complicate matters, most animal exhibitions are permanent (e.g., the elephants can not be packed away in storage if they go out of style), creating the challenge of making exhibits appeal to people who may have already seen them on an earlier visit or similar species at a different facility.

Traditional ways that adult visitors are educated include the context in which the animal is exhibited, the use of static graphics and text panels, handouts (usually a map or visitor guide distributed at entry) and talks by animal keepers or volunteers. Zoos do not often use interactive exhibitry (Kelsey, 1989).

The context of the exhibit has been shown to be one of the most powerful factors influencing visitor perceptions of zoos (Altman, 1998), and can enhance or nullify the educational messages (Coe, 1982). The expense of redesigning exhibits is prohibitive and in most cases exhibitry has been slow to catch up with philosophy and current husbandry practices, which has left many zoos contending with a mix of exhibit types or generations (Tofield, Coll, Vyle, and Bolstad, in press). First generation cages are concrete pits that are similar to bunkers. Second generation enclosures are usually small, but more open with glass or moats and electrical wires separating visitors and animals. Third generation exhibits, called immersion exhibits, allow the visitor to feel as if they are a part of the exhibit, as they walk into landscaped areas with carefully hidden barriers between themselves

and the animals. Studies to date have shown that third generation exhibits hold visitor attention longer, in comparison with first and second generations exhibits (Coe, 1982; Peart, 1984; Tofield et al., in press). Research is lacking and so too an understanding of how immersion exhibits affect the public's perceptions of nature.

In Australia, regulations for keeping animals are developed by individual states and territories. Some regulators mandate that enclosures include signs and illustrations identifying the animal, alerting the public to any dangers, and describing the population status, range, habitat, food habits, and any environmental, physiological, anatomical, and behavioral adaptations of the animal or animals (Exhibited Animals Protection Regulation (NSW), 1995). In 1997 67% of zoos were in compliance with the guidelines (Australian Bureau of Statistics, 1998). Larger zoos labeled exhibits more extensively than smaller facilities (Australian Bureau of Statistics, 1998). Information on static displays is updated infrequently. Previous studies have shown that visitors spend only 12-120 seconds viewing an exhibit (Rosenfeld, 1980; Bitgood, Patterson, and Benefield, 1988; Johnston, 1998). This means that zoos rely heavily upon face to face contact to deliver information.

Maps are typically provided to visitors upon entry. The maps highlight the places where popular animals are located, and often display the time and place for talks and demonstrations. Talks given by keepers provide basic information about biology, ecology, physiology, and behavior of specific animals selected from the entire collection. Personal contact with animals and animal keepers is believed to be a highly effective method of communication with visitors (Ehmke, 2001), and often encourages visitors to stay longer (Phillpot, 1996). However, direct contact between visitors and animals is increasingly limited due to safety issues (Kreger

and Mench, 1995). Demonstrations and talks are replacing animal rides, petting zoos, and the feeding of animals by the public.

#### How Zoos Educate

A zoo visit should be educational and even a bit inspiring.

Greg Miller, New Scientist

A good zoo would leave you changed.

David Handcocks, Director of Victoria's  
Open Range Zoo at Werribee

The primary role of zoos is not environmental education nevertheless, it is one of the most stated goals in mission statements (see Table 2) and a primary justification for keeping animals in captivity. The international educational agenda for zoos is to "successfully communicate the importance of biodiversity and the severity of the extinction crisis" (Koebner, 1994, p. 13). To educate, zoos must communicate in ways that are both entertaining and informative. The mission to educate applies to both children and adults. Children often participate in formalized educational programming designed by zoos to be compatible with school curriculum guidelines. In contrast, adults are primarily left to learn informally. When asked, adult visitors indicate that sources of information from which they learned included watching the animals, reading signs, listening to talks given by keepers, and reading guidebooks (Broad, 1996).

Given the important relationship between zoos and adult visitors and the importance of communication that educates as well as entertains, it might come as a surprise that published research in the area is lacking (Heinrich and Birney, 1992; Reade and Waran, 1996; Morgan and Hodgkinson, 1999).

In 1998, the *Journal of Zoo Biology* contained a report claiming a four-fold increase in visitor activity studies since 1986, making people second only to carnivores as the most popular taxa to study at American zoos (Wemmer, Rodden, and Pickett, 1997; Stoinski, Lukas, and Maple, 1998). Many of these same zoos have begun to review their educational programs. Taken together these trends signify an increased interest in visitor experiences. However, the same report explains that much of the research is not published, rendering it virtually useless and questioning the professionalism with which it was conducted (Wemmer, et al. 1997; Stoinski et al., 1998).

In the late 1990s, Mazur published several papers on the results of an extensive study of Australasian zoo policy and visitors, which discussed communication and educational issues (Mazur, 1997; 1998; 2001). During the 1998 International Conference on Learning Science in Informal Contexts, only one case study of a zoo and a paper on a nature park were presented compared to 22 papers concerning museums and science centers (1999). The 1999-2000 annual reports of the two largest regional zoo boards in Australia, the Zoological Board of Victoria and the Zoological Parks Board of New South Wales, showed that their visitor- related research publications represented only 4% and 2% of total publications, respectively. Zoo visitor research has been driven by market forces rather than from a need for academic or qualitative research. The major criticism of market survey data is that market surveys tend to be quantitative and so report only on the number of zoo visitors attending a program rather than illuminating any of the outcomes from a visit (see chapter 3 for further criticism of market surveys).

What *is* known is that learning is closely related to how animals are displayed (Miller, 2002). Visitor learning improves with an increase in animal

activity (Kreger and Mench, 1995). Visitors often comment most on animals which are familiar and less on exotic species (Taylor, 1986). Comments are made using anthropomorphic descriptions (Rosenfeld, 1980) in discussions with other visitors. Visitors are learning information from such discussions (Taylor, 1986). Many researchers have identified a need to evaluate education programs (Mason, 2000; Mazur, 1998). Filling all of the gaps would be impossible for any single research effort and the constraints placed upon this research project necessitated the selection of one artifact.

### **Vignette 2    Animal Attacks**

Occasionally the Australian press has reported about animals and people in conflict and introduces the stories with dramatic headlines like this one: "Roo attacks boy at animal park." In 2001 tragedy struck again and the headlines cried: "Dingo kills boy on Fraser Island;" "Dingoes rely on human feeding;" "Thoughtless feedings by humans makes a shy animal fearless;" and "When animals attack they usually have a perfectly good reason" (Squires, 1997; Tydd, 2000; Robert, 2001a/b).

At the time of the Fraser Island tragedy I had been chatting with staff at a Victorian zoo about the animal feeding programs offered at their facility. I was told that twice annually the zoo receives information about their animal feeding times from one question allotted on a market survey. The results show that people are participating in the program; it says nothing about why they are there or what they are gaining from the experience. One staff member said, "we want to know are people left with the impression that the animals are pets or do they gain an understanding of behavior, habitat and conservation" (J. Allen, personal communication, May 18, 2001)?

Is there a link between zoo feedings and wild animal feedings? Are people imitating what they see at the zoo? I knew my study was not broad enough to answer such speculative questions, but I did become even more curious to know what ideas visitors were taking with them after watching the animals and listening to the keepers at zoo feeding times.

### **The Artifact**

Public animal feedings programs were selected as the artifact for this study. The history and a description of public feedings programs as well as how such programs relate to enrichment and education follows. This information provides an understanding of why public animal feedings programs are worthy of detailed study.

In the recent past, visitors were allowed to hand-feed some zoo animals at some facilities. Accidents caused by aggressive feeding have resulted in the practice being largely discontinued (Kreger and Mench, 1995), despite the fact that direct contact with animals is thought to be one of the most effective ways of altering visitor misconceptions. Feeding demonstrations are designed, in some cases, to partly replace hands-on feeding. Demonstrations are arguably less effective than direct contact (Kreger and Mench, 1995); but are a safer option because no contact is made directly with the animals. The design of public feeding programs (e.g., the time of day, frequency, and the type of animal and food fed) is often left to the intuition of staff or dictated by the environmental enrichment calendar. This may not be the best time for visitors to participate.

Public animal feeding programs are one of the safest and most cost-effective ways for facilities to engage visitors. Because daytime animal feeding is usually part of most zoos' environmental enrichment programs, few added resources are needed to develop the feeding into a program. There are many potential benefits from developing feeding programs. Feeding programs enrich the animal and increase animal activity; thereby increasing visitor satisfaction (Kreger et al., 1998). Feedings provide close contact with zookeepers and mediated contact with the animals (Kreger et al., 1998). They are meant to educate participants about the zoo, the particular animals, the animals' feeding habits, and

environmental issues (Shepherdson, Mellen, and Hutchins, 1998; Kreger et al., 1998) to “help visitors learn how to react responsibly during wild encounters” (Houts and Greaves, 2000, p. 4; Houts, in press). They are well attended by visitors who find the talks accompanying feedings to be a good source of information (Broad, 1996). As a result, most zoos have public animal feeding programs.

Internal and external research on the effectiveness of such programs in enhancing animal behavior is readily available (McPhee, Foster, Sevenich, and Saunders, 1998; Young, 1998b; Stoinski, Daniel and Maple, 2000; Vick, Anderson, and Young, 2000). However, public feeding programs are not usually evaluated for their ability to enrich the visitors’ experience. For these reasons detailed investigation of public animal feedings in Australian zoos is an appropriate communication artifact to begin a greater body of work on communication and informal cognitive and affective learning at zoos.

#### Feeding as Enrichment

Food is often used for captive animal enrichment as it offers biologically relevant stimuli and fulfills basic dietary needs (Bond and Lindburg, 1990; Carlstead and Shepherdson, 1994; Baker, 1997; Coulton, Waran, and Young, 1997; Lindburg, 1998). Providing a variety of food in a manner that closely resembles its natural state and requires foraging effort to obtain, are proven to be the most effective methods to enrich the environments of captive animals (Carlstead and Shepherdson, 1993; William, Waran, Carruthers, and Young, 1996; Lindburg, 1998). Rarely is food introduced in ways that fully replicate what animals would find in the wild — often because of concerns for the animals’ safety (Baer, 1998) and sometimes for fear of negative public response (Houts, in press).

Many zoos believe that visitors would find the feeding of live prey or carcasses unacceptable. There are however strong arguments for the feeding of live prey and carcasses to some zoo animals (Beck, 1991). It may be desirable and even necessary to create more natural feeding situations because evidence is building to suggest that animal health is compromised when captive animals are kept on a diet of prepared foods (Lindburg, 1998; Houts, in press). Prepared food creates poor oral and digestive health resulting in aberrant behavior, reduced condition, and shortened life expectancies (Lindburg, 1998). In one example a small cat stopped plucking its own fur when offered fully feathered fowl as part of its diet (Lindburg, 1998). To provide natural feedings might require changes to laws and to the education of zoo visitors (Beck, 1991).

### **Vignette 3     Pulling Faces With a Red Panda**

The little red tongue pushed out of the furry face, vaguely resembling the look of a deeply concentrating child. The look was both amusing and depressing because the expression on the face of the red panda was as constant as its pacing.

Up into the tree and out onto the tip of a branch, back down the log, through the tree and in a clockwise circle on the well worn path around its base and then back again up the tree to the tip of the branch, over and over. Every fifth or sixth repetition the bear would alternate — repeating the pattern in the opposite direction.

The habitat seemed lush but the ample space did not reduce the red panda's display of stereotypic behavior. I wondered as I watched if there were environmental enrichment suggestions for red pandas. Surely something could be done to relieve the little fellow's boredom?

It may also become necessary to provide animals that are eligible for eventual release into the wild with more realistic forms of enrichment, because hunting and foraging behaviors must be learned at some stage (Snyder, 1977;

Young, 1998b; Houts, in press). Currently there are no adequate substitutes for live prey (Williams, et al., 1996; Bashaw, Bloomsmith, Marr, and Maple, 2001).

In 1997, researchers in the United Kingdom performed a study on the “attitudes of zoo visitors to the idea of feeding live prey to zoo animals” (Ings, Waran, and Young, 1997). Researchers used a series of prey-predator pairs representing different types of animals and for each pair asked visitors if they would approve of feeding the prey to the predator on or off exhibit, meaning in or out of public view. For example, instead of asking if visitors would approve if an invertebrate were fed to a vertebrate, researchers asked, “would you approve of insects being fed to lizards” (Ings et al., 1997, p.344)?

The UK study concluded that visitors were more likely to accept public feeding of live prey than had previously been thought. The results also indicated that culture might have an influence on visitor attitudes towards feeding live prey. Replication of the UK study, using data collected from Australian visitors, might better inform any recommendations for the type of food fed to carnivores during public animal feeding programs in Australian zoos.

Those against feeding more natural diets to zoo animals argue that predators raised in captivity have little innate hunting ability meaning that initially there is a possibility of injury by prey to the valuable zoo animal and/or “messy” kills resulting in suffering for the prey (Snyder, 1977). They are also concerned with public perception and the logistics of training and providing staff with the time for and the means of conducting natural feedings (Snyder, 1977). Zoos are sensitive to public opinion and this often dictates a cautious approach to public feedings (Snyder, 1977).

### Feeding as Public Education

Currently there are no Australian studies on the visitor-based outcomes of feeding programs. Visitors seem responsive to animated activity in bears (Altman, 1998) and foraging in chimpanzees (Wood, 1998). When researchers observed visitors creating explanations for the feeding behaviors witnessed during an evaluation of the enrichment device, explanations were anthropomorphic and inaccurate (Wood, 1998), indicating the importance of having knowledgeable zoo staff or docents to explain behaviors. Feedings occurring without interpretation may be counter-productive.

What should a feeding time talk consist of to be successful? Like any effective communication tool, it must provide evidence of outcomes, be practical for staff and support the mission of the organization. Research has suggested that talks given by keepers are effective educational tools capable of positively influencing visitor behavior (Broad, 1996).

### Zoo Keepers as Educators

Animal feeding is typically the responsibility of zoo keepers. When a feeding program becomes an educational program; keepers are often suddenly expected to fulfill the role of communicator and educator. Keepers are not often viewed as members of zoo education staff (Mazur, 2001). Keepers unlike educational staff members may not receive training in teaching and learning theory and practice. By using enrichment as a device to enhance the visitor experience, the role of the keeper is expanded to include that of presenter and educator. More needs to be known about the relatively new, educational role keepers have as a result of feeding time programs.

### Summary

Keeping animals in captivity dates back at least to the time of the Egyptian Pharaohs (Bostock, 1993; Koebner, 1994) leading to the evolution of a tradition of keeping animals. Today that tradition is justified by claiming that zoos are a resource for conservation, research and education.

Zoo animals, with their ever-changing behavior, provide a rich source of material to create awareness of animal welfare, conservation, behavior, ecology, and other important environmental issues. Zoos claim to inform the public about the animals and related environmental issues; however, very little research exists to support that claim. The greatest challenge facing zoological parks and aquaria may be to evaluate the effectiveness of their ability to communicate information about animals, and to ensure that their messages are actually educating as well as entertaining the public -- a public which ultimately will decide the fate of all wild creatures.

## Chapter 3      Methodology

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This chapter is a discussion of the methods commonly used in science communication studies and description of the choices made in selecting specific methods for the collection and analysis of data in this study. First is a review of methodological theories topical to this study. The chapter continues with a summary of the research procedures, the variables measured, and the methodological constraints encountered throughout this study.

### **Evaluating Effective Communication**

Communication is an essential part of being human, creating meaning, and culture (Carey, 1997). The study of communication is often an implicit part of social, cultural, psychological, and education research. Few methodologies are labeled as “communication methodologies” because the methodologies created by communication theorists have typically been appropriated by other disciplines (e.g., conversation analysis, discourse analysis, and textual analysis), which have all been adopted by social scientists. While it may not be necessary or possible to create or claim the use of a communication methodology in order to study communication, it is important to understand and define those aspects of communication that a study is meant to examine (see chapter 2). The choice should be made to study the whole or the parts or both.

Science communication is relatively new as an academic discipline and is still establishing its own definitions and methodologies. As is the case with other social sciences, science communication does not dwell in a discrete and separate domain, but instead often borrows from other disciplines, including communication, sociology, and psychology. Current fields of inquiry include: analysis of and development of applications for interactive science centers and

museums; science awareness by the general public; science student recruitment; and case studies of particular tools including popular science books, multi-media and formal and informal science education (Stocklmayer, Gore and Bryant, 2001; Schiele and Koster, 2000). Bitgood, Patterson, and Benefield (1988) argue strongly in favor of focusing on audience analysis, which seems appropriate for areas of science communication where a great deal is now known about the mechanics of the message and how it is sent. However, that is not necessarily the case in communication about animals in zoos and so, in this study, the sender, receiver, and message are examined. There is also a component of cross-cultural research to this study, as it allows for a limited comparison of zoo visitors in the United Kingdom with those of Australia. The avenues of study are diverse and most require interdisciplinary approaches.

### **Interdisciplinary Studies**

Interdisciplinary studies offer a challenging opportunity as they cut across academic cultures to combine the most appropriate ideas from multiple academic fields. The marriage, however, of separate academic cultures can be difficult. One danger of interdisciplinary research, according to Sherif and Sherif (1969), is that of sacrificing depth for breadth. The danger can be avoided if the researcher pays careful attention in selecting only the most applicable methodology from other disciplines, limiting the scope of the research project, creating focused literature reviews and undertaking the analysis of discrete artifacts (Sherif and Sherif, 1969). Another concern is in establishing the appropriate unit or level of analysis, as each discipline tends to focus on different levels, for example, sociologists are concerned with society while psychologists are concerned with the individual. The selected methods should be appropriate to the unit of analysis desired.

Despite the potential pitfalls of interdisciplinary research there are also many advantages because interdisciplinary studies allow for the creation of linkages in theory and application that might not otherwise occur. Cross-cultural studies are classic examples of interdisciplinary research, as is the study of science communication. There are two requirements for performing interdisciplinary research (Sherif and Sherif, 1969). The first requirement is that the researcher must be knowledgeable of current developments in each of the disciplines being combined. This permits the researcher to be highly selective when borrowing information, theories, and methods (Klein, 1990). Second, researchers must understand that different disciplines concentrate on different units or levels of analysis (e.g. individuals versus groups).

In chapter 2 information regarding current developments in the disciplines most influential to this study were surveyed. From that literature only the most appropriate methods have been selected, and care has been taken to ensure that data collection has satisfied Sherif and Sherif's second requirement for interdisciplinary study by selecting methods which were most appropriate to the intended unit of measure.

### **Measuring Learning**

Social scientists have developed methods to measure most types of learning, but it has proved problematic to use most of these methods when measuring the affective learning which results from informal learning situations (Rennie and McClafferty, 1999). Open-ended questioning is currently recognized as the most reliable way to gain information about affective learning from visitors (Rennie, 1993; Rennie, 1999). Such questions are often asked prior to the experience and then again immediately after the experience in a pre-test, post-test

design (Beiers and McRobbie, 1992; Rennie, 1994). The risk in such a design is in influencing the results by altering the participants' responses due to prior knowledge of a post-test. Leaders in the field of visitor studies suggest that cognitive and affective learning might not be immediately evident as visitors take time to connect the experience to aspects of their daily lives (Anderson et al., in press).

Therefore, in measuring cognitive learning for this study, open-ended questions were asked directly after the feeding program and again 6-10 weeks later. Questions were phrased in such a way as to encourage visitors to respond with examples of any new information learned. Other questions scattered throughout the interview helped to understand affective learning.

### **Data**

Exploratory research is about capturing the “story” of the participants engaged in a specific event or process (Patton, 2002). There were three types of “characters” in this “story”— zoo personnel, the animals, and visitors, or as they are described in the context of communication research — senders, the message, and receivers. To capture information from or about all three characters, research was conducted in four phases (see Table 3).

In phase one, discussed in chapter five, structured open-ended interviews were conducted with administrators and staff at three small facilities in regional Australia. The facilities were selected to include at least one (and perhaps more) aquariums, zoological and wild animal parks. Phase two and phase three, occurred concurrently as structured interviews were held with visitors at one of the three facilities. In phase two, 50 adults were interviewed and asked about their attitudes toward the feeding of live prey or carcasses to zoo animals (see chapter

4). In phase three, six adults were interviewed after they had attended an animal feeding program (see chapter 5). During phase four follow-up interviews were conducted with the six adults (see chapter 5).

