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Exploring the implications of cultural diversity for environmental learning at an African aquarium

Judy Brenda Mann

Master of Science

Bachelor of Business Administration

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Business School (Tourism Cluster)

Abstract

Zoos and aquariums, which are visited by over 700 million people each year, can play a vital role in exposing and sensitising visitors about the importance of environmental conservation and encourage them to engage in environmentally responsible behaviours after their visit. To attract visitors, zoos and aquariums offer a range of experiences that focus on the viewing of live animals. These may include animal presentations, personal interactions between staff and visitors, opportunities to physically interact with the animals and, most commonly, the use of interpretive signage. Most zoo and aquarium experiences are aimed at increasing visitors' awareness of, interest in and concern for environmental issues. To improve the design of visitor experiences, research is needed to evaluate the impact of a visit on visitor environmental learning outcomes, which are a major part of the zoo and aquarium raison d'etre.

In this regard, literature indicates that little work has been undertaken to explore the impact that culture (and in the case of multicultural audiences, cultural diversity) has on visitors' zoo and aquarium conservation learning experiences. Such information is of particular relevance to uShaka Sea World, located in the multicultural city of Durban, South Africa, where educational experiences have traditionally been modelled on Western best-practice without consideration of the increasing numbers of visitors from diverse cultural backgrounds. Accordingly, this thesis aims to build a better understanding of the needs of South African visitors to uShaka; to investigate the influence of culture on their on-site experiences and conservation learning; and to use such information to inform the design of culturally inclusive environmental learning experiences.

This research involved the collection of primarily quantitative data from 748 visitors, representative of three cultural groups. Pre- and post-visit questionnaires were designed to identify relevant demographic, psychographic and cultural characteristics of visitors, as well as to provide information on how visitors experienced the site, and the impact of the visit on environmental learning measured immediately after the visit. The extent and nature of the impact of cultural group on visitor learning was assessed. The focus on cultural differences necessitated an extensive assessment of cultural equivalence of meaning, and adjustment for culture-specific response styles.

Comparisons between the three cultural groups revealed differences on a range of learning outcomes, which could not be explained by confounding with other demographic variables,

or by culture-specific response styles. Cultural group was, however, a relatively weak predictor of learning outcomes. Psychographic constructs, in particular motivational variables and connection to nature, were much stronger predictors of learning. The results of this study suggest that, while culture does have an impact on environmental learning, psychographic constructs explain much of this effect, as well as explaining a significant amount of additional variance.

The findings of this study have important theoretical, methodological and practical implications for researchers interested in the influence of cultural background on environmental learning. The research describes the first analysis of the differences and similarities in visitor characteristics, experiences and environmental learning of three South African cultural groups. The study addressed the complex role of nature connectedness in environmental learning amongst multiple cultures. It has also provided insights regarding the communication of conservation messages and the use of message recall as a measure of environmental learning. By providing evidence of the importance of addressing