Table 3: Summary of Observed Variables.

| Research Question           | Participants             | Variables                             |
|-----------------------------|--------------------------|---------------------------------------|
| Attitudes towards live prey | Visitors                 | Attitudes                             |
| Goals                       | Administrators and Staff | Goals                                 |
| Expectations                | Visitors                 | Motivation                            |
| Learning                    | Visitors                 | Cognitive and affective learning      |
| Demographics                | All                      | Age                                   |
| Demographics                |                          | Lifestyle                             |
| Demographics                |                          | Gender/Sex                            |
| Sociographics               | All                      | Pet Ownership                         |
| Sociographics               |                          | Affiliation with environmental groups |

### Multiple Data Sources

The emphasis on qualitative data and many of the methods of data collection used during research set science communication inquiry apart from traditional science and align it closer to the social sciences. The methods of data collection and reasons why multiple kinds of data (qualitative and quantitative) were collected from multiple sources should be considered.

Qualitative data consists of rich textual information rather than numerical information and variables are observed rather than manipulated (Haslam and McGarty, 1998). The strength of qualitative data lies in the opportunity for researchers to gain meaning from the context and the participants' thoughts on the issue being studied. The weaknesses of this type of data include the inability of researchers to prove anything about relationships like causation and correlation between participants. In comparison, quantitative research techniques are

numerical and allow for statistical analysis and can provide insight into trends and allow viable comparisons to be made. Quantitative research requires the use of pre-coded, closed-ended questions with a series of possible answers pre-selected by the researcher to produce standardized measures (Patton, 1990). Experts argue for the use of a combination of the two types of questions (Foddy, 1999; Silverman, 1994).

Most market research, which is the predominant type of social research conducted by Australian zoos (Mazur, 2001), is quantitative. Market surveys are by nature limited in the type of information they can provide. Sometimes they conceal information important in understanding of the underlying social processes (Silverman, 1994; Lacey, 1998). Reliance upon market research offers one explanation for the relative lack of information currently available about visitor-based zoo programs.

Selection of the data source most appropriate to a study depends upon the unit of analysis. A study, like this one, which aims to understand multiple levels of analysis, requires the use of multiple data sources.

### Data Collection

The research questions for phase one and three of this study are best explored at the level of the individual using qualitative methods. This is because the information collected is unlikely to have meaning outside of the context (feeding programs at small regional zoos) in which the research was conducted.

The questions of attitudes towards feeding live prey (phase two) are meant to say something about all Australian zoo visitors so best explored at the group level using quantitative methods. Primary data collection for this study has been via the structured interview method (Patton, 1990).

Structured interviews allow for consistency in questions, which is important when, as here, comparisons will be made between individual responses. Open-ended questions were used to collect data to explore goals, expectations and learning outcomes, helping to answer the research questions regarding these issues. Closed-ended questions were designed to gather demographic and sociographic information from all participants and were also used to gather data to answer questions about attitudes towards feeding live prey. This combination of methods best met the goals for the exploratory nature of the study (Hammersley, 1996; Haslam and McGarty, 1998).

Interviews using open-ended questions allow the interviewees to express opinions without predisposing them to a particular series or set of possible responses. For example visitors were asked, "What did you learn?" instead of "Did you learn A, B, or C?" This type of questioning, although time consuming, is best used in investigative research where little information exists to inform or predict a range of possible responses (Patton, 1990; Foddy, 1999; Patton, 2002). All questions were framed to be as neutral as possible to avoid leading respondents towards particular types of responses (Foddy, 1999). For example, instead of asking the question: "Have you ever been disappointed with the information you learned while at the zoo?", which implies that zoos should be criticized, participants were asked: "What would you like to learn while at the zoo?" All questions were pre-trialed and language adjusted according to suggestions made during the pre-trialing.

### Sampling

The methods used for sampling vary widely and are heavily dependent upon factors such as access to facilities and participants, intended purpose of the research and ethical responsibilities towards the participants. Sampling method,

sampling frame and sample size varied throughout this study. Interviews occurred at three small regional facilities in Australia. These facilities were chosen because they allowed for study of public and private facilities two of which are zoological parks, a wildlife park and an aquarium. Visitors were selected by a process of systematic sampling (Haslam and McGarty, 1998). Every fourth adult was approached and asked to participate in the study. Previous studies have shown that zoo visitor responses may vary with age, sex, culture, and frequency of visits (Broad, 1996; Reade and Waran, 1996; Kellert, 1998). Therefore, only visitors over the age of 18 identifying themselves as Australians were interviewed. Information was collected on visitor age, sex, and the frequency with which they visit zoos. If the selected visitor was unwilling, or not within the target demographic, then the next fourth adult visitor was asked to participate.

Systematic sampling was used to select visitors because it was not possible to obtain a sampling frame. Visitor demographics were not available, and it was impossible to collect information from all visitors visiting on the days of the study. Systematic sampling provided the best method for selecting a representative sample without the benefit of a sampling frame.

Interviews with administrators and staff were held at all three of the selected facilities. At least two employees of each facility were interviewed. Those interviewed were either administrators, staff in charge of visitor education or program presenters (and ideally all three types of employees were interviewed to provide for triangulation). The zoo administrator selected participants.

### Analysis

In order to answer some of the research questions concerning visitor attitudes towards feeding live prey to zoo animals and how selected demographic and sociographic characteristics of visitors influence their attitudes, data were

collected using short structured interviews primarily consisting of closed-ended questions modeled on those of the study conducted in the United Kingdom by Ings, Waran, and Young (1997). Fifty adults were interviewed to allow for statistical comparisons with the UK study.

Statistical results were generated using S-Plus and GenStat Statistical packages. Binomial generalized linear models were fitted to test the effect of country (UK or Australia) and “in” or “out” of public view (Insightful Corporation, 1988/2001; Station, 2001). In and out help to distinguish between feeding occurring when the animal was on exhibit and could be seen by the public and feeding occurring off exhibit where the public would not be able to see the feeding. In this study, statistically significant results are those having a probability (p) value equal to or less than 0.05. Probability (p) values of 0.05 means that there is only a 5% likelihood that the results occurred by chance and is widely considered a sufficiently rigorous measure of statistical significance. When an effect was measured as significant, the generalized linear models were reduced to examine the direction of the effect. Effects were also compared to demographic and sociographic characteristics of the participants.

All interviews were transcribed verbatim (examples appear in Appendix C). Answers were then grouped and assigned to categories. A process of content analysis was used to analyze the responses question by question in a search for patterns that would indicate themes or categories (Patton, 2002). The categories may be used in future research to pre-code questions for quantitative sampling of larger numbers of visitors both as a way of verifying the extent to which the results of this study might be generalized and to discover zoo industry-wide trends. Categorizing responses to each question gave depth and context to the report (Patton, 2002).

Assumptions were made during the content analysis of qualitative results. It was assumed that if public animal feeding programs are effective the goals of zoo personnel should be fulfilled. If visitor motivations to attend feeding programs are not the same as the goals of zoo personnel in providing them, any such differences should not prevent the fulfillment of stakeholder expectations, unless the two motivational perspectives are mutually exclusive. If motivations are mutually exclusive, changes made by stakeholders would be unlikely to make significant changes to visitor outcomes.

### Triangulation and Other Verification

One of the criticisms of qualitative research is that the information gathered is neither as rigorous nor as objective as quantitative research. While it is true that conclusions drawn from qualitative research can rely more upon context and thus are usually less generalizable than the type of conclusions normally drawn using quantitative research, qualitative research tools and results are tested for reliability and validity by undergoing rigorous processes of verification (Haslam and McGarty, 1998). The most widely used method of verification is triangulation. There are several types of triangulation including data triangulation and methodological triangulation (Mathison, 1988; Patton, 1990). This study makes use of both qualitative and quantitative collection methods and is thus an example of data triangulation. The interdisciplinary nature of this study also acts to triangulate the results (Sherif and Sherif, 1969).

### **Methodological Limitations**

This study was primarily exploratory, which meant that the most appropriate data collection method was through qualitative, using open-ended questions during structured interviews. This allowed for the collection of abundant data from a few participants. The greatest limitation with this type of data is that causation can not be established and so generalizations must therefore be tentative (Haslam and McGarty, 1998).

In addition, this study was not longitudinal. Samples could not be taken throughout the year and so it is important to recognize that results might vary depending upon the season, as it is possible that some visitor populations (e.g., summer tourists) were not included. Limitations specific to the research methods described in chapters 4 and 5 will be explained within those chapters.

## Chapter 4      Visitor Attitudes to Live Prey

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This chapter describes the results from the short interviews that were used to gather data to answer the first two research questions posed in chapter 1:

- What are visitor attitudes towards feeding live prey to zoo animals?
- How do selected demographic and sociographic characteristics of visitors influence their attitudes?

The chapter begins with the research procedures, then discusses visitor attitudes based upon the data, continues with demographic and sociographic results, and ends with conclusions.

### **Research Procedures**

Short structured interviews were conducted with 50 adult visitors to determine their attitudes and beliefs about the feeding of live prey to zoo animals in public. The core questions of this survey were modeled upon those of Ings, Waran, and Young (1997) which have been described in chapter 2 (see Appendix B, Visitor Interviews — Closed-Ended).

Questions were divided into two parts. Questions in part one were asked using specific combinations of familiar prey and predators as this was thought to provide the most honest representation of the type of animals involved (vertebrates or invertebrates, high-order animals versus lower-order animals) and so would make the scenarios easier for visitors to envision. Two questions, which did not appear in the UK study, were added (feeding insects to meerkats and dead rabbits to Tasmanian Devils) to test visitor attitudes toward feeding of an invertebrate to a mammal and to test the feeding of a carcass to a vertebrate. In part two, visitors were asked some general questions regarding their experiences

at the zoo. Finally, visitors were asked to describe their demographic and sociographic characteristics.

The interviews were conducted between Saturday 27th October and Saturday

#### **Vignette 4 Strawberry Milkshakes**

The bear's large tongue lapped dexterously into the bottle of flavored milk that the keeper had tipped through the chain link fence that was the only barrier between the bears and the watching crowd. With her back turned on us the young keeper yelled to be heard as she explained that strawberry flavored milk shake is a special treat for the bears. She told us that the milk Pooh and his partner were eagerly slurping were treats. Then she explained that the normal diets for the bears included fruit, vegetables, and canned dog food.

The audience pushed in even closer to better see and hear. I stood on the edge of the group with others who looked as hot, sweaty and flustered by the pushing crowd as I felt. Sticky strawberry pink splashes of milk splattered the bear's muzzle. Occasionally its flicking tongue squirted a few drops onto the keeper and the closest of the visitors.

The keeper turned for a moment to face the crowd. For the first time it was possible to hear her without straining forward on tiptoes. She rapidly described the bears' habitat, normal range, average sizes, and weights. Then she twisted back towards the enclosure and began to toss peanut butter sandwiches into the pen.

The bears scrambled for their treats. Once a sandwich was in their paws they sat on their haunches and began to gently separate the pieces, licking the peanut butter before discarding the bread. In reply to a question the keeper explained that these bears often ate only the peanut butter; tossing the rest of the treat away, leaving me to wonder why the keeper bothered with the bread.

November 3<sup>rd</sup>, 2001 (to allow for temporal triangulation). Only visitors over the age of 18 identifying themselves as Australians were interviewed. All visitors were selected by systematic sampling (Haslam and McGarty, 1998) whereby every fourth adult was approached and asked to participate. If the selected visitor

was unwilling to participate, or not within the target demographic, then the next fourth adult visitor was asked to participate.

A volunteer was recruited to assist with the surveys. He conducted approximately 15 of the 50 surveys. He had had previous training and experience conducting surveys, received a full briefing including a detailed description of standardized prompts and spent time practicing before collecting the data. Once data collection began consultations with the research assistant were held regularly to compare data and verify quality of the information collected. The consultations guarded against potential errors that could have resulted with data that was collected by more than one interviewer.

### Study Sites

Two of the facilities studied for this project are small privately owned zoos. Both have undergone major managerial changes within the last four years, which have resulted in a dramatic increase in capital development. Many of the animals in the zoos' collections were acquired from collectors including circuses, or were retired from larger public zoos. The collections include several species of big cats, bears, primates (including Golden Lion Tamarins), African and Asian hoofed stock, red panda (one zoo supports an *in situ* breeding program), native animals including dingoes, birds including little penguins, reptiles, domestic animals, and, in one case, an aquarium which houses tanks containing fresh- and saltwater animals.

The third facility houses a collection of native Australian animals in large free-range enclosures. The facility is currently engaged in special *ex situ* breeding projects. The facilities are described in some of the vignettes in this study. Detailed descriptions have been withheld to preserve the anonymity of the

facilities. Preliminary observations occurred in March and April 2001. Visitor interviews were conducted at only one of the three facilities.

### Analysis

Data collected describing visitor attitudes towards live prey were statistically analyzed. Binomial generalized linear models were fitted to test the effect of country (UK or Australia) and public view (in or out) with statistically significant results having a probability (p) value equal to or less than 0.05. When an effect was measured as significant the generalized linear models were reduced to examine the direction of the effect. Effects were also compared to the demographic and sociographic characteristics of the participants.

### Limitations

The lack of a sampling frame or other reliable visitor demographic and sociographic data means that tests of the representativeness of the sample are limited to comparisons of general statements about zoo visitors made in the literature and limited data from the Australian Bureau of Statistics. No questions were asked to help describe the composition of the group, if any, that the visitor was with. So it is not known how many of the visitors were with families, or other adults, or on their own and therefore what effect group dynamics may have had on visitor response.

Another limitation has to do with the types of animals selected as examples in the questions concerning the food given to zoo animals. One of the animals selected as an example of a possible prey item were rabbits. Rabbits are pest animals in Australia and often regarded as vermin, although people do still keep them as pets. This means that the use of rabbits as one of the prey types might have polarized the responses given by visitors. In the literature, there are

documented difficulties in accurately measuring attitudes during direct questioning, as it is possible that responses are unconsidered and that the answer does not take into account the intensity or the complexity of the response (Patton, 2002).

### **Vignette 5     Penguin Parade**

The morning was still and quiet as I ambled up the path to the little penguin enclosure. Other visitors were already lining up on one side of the fence and, with a strange sort of symmetry the penguins were lining up across the moat. A few of the birds dived into their pond for a quick pre-breakfast lap. The air bubbles trapped in their coats made them shimmery-silver. In hushed tones visitors admired the agility of the swimmers and giggled when the plump birds heaved themselves back on land.

Soon the keeper was wandering towards us along the path from the husbandry complex, behind the scenes, off-limits to visitors. He hopped over the low fence and into the enclosure moving swiftly to the penguins' night quarters to encourage the stragglers out for their meal. The other penguins patiently held their orderly positions near the water's edge. This is where the keeper went next. Setting his bucket down, he reached in and took out a small pail filled with liquid. Next from the bucket he took fish, rinsing them in the pail before offering one to the nearest uplifted beak.

Gulping their food, the penguins jostled each other in their rush to feed. The keeper calmly watched, breaking up squabbles and monitoring the fair distribution of the fish. Occasionally a large, slippery pilchard was too much for one of the birds. It would struggle to swallow, then let the fish flop from its mouth. The keeper would pick the discarded fish up and re-rinse it before offering it again to the same bird.

As they became sated the little penguins began to coo and twitter in the most charming ways as they ambled off to their daytime territories. When all the penguins had left his side, the keeper stood and for the first time looked at those few visitors who had remained. Uncomfortably he mumbled, "Any questions?" before replacing pail in bucket and hopping back over the enclosure's fence. One brave visitor asked the keeper a question, while I asked a visitor who was just leaving if I could have an interview.

The sample included only people identifying themselves as Australian. This was done to allow for cultural comparisons of attitudes between zoo visitors of Australia and the United Kingdom. Targeting Australians may not completely permit for such a comparison because in a country as large and multicultural as Australia, cultural homogeneity cannot be assured. A similar weakness exists for the UK study. The comparison between Australian and UK visitors is of limited value as a measure of culture because in neither the study in the UK nor in this one were the life histories of the participants collected, which limits the understanding of cultural context in which visitor attitudes were formed. It also means the results have restricted cultural relevance, as there are limits to what can be concluded from the results. Despite these limitations comparisons of culture were carried out in order to ascertain if additional study in this area might be fruitful.

The study is also limited in ability to compare between types of facilities (e.g., aquariums versus zoos). It is important to understand that there may be differences between types of facilities. For example aquarists argue that their facilities may enable visitors to gain a better of the inter-connectivity of habitats and the creatures living within them understanding than do other types of zoos (Love, 2002). Such possible differences were not taken into account in this study. If such a comparison were to be done in the future at least two of each type of facility would need to be studied to avoid pseudo-replication if results were analyzed statistically, and to allow for triangulation of qualitative results. Therefore, data are currently indicative but may not be universally representative as further verification will have to take place before knowing how applicable these result are to larger zoos, wildlife and open range parks and aquaria.

## Results and Discussion

In general, results from this study were very similar to those of the UK study. As with UK zoo visitors, Australian zoo visitors approved most of feeding invertebrates to vertebrates and approved far less of feeding vertebrates to other vertebrates. Like UK visitors, Australian visitors were more likely to accept the feeding of live prey if it was done out of the view of the public. There were some differences in the types of demographic and sociographic factors affecting visitor attitudes. The homogeneity of responses between visitors from two different nations casts doubt on the ability of the questions to distinguish cultural differences in the attitudes towards animals, specifically feeding live prey to carnivores. It may be that such attitudes are more a function of human nature than culture (Hofstede, 1997). Or it could be that the zoo going population of both countries have similar ethnic and educational backgrounds (i.e. a shared culture).

### Visitor Attitudes

The results of the two studies are compared in Table 4. Results between the two studies varied, with Australian visitors agreeing less to the feeding of invertebrates to vertebrates and agreeing more to vertebrates being fed to other vertebrates than the UK visitors.

Table 4: Agreement of Visitors to Feeding Prey In Public and Out of Public View. [The value in parenthesis in the body of the table represents the number of visitors agreeing with live feeding.]

| Prey-Predator Pair                          | In public view |            | Out of public view |            |
|---------------------------------------------|----------------|------------|--------------------|------------|
|                                             | UK (N=200)     | AUS (N=50) | UK (N=200)         | AUS (N=50) |
| Insects to lizards                          | 96% (192)      | 92% (46)   | 100% (200)         | 98% (49)   |
| Insects to meerkats                         | -              | 94% (47)   | -                  | 96% (48)   |
| Fish to penguins                            | 72% (144)      | 78% (39)   | 84.5% (169)        | 86% (43)   |
| Rabbits to big cats                         | 32% (64)       | 38% (19)   | 62.5% (125)        | 72% (36)   |
| Dead rabbits (carcasses) to Tasmanian Devil | -              | 70% (35)   | -                  | 88% (44)   |

Slight differences in the proportion of responses between Australian and UK visitors were found not to be significant when tested-using binomial generalized linear models (see Table 5).

Table 5: Analysis of Deviance, the Effect of Country and Being In or Out of Public View (view) on Visitor Attitudes Towards Feeding Prey.

| Prey-Predator Pairs                     | Variable | df | Deviance | P      |
|-----------------------------------------|----------|----|----------|--------|
| Insects to lizards                      | Country  | 1  | 2.416    | 0.120  |
| Insects to lizards                      | View     | 1  | 11.276   | 0.001* |
| **Insects to meerkats                   | View     | 1  | -1.110   | 1.110  |
| Fish to penguins                        | Country  | 1  | 0.698    | 0.404  |
| Fish to penguins                        | View     | 1  | 10.260   | 0.001* |
| Rabbits to big cats                     | Country  | 1  | 1.924    | 0.165  |
| Rabbits to big cats                     | View     | 1  | 49.734   | 0.000* |
| **Rabbit (carcasses) to Tasmanian Devil | View     | 1  | 4.012    | 0.025* |

\* Significant values.

\*\* Australia only.

Visitors disagreeing with the idea of live prey being fed in public were often concerned about the reaction of others, especially children, to the sights and sounds of the hunt. These concerns prompted UK researchers to give visitors a choice, asking them if they would agree to prey being fed when animals were out of public view. Statistically, while there was no significant effect of country, there was a significant effect of view for all prey-predator pairs tested (see Figure 4).

In every case more visitors agreed with the proposition of feeding live prey, provided the feeding occurred outside of public view. As in the UK study, these results also indicate that the feeding of live insects to lizards when done out of public view would most likely be acceptable to adult visitors. This attitude might extend to other invertebrates being fed to vertebrates. In fact, when a second question was asked about a vertebrate eating an invertebrate (meerkats

eating insects) the proportion of responses agreeing was almost the same as with the earlier question (lizards eating insects).

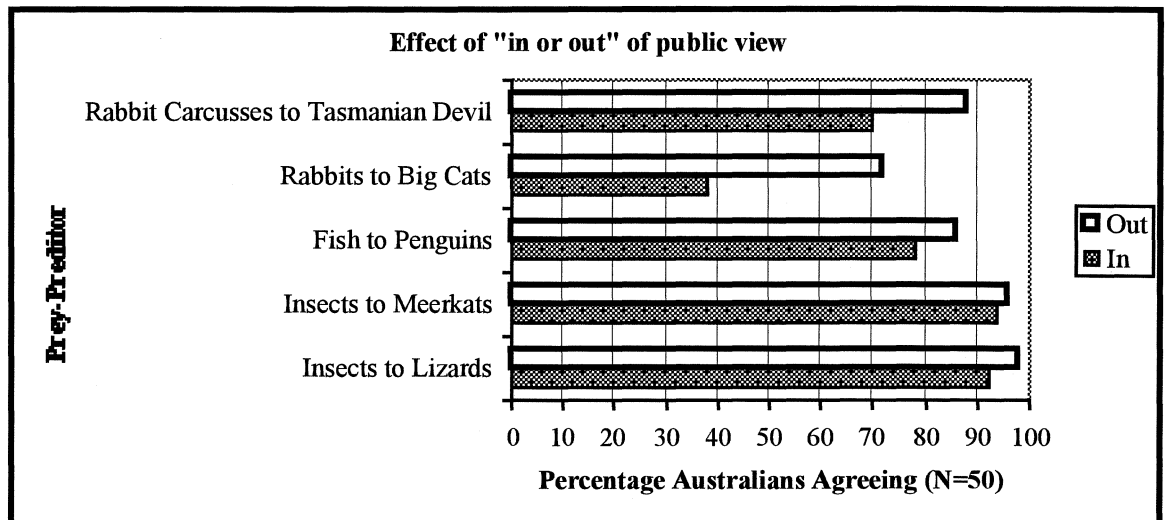


Figure 4: Effect of public view (in or out) on Australian visitor agreement to feeding of prey to predators.

In selecting predator-prey pairs as examples within the interview questions, every attempt was made to use animals that were housed at the zoo. This, however, was not the case with the second question, as the zoo chosen for visitor surveys did not at that time have meerkats. While a popular zoo animal, it did become clear that not all visitors who participated in the survey were familiar with meerkats, so interviewers prompted visitors by explaining that meerkats were small furry mammals which feed on insects in the wild. The lack of familiarity of some visitors with meerkats may have had an effect on visitor responses.

Two more general questions were asked to help validate the response of Australian visitors to the specific predator-prey pairs. Visitors were asked, "Is there any animal you would like to watch eating food, prepared or live?" Eighty-two percent (41, N= 50) gave a positive response to this question, listing bears,

big cats and Tasmanian Devils as the animals they would most like to see feeding. Visitors were also asked, "Is there an [any] animal you would refuse to watch if it were eating live prey?" Forty-two percent (21, N= 50) agreed, naming big cats and dogs as animals they would refuse to watch if they were eating live prey. This response might justify continued caution in feeding live prey when facilities are open to the public, without first educating the public about the natural feeding behaviors and reasons why animals might need to be fed live prey or carcasses.

### Demographics and Sociographics of Participants

Demographic and sociographic information was collected at the end of each interview. This information allows for a description of the participants and provides the basis to compare participants' responses. Demographic data collected included the observed apparent sex (male or female, inquiry was not made as to gender preferences) of the visitor, age category, state or territory of residence and whether their current place of residence was in an urban or a rural area (see Figure 5). Age categories included 18-20 for young adults and then were grouped by decades (20s, 30s, 40s, 50s, 60+) as it was felt this would encourage more accurate answers from visitors unwilling to reveal their exact ages. There was no apparent reason to establish more detailed information regarding the ages of visitors. Most of the visitors interviewed were in their 20s or 30s which matches national figures that show zoos to be most popular for people aged 25-44, followed by those aged 15-24, then those aged 45-55, with people aged 55+ attending with the lowest frequency (Australian Bureau of Statistics, 1999). Answers to the state or territory of residence question allowed visitors to be classified as local or as tourists.

There were slightly more women than men interviewed, which compares well with national figures showing slightly higher attendance by women than men (Australian Bureau of Statistics, 1999). Visitors in their 20s were the most numerous. Nearly half of those interviewed were local and just under half were tourists. Most of those interviewed live in urban areas.

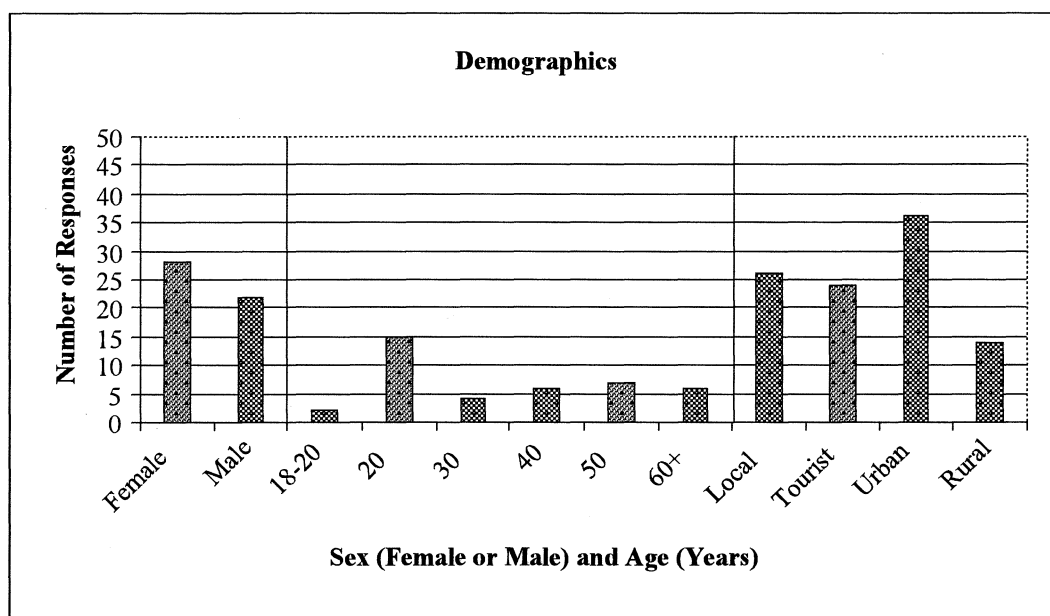


Figure 5: Visitors sex and responses to questions of age and area or residence, N = 50.

In addition to questions about demographics, information was also gathered to understand better some sociographic characteristics of the visitors (see Figure 6). To determine whether visitors had a predisposed willingness to watch wildlife they were asked if they watched nature television. Wildlife documentaries often show animals engaged in struggles. Watching such programs might indicate predisposition to seeing animals engaged in predator-prey behavior. Pet ownership was established as it may have affected the attitudes of participants towards animals (Broad, 1996; Kellert, 1998). For example, pet owners may be

more understanding of animal behavior from watching their own animals. Visitors were also asked if they belonged to an environmental or conservation group. Previous research suggests that asking visitors if they are members in an environmental and/or conservation group may help to determine their current level of environmental awareness and participation in conservation (Mazur, 1997). After asking the state or territory of residence, visitors were asked if they had always lived in their current area of residence. They were then asked if their place of residence was in an urban or a rural environment because research indicates that people who live in urban areas tend to romanticize nature more than those who live in rural areas (Kellert, 1998).

Most of the 50 people interviewed watch nature programs. The most named programs were David Attenborough documentaries, the Discovery Channel, *Sandra Sully Presents* and *The Great Outdoors*. Most also own pets but do not belong to environmental groups and have not always lived in the same region as their present location.

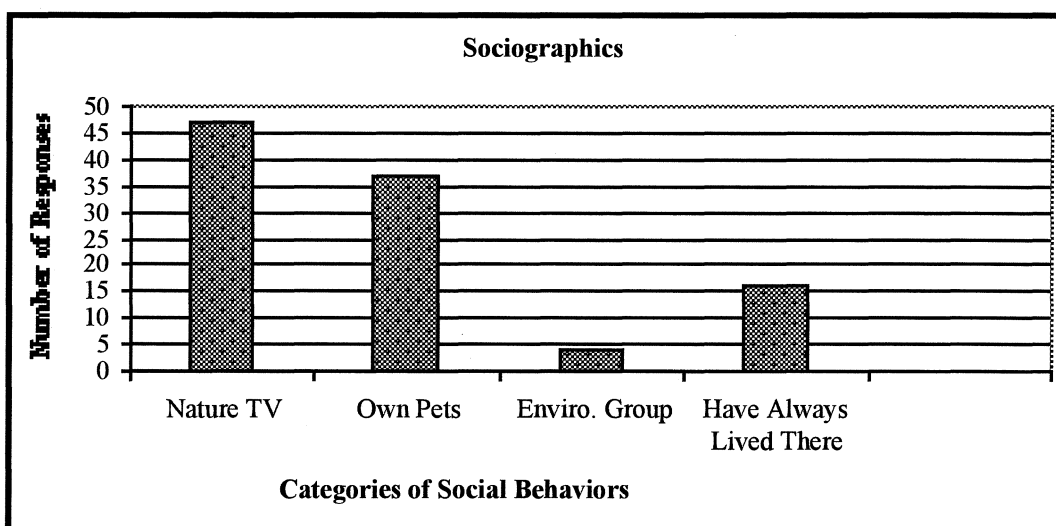


Figure 6: Visitor responses to questions about pet ownership, television watching habits, membership in environmental or conservation organizations and location.

### Effect of Demographic and Sociographic Factors on Attitudes

Previous studies of attitudes towards animals, including the UK study, have indicated that demographic and sociographic factors influence the development of those attitudes (Broad, 1996; Kellert, 1998). Therefore, the demographic and sociographic data collected were compared using generalized linear models to understand how the lifestyles of participants affect their attitudes towards animals with the results to following later in this section.

Answers to the questions regarding the feeding of insects to lizards and insects to meerkats were not analyzed because of the small percentage of visitors disagreeing. When factors appeared to be significant after analysis using the full model, the model was reduced and direction of the effect tested. Pet ownership, membership in an environmental group and living in urban or rural areas were factors that significantly influenced visitors' attitudes (see Appendix A for analysis using the full model and including non-significant factors).

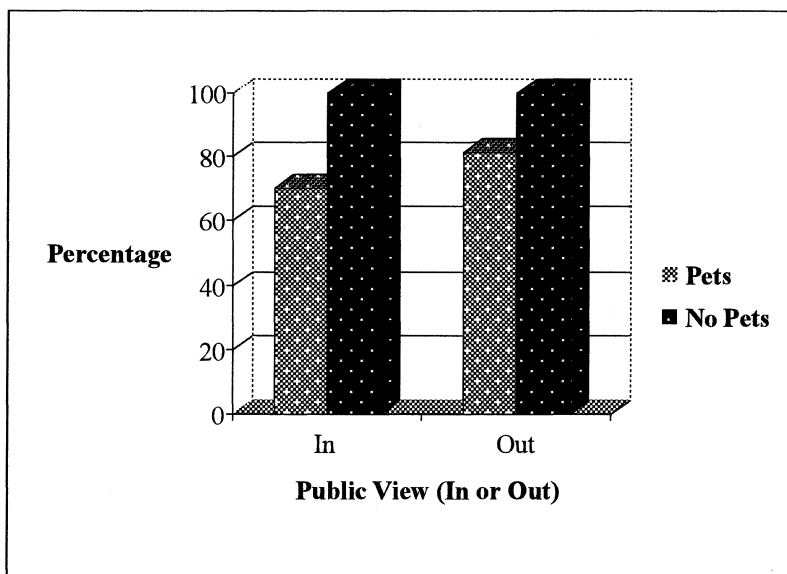


Figure 7: The effect of pet ownership on the percentage of visitors agreeing to live fish being fed to penguins.

Pet ownership had an effect on the attitudes of visitors towards the feeding of live fish to penguins (In public view:  $df=1$ ,  $p=0.006$ ,  $N=50$ ; Out of public view:  $df=1$ ,  $p=0.000$ ,  $N=50$ ; values given are after the model was reduced and do not appear in the appendix) and to live rabbits being fed to big cats (In public view:  $df=1$ ,  $p=0.028$ ,  $N=50$ ; values given are after the model was reduced and do not appear in the appendix) as described in Figures 7 and 8.

In both cases, a higher percentage of visitors without pets agreed, with most agreement occurring if feeding was out of public view.

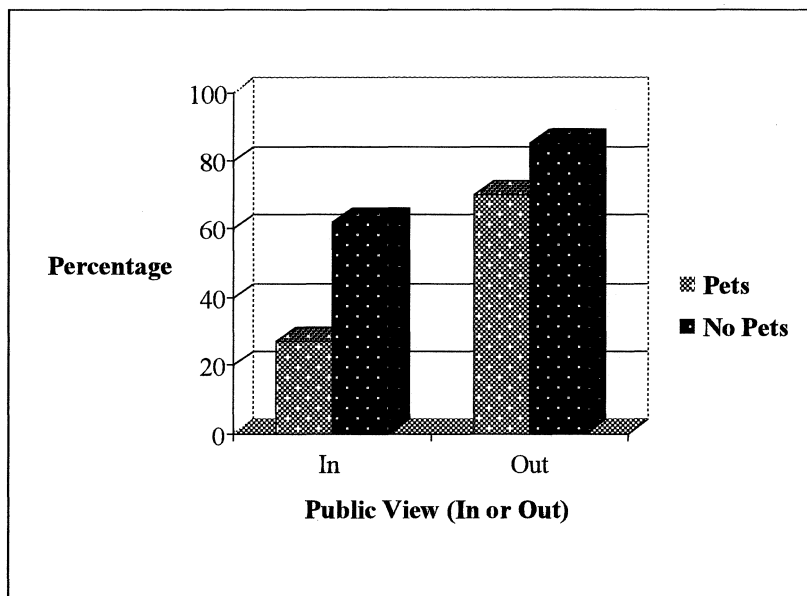


Figure 8: The effect of pet ownership on the percentage of visitors agreeing to live rabbits being fed to big cats.

These results indicate that people with pets are less likely to agree to vertebrate prey being fed to vertebrate predators. The responses of adults interviewed were similar to those of young adults who had been pet owners as children (Paul and Spell, 1993). Young adults who kept pets as children had positive attitudes towards and concern for the welfare of animals. Pet owners seem to be sympathetic to the plight of the prey which is surprising as it would

seem pet owners, more than non-pet owners, should be more aware and even sympathetic to the dietary needs of animals.

Membership in an environmental or conservation group had an effect on visitor attitudes towards feeding live rabbits to big cats (In public view:  $df=1$ ,  $p=0.000$ ,  $N=50$ ; values given are after the model was reduced and do not appear in the appendix) and feeding dead rabbits to Tasmanian Devils (In public view:  $df=1$ ,  $p=0.005$ ,  $N=50$ ; Out of public view:  $df=1$ ,  $p=0.050$ ,  $N=50$ ; values given are after the model was reduced and do not appear in the appendix) as shown in Figures 9 and 10.

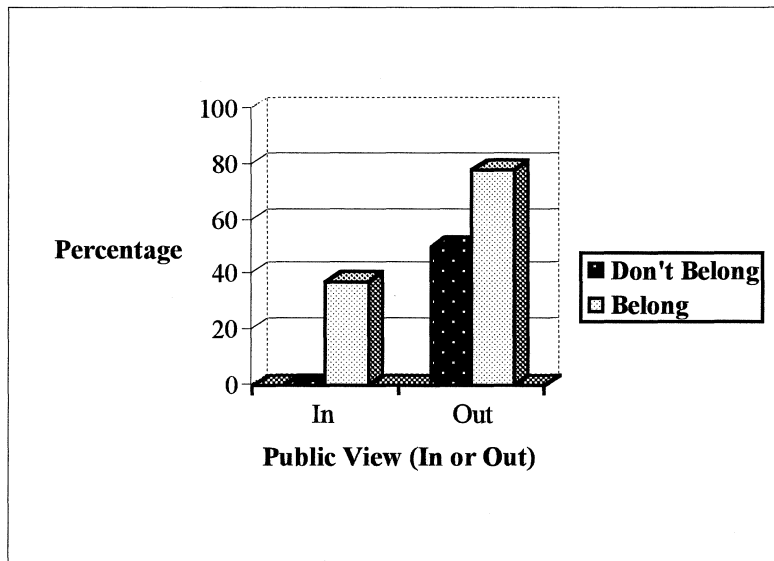


Figure 9: The effect of membership in an environmental or conservation group on the percentage of visitors agreeing to live rabbits being fed to big cats.

Those not belonging to an environmental or conservation group were less likely to agree than those who belong to an environmental or conservation group.

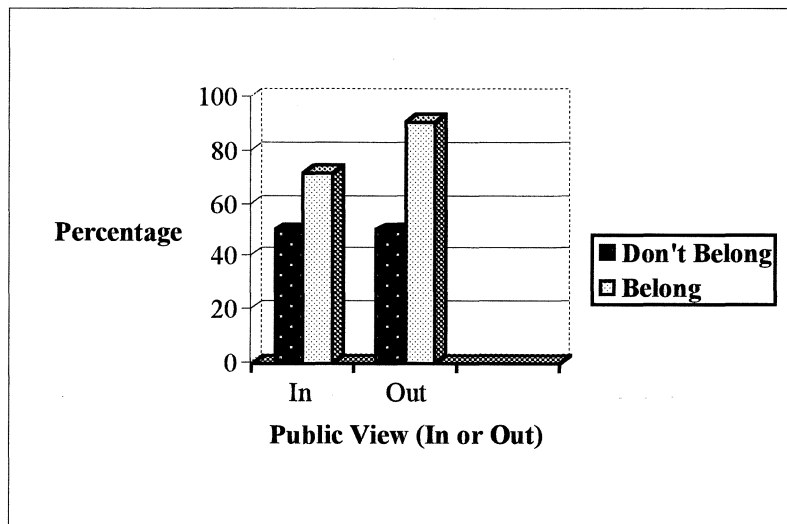


Figure 10: Effect of membership in an environmental or conservation group on the percentage of visitors agreeing to feeding a dead rabbits to Tasmanian Devils.

This may mean that those who belong to an environmental or conservation group are more understanding of animal behavior and/or ecology in general and are willing to be exposed to the sights and sounds of hunting.

Whether a person was from an urban or a rural environment was significant in response to feeding dead rabbits to Tasmanian Devils (In public view:  $df=1$ ,  $p=0.016$ ,  $N=50$ ; values given are after the model was reduced and do not appear in the appendix) as indicated in Figure 11. Again there was slightly more agreement if done out of public view, which is consistent with the findings reported earlier (Figure 4).

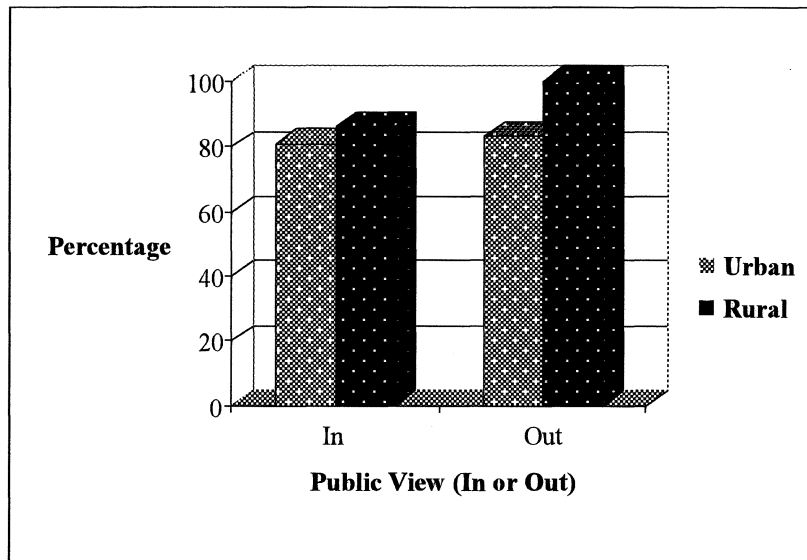


Figure 11: Effect of location (urban or rural) on the percentage of visitors agreeing to feed dead rabbits to Tasmanian Devils.

In an earlier study, students living in rural areas were found to be more knowledgeable and held higher opinions of animals than did students living in urban areas (Flannery, 2000). Adults who live in urban areas interviewed for this study were more likely to sympathize with the prey and so were less likely to agree to the feedings.

### Other Results

One of the surprises of the study is that in every case, 50 out of 50 interviews, an adult, not a child, suggested their visit to the zoo on the day when they participated in this study. This is surprising because zoo personnel interviewed for this study (results in chapter 5) suggested that children would be most likely to suggest a visit the zoo. Visitors were asked questions to reflect their experience and feelings about the zoo in general. They were asked if they had gained a greater appreciation for animals after their visit, with 76% (38) agreeing.

Of the visitors, 42% (21) were repeat visitors and 88% (44) said that they would revisit.

### Conclusions

This part of the study was designed to provide information about visitors' attitudes towards feeding prey to zoo animals. It is not meant to suggest that zoos should incorporate live prey into animal diets and in fact such practice is illegal in some regions of Australia. Instead, insight into visitors' attitudes towards what is arguably one of the most controversial aspects of feeding – the diets of carnivorous zoo animals - has been provided. It is important to understand such attitudes, since they illuminate the way that visitors are affected by the various items that are fed to zoo animals. It is also important to understand visitor attitudes in the event that zoos decide to feed their zoo animals more natural diets.

One of the inferences made by the UK study is that if visitors support feeding of live prey then they would not be opposed to feeding carcasses for dietary and enrichment purposes. The Australian data challenges this assumption, as not all visitors agreed to carcass feeding. The percentage of Australians objecting to carcass feeding, even out of public view, was 12% (see Table 4). This number is greater than the 2-4% of people opposed to feeding live insects. Armed with this insight zoos can better gauge public response to potentially controversial feeding practices like carcass feeding.

Demographic and sociographic factors affected the attitudes in both the UK study and this study of Australian zoo visitors. Pet ownership, age and sex influenced attitudes in the UK. In Australia, pet ownership, membership in an environmental group and whether or not they lived in an urban or a rural area

affected attitudes. The two latter factors were not included in the UK study, which may mean that they might also have influenced UK visitor attitudes. Pet ownership was a factor for visitors from both countries. Sex was not a factor affecting the attitudes of Australian visitors.

Visitors from both countries were sensitive to the effect of public animal feeding on others, particularly children. Future studies should collect information on the types of groups visiting Australia zoos. Zoos may wish to consider how feeding programs affect all age groups by studying the attitudes of audiences younger than those studied here.

## **Chapter 5      Expectations for Feeding Programs, Reasons Visitors Attend and Their Learning Outcomes**

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This chapter contains the results from structured interviews with administrators and staff describing feeding times, their expectations for feeding programs, a self-assessment of those programs, and the preparation undertaken to produce such a program. This chapter also contains the results from structured interviews with six zoo visitors. The visitors were asked about their expectations, reasons for attending feeding times, how the experience might have affected them, and the learning outcomes that seemed to have resulted from the feeding times. The data were collected for the purposes of answering the following research questions:

- What goals do zoo administrators and staff have for providing public animal feeding times?
- What motivates visitors to attend?
- Are goals and motivations in agreement?
  
- What messages are conveyed and what messages are received by the participants during public feedings?
- How do zoo messages affect visitors?
- Do visitors learn any factual information about animals?
- Do visitors retain any facts that they have learned?

The chapter ends with conclusions drawn from the data.

### **Research Procedures**

Interviews with administrators and staff were undertaken at three small regional facilities in Australia (described in chapter 4). These facilities were chosen because they are representative of public and private facilities; and three different types of zoos. One of the zoos has organized an educational volunteer program; however, at the time of this study, none of the facilities had salaried educational staff. Two of the facilities belong to the Australasian Regional Association of Zoological Parks and Aquaria.

#### Zoo Personnel

At least two employees of each facility were interviewed. Those interviewed were either administrators, staff in charge of visitor education, or program presenters (and ideally all three types of employees were interviewed to provide for triangulation). The zoo administrator selected participants to insure that interviews did not conflict with staff priorities and scheduling. Structured interviews were conducted in three parts (see Appendix B, Administrator and Staff Interviews). In part one, questions about goals and reasons for providing feeding programs were asked. In part two, questions were asked about their attitudes towards feeding live prey to zoo animals (results will not appear in this study as the sample was not large enough to provide for statistical comparison to data collected from visitors). In part three they were asked about their demographic and sociographic status.

#### Zoo Visitors

Structured interviews (see Appendix B, Visitor Interviews — Open-Ended) with visitors occurred at one of the three facilities between Saturday 27th October 2001 and Saturday 3rd November 2001 (to allow for temporal

triangulation). There were three sections of interview questions. The first of the questions dealt with motivation, the second set with learning, and the final set with demographic and sociographic status.

A series of closed and open-ended questions were used to determine the visitors' motivation for attendance (see Appendix B, Visitor Interviews — Open-Ended). The in-depth interviews were lengthy, making it impossible to obtain more than one interview per feeding program and since all interviews (including those described in chapter 4) had to be completed within the seven day time frame, participation was limited to six adult visitors. Visitors were interviewed immediately after attending a bear, big cat (tiger, lion, etc.), or penguin public animal feeding program. Follow-up interviews were conducted by telephone six to ten weeks after the initial interviews, using a method adapted from Heinrich and Birney (1992). Questions for the follow-up interview were repeats of those asked in section three of the original interview (Appendix B, Visitor Interviews — Follow-up questions).

Previous studies have shown that when zoo visitor have been interviewed responses may vary with age, sex and culture (Broad, 1996; Kellert, 1998). Therefore only visitors over the age of 18 identifying themselves as Australians were interviewed, and age and sex were noted. It was impossible to develop or obtain a sampling frame from which to randomly select participants so a systematic sampling approach was used. Therefore, every fourth adult leaving the feeding program was approached and asked to participate. If the selected visitor was unwilling, or not within the target demographic, then the next fourth adult visitor was asked to participate.

### Vignette 6     Hide and Seek With Otters

Coming around the corner, I saw the two small clawed otters sunbathing by the stream. Their raised heads and chirps of curiosity let me know they were aware of my approach. Glancing around to be sure I was alone and not in danger of losing my dignity by being caught in an act of silliness by a zoo visitor, I hunched over and pretended to sneak up on the otters.

Seeing me behave so strangely the otters immediately approached the glassed-in end of the enclosure closest to me. For ten minutes we three played a mischievous game of hide and seek. At times I was doubled over with the pleasant, yet nearly debilitating, internal convulsions resulting from my silent laughter. I do not know how many minutes passed until we three tired of our game. I do know that the next visitors to walk past the enclosure saw a bemused researcher standing next to an enclosure that held two sunbathing otters.

### Analysis

Interviews were tape recorded and later transcribed. In line with qualitative methodology (Haslam and McGarty, 1998), visitor responses have been analyzed, but no attempts were made to quantify the responses. The transcriptions were analyzed first by searching for patterns that might be indicative of broader themes. Tables are used to illustrate the patterns that arose when answers to each question were grouped into categories. The categories assigned to describe some of the information represent the themes of education, observation, communication, action and recreation that reoccurred throughout the interviews.

Grouping by category served another purpose. It would have been unfair to expect visitors to answer questions meant to assess cognitive learning and expect responses which used the same language as a trained animal keeper, especially as people are unable to repeat the exact words that they hear during a presentation (Shepherd, 1975). The use of categories enabled the assignment of the perceived

meaning made by the visitor rather than attending to how closely their exact words matched those spoken by the keeper during the presentation. These categories might be used as codes in futures studies.

### **Limitations**

Only a small number of in-depth interviews were conducted. These interviews were meant to lend depth to the study and are in no way intended to imply that results or conclusions drawn from this small sample are indicative of all visitor attitudes. This is an exploratory study and demonstrates the need for further research.

#### **Vignette 7     Satin Bower Visitors**

A delicate gasp accompanied by a wondering look originated from my friend. This was my first indication that we had a visitor to our picnic. Slowly I turned saw the most beautiful, deep purpley-blue-black, bird I had ever seen. "Oh it's a satin bowerbird," exclaimed my clearly delighted supervisor who was acting as the chauffeur on this expedition to the wildlife park.

He tossed out a bit of bread. We held our breaths in anticipation that the cautious purple-black bird might take our offering. Before we saw him we saw a flash of green. Upon closer inspection the iridescent green became the outlines of a female bowerbird. Her eyes were like amethyst on fire.

After our own picnic time bird feeding, the flock of cockatoos and crimson rosellas which came to feed in front of the presenter and other visitors did not seem nearly as exotic or as exciting. The presentation was very informal; a simple question and answer session as the birds were fed fruit and seeds. Soon all of the participants were drifting away.

This study was not longitudinal. Samples could not be taken throughout the year and so it is important to recognize that results might vary depending upon the season, as it is possible that some visitor populations (e.g., summer tourists) were not included. As with all qualitative research, it is not possible to prove

causation or correlation, but it may be able to eliminate the possibility of both (Patton, 2002). At this time, demographic and sociographic data for Australian visitors to the selected facilities are not publicly available, thus limiting the ability to evaluate the representativeness of the sample.

### **Results and Discussion**

What does a feeding time talk have to consist of to be successful? Like any effective communication tool, it must provide evidence of outcomes, be practical for staff, and support the overall mission of the organization.

In general, results indicate that visitor expectations are recognized by zoo personnel and are being met; however, zoo goals for programs were much greater than expectations. Results also show that most visitors learned new facts as a result of attending a feeding program. They retained the information that was cognitively learned for several weeks afterwards. Information which was learned may not have been learned accurately.

#### **Demographics and Sociographics of Participants**

For this part of the study demographic and sociographic information was collected at the end of each interview to describe the participants. This information provided some of the indicators of the personal background of each respondent, which is important information to fully understand the responses.

Demographic data collected included: observed sex of the participant, age category, state or territory of residence, and whether their residence was in an urban or a rural area. Age categories included 18-20 for young adults and then was grouped by decades (20s, 30s, 40s, 50s, 60+) as it was felt this would encourage

more accurate answers from participants by not requiring them to reveal their exact ages.

### Visitors

The question about state or territory of residence was only asked of visitors. Answers to the state or territory of residence question allowed visitors to be loosely classified as either locals or tourists.

An equal number of men and women visiting the zoo were interviewed. More visitors in their 40s were interviewed than any other age group. The national figures for attendance show that this is not normally the largest age group visiting zoos annually. The week chosen for data collection was in spring and followed school holidays which means it may not have been a typical week.

Only one of the administrators and one visitor, compared to half of the staff, belong to environmental or conservation groups. Previous studies indicate that the numbers of zoo visitors belonging to environmental or conservation groups is generally low (Mazur, 2001). Visitors were more likely than zoo personnel to own pets.

### Zoo Personnel

The administrators interviewed were men in their 30s or 40s. More male staff than female staff were interviewed. There was a higher proportion of male zoo personnel participating compared to females which is somewhat surprising. National statistics indicate that in the past administrative, managerial and full-time staff positions were gender balanced, although there were more women in part-time roles resulting in a higher total number of women in zoo professions (Australian Bureau of Statistics, 1998). It is possible that small regional zoos such as the ones selected for this study could be less gender balanced than larger zoos.

Or there may be some reason that men were volunteered to participate. Perhaps their schedules made them more available on the day, or perhaps middle-management positions, like the kind of position this study targeted, are male-dominated.

### Expectations for Feeding Programs

Knowing the expectations for feeding programs is a way to understand the reasons they were offered and attended. Responses were often very rich and occasionally included information about outcomes which zoo administrators and staff might not have wanted to occur. In reference to the feedings programs at his facility a staff member said, "We do not have it to encourage people to feed the animals. We actually have it as a way of explaining why we don't feed the animals here." On the surface this comment appears contradictory. Why do something that they don't want the public to do themselves? Perhaps he meant that they don't want visitors to feed animals the wrong foods. It is important to remember the historical context of the situation in that the very practice of showing people "wild animals" which are captive, the very premise upon which zoos are built, is similarly contradictory. So long as visitors receive the intended message and are not influenced more by the animal behavior that they see than how the presenter explains the behavior, then contradictions are not likely to matter.

Administrators and staff were asked about their goals for feeding programs (see Table 6). Throughout all the interviews respondents seemed to believe visitor education was a priority. Goals were multi-faceted as shown by this excerpt taken from the interview with a staff member.

...to bring species which normally can only be viewed from a distance much closer to people so they get a more intimate

understanding of the birds.... explain to them the differences between the species, between the sexes and even between age classes...to explain other conservation messages. You have a situation where you have a fairly intimate situation between the presenter — or can have an intimate situation between a presenter and the visitors attending the session, and it opens people up to receiving other messages which they would normally not be as comfortable receiving because it is just sort of an education type message — but if you can make it a little bit of fun or a little bit interesting those messages get across a lot easier.

Table 6: Goals of Public Animal Feeding Programs as Identified by Administrators and Staff.

| Response                                           | Goal                      |
|----------------------------------------------------|---------------------------|
| "To give information about the reserve"            | Educational               |
| "Explain conservation messages"                    | Educational               |
| "Stewardship"                                      | Educational               |
| "Education"                                        | Educational               |
| "Public can talk to the rangers"                   | Communication/Educational |
| "Enhance the experience by developing empathy"     | Communication/Educational |
| "To talk to the public"                            | Communication/Educational |
| "To bring birds closer to people"                  | Action                    |
| "More money as people will remember it and return" | Action                    |
| "Entertainment"                                    | Recreational              |
| "Enjoyment"                                        | Recreational              |

The goals given are visitor-focused, which seems to indicate that while feeding programs might have originally developed as spin-offs from pre-existing environmental enrichment programs, visitor involvement may now be a major concern for zoos. High proportions of the statements reflect a desire to achieve educational goals. Communication is the next most frequently given purpose for the programs, followed by the desire to encourage visitors towards some environmentally supportive action.

To directly compare zoo personnel goals to visitor expectations, administrators, staff and visitors were asked why they thought visitors attended a public animal feeding program (see Table 7). Answers to this question were often very brief, typically one word — education or entertainment. Only two zoo professionals credited visitors with having multiple expectations, for example a keeper said that visitors attended “to learn something about the animals, to see them feed.” Most of the zoo professionals had a simple one-word reply – visitors attended to be “entertained.”

Table 7: Visitors’ Reasons for Attending Public Animal Feeding Programs.

| Administrators and Staff                                                                   | Visitors                                                                                                 |
|--------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| “See the animals active”<br>“Entertainment”<br>“Education”<br>“To be close to the animals” | “See animals active”<br>“To keep the children interested”<br>“To hear the keeper talk”<br>“We were here” |

Seeing animals active was the most frequent reason given for why visitors attended a program, and was closely followed by the desire to interact with and learn from the keeper. In the words of one of the visitors, “...you can see a bit more of the animals...see what they eat...see them sort of active...sometimes the keepers will talk about the animals.”

Despite the numerous and diverse goals, with an emphasis on education, which zoo personnel had for the programs (see Table 6), visitors have different expectations. Administrators and staff clearly seem to recognize the reasons visitors attend their programs (see Table 7), indicating that administrators and staff are aware that program goals are greater than visitor expectations. These results do not indicate anything about the actual outcomes for the programs. In order to better understand outcomes, further questions were asked and analyzed.

### Evidence of Learning

To better understand the expected learning outcomes, administrators and staff were asked what they expected visitors to take away with them (see Table 8).

Table 8: Expectations, Identified by Administrators and Staff, as to What Visitors Would Take Away From a Program.

| Response                                                          | Outcome     |
|-------------------------------------------------------------------|-------------|
| "Increased understanding of threats to animals and environment"   | Educational |
| "Knowledge about habitat"                                         | Educational |
| "Conservation"                                                    | Educational |
| "Zoos aren't bad, they are a necessary evil"                      | Educational |
| "An explanation of the animals' individual and zoo history"       | Educational |
| "To gain empathy for the animals"                                 | Educational |
| "Knowledge about the animals"                                     | Educational |
| "To encourage them to extend a duty of care to all living things" | Educational |
| "The role of zoos"                                                | Educational |
| "To see the animals are healthy and happy"                        | Action      |
| "Interactions with the animals and the keeper"                    | Action      |
| "A sense of hands-on, being involved"                             | Action      |

These statements, reflecting expectations, provided by administrators and staff, emphasize educational outcomes. Usually, effective programs are those which best satisfy expectations, so one way to test effectiveness is to simply compare expectations with outcomes.

To test visitor cognitive learning outcomes and thus develop some indication of program effectiveness, visitors were asked what they remembered most about the program (see Table 9). One of the visitors who had attended the big cat feeding said

...that the keeper was able to talk really knowledgeably and comprehensively about each of the different animals, their likes and dislikes, talking in general about the animals in the wild and also in captivity in general and then specific examples for these cats.

This visitor was unusual in that the keeper and his talk was a part of what she identified as having remembered. Most visitors responded very differently by describing something that they had observed during the feeding, for example, a visitor to the bear feeding program said he remembered

...the fact that they were being fed fruit and vegetables and that they seemed to enjoy that and it didn't seem to be a very big quantity for such large animals, so I am not sure how many times a day they get that amount, but that was interesting too.

Table 9: What Visitors Remembered Most About the Feeding Program.

| Response                                                                                                                                                                                                                                                            | Outcome                                                                                                                                         |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| "That the bear ate fruit and vegetables"<br>"How the new lion will be introduced to the others"<br>"That each cat has its own preference"<br>"That the animals were hand fed"<br>"The large size of the fish being fed"<br>"The animals standing in line to be fed" | Indicative of Factual Learning<br>Indicative of Factual Learning<br>Indicative of Factual Learning<br>Observation<br>Observation<br>Observation |

Half of the responses seem to indicate that something factual was learned during the feeding. Half of the responses were observational. The responses were directly attributed to the program with all factual learning occurring at the bear and big cat feedings and all observation learning occurring at the penguin feeding. This clear trend occurred despite interviews occurring throughout the week, with different keepers presenting the programs. The distinguishing factor between the talks seemed to be that the big cat and bear talks were given concurrent to the feeding whereas no formal talk was given during the feeding of the penguins. The birds were fed and then the keeper asked visitors if they had any questions. The format for the penguin talk was remarked upon by visitors:

I was surprised at how little has been said at the feeding program for the penguins, but I think we went to a feeding program with the big cats later in the day in which a lot of things were said, and the person who did that had a lot of information, so initially I was disappointed in the morning by the lack of information but obviously that was just – wasn't a generalized observation at [sic] the zoo as a whole, so later in the day I think perhaps a more experienced person gave a very good talk on the large cats.

It may be that the public has come to expect a talk when zoos advertise feeding times.

To attempt to understand the depth of learning outcomes, visitors were asked if they had learned anything specifically related to the food requirements, characteristics, or habitat of the animals they had watched during the program (see Table 10).

Table 10: What Visitors Learned About the Type of Food Required by the Animals They Had Watched Being Fed.

| Response                                                                                                                                                                                                                                                                                      | Outcome                                                                                                                                                             |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>"Surprised that the bears are herbivores"</p> <p>"In summer the big cats get ice cubes, which is not natural"</p> <p>"The big cats eat a lot and then skip days"</p> <p>"The fish fed to the penguins were long"</p> <p>"Saw fish being fed to the penguins"</p> <p>"Not a great deal"</p> | <p>Indicative of Factual Learning</p> <p>Indicative of Factual Learning</p> <p>Indicative of Factual Learning</p> <p>Observation</p> <p>Observation</p> <p>None</p> |

The language used by visitors to describe their learning experiences might be rather simple – again, one half of the responses seemed to indicate that something factual was learned about the natural diet or feeding behavior of the animals watched. However, in at least one case (bears being herbivores), the

information repeated by the visitor was incorrect. Other visitors responded to the question with a description of what they had observed. Learning outcomes may be influenced by visitor observations of the type of food being fed to the animals. To better understand visitor perception of food items, particularly those items eaten by carnivores see chapter 4.

According to visitor studies researchers (Anderson et al., in press), learning may not occur directly after the education experience because it may take sometime for visitors to absorb and then link the experience to important aspects of their everyday lives. Therefore, all visitors were contacted six to ten weeks later for a follow-up phone interview. They were asked some of the same questions as those asked on the day of their visit to the zoo (see Appendix B, Visitor Interviews — Open-Ended, Section Two and Visitor Interviews — Follow-up questions). In the tables that follow excerpts were taken from the two interviews to gauge the specific information learned about the animals they had watched during the feeding program.

Those visitors who indicated that they had learned something at the zoo were also likely to remember something about the animal six to ten weeks later. Talks seemed to provide visitors with lasting memories. However, what was remembered was not always the same information as was given in the initial interview. The simplest explanation for the difference is the difficulty most people have in repeating exactly what they had said the first time. It may be that the conditions of the interview partly account for this change because the second interview was conducted by telephone at a time convenient for the participant, which may have meant they had more time to consider and more fully answer the questions because they were less pressured by other visitors to hurry their

answers. Or this could be evidence that visitors continue to process the facts that they had learned at the zoo, deepening long-term cognitive learning.

Visitors were asked several questions which would evoke descriptions of affective learning. In response to the questions, “What do you remember most?” and “What did you like the best?” visitors consistently responded with a fact or two, or by describing an action of the animal. When asked if they had gained a greater appreciation for animals after their visit to the facility, all six visitors responded affirmatively (see Table 11).

While it seems clear that for some visitors the information given in the feeding programs was attended to; however, the depth and accuracy of facts learned could be improved. Zoo personnel already feel that improvements could be made to the information and delivery of public feeding programs. In response to a question asking them to assess current feeding programs. Half replied that programs were inadequate at meeting goals.

Administrators and staff were asked to provide their own reasons as to why programs were not as successful as desired. The responses indicated that current programs could be better at meeting zoo goals if additional programs were provided, consistency between presenters was established, and if additional training and time were provided.

Table 11: What Visitors Learned (Follow-up)

| ... about the characteristics, skills and abilities of the animals. |                                                                                                             |                                                                                        |
|---------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| Visitor                                                             | At the zoo                                                                                                  | Follow-up                                                                              |
| 1                                                                   | The male is dominant                                                                                        | Ligons+ are infertile, and female tiger would kill any mate                            |
| 2                                                                   | They are territorial, they can eat more than one large fish at a time, they live in little boxes, they jump | They paired off towards the end and went to their little houses                        |
| 3                                                                   | They are happy with their lot, not bored, inquisitive and get on well                                       | The dexterity of the bears in grabbing grapes                                          |
| 4                                                                   | Tigers are solitary                                                                                         | The tigons+ were related and tigers are solitary                                       |
| 5                                                                   | Not much                                                                                                    | They were well fed                                                                     |
| 6                                                                   | Hard to say, no real skills                                                                                 | Some eat more than others                                                              |
| ... about the type of food required by the animal(s).               |                                                                                                             |                                                                                        |
| Visitor                                                             | At the zoo                                                                                                  | Follow-up                                                                              |
| 1                                                                   | In summer they get ice cubes which is not natural                                                           | Chicken and ice-block to play with                                                     |
| 2                                                                   | Long fish                                                                                                   | Fish                                                                                   |
| 3                                                                   | Surprised that they are herbivores                                                                          | The bears eat fruit and veg and that the keeper was able to hand feed all the penguins |
| 4                                                                   | They eat a lot then skip days                                                                               | After eating they may have a day when they eat nothing                                 |
| 5                                                                   | Fish                                                                                                        | Already knew, fish                                                                     |
| 6                                                                   | Not a great deal                                                                                            | Not a great deal                                                                       |
| ... about the animals' natural habitat.                             |                                                                                                             |                                                                                        |
| Visitor                                                             | At the zoo                                                                                                  | Follow-up                                                                              |
| 1                                                                   | Tigons+ rip up the vegetation                                                                               | Ligons+ areas of sparse cover and tigers deep forest                                   |
| 2                                                                   | They live in burrows, which here are man-made                                                               | Live near to water                                                                     |
| 3                                                                   | Nothing new                                                                                                 | Bears are destructive-tear the place apart                                             |
| 4                                                                   | In the areas where they are found their numbers are declining                                               | Can't remember                                                                         |
| 5                                                                   | Nothing from the keeper-reading the sign, off-shore islands                                                 | Nothing from the keeper- on the sign they live offshore as far north as Sydney         |
| 6                                                                   | Didn't think they would live around grass and rocks                                                         | Very little                                                                            |

+ Artificially bred crosses between lions and tigers. The zoo has only ligons, but text on a panel describes tigons and how they differ from ligons. Information is also given to inform readers that ligons and tigons do not occur in nature.

Administrators and staff did not propose visitor-based reasons (e.g., lack of motivation, or conflicts with recreation or social aspects of the visit) as to why programs were not entirely successful in achieving goals. In Tables 9 and 10, comments would indicate that cognitive learning occurred when visitors attended the big cat and bear programs, whereas only observations are made by visitors who attended the penguin program. This difference might be an example of inconsistencies between presenters. Consistency in presentation of programs may be related to the level of public speaking training received by the presenter.

### **Other Results**

The qualitative data collected during this phase of the study provided a rich source of information not all of which related to the expectations, reasons for attendance and/or learning outcomes. The results provided in this section have been roughly sorted based upon the group (zoo staff versus visitors) providing the information.

#### **Zoo Personnel**

One of the questions asked of administrators and staff was designed to better understand the level of training in public speaking provided or possessed by the presenters (see Table 12). One of the administrators emphasized the importance for keepers to feel empowered and to be aware of their impact on listening audiences:

I don't want to see keepers walking around thinking "you know, I am a glorified poo picker-upper." I want them to feel that what they are doing is important, and to know that once that information is released publicly that you will be just as much on display as what the animals are.

Table 12: Presentation Skills of the Program Presenter.

| Response                                                                                                                                                                                                                                                                                          | Training                                                                              |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| "Occasional training"<br>"Some off-site training, a university course"<br>"Experience"<br>"Learn by watching talks at other zoos"<br>"Natural ability to talk in an entertaining way"<br>"Some practice of delivery"<br>"No prior public speaking"<br>"Whatever speaking skill they already have" | Formal<br>Formal<br>On the job<br>On the job<br>Talent<br>Informal<br>None<br>Unknown |

Very little prior or ongoing formal public speaking training seems to have been provided. There were some slight inconsistencies in responses when administrators and staff at the same facility were compared. Administrators indicated that talks had originally been scripted and discussions held to determine the most important information to provide visitors. Scripts were often old, rarely referred to or rewritten. Most staff members interviewed said that talks were not scripted, and while most seemed to have a plan of what they felt they should say, very little preparation or practice occurred before the talks were presented.

Two of the zoo professionals interviewed felt that public animal feeding programs were formal. Half felt they were interactive for the visitor and described some of the interactions they had observed.

Visitors and visitors...you hear them talking about what's going on. They're saying, "did you see that," and then when you are talking yourself you see them interact if someone is being a bit too noisy, they will go "shhh" – they are trying to listen...they all laugh together...and if someone misses something someone else will tell them what happened...people feel that they know that particular animal or that little group and they take a personal attachment to it.

The interaction described is not how museums and science centers would define interactive exhibits. Perhaps zoo professional lack an understanding of interactivity with regard to exhibits.

When asked what would be most useful in further developing the feeding programs most zoo personnel were taken aback by the question as it asked them to imagine having unheard of resources. After gentle probing, answers varied. Three people wanted to know more about what visitors wanted:

What information, what knowledge... would assist me would probably be what visitors' expectations are and what they would like to see in addition to what we currently do.

The number of visitors attending each program were said to be recorded, but no other information was collected by any of the facilities on other visitor expectations and outcomes resulting from programs. One of the administrators thought that they had all the information they needed. Another administrator was interested in knowing information specific to feeding programs -- "We would love to have a platypus feeding," or in hiring educational experts:

...as an ultimate you would like to have a person, an information and education person with every enclosure so that as people come up they can answer questions.

When asked what surprised them most about the feeding programs, one staff member was surprised that:

no matter how many times you say something to a group of people, there'll always be one or two that will come at the end and ask a question about exactly what you've just been telling them.

This staff member has recognized the tendency for visitors to be selective of the information to which, they attend or, who may not accurately interpret what they hear (Shepherd, 1975). It could be the case that visitors *are* attending, but that their ability to receive information is impeded by the manner of presentation, or the physical environment (e.g., nearness to speaker, volume of the speaker, background noises, competing events such as movement by the animal, etc.).

A staff member who was a regular presenter during talks said she was most surprised by the

amount of people that come back and remember them... I had a kids' tour this morning — 60 children — and they had already been here last year and the year before and they had remembered everything, and when you start talking about something and they say, "I already know that." It is quite amazing.

One of the administrators said what surprised him most about the feeding programs was that:

sometimes am a little amazed that more people don't go to them... I sometimes am disappointed that people aren't as fascinated or concerned about animals as I am, and I recognize that obviously being in the industry I am going to have a lot more interest... but I would love to think that everyone who came through the gate would head straight to a keeper talk because they are going to learn something... that surprises me — that people don't take advantage of the information that is available or the activity that is available.

Perhaps visitors are interested in the feeding programs. But if they are repeat visitors, as were two of those interviewed for this study, and have already heard talks the talks which are infrequently changed, then they have no reason to

believe they would encounter new facts. Such visitors would not expect to learn anything new and so may not have a reason to attend.

Zoo staff said that feeding programs cost very little in real dollars, and only required additional employee time. None of the animals were fed diets substantially different from their normal diets — for example, carnivores were given raw meat, which otherwise would have been fed to them in their nighttime enclosures. One of the staff members was surprised that the public responded so well when standard diets were fed:

I thought they'd always be disappointed if they are not seeing like a lion tearing into a big chunk of meat and just someone passing a few chicken necks through the wire but they all seem quite satisfied and thrilled with that.

All animals could, according to administrators and staff, be fed when the public was present, although some individuals were fed after hours as a result of their particular dietary requirements. The animals chosen for use during programs were those that are normally fed more than once per day.

Feeding programs were scheduled to coincide with keeper schedules, and occasionally times were determined by the animals' willingness to take food. As an administrator explained, they

feed the bears in the middle of the day to get them up and active and something to stimulate them....The cat fed [sic] we originally did try it in the middle of the day. We did it in the middle of the day and that was partly to get the cats active and partly because that's when most of our people tend to be here. It didn't have a great impact because the cats weren't too interested in moving so we said, "well you guys set the rules," and we now do it at 3:30 which is when they decide to get active again, and that is a lot

more successful as far as getting them up and about and interested in food. So that was originally tried partially to cater for the public at 12 o'clock.

Thought was given to the time of day when animals were less active and programs scheduled to provide visitors with something to see when most animals could be resting.

### Visitors

Visitors were encouraged to attend feeding programs through the notice on the free maps provided at the entry gates. In one case signs and a message on the information line alerted visitors to feeding times. Five of the visitors interviewed said that an adult had suggested their visit. Two of the six had said that they had visited before. Most planned to stay for two hours. Five said that they would revisit, most adding that they would return after ongoing construction was completed. Few of the visitors visit similar facilities more than once per year.

Visitors indicated that they were at the zoo the week of the interviews in order to enjoy the facility with visiting family, friends, and (in one case) as a special award. Once at the zoo visitors were interested in learning.

The visitors interviewed believe that zoo messages should promote conservation, human duty of care to animals, and human impacts on animal habitats:

... conservation is one...in the past there has been a certain sort of circus-like interest in large aggressive animals, and I think that's a wrong message... animals should be promoted for their interesting qualities and the most interesting animals aren't necessarily the largest ones or the most aggressive.

According to visitors zoos should go about promoting important messages through the use of computer displays and other interactives, “more people like at amusement parks,” and educational school groups.

Visitors were asked to describe how the animals appeared. The description made was directly influenced by the actions of the animals, so penguins standing in a group beside their pond were “hungry” and the big cats resting in the sun were “placid.” These are, of course, rather human traits to attribute to animals. But visitors might not mean to be anthropomorphic as it seems more likely that they simply lack the understanding or words to describe animal behavior in scientifically objective ways.

Visitors were asked to rate the naturalness of the feeding on a scale (1 to 5, with 5 being the most natural and 1 being the least). Ratings fluctuated from a low of 1 at the penguin enclosure to a high of 5 at the big cats. However, some of the comments made about the feedings emphasized behaviors that would not typically be displayed in nature (e.g., animals queue for food, animals are hand fed, lions eating ice cubes). While commenting on the penguin program, perceived as the least natural of the three programs, a visitor said, “it’s all fun to watch, to see what they do naturally.” Research suggests that zoo visitors may blur the boundaries between what they perceive as ‘natural’ and ‘unnatural’ (Mazur, 2001). In this study the attention visitors paid to unnatural behaviors may be due to the way in which the keeper is required to feed the animal. For example keepers must feed frozen fish to the penguins and ensure that each penguin receives the correct number of fish. Overtime the penguins appear to have become trained, lining up for their food. In this case the unnatural behavior of the penguins is a result of the way in which the keeper is required to feed them and not meant to represent wild penguin behavior.

## **Conclusions**

The responses collected from six adult Australian visitors to a private regional zoo suggests that informal learning outcomes from public animal feedings do not entirely meet the goals given by the administrators and staff interviewed at similar facilities. This may simply indicate that current expectations are too high, since zoo personnel are aware of the reasons visitors give for attending the programs. It is also clear that visitor expectations are for the most part being fulfilled. Low visitor expectations could reflect the tradition which visitors have developed in attending zoos for recreation and spectacle (see chapter 2, "Zoos"). Zoo personnel may wish to rethink goals for the programs or change programs ways to promote greater learning outcomes or alternatively instruct visitors on how to make the most out of opportunities offered by zoos to reap the greatest educational benefits from a trip to a zoo. Instead of trying to alter visitor motivation, adjustment of the goals or to the program itself might be warranted (Massey, 1994), or might indicate that current programs are not appropriate for achieving the stated goals, but do provide some other outcome.

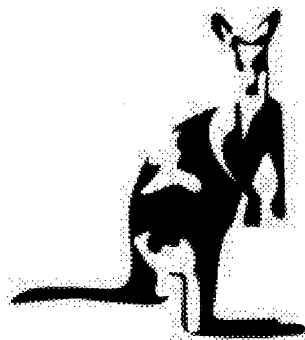
A difference between presenters seems to have had an effect on visitor outcomes. When visitors were asked what they had learned about the animals, most of the comments provided about the penguin feeding were observational, whereas comments about the other programs were indicative of other kinds of learning. This seems to be an example of the influence of staff consistency on cognitive learning outcomes. Consistency in presentation of programs may be related to the level of public speaking training or comfort and experience of the presenter. Visitor attitudes about the food fed to animals might influence cognitive and affective learning outcomes, and this has been the focus of a secondary study.

Many of the visitors left and retained the impression that feedings were natural when clearly this was not always the case (e.g., penguins). The idea that visitors would mistake unnatural behaviors for natural ones could be of concern to presenters. It might be necessary to provide visitors with a fuller explanation of the reasons a behavior is not natural and talk in more detail about what would be natural.

American research has suggested that zoo aims and visitor expectations may be incompatible (Morgan and Hodgkinson, 1999). That did not appear to be the case in this study because visitors' expectations are being met and visitors seemed willing to learn more during their visit. What is not being met are the expectations of zoo personnel as few of the educational outcomes they desired are actually being met. Therefore, if zoos want to increase the educational outcomes of the zoo visitors' experiences then change to feeding programs, not the visitors' attitudes, may be necessary.

## Chapter 6

## Conclusions



In the end, we will conserve only what we love. We will love only what we understand. We will understand only what we are taught.

-- Baba Dioum, Sengalese conservationist

This chapter is a summary of the primary conclusions drawn from the data and answers the research questions asked in chapter 1. How feeding programs are succeeding, and how they might be enhanced, future research, limitations, and a few final words are issues also considered. Threaded throughout are recommendations, many based on ideas from the literature.

Zoos are complex, conservative institutions that attempt to reconcile competing priorities in their ongoing efforts to conserve, educate and conduct research. What seems clear from this study is that visitor-focused research is lacking, but that communication by zoos to visitors could be improved upon, not because visitors are unhappy, but because the goals zoos have are not being entirely met. This study and others (Morgan and Hodgkinson, 1999; Packer, in press) show that visitors are willing to learn more during zoo visits, but that recreation rather than education, seems to motivate them to visit.

### **Answering the Research Questions**

The purpose of this study was to understand the communication environment zoos create to educate visitors, the role feeding times play in zoo communication strategy, and how the public responds to feeding times. Through analysis of feeding time talks given by zoo keepers, implications have been raised for all talks, zoo communication strategies, informal learning, and for future research.

Many of the research questions used to frame this study were exploratory.

They were designed to help fill the gap in what is known about communication and outcomes from talks given by zoo keepers, and to provide background for future study. The animals, their appearance, activities, and enclosures are all a part of the messages that zoos send to the public. Within the context of a feeding program, understanding the attitudes of the public to the food eaten by animals could be important, so specific questions were asked of visitors about their attitudes on the most controversial feeding issues — feeding live prey. To evaluate the talk given by keepers at feeding times, questions focused on informal learning as a primary area for consideration.

### Attitudes Towards Live Prey

Visitors seem to accept that animals eat live prey. One of the visitors, when asked what messages zoos should promote, put it this way: “natural behavior, that’s why I say its ok to use live prey.” For the most part visitors agree with invertebrates being fed to vertebrates both in and out of public view; however, they show concern for feeding live vertebrate prey to vertebrate zoo animals. Attitudes might be changed if visitors are provided with information that allows them to make informed choices (Houts, in press). During the follow-up interview, one of the visitors described another visit he had made:

The other thing that was a little curious...was to see the – I think it was the lions – actually with a – the little sign said they get some of the kangaroo road kill from around the city. It was quite spectacular again for the group that was there watching this lion sort of dragging virtually a full kangaroo carcass around....with such a high number of road kill of kangaroos, I guess it was an interesting way of using some of them, it wasn’t upsetting or anything. It was really quite sort of – it was quite interesting..it was being put to a use and the lion it was obviously pretty close to its natural sort of food in

that it was a fresh kill of some sort, even though a car had killed it rather than the lion itself. So that was quite spectacular too.

There were no apparent differences in attitudes towards the feeding of live between country (UK versus Australia). Perhaps UK and Australian visitors are too culturally similar for differences in attitudes to have arisen, or perhaps attitudes towards prey and predators are more a matter of human nature and less a product of culture. Certain demographic and sociographic factors affected visitor attitudes towards the idea of feeding live prey to zoo animals. For example, pet ownership consistently affected visitor attitudes (Broad, 1996; Ings, et al., 1997; Kellert, 1998). When creating communication strategies zoos might consider developing materials specific to, and sensitive to, the attitudes and understanding that seem to be affected by their visitors' demographic and sociographic characteristics (e.g., special signs explaining environmental enrichment from the perspective of the pet owner).

Visitor attitudes towards feeding live prey are complex and sometimes contradictory. In future a better question to ask might be: "Do visitor attitudes towards the feeding of live prey change after attendance at a zoo feeding program?" Ultimately, if in the future zoo carnivores require live prey for dietary enrichment or training then zoos may have to change attitudes and laws or confine the practice to hours when the public is not present.

### Expectations and Motivations

Zoo administrators and staff have many reasons for providing public animal feeding programs, including education, entertainment, increasing the ability of visitors to view the animals, as well as providing environmental enrichment to the animals. Zoo feeding times are entertaining for the visitor and,

at least to a limited extent, educational for some visitors. Zoo personnel have successfully created a form of communication which engages their visitors and satisfies some of the expectations of a good visit to a zoo. During the follow-up interviews, one visitor described his experience: "it was really marvelous...we really value [the facility] and I think it's making a great contribution. Feeding programs do not, however, currently seem to satisfy all of the expectations zoo personnel have for them.

Visitors are motivated to attend out of convenience, a desire to see the animals, to interact with the keeper, and to enhance the enjoyment of trips to the zoo for themselves and other members of their group. While it is clear that zoo personnel understand that visitors have few expectations, zoo stakeholders have ambitious goals for the educational and recreational outcomes of these programs. Visitor expectations may be the result of the long tradition of zoos as places for spectacle and recreation rather than education. Visitor expectations do not exclude zoo goals, and in fact visitors sometimes criticize zoos because of the lack of learning opportunities. In the words of one of the visitors interviewed for this study:

It's what happens when you get there and what you learn that's important. There's no point sort of having sort of a national marketing strategy sort of preaching conservation and then coming to the zoo and being utterly disappointed by what you see...I tend to like zoos with a lot of information, although it has to be the right sort of information, it has to be easily digested, but I tend to like a lot of information.

### Vignette 8 Meeting Murray the Cod

The building was cool and dimly lit. Reflections from the sides of the perspex tanks and the flowing water refracted off the walls to create rainbows and mysterious shadows while making the signs difficult to read. The air cooler whined in the background and scaffolding blocked many of the corners. Sure, it was in need of the renovation which apparently was planned, judging by the scaffolding. Yet it was also such an appropriate setting for creatures of the deep, adding to my sense of exploration and discovery.

Walking round a corner I saw a flash of silver and a huge, cold, unblinking eye watching me. I had come "face to fish" with Murray, the cod. Drifting peacefully in his large circular tank gazing out as visitors like me gazed in. We seemed to contemplate one another for a time, he suspended in the water and me in my admiration of such a magnificent example of the endangered species. Then, with a swish of his tail, Murray turned in his tank. He was now pointing in the direction of the exit, so I took the cue and wandered back into the sun, senses assaulted with capuchin monkey chatter and a vague craving for fish and chips.

### Adult informal learning outcomes

There is evidence that visitors learn cognitively and effectively while at the zoo and they retain this learning for several weeks afterwards. That is not to say that what they are learning is correct. Visitors seem to learn first from the animals within the context of the exhibit, then from the actions of the keeper, and finally from some of the information provided. So visitor lessons in conservation, ecology, animal behavior, physiology, and so forth, are driven by what they see and not by what they hear or read. For example, the sign by the tigers, at one of the facilities, might clearly explain that tigers are artificial hybrids between lions and tigers, something which does not occur naturally and still have visitor go away believing that "tigers live in sparsely vegetated areas."

Administrators and staff were asked to make their own assessment of the success of their public feeding programs. Half responded “no” that their goals were not being met. Insufficient or inconsistent presentation skills were identified as a part of the “problem.” Animal feeding is typically the responsibility of zookeepers. When a feeding program becomes an educational program, keepers are often suddenly expected to fulfill the roll of communicator and educator. Keepers who are poorly prepared to assume the role of effective communicator could resent this extension of their duties.

There was evidence that inconsistencies between presenters, perhaps resulting from different levels of training, strongly influenced what visitors learned. Keepers who presented the bear and big cat talks facilitated cognitive learning in visitors. Visitors even retained certain facts that they had learned for several weeks after the talk. “Its easy to talk about conservation but it just bores everyone,” said one administrator, who continued, “only certain people can make it entertaining, be able to get those messages in.” These inconsistencies and idea that “only certain people can” *naturally* “get those messages in” are likely the result of the differing levels of training in public speaking held by each keeper. So the most important step then towards creating consistency would be to create effective communicators.

On-site training by local experts in communication or mini-workshops given by people who are already competent speakers in the organization, are just two examples of cost effective methods of training. Coaching presenters to engage with the audience so that they use plenty of eye contact, speak only when facing the audience, to use microphones, and know how to control the crowd to ensure that all visitors can hear are all simple techniques that could help keepers present practiced, professional talks.

The more effectively the presenter communicates with the audience the more likely public animal feeding programs are to produce positive adult learning outcomes. If keepers and other presenters are encouraged to better understand visitor motivation and attitudes and then incorporate such feedback in development of better communication strategies then zoo feeding programs might begin to play a more significant role in educating the public about captive and wild animals.

The animals, their food and the actions of the keeper seemed to have had a strong influence on what visitors learned from observation. Not all of the conclusions drawn by observing visitors were accurate. Visitors seemed to confuse what they saw with what might occur in nature. When auditory and visual messages conflict there may be a failure to communicate (Heinrich and Birney, 1992). To prevent visitors confusing what is natural with what is unnatural, in zoo animal behavior and habitat, it is important to contextualize the experience (Coe, 1982). This means using appropriate enrichment devices and ensuring that auditory and visual messages are compatible rather than conflicting.

Zoos should be able to evaluate, change and further develop programs until more of their goals are achieved by working to provide the “right sort of information” — this might increase visitor appreciation for zoos. It might be possible to enhance visitor response and learning outcomes by creating an environment for more active learning or learning which engages visitors in participatory activities. For examples, some zoos offer visitors the opportunity to make enrichment items (Houts, 2000). Other zoos allow visitors to participate in laying scent trails or delivering the food to the animals. Simply asking visitors questions during the talk can engage them in the activity. Some exhibit designers argue that zoos should increase the use of interactive exhibits (Kelsey, 1989).

Schultz (2000) has shown that there is a link between the public's willingness to support conservation efforts and the degree to which they feel a part of the environment. Designing activities that would allow visitors to be included in the process and feel a part of the zoo may encourage them to contribute additional time, money, energy and other resources both at the zoo and away from the zoo. Zoos have even increased the average visitor's willingness to pay for conservation when programs are interactive, immediate and tangible (Gershenz and Saul, 1993). This would create a situation benefiting visitors, animals and zoos. Worthwhile entertainment is partially defined by visitors by the quality of the learning experience (Henrich and Birney, 1992). It should be possible to design informal learning experiences for adults which are as enriching for them as it is for the animals being fed.

### **Future Research**

Context is an important part of understanding the way people communicate and learn. Context can affect attitudes (Altman, 1998). Informal adult learning within the context of zoos has received relatively little attention from researchers within zoos (*in situ*) or through collaborations with academics and/or professional evaluators (*ex situ*). What follows are ideas for further research by zoos and with help from the academic community.

#### **In situ**

The administrators and staff interviewed for this study were candid in replying that they did not currently gather quantitative feedback from visitors. In some cases the numbers of visitors attending the program were recorded and

### Vignette 9 Polar Bears and Peanut Butter

My mind was wandering in couch potato bliss when an advertisement for Sea World Australia caught my full attention. The advertisement showed massive polar bears playfully eating peanut butter sandwiches. Is the treat a part of the bears' environmental enrichment program? Several months later peanut butter sandwiches were used again in an advertisement announcing the two new polar bear cubs visiting Sea World Australia.

It is cute to see the polar bears munching a favorite tucker-box treat. Yet polar bears are not "cute" — they are the world's most aggressive bear, a constant threat to people who live in the Arctic, costly for zoos to keep, fraught with behavioral problems when in captivity, and not at all cute, cuddly living "teddy bears" portrayed in the advertisements.

Of course I know better. I hold a degree in animal behavior and have talked with people who live in polar bear territory. But what messages are being conveyed to the predominantly naive public? Should polar bears be portrayed as docile, eating peanut butter like a pet or a child? Couldn't the peanut butter be delivered in ways that would create at least the illusion that the bears were behaving naturally? Or is some sponsor pulling the strings, dictating the impression that Australians will form of polar bears?

At times during the interviews it was quite apparent that visitor needs and opinions were not, in the past, highly regarded:

Zoos in the past...there are two things that they have done: a fortress mentality which is a self indulgence thing which is we are doing good things for animals here...whether you can see them or interact with them or not we don't give a damn. We are doing our job. And they are not necessarily customer focused institutions.

This begs the question, have they now become customer focused institutions?

Perhaps not, if the views expressed in the following excerpts are prevalent within the industry:

The public do come second in most of the things we do although I will make that perfectly clear to people if they query ...the animal takes a higher priority over the public, but I have to get people through the gate to be able to feed the animals...

And a staff member said,

In many cases what the visitor necessarily sees as something they would like could be a little bit blinkered, that they probably aren't as aware of some of the other opportunities that might be available to them so you don't want to get locked into just responding to what visitors want.

Internal evaluation and frequent surveys and interviews with visitors have become standard procedure for many museums and science centers because studies of visitor responses helps to provide situations and programs that encourage visitors to participate and participate often (Hood, 1994; Perry 1994). The initial cost to facilities performing visitor studies is usually recovered and visitor-recommended improvements tend to encourage higher attendance (Hood, 1994). Zoos which are not involved in visitor studies should consider the strong arguments for developing regular evaluations and visitor-based research incorporated into management plans. Zoos that are currently engaged in such research should be encouraged to publish their results and make them accessible.

### *Ex situ*

Resources can often be limited or stretched to capacity especially at smaller zoos. Collaborative research with local schools and universities might be an option to do research without sacrificing the budget. Current trends in collaborative research focus on scientific collaborations with few social science

collaborations (Wemmer, et al., 1997). Zoos and social science researchers could collaborate on further research into:

- the influence of the visit on the visitor for the short and long term,
- evaluations of zoo education effectiveness over time,
- design and testing of interactive exhibits,
- outcomes from repeat visitation, exhibit enrichment, and total immersion,
- outcomes from behind the scenes tours, shows, and animal contact ,
- the impact of zoo rhetoric on educational outcomes,
- influence of zoos on conservation behavior,
- the effects of animal representation on visitor awareness and appreciation
- attitudes of minorities, vegetarians, and other special interest groups towards zoos and zoo animals.
- cross-cultural research of zoo visitors
- affects of immersion exhibits on learning, and
- influence of training on zoo keepers to be public speakers and educators.

This list is just the beginning, as each path would lead to further questions. Zoos are often responsive to critical visitors. Visitor-based research could be employed to provide zoos with a balanced understanding of what visitors want and take the guess work out of the formation of visitor-based communication strategies.

### **A Few Final Words**

This excerpt from one of the staff interviews almost summarizes the study.

Interpretative programs that involve a one on one person are very effective and you can build a very good rapport with a visitor, but

it is a very expensive way of delivering messages. Good interpretive panels, static signs, whilst initially they are expensive to put in, the majority of the people that come through will see that sign, or at least most of them will read at least part of that sign depending upon how effective your interpretation has been, whereas one on one can only capture a small percentage of the visitors. In addition to static signage I think there should be mobile signage that takes advantage of different things that are happening at different times of the year. Live animals in displays and displays themselves have been designed to convey some interpretive messages. There is a complete spectrum of how some of these measures could be conveyed, and I think we are really only scratching the surface at the moment. Here we need to build up our diversity of methods.

In the quotation there is evidence of the careful consideration zoo personnel can give to the type of communication they engage in with visitors, the effectiveness of keepers talking with visitors, the importance of the animals and exhibits as part of the message, and the desire to do more.

Zoos are often placed in the same category as museums and science centers in the literature. In fact, by some definitions, zoos *are* museums (Mason, 2000). Yet most museums and science centers have shifted paradigms, no longer believing in transmission models of communication or the positivist model of learning (Rennie and McClafferty, 1999; Stocklmayer, in press). The goal of modern science communication is not so much seen as providing an education, but rather to encourage people to want to educate themselves (Bryant, 2002).

In her article about learning science Massey advises, "if you discover a large gap it might be best to rethink goals" (1994, p.10). A gap between the goals zoos have for feeding programs and the outcomes of those programs has been

discovered during this study. Perhaps it is time for zoos to look towards successful museums and science centers to adopt practices which fulfill more of the expectations zoos have for their programs. Perhaps it is also time for the industry and government regulators to reconsider the burden adopted by zoos to educate the public in favor of stimulating awareness of environmental and conservation issues.

Biophilia, the human need to connect with nature, may guarantee that zoos will continue to be visited. However as zoos evolve into conservation centers, making a visit more satisfying to the adult public may be the greatest motivation for zoos in creating balanced communication strategies. All zoos, even those which are private, depend upon paying visitors. Continued patronage of zoos and allied government funding relies on the support of satisfied adult visitors. When communication to the public about zoos and zoo animals is ineffective zoos often suffer financial, managerial, legal, and public relations consequences (for an example see Hirshberg and Simon, 1997).

Zoos attempt to communicate complicated scientific notions of animal behavior, biology, ecology, and zoology. They do so within highly complex organizations. They are organizations that of necessity are focused first on the health and safety of the animals and the visitors and second on the generation of revenue for the perpetuation of the organization. In recent times the greatest success of zoos may be their part in conservation of endangered species; their greatest failure may have been their inability to communicate those successes to the general public.

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## **Appendix A      Additional Data**

### **Public Attitudes to Feeding Live Prey**

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### Analysis of Effects of Demographic and Sociographic Characteristics

Table A1: Analysis of Deviance for Demographic and Sociographic Characteristics of Australian Zoo Visitors in Response to Live Fish Being Fed to Penguins, N= 50.

| Public View<br>(in or out) | Variable                          | df | Deviance | P      |
|----------------------------|-----------------------------------|----|----------|--------|
| In                         | Watches nature shows on TV        | 1  | 0.218    | 0.641  |
|                            | Has always lived in present area  | 1  | 3.414    | 0.065  |
|                            | Lives in an urban area            | 1  | 0.785    | 0.376  |
|                            | Owens pets                        | 1  | 7.255    | 0.007* |
|                            | Belongs to an environmental group | 1  | 1.779    | 0.182  |
|                            | Age (18-20, 20, 30, 40, 50, 60+)  | 2  | 1.531    | 0.465  |
|                            | Sex (male or female)              | 1  | 0.018    | 0.893  |
| Out                        | Watches nature shows on TV        | 1  | 0.777    | 0.378  |
|                            | Has always lived in present area  | 1  | 0.190    | 0.663  |
|                            | Lives in an urban area            | 1  | 0.653    | 0.419  |
|                            | Owens pets                        | 1  | 3.932    | 0.047* |
|                            | Belongs to an environmental group | 1  | 0.944    | 0.331  |
|                            | Age (18-20, 20, 30, 40, 50, 60+)  | 2  | 0.923    | 0.630  |
|                            | Sex (male or female)              | 1  | 0.085    | 0.771  |

\* Significant values from analysis using full models, values for reduced models (for significant characteristics only) appear in the text of chapter 4.

Table A2: Analysis of Deviance for Demographic and Sociographic Characteristics of Australian Zoo Visitors in Response to Live Rabbits Being Fed to Big Cats, N= 50.

| Public View<br>(in or out) | Variable                          | Df | Deviance | P      |
|----------------------------|-----------------------------------|----|----------|--------|
| In                         | Watches nature shows on TV        | 1  | 0.010    | 0.921  |
|                            | Has always lived in present area  | 1  | 0.932    | 0.334  |
|                            | Lives in an urban area            | 1  | 0.441    | 0.507  |
|                            | Owens pets                        | 1  | 4.707    | 0.030* |
|                            | Belongs to an environmental group | 1  | 5.794    | 0.016* |
|                            | Age (18-20, 20, 30, 40, 50, 60+)  | 2  | 2.004    | 0.367  |
|                            | Sex (male or female)              | 1  | 0.350    | 0.554  |
| Out                        | Watches nature shows on TV        | 1  | 2.340    | 0.126  |
|                            | Has always lived in present area  | 1  | 0.104    | 0.747  |
|                            | Lives in an urban area            | 1  | 0.039    | 0.844  |
|                            | Owens pets                        | 1  | 0.664    | 0.415  |
|                            | Belongs to an environmental group | 1  | 1.962    | 0.161  |
|                            | Age (18-20, 20, 30, 40, 50, 60+)  | 2  | 2.339    | 0.310  |
|                            | Sex (male or female)              | 1  | 0.036    | 0.850  |

\* Significant values from analysis using full models, values for reduced models (for significant characteristics only) appear in the text of chapter 4.

Table A3: Analysis of Deviance for Demographic and Sociographic Characteristics of Australian Zoo Visitors in Response to Dead Rabbits (Carcasses) Being Fed to Tasmanian Devils, N= 50.

| Public View<br>(in or out) | Variable                          | Df | Deviance | P      |
|----------------------------|-----------------------------------|----|----------|--------|
| In                         | Watches nature shows on TV        | 1  | 0.044    | 0.835  |
|                            | Has always lived in present area  | 1  | 2.046    | 0.153  |
|                            | Lives in an urban area            | 1  | 0.495    | 0.482  |
|                            | Owens pets                        | 1  | 1.297    | 0.255  |
|                            | Belongs to an environmental group | 1  | 1.397    | 0.237  |
|                            | Age (18-20, 20, 30, 40, 50, 60+)  | 2  | 0.142    | 0.931  |
|                            | Sex (male or female)              | 1  | 0.415    | 0.519  |
| Out                        | Watches nature shows on TV        | 1  | 1.329    | 0.249  |
|                            | Has always lived in present area  | 1  | 0.201    | 0.654  |
|                            | Lives in an urban area            | 1  | 3.043    | 0.081  |
|                            | Owens pets                        | 1  | 0.007    | 0.935  |
|                            | Belongs to an environmental group | 1  | 5.657    | 0.017* |
|                            | Age (18-20, 20, 30, 40, 50, 60+)  | 2  | 5.747    | 0.057  |
|                            | Sex (male or female)              | 1  | 0.099    | 0.754  |

\* Significant values from analysis using full models, values for reduced models (for significant characteristics only) appear in the text of chapter 4.

### Effects of Selected Demographic and Sociographic Characteristics by %

Table A4: Effect of Pet Ownership on Visitors Agreeing to the Feeding of Live Vertebrate Prey In and Out of Public View. [50 adults interviewed, N given for each group (pet versus no pet = 50). Values in parenthesis in the body of the table are the number of interviewees agreeing with the feeding.]

|                     |                | In       |            | Out      |            |
|---------------------|----------------|----------|------------|----------|------------|
| Prey-predator pair  | Pet ownership  | % Agree  | % Disagree | % Agree  | % Disagree |
| Insects to lizards  | Pets (N=37)    | 89(33)   | 11(4)      | 97(36)   | 3(1)       |
|                     | No pets (N=13) | 100(13)  | (0)        | 100(13)  | (0)        |
| Insects to meerkats | Pets (N=37)    | 92(34)   | 8(3)       | 95(35)   | 5(2)       |
|                     | No pets (N=13) | 100(13)  | (0)        | 100(13)  | (0)        |
| Fish to penguins    | Pets (N=37)    | *70(26)  | *19(7)     | *81(30)  | *19(7)     |
|                     | No pets (N=13) | *100(13) | *(0)       | *100(13) | *(0)       |
| Rabbits to big cats | Pets (N=37)    | *27(10)  | *30(11)    | 70(26)   | 30(11)     |
|                     | No pets (N=13) | *62(8)   | *15(2)     | 85(11)   | 15(2)      |

\* Showing a significant effect after analysis with a reduced model (see Chapter 4).

Table A5: Effect of Membership in an Environmental Group on Visitors Agreeing to the Feeding of Live Vertebrate Prey In and Out of Public View. [50 adults interviewed, N given for each category (belong versus don't belong). Values in parenthesis in the body of the table are the number of interviewees agreeing with the feeding.]

|                     |                     | In      |            | Out     |            |
|---------------------|---------------------|---------|------------|---------|------------|
| Prey-predator pair  | Environmental Group | % Agree | % Disagree | % Agree | % Disagree |
| Insects to lizards  | Don't Belong (N=46) | 91(42)  | 9(4)       | 98(45)  | 2(1)       |
|                     | Belong (N=4)        | 100(4)  | (0)        | 100(4)  | (0)        |
| Insects to meerkats | Don't Belong (N=46) | 93(43)  | 7(3)       | 96(44)  | 4(2)       |
|                     | Belong (N=4)        | 100(4)  | (0)        | 100(4)  | (0)        |
| Fish to penguins    | Don't Belong (N=46) | 76(35)  | 20(9)      | 80(37)  | 15(7)      |
|                     | Belong (N=4)        | 100(4)  | (0)        | 100(4)  | (0)        |
| Rabbits to big cats | Don't Belong (N=46) | *37(17) | *63(29)    | 78(36)  | 22(10)     |
|                     | Belong (N=4)        | *(0)    | *100(4)    | 50(2)   | 50(2)      |

\* Showing a significant effect after analysis with a reduced model (see Chapter 4).

Table A6: Effect of Length of Stay in Current Location on Visitors Agreeing to the Feeding of Live Vertebrate Prey In and Out of Public View. [50 adults interviewed, N given for each category (always versus not). Values in parenthesis in the body of the table are the number of interviewees agreeing with the feeding.]

|                     |                    | In      |            | Out     |            |
|---------------------|--------------------|---------|------------|---------|------------|
| Prey-predator pair  | Length in Location | % Agree | % Disagree | % Agree | % Disagree |
| Insects to lizards  | Always (N=24)      | 88(21)  | 13(3)      | 100(24) | (0)        |
|                     | Not (N=26)         | 96(25)  | 4(1)       | 96(25)  | 4(1)       |
| Insects to meerkats | Always (N=24)      | 92(22)  | 8(2)       | 96(23)  | 4(1)       |
|                     | Not (N=26)         | 96(25)  | 4(1)       | 96(25)  | 4(1)       |
| Fish to penguins    | Always (N=24)      | 67(16)  | 33(8)      | 83(20)  | 17(4)      |
|                     | Not (N=26)         | 88(23)  | 12(3)      | 88(23)  | 12(3)      |
| Rabbits to big cats | Always (N=24)      | 29(7)   | 71(17)     | 75(18)  | 25(6)      |
|                     | Not (N=26)         | 42(11)  | 58(15)     | 73(19)  | 27(7)      |

\* Showing a significant effect after analysis with a reduced model (see Chapter 4).

Table A7: Effect of Location on Visitors Agreeing to the Feeding of Live Vertebrate Prey In and Out of Public View. [50 adults interviewed. N given for each category (Urban versus Rural). Values in parenthesis in the body of the table are the number of interviewees agreeing with the feeding each category.]

|                     |                | In      |            | Out     |            |
|---------------------|----------------|---------|------------|---------|------------|
| Prey-predator pair  | Urban or Rural | % Agree | % Disagree | % Agree | % Disagree |
| Insects to lizards  | Urban (N=36)   | 92(33)  | 8(3)       | 97(35)  | 3(1)       |
|                     | Rural (N=14)   | 100(14) | (0)        | 100(14) | (0)        |
| Insects to meerkats | Urban (N=36)   | 94(34)  | 6(2)       | 97(35)  | 3(1)       |
|                     | Rural (N=14)   | 93(13)  | 7(1)       | 93(13)  | 7(1)       |
| Fish to penguins    | Urban (N=36)   | 75(27)  | 25(9)      | 83(30)  | 17(6)      |
|                     | Rural (N=14)   | 86(12)  | 14(2)      | 93(13)  | 7(1)       |
| Rabbits to big cats | Urban (N=36)   | 33(12)  | 67(24)     | 72(26)  | 28(10)     |
|                     | Rural (N=14)   | 43(6)   | 57(8)      | 79(11)  | 21(3)      |

\* Showing a significant effect after analysis with a reduced model (see Chapter 4).

Table A8: The Effect of Age on Visitors Agreeing to the Feeding of Live Vertebrate Prey In and Out of Public View. [50 adults interviewed. Values in parenthesis in the body of the table are the number of interviewees agreeing with the feeding.]

| Prey-predator pair  | Age   | N  | In      |            | Out     |            |
|---------------------|-------|----|---------|------------|---------|------------|
|                     |       |    | % Agree | % Disagree | % Agree | % Disagree |
| Insects to lizards  | 18-20 | 2  | 100(2)  | (0)        | 100(2)  | (0)        |
|                     | 21-29 | 15 | 100(15) | (0)        | 100(15) | (0)        |
|                     | 30-39 | 14 | 93(13)  | 7(1)       | 100(14) | (0)        |
|                     | 40-49 | 6  | 100(6)  | (0)        | 100(6)  | (0)        |
|                     | 50-59 | 9  | 67(6)   | 33(3)      | 89(8)   | 11(1)      |
|                     | 60+   | 4  | 100(4)  | (0)        | 100(4)  | (0)        |
| Insects to meerkats | 18-20 | 2  | 100(2)  | (0)        | 100(2)  | (0)        |
|                     | 21-29 | 15 | 100(15) | (0)        | 100(15) | (0)        |
|                     | 30-39 | 14 | 100(14) | (0)        | 100(14) | (0)        |
|                     | 40-49 | 6  | 100(6)  | (0)        | 100(6)  | (0)        |
|                     | 50-59 | 9  | 78(7)   | 22(2)      | 89(8)   | 11(1)      |
|                     | 60+   | 4  | 75(3)   | 25(1)      | 75(3)   | 25(1)      |
| Fish to penguins    | 18-20 | 2  | 100(2)  | 0          | 100(2)  | (0)        |
|                     | 21-29 | 15 | 87(13)  | 13(2)      | 87(13)  | 13(2)      |
|                     | 30-39 | 14 | 79(11)  | 21(3)      | 93(13)  | 7(1)       |
|                     | 40-49 | 6  | 100(6)  | 0          | 100(6)  | (0)        |
|                     | 50-59 | 9  | 33(3)   | 67(6)      | 56(5)   | 44(4)      |
|                     | 60+   | 4  | 100(4)  | 0          | 100(4)  | (0)        |
| Rabbits to big cats | 18-20 | 2  | (0)     | 100(2)     | 50(1)   | 50(1)      |
|                     | 21-29 | 15 | 53(8)   | 47(7)      | 87(13)  | 13(2)      |
|                     | 30-39 | 14 | 36(5)   | 64(9)      | 79(11)  | 21(3)      |
|                     | 40-49 | 6  | 33(2)   | 67(4)      | 67(4)   | 33(2)      |
|                     | 50-59 | 9  | 11(1)   | 89(8)      | 44(4)   | 56(5)      |
|                     | 60+   | 4  | 50(2)   | 50(2)      | 100(4)  | (0)        |

\* Showing a significant effect after analysis with a reduced model (see Chapter 4).

Table A9: Effects of Demographic and Sociographic Characteristics Visitors Agreeing to Feeding Dead Rabbits (Carcasses) to Tasmanian Devils. [50 adults interviewed. Values in parenthesis in the body of the table are the number of interviewees agreeing with the feeding.]

|                                            |    | In      |            | Out      |            |
|--------------------------------------------|----|---------|------------|----------|------------|
| Demographic or Sociographic Characteristic | N  | % Agree | % Disagree | % Agree  | % Disagree |
| Own Pets                                   | 37 | 65(24)  | 35(13)     | 86(32)   | 14(5)      |
| Don't Own Pets                             | 13 | 85(11)  | 15(2)      | 92(12)   | 8(1)       |
| Don't Belong to Enviro. Group              | 46 | 72(33)  | 28(13)     | *91(42)  | *9(4)      |
| Belong to Enviro. Group                    | 4  | 50(2)   | 50(2)      | *50(2)   | *50(2)     |
| Always Lived in Area                       | 24 | 67(16)  | 33(8)      | 83(20)   | 17(4)      |
| Not Always Lived in area                   | 26 | 73(19)  | 27(7)      | 92(24)   | 8(2)       |
| Urban                                      | 36 | 81(29)  | 19(7)      | *83(30)  | *17(6)     |
| Rural                                      | 14 | 86(12)  | 14(2)      | *100(14) | *0         |
| Age 18-20                                  | 2  | 50(1)   | 50(1)      | 50(1)    | 50(1)      |
| Age 21-29                                  | 15 | 80(12)  | 20(3)      | 87(13)   | 13(2)      |
| Age 30-39                                  | 14 | 71(10)  | 29(4)      | 93(13)   | 7(1)       |
| Age 40-49                                  | 6  | 67(4)   | 33(2)      | 83(5)    | 17(1)      |
| Age 50-59                                  | 9  | 67(6)   | 33(3)      | 100(9)   | 0          |
| Age 60+                                    | 4  | 95(3)   | 25(1)      | 100(4)   | 0          |

\* Showing a significant effect after analysis with a reduced model (see Chapter 4).

## Appendix B Interview Questions



# Questionnaire

ID: \_\_\_\_\_

Interviewer's Initials: \_\_\_\_\_

Date &amp; Time: \_\_\_\_\_

## Visitor Interviews – Closed-Ended (Chapter 4)

10-15 minutes. Are you an Australian? If yes, provide info sheet and obtain signature.

### Section One

This section is designed to understand public attitudes about feeding live prey to zoo animals.

1. Do you agree with insects being fed to lizards? Y/N In or out of public view? Both?
2. Do you agree with insects being fed to meerkats? Y/N In or out of public view? Both?
3. Would you agree to live fish being fed to seals or penguins? Y/N In or out of public view? Both?
4. Would you agree to a live rabbit being fed to a big cat? Y/N In or out of public view? Both?
5. Would you agree to a dead rabbit being fed to a Tasmanian devil? Y/N In or out of public view? Both?
6. What animals would you like to see eating prepared food?  
Live prey?
7. Is there an animal you would refuse to watch if it were eating prepared food?  
Live prey?
8. Do you watch nature programming on TV? Y/N What program do you watch most frequently?

### Section Two

The purpose of this section is to gather demographic material.

1. Would you agree with the statement: I have gained a greater appreciation for animals after my visit to the zoo? Y/N
2. Is the person who suggested your visit over 18? Y/N
3. Which of the zoo animal(s) did you like the most?
4. Have you visited before? Y/N How long do you plan to visit?  
Would you re-visit? Y/N How often do you visit similar facilities each year?
5. What messages should zoos promote?  
What form should those messages take?  
How should they be expressed to the public?
6. Which part of Australia are you from?  
Has your family always lived there?  
May I have your postcode?
7. Is that an urban area or rural area?
8. Do you own pets? Y/N

9. Are you affiliated with any environmental or conservation groups? **Y/N**  
10. What is your profession? (e.g. teacher, academic, self employed....)  
11. Age group? 18-20 20s 30s 40s 50s 60+  
12. Sex? **M/F**

# Questionnaire

## Administrator and Staff Interviews (Chapter 5)

Completion time approximately 30-45 minutes.

1. Interviews will be tape recorded to allow for accurate transcription. Depending upon answers, it is possible that not all questions will be asked.
2. These questions are not asked in order for judgements to be made by the researcher. Rather it is hoped that the information provided will allow for greater understanding of public animals feedings.

### Section One

This section is intended to collect background information about feeding sessions to compare with the visitors' motivation for attending such sessions.

1. Does your facility feed animals when the public is present? Would you consider the public feedings to be formal or informal? Would you consider the program to be interactive for the visitor? What makes it so? What does the program cost to administer?
2. Which animals are fed? What do the animals eat? Does this differ from what is fed to the animals when the area is closed to the public? Why?
3. Are there animals that are not fed in public? Which animals and why not?
4. How did you decide what animal(s) to feed?
5. When are feeding sessions scheduled? How long? How often? How many per day, week, month?
6. Why were those times and frequencies chosen? Would you increase or decrease that number?
7. Do you encourage visitors to attend the feeding sessions? How?
8. Who feeds the animals during public feeding sessions? What presentation skills do presenters have? How were they chosen?
9. How does the presenter explain what is occurring to the public? Has this explanation been scripted?
10. What are your goals for having public feeding sessions? Are those goals being met by your current programs?

11. Can you describe the interactions that you have observed during the feeding sessions?
  - Visitor to visitor
  - Visitor to keeper
  - Visitor to animal
  - Keeper to animal
  - Animal to animal
12. Is any information collected on the outcome of the program? May I have access to that information?
13. If you had time, funding, resources, etc., what knowledge would be most useful to you in developing your public feeding programs and how would you obtain that knowledge?
14. What has surprised you the most since you started feeding animals in public?
15. What do you expect visitors to take away from the feeding? From the zoo visit?

### Section Two

This section is a series of questions used to give insight into the attitudes and beliefs staff and administration have in regard to which animals are fed and what those animals eat.

1. Do you agree with live insects being fed to lizards? In or out of public view?
2. Do you agree with live insects being fed to meerkats? In or out of public view?
3. Would you agree to live fish being fed to seals or penguins? In or out of public view?
4. Would you agree to a live rabbit being fed to a big cat? In or out of public view?
5. Would you agree to a dead rabbit being fed to a Tasmanian Devil? In or out of public view?
6. What animal would you like to see eating? Live prey?
7. Is there an animal you would refuse to see eating? Live prey?
8. Do you watch nature shows on TV? What are the names of the nature shows that you watch?

Section Three

The purpose of this section is primarily to gather demographic material.

1. In your opinion what is the main reason a visitor would come to your facility?  
In your opinion what is the main reason a visitor would attend an animal-feeding program?
2. In your opinion what type and age of visitor suggests a visit to the zoo?
3. In your opinion what messages should zoos promote? How should those messages be conveyed?
4. How frequently (once per day, once per week, 5-10 times per week) do you interact directly with visitors?
5. How long have you worked here? Have you worked at other zoos?
6. What is your formal job title?
7. Are you affiliated with any environmental or conservation groups?
8. What animal(s) here do you like the most? Do you take care of any of the animals here? Which one(s)?
9. Do you own pets?
10. What is your age group? Between 18-20 20s 30s 40s 50s 60+
11. Sex M or F
12. Is there anything else you would like to add?

# Questionnaire

ID: \_\_\_\_\_

Interviewer's Initials: \_\_\_\_\_

Date &amp; Time: \_\_\_\_\_

## Visitor Interviews – Open-Ended (Chapter 5)

Completion time approximately 10-15 minutes.

**Did you attend an animal feeding program today? Are you an Australian? Are you willing to participate in a follow-up phone interview (5-10 added mins)?**

All answers must be yes before proceeding. Provide info sheet and obtain signature and phone details. Follow-up will occur approx. 4-6 weeks from this interview. Interviews will be tape recorded to allow for accurate transcription. Depending upon answers, it is possible that not all questions will be asked.

### Section One

This section is intended to collect information about your experiences at one of the zoo's feeding programs.

1. What was your main reason for coming to the zoo?  
Why today?  
And your reason for attending an animal feeding program?
2. Which program(s) did you attend?  
What animal was being fed?  
What was the animal eating?  
Would you attend other programs if they were offered? For which animals?
3. What expectations did you have about the program?  
How did you first learn about the session?
4. Did you stay for the entire program? Why or why not?  
Was the time when the animal was fed a good time for you to go see the animal?  
Was the session too short? Too long? About right?
5. On a scale of 1 to 5 with five being the most and one being the least, how natural was feeding?
6. How did the animals appear?
7. What do you remember most about the program?  
Which part of the feeding did you like the best?
8. Would you consider the program to be interactive? What made it interactive?  
Did you interact with:  
Other visitors?  
The animals?  
Did you visit with staff after the program?

### Section Two

This section is intended to collect information about what you may have learned during the feeding program.

1. What do you remember most about the program?
2. What did you learn about the characteristics, skills, and abilities of the animals?  
Can you give me an example?
3. What did you learn about the type of food require by this type of animal?
4. What did you learn about the animal's natural habitat?
5. What surprised you most during the feeding?

### Section Three

The purpose of this section is to gather demographic material.

1. Would you agree with the statement: I have gained a greater appreciation for animals after my visit to the zoo?
2. Is the person who suggested your visit over 18?
3. Which of the zoo animal(s) did you like the most?
4. Have you visited before?  
How long do you plan to visit?  
Would you re-visit?  
How often do you visit similar facilities each year?
5. What messages should zoos promote?  
What form should those messages take?  
How should they be expressed to the public?
6. Which part of Australia are you from?  
Has your family always lived there?  
May I have your postcode?  
Is that an urban area or rural area?
7. Do you own pets?
8. Are you affiliated with any environmental or conservation groups?
9. What is your profession? (e.g., teacher, academic, self employed....)
10. Age group?  
Between 18-20      20s      30s      40s      50s      60+
11. Sex? M or F

# Questionnaire

ID: \_\_\_\_\_

Interviewer's Initials: \_\_\_\_\_

Date & Time: \_\_\_\_\_

## Visitor Follow-up Interviews – Open-Ended (Chapter 5)

Completion time approximately 10-15 minutes.

### Visitor Recall – Follow-up Survey

These questions are designed to give an indication of what you learned during your visit to the zoo. These questions should be familiar as they were asked during the original interview.

1. You attended an animal-feeding program during your visit.  
What animal was being fed?  
What was the animal eating?
2. Have you thought about the program since?
3. What do you remember most about the program?
4. What did you learn about the characteristics, skills, and abilities of the animals?
5. What did you learn about the type of food required by this type of animal?
6. What did you learn about the animal's natural habitat?
7. Which part of the program did you like the best?
8. Would you like to add anything else?

## Appendix C Transcripts of Interviews

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For all transcripts 'I' is the interviewer and 'R' is the respondent.

## Staff Interview

**I:** The first section of questions that I would like to ask you, is just to collect some background information regarding any feeding sessions that you have at this facility and compare those eventually with visitor motivation for attending those sessions. Keep in mind that whenever I mention feeding session I am not talking about any supplemental feeding you do with your wildlife, I am talking only those questions where the public is encouraged or invited to come and watch the animals being fed - otherwise it will sound like I am asking you if you ever feed the animals at all. I think they are ... To start off with, does your facility feed animals when the public is present?

**R:** Yes.

**I:** Would you consider the public feedings to be an informal or a formal experience?

**R:** Both - depending on the person's interests. If we are talking about the bird feeds we have here - we have all ages of people naturally, ... from the general public. The little children love it because they can get up close to the animals, right up through to people who are generally interested in birds and are supportive, for want of a better phrase, 'birdos'. It is an opportunity for them to actually talk to a ranger about the bird life in here - not also for the bird feeding itself, so it's a good communication thing. And also lets us portray to the public - we tell the public that even though we are feeding the birds here they are not totally reliant on the bird feed - that constitutes about 20%, or not even that, of their regular feed, and there is a lot of bird feeding which goes on in this region where people feed magpies and things like that. So it's a good opportunity say in terms of people who are interested in - who are doing the magpie feeding or are thinking about feeding birds that they have a responsibility that the birds to rely on them just like they have a pet just like a cat or a dog, that they should take responsibility to feed these things regularly, and if they go away on holidays, to look after these things, and also be aware that birds attract predators. So it gives them some insight into that, although - throughout the reserve we have signs up saying, 'Do not feed the animals', you know feed the emus et cetera. So it is not a thing to - we do not have it to encourage people to feed the animals. We actually have it as a way to explain to them, also why we don't feed the animals here.

**I: Right. What aspects would make that presentation formal?**

**R:** Well you get specialized groups coming along here - you get all sorts of animal type people interested in things like that, so. Um, yeah, you sort of have to adjust your spiel to meet their needs - which are completely different to mum and dad with the kids and they just want to feed the birds. That is what I mean by formal as such.

**I: Right. Would you consider the program to be interactive for the visitor?**

**R:** Yes it is, yes. We give the people little cups and the birds can land on those cups and they feed out of the cups. It is a great thrill for them too.

**I: Right. What does the program cost to administer?**

**R:** I don't know the exact cost. It is probably a couple cups full of different seed each day. The guy you're going to interview next would know - he is the wildlife officer - he buys it. I don't think it would be - it certainly would not be exceptional.

**I: So the cost of including the food itself and then any time that the staff do their activity?**

R: Yes. We just feed the birds during the weekdays between say 2.30 we starting feeding them and it finishes by 2.45. On weekends we use it as a tool to - here's another interactive thing - a tool to encourage people, once we feed the birds on the weekend we also says to them well, I am having a walk to the wetlands if anybody wants to come for a walk through the wetlands we can talk about the birds and things down there. So, it's a thing we are - at time-wise for the staff I don't think it is a major concern.

**I: Right. And which animals is that? You've already mentioned birds.**

R: Yeah. We feed pelicans - that's about it for the general public.

**I: And what do those animals eat?**

R: The birds? The birds eat sunflower seed, corn, wheat, we put out soaked Meaty Bites for the magpies and we put out millet for the red tails and the little wrens, and also apple for things like bowerbirds and things like that. We try and have as wide a range of birds as possible by using the different types of food.

**I: Right. Now do you also supplement all your wildlife's food sources - for instance the kangaroos, do they receive supplements also?**

R: No. The whole reserve is six and a half thousand hectares. The animal closure is about 140 hectares so it is a very small part. Most of the reserve has free range animals - our local species of eastern gray kangaroos, wallabies, emus et cetera, all pretty much look after themselves - we don't supplement their feed at all. The only ones we do supplement their feed when necessary are the animals in the enclosures which entails probably - probably 60 per cent of the bird life in the enclosures and the animals - like we have our animal house where we keep rare and endangered species and so forth, so we supplement their feed as well.

**I: So the food that the birds that are kept in enclosures, that food that is fed during the public programs, is that different from the food they would eat at any other time?**

R: Slightly different yeah. Because the birds that turn up at the bird feed also help themselves to the food that we give the other birds in the wetlands - we give them things like laying pellets and things like that which the birds, the other cockatoos, might not help themselves to. Basically the cockatoos are scavengers - they eat everything. But, as I say, they tend to hang around because of that - because we do feed the birds in the wetlands, but that's only the cockatoos. Generally you find that the rosellas that turn up at the bird feed don't go looking for the other food. The cockatoos tend to take over any other food that's left around.

**I: So the birds in the enclosures would be receiving laying pellets which would be different from the fruit and the seeds and the other things that you give during the public feeding?**

R: Yeah. Bearing in mind too that and depending on what species of bird - say the wood duck. The wood duck goes and eats lots of grasses and things as well, so it is supplementing their feed but they do have access to other areas. The reason we do have the birds in the wildlife in the wetlands is because we basically have a lot of breeding pairs, because we have a lot of rare and endangered species here such as the magpie geese. So we do tend to clip, clip their wings so that the breeding pairs stay so we can get more birds basically.

**I: For those animals that you do feed, and I'm talking in general now, at any point in time, are there animals which you don't allow the public to see feeding?**

R: Er - no. Everything is quite visible. We have feeding pens for say things like the red kangaroos, and then we have the public walk up there and they can quite

easily see that they are being fed. And there's always the question "why are you feeding these animals?" So that's also another interactive type thing. We can explain to them that they are in captivity and the reason we have red kangaroos is because they are different to our local species who are free range. So it's a ...

**I: Right. How do you decide which animals to feed during a public feeding program like your bird-feeding program? How do you decide the birds should be fed instead of a big public program on feeding the red kangaroos, or -?**

R: Er, I don't know - tradition I suppose. I don't know why. There's been a lot of talk about that, to make - well basically the reason you feed animals is to make them visible to the public - okay. Now say with the red kangaroos, they are visible to the public anyway. So there's really no need to do that.

**I: Great. When are feeding sessions scheduled - the public program?**

R: Well it's 2.30 every day, 365 days a year.

**I: Yep. And how long does that last approximately?**

R: About 15 minutes.

**I: Great. And why were those times and frequencies chosen?**

R: Er, to mesh in with the rest of our duties. We find that if we have - on weekends especially, we have a range of guided activities and every day we have like a one o'clock koala walk and, depending on the season, we have another activity in the morning or the afternoon. It could be anything from platypus walks to history walks. So it just slots in with our programs. And also with the animal enclosures, keeping people in one area, we find that if we have the koala walk at one o'clock people could have a better look than two o'clock or thereabouts, the people have time to gather themselves to go to the bird feed areas, which isn't too far away. So we keep the public in that area. It is one of the things we - that is quite important in the nature reserve, is controlling people, controlling crowd areas.

**I: Right. Would you increase or decrease the number or frequency of the feed programs?**

R: I would certainly increase them for sure.

**I: And do you encourage the visitors to attend the feeding sessions?**

R: Yes, we advertise by word of mouth and also at the information center, we have brochures which advertise it as well, and on our maps, so they have got plenty of notice.

**I: Great. And who feeds the animals during the feeding sessions?**

R: Er, the wildlife person who generally does the daily feedings every day and rangers do as well, especially on weekends when there is a lot of the public around.

**I: What is the difference between the wildlife person you mentioned and a ranger?**

R: Well a wildlife person is basically - their core duty is to look after the wildlife. They count koalas, they feed the animals, look after the animals and the enclosures et cetera. Rangers have a vast range of duties from interpretation walks to land management to looking after reserves and all those aspects - looking after interpretation walks - the list goes on and on.

**I: Right. What presentation skills would the person doing the feeding program have?**

R: Er - are you talking about the wildlife person or the ranger?

**I: Both.**

R: Both - what presentation skills? They are the skills that you get up through basic experience and the odd course on dealing with them or talking to the general public.

**I: And are any courses or training provided at here in presentation?**

R: We have had one or two over the years, yes. But basically it's you learn as you go along. The new ranger is sort of thrown in the deep end so to speak. They come with us on a couple of walks and then they are told how to - they get ideas from what they see from us, and then they learn themselves. What we find is beneficial to the public is that, say everybody did a course on interpretation, everybody would sound a little the same, whereas with the different rangers you always get a different aspect, so it makes each ranger go with - you know you look at something through different eyes, which is always handy.

**I: Great. I just want to get all that down. Now how would they have been chosen? How do you designate who does the bird-feeding program?**

R: Oh, you are just rostered on and that's all there is to it basically. During - just getting back to rangers - we all sort of specialize I suppose at least in different aspects of walks. Like I've got a natural liking for history so I tend to do a lot of the history walks around the place because I sort of know it all. Some people prefer flowers and some people prefer animals. So we sort of try and keep things in our specialized areas, but sure everybody goes right over the whole lot, so everybody has got a general idea of everything that happens on the reserve.

**I: And how does the presenter explain what is occurring to the public?**

R: How - we stand there and talk quite loudly basically and answer any questions, introduce yourself.

**I: Uh, uh. And has the talk, would it have been scripted?**

R: No, no.

**I: What are the goals in having a public feeding session?**

R: Well as I said before, it gives you the opportunity for people to talk to the rangers. A lot of people arrive at different times or they don't read their itineraries properly and they might miss out on a koala walk or something where they would have had the opportunity to talk to a ranger. So it does give them the opportunity. We find it essential because it gives the public - they probably don't realize it at the time, but we can give them a lot of information about the reserve which they didn't realize they needed until you started talking to them about things, and they are always quite pleased to have that feedback.

**I: Uh, uh. And do you think those goals are being met by the current programs?**

R: Er, the fact that there could be more animal feeding - I would like to see more of that.

**I: Right. Now I would like to ask a series of questions describing the interactions that you might have observed yourself when you've either done the feeding yourself or passed by while the feeding is occurring. The first interaction I would like to ask you about is visitor to visitor. Have you noticed visitors interacting during feeding?**

R: Oh yes, yes.

**I: And how would they interact? Can you give me an example?**

R: Well they just start talking about birds. They always say "we've got one of those at home" or "isn't she pretty" and "what about this one" and yeah it is an interactive thing - also especially with children as well. They share the feed buckets and things so families start interacting then too. They watch other kids holding the feed buckets properly and things like that, so yes it does get them together.

**I: Yeah. And how about visitor to ranger or wildlife person?**

R: Yes. As I say it does give them the opportunity - it doesn't matter how many people are there, there's always somebody who wants to come up and tell you

about the birds they have at their place or something like that. They just want to relate to you in some way.

**I: Yes. And what about visitor to animal?**

R: Er, well that varies. Er, depending - well, we have a lot of overseas visitors here too so there is a wide reaction from absolute adoration to sheer fright that a bird lands on them. So all of the above I suppose.

**I: So a bird could actually come up and land -**

R: Oh they do. They land on people's heads and things. So some people will actually drop the feed bucket and run and -

**I: (Laughs)**

R: And other people just love it. Everybody's got their cameras out and -

**I: What about interaction between the ranger, or the wildlife person and the animal or animals?**

R: Yeah. The animals know when we are coming. Um, the crimson rosellas will wait in the trees and when we walk through the gate with the feed bucket they will fly back onto the feeding, which everybody loves because you have this swarm of birds flying over their heads. So they're ready, yeah they are quite relaxed, and actually not only just the birds, but it seems just walking through the wetlands that the animals know you. I don't know whether they pick the uniform or whatever, but straight away they tend to know that you are one of the people that are here, they act differently - it's funny.

**I: Yeah. And how about between the animals themselves?**

R: Um - yes there's always the pecking order - always, always the pecking order, it doesn't matter what species of animal.

**I: Is it within species or between species?**

R: Both.

**I: Both. And is there any information collected on the outcome of the program?**

R: Yes, we have a regular thing like that with the bird feed we fill in how many people were there, what different types of birds and things.

**I: Uh, uh. And is it possible for me to get access to some of that information?**

R: I don't see why not.

**I: Okay. I'll go back to that in a bit. If you had let's say additional time, funding, resources et cetera, what knowledge would be most useful in further developing the feeding programs?**

R: Oh - well we have been sort of looking - we look at other areas, other reserves, wildlife parks and what not, I mean we sort of get ideas from them and try and see how they would work here at Here. For instance we would love to get a platypus feeding area going. At the moment we do do platypus - we do platypus walks and people see platypus. But to get a really good experience, it has been kicked around before and we were getting some positive feedback. It wouldn't cost all that much money to do say platypus feeding - that would be wonderful for the people to see.

**I: So when you are obtaining information about knowledge to use to design those programs for the future, where do you go to obtain that knowledge?**

R: Well we - well people come back from - well they visit all different parks around the world for that matter, and they sort of get different ideas. We talked about wildlife people, if that would be possible to do it, it also depends on the funding as well.

**I: Right.**

R: So that's about it.

**I: What about facilities like for instance zoos, would you seek information from zoo literature or -?**

R: There's a lot of that going on because we have our captive animals, so therefore we are very highly joined in with zoos. We also do animal trading if you like and also purchase animals from zoos. So you have to keep up with - you know, the best ways to look after animals in captivity.

**I: What surprised you the most since you started feeding the animals in this public program?**

R: Er - nothing has really surprised me, no. I don't know what -

**I: What do you expect the visitors to take away from the feeding program experience?**

R: Just a sense of having a hands on experience, being more involved in it, getting closer to the animals.

**I: And from the park visit in general?**

R: Oh a sense of - hopefully, from relaxation to exhilaration.

**I: Okay. We are on to the second section and this section tends to go very quick. It is simply yes or no sort of question and answer on - to give me insight into the attitudes and beliefs of yourself and other staff in regard to which animals can be fed when the public is present and what those animals eat. Now many of the animals I am going to mention you may not have here, but in that case just in general what would your opinion be as far as seeing these animals fed and what they should eat. To begin, would you agree with live insects being fed to lizards?**

R: Yes.

**I: In or out of the public view?**

R: In - we do that actually.

**I: Do you agree with live insects being fed to meerkats?**

R: I don't know about meerkats.

**I: Okay - so unsure, or -?**

R: Er yeah.

**I: In or out of public view?**

R: Er yeah - I'm not really sure.

**I: Okay. Would you agree with live fish being fed to seals or penguins?**

R: No, not live fish.

**I: In or out of public view?**

R: Well you certainly can feed them live fish out of public view.

**I: Would you agree to a live rabbit being fed to a big cat?**

R: No, I don't think so.

**I: Okay. Would it a difference if they in or out of public view?**

R: Er - yes, yes.

**I: So if they are out of public view would be -?**

R: If it was well - the only reason I would think of that you would be giving a cat a live rabbit was if it was beneficial to the cat. So in that case whatever is beneficial to the cat I would certainly condone.

**I: Yep. Would you agree to a dead rabbit being fed to a Tasmanian devil?**

R: Yeah, I reckon that would be great.

**I: In or out of public view?**

R: In public view.

**I: What animal would you like to see eating food in general?**

R: What animal would I like to see eating food in general - I don't understand the question.

**I: Is there a particular animal that you would be keen to watch eating pellets or eating chopped up meat?**

R: Oh I see. I would like to see the platypus - they eat worms and things. I would like to see that.

**I: And the food you would like them to see - live prey?**

R: As far as worms being a live prey - yes.

**I: Is there an animal if it were offered, that you could see it eating, is there an animal you would refuse to go and watch?**

R: Refuse to go and watch?

**I: Uh, uh.**

R: I can't think of anything, no.

**I: Okay. How about anything if it involves live prey?**

R: No, I can't think of anything.

**I: Do you watch nature shows on television?**

R: Oh yes.

**I: And do you know some of the names of the nature shows that you might watch frequently?**

R: Oh I watch the National Geographic on Foxtel basically, and Discovery program.

**I: Uh, uh. Okay that's it. This third section is primarily to gather demographic material, although I will be asking about your opinion. Please allow me to remind you that these are your personal opinions - you don't need to worry about what you feel is best for the visitor. In your opinion what is the main reason a visitor would come to this facility?**

R: To enjoy nature, enjoy the space, enjoy - a lot of people come here actually with overseas visitors so they can see Australian native animals.

**I: Yep. In your opinion what is the main reason a visitor would attend the animal feeding programs?**

R: For that closeness to animals.

**I: And in your opinion what type and age of visitors suggest a visit to the zoo?**

R: The zoo?

**I: To the park - the nature reserve.**

R: Oh, well what age and type. If we are talking local people, it would be people in their early 30s with some children.

**I: And would it be the children or the adults that would recommend the visit?**

R: Er I think probably both. There's both - kids want to come back and the adults want to show - teach their kids things.

**I: How about the visitor who doesn't come locally?**

R: What would they be like?

**I: Yes. Who would suggest a visit to them?**

R: Er -

**I: What I am saying is those people who travel quite some distance to come here - who would in or outside that group would have suggested that visit?**

R: Oh I see. Well, it's word of mouth. One of the greatest advertising ploys you can have is basically word of mouth, so I would suggest that people they knew probably around about their age with slightly similar interest - which I suppose is getting back to the mum and the dad and the 2.1 kids or whatever.

**I: In your opinion what messages should the reserve promote?**

R: Well, looking after the environment, appreciating the animals.

**I: And how should those messages be conveyed?**

R: Er - basically through ranger guided activities, whether it be during the animal feed or on a ranger guided walk or even just talking to people at the visitor information center.

**I: And how often - once per day per week, five to ten times week, more often per day - do you interact directly with visitors?**

R: Well practically every day.

**I: More than once a day or just -?**

R: Well it depends. Sometimes we spend most of the day interacting with visitors - other days not nearly so much. Basically we work a 10 day shift so in that 10 day shift we have a weekend on where we totally visitor interact at the visitor information center or on walks, so that's 100 per cent of that time. During the week - again it depends on how many walks we have. Some days we will have probably six hours - you could be on walks, and on other days you only run into the occasional visitor. So all in all a lot of our time would be spent with visitor interaction.

**I: And how long have you worked here?**

R: I've been here just over four years.

**I: Have you worked at other reserves or parks?**

R: Yes, I have been rangers for about 18 years, and I started off on horseback actually - looking after areas, take off with my dogs and horses. Then I went to looking after government horse paddocks. We had a lot of horse paddock carer groups so we are doing a lot of land care work and so forth. And then I sort of came here.

**I: And what is your formal job title?**

R: Ranger.

**I: And are you affiliated personally with any other environment or conservation groups?**

R: No.

**I: What animal here do you like the most?**

R: (Laughs). Well I always enjoy the koalas and the swamp wallabies.

**I: And do you personally take care of any of these animals?**

R: Not as such, no.

**I: And do you have pets?**

R: No, no.

**I: And then - this is the most personal question of all - what is your age group, 18-20, 20s, 30s, 40s or 50s?**

R: Forties.

**I: And is there anything else you would like to add?**

R: No, nothing that springs to mind.

**I: Terrific.**

**End of Interview**

## Visitor Interview

### At the Zoo

**I: What was your main reason for coming to the zoo today?**

R: Just to see what it's like because I'm a visitor to the region.

**I: And why today?**

R: Because my sister and her children were over on holidays.

**I: And what was your reason for attending the animal feeding program?**

R: Just to see a lot of them in one space at the same time I suppose and to see how they react.

**I: And you attended the penguin feeding?**

R: Uh, uh.

**I: Do you plan to attend any other feedings today?**

R: Yeah if we are here - if we're here at the time.

**I: And what was the animal eating?**

R: Fish I think - I couldn't really see from here.

**I: Would you attend some more programs if they were offered at a convenient time?**

R: Um, I'm not sure what you mean.

**I: Would you attend similar feeding programs if they were offered at -**

R: Here?

**I: Uh, uh.**

R: Today?

**I: Yes.**

R: Yeah probably.

**I: And for which animals?**

R: Whatever I was closest to I suppose. I don't know, it doesn't really matter.

**I: Did you have any expectations about the program?**

R: No. I didn't expect to see them all standing there in a row, but then I suppose that's just habit.

**I: And how did you learn about the feeding session?**

R: By the information brochure.

**I: Did you stay for the entire program?**

R: Yes.

**I: And what kept you for the entire program?**

R: The tree, and the shade.

**I: Was the time when the animals were fed a good time for you?**

R: Yep.

**I: Was the session too short, too long, just about right?**

R: Um, probably about right, yeah.

**I: On a scale of one to five, five being the most and one being the least, how natural was the feeding program?**

R: Um, being out of a bucket it's not really natural I suppose, so it was unnatural, but it was very fair (laughs) - they all had enough and then they walked away sort of thing, so yeah.

**I: On that scale of one to five -?**

R: Sorry - how natural was it? Well one I suppose, the least, yeah.

**I: How did the animals appear to you?**

R: Hungry.

**I: What do you remember most about the program?**

R: I remember the paws of the last one I saw and thinking "is that a baby or is that just a disabled penguin"? (Laughs)

**I: Which part of the animal feeding did you like the best?**

R: Um, seeing that it was sharing it out - like evenly between them all I suppose, and that they were hungry I suppose was another good thing.

**I: Would you consider the program to have been interactive?**

R: No.

**I: And did you interact with other visitors?**

R: Yes - I tried to. (Laughs)

**I: How about the animals?**

R: Well one was talking to me but I don't think he really understood what I said back.

(Laughter)

**I: And did you visit with the staff after the program?**

R: Well yes, I asked a couple of questions, yes.

**I: Okay, we are on to the second section. This is a rather short section. It's not intended to test, recall information but it is intended to gain an insight into what you learned during the feeding program.**

R: Go ahead, you're right.

**I: What do you remember most about the program?**

R: Probably them all standing there waiting for their food.

**I: What did you learn about the characteristics, skills and abilities of the animals?**

R: I learnt that they all have their little boxes that they go to. I learnt that they territorial when they come back after they have their feeding. I learnt that they can jump. I learnt that they come to a call. I learnt that they eat more than one fish and some of them have like little partners, and that's about it that I can think of right now.

**I: What did you learn about the type of food required by this animal?**

R: The only thing I learnt was that they ate these long fish that the guide gave them.

**I: What did you learn about the animals' natural habitat.**

R: Er, I learnt that they like to have little burrow things but these are man-made, not natural burrows, and obviously water.

**I: Yes. What surprised you mostly in the feeding?**

R: Er, that they had the man-made shelters I suppose. I thought they'd all be in like natural habitat burrows - like down at Philip Island in Victoria.

**I: Okay. This last section is designed primarily to gather demographic material, although some of the questions are opinion oriented. Would you agree with the statement, "I have gained a greater appreciation for animals after my visit to the zoo"?**

R: Er yes.

**I: Is the person who suggested your visit over the age of 18?**

R: Yes.

**I: Which of the zoo animals that you've seen so far do you like the most?**

R: Er, (long pause - not timed) probably the monkeys, yes. No, I like the penguins actually.

**I: Have you been to this facility before?**

R: No, never.

- I: Okay. How long do you plan to visit today?**  
**R:** Only for a couple of hours at the max, yep.
- I: Would you revisit?**  
**R:** Er, probably not.
- I: And how often do you visit similar facilities each year?**  
**R:** Not very often.
- I: So once a year, maybe, once every two years?**  
**R:** Oh, yes, maybe once every two to three years, yep -if that.
- I: This next is a series of questions about zoo messages - which messages they should be promoting and how those messages should be promoted. So I will simply ask - what messages do you think the zoo should promote?**  
**R:** To look after the environment and the animals within it I suppose.
- I: And what form should those messages take?**  
**R:** Er, I think they probably could have more people out around the zoo, like they do have in amusement parks - that talk to people as they walk past rather than just have a sign because people don't read.
- I: And which part of Australia are you from:**  
**R:** I'm from New South Wales, Wollongong.
- I: Has your family always lived there?**  
**R:** No.
- I: May I have your postcode?**  
**R:** My postcode is 2526.
- I: Is that an urban or rural area:**  
**R:** Suburban, yeah.
- I: And do you own pets?**  
**R:** Pets yes - a dog, yes.
- I: Are you affiliated with any environmental or conservation group?**  
**R:** No.
- I: And may I have your profession please?**  
**R:** Computer analyst.
- I: Now this is the last and most sensitive question today. I need your age group.**  
**R:** (Laughter) How did I know you were going to say that?
- I: Eighteen, 20, 30, 40, 50?**  
**R:** And this is for you now - what do you think? (Laughter) It is the 40s thanks.

**End of interview**

**Follow-up**

**I:** These questions are designed to give an indication of what you've learned during your visit to the zoo. The questions should be familiar as they were asked during the original interview. So when you visited the zoo you attended an animal feeding program during your visit. Do you remember what animal was being fed?

**R:** Penguins.

**I:** And what were the animals eating?

**R:** Fish.

**I:** Have you thought about the experience since?

**R:** Not really.

**I:** What do you remember most about the program?

**R:** Uh, I don't know, probably that the man didn't talk to the crowd.

**I:** And what did you learn about the characteristics, skills and abilities of the animals?

**R:** I remember him saying a little bit towards the end, but I know they like to have little houses and they're in little groups or they pair off or whatever. That's about all I can remember.

**I:** And what did you learn about the type of food required by this animal?

**R:** Um, I don't know. I just remember that they ate fish.

**I:** And what did you learn about the animals' natural habitat?

**R:** Well obviously they've got to have something reasonably low to the ground, because they don't have very long legs. And that they need water and protection I suppose.

**I:** And which part of the program did you like the best?

**R:** Just watching them all walking around I suppose - not particularly the feeding bit because they are all sort of coming up at the same time and it's probably not a natural situation.

**I:** Uh, uh. And during your visit to the zoo, in general, which animals did you like the most?

**R:** Probably the Capuchin monkeys.

**I:** And that really concludes the formal questions that I have to ask you today. Before I say goodbye is there anything else you'd like to add about your experience at the zoo or during the feeding program?

**R:** Um, no. I think it is a great idea that the owners have and I suppose anything in this small area is always looked at as if it's being cruel, but then I suppose people have dogs and cats and birds in small areas and it doesn't mean that they are being cruel to them. So if they were looked after and they're given things to do, if they need it, that's their natural thing to go searching and hunting and things like that I suppose that that is a good thing. So as long as they're getting the care that they need, they're there for people to see and for breeding programs, and I suppose in some instances to fund the breeding programs they have to let the public in to get some money to do that. So, it's sort of a catch 22 - if you want to see them you've got to see them in captivity, so you have got to accept what you see once you get there. You've got to sort of compromise on both sides I suppose. Other than yet, yes I quite like it. It was good and it was all nice and clean or whatever.

**I:** Terrific. Well thank you very much for your participation both during your visit and today.

**End of interview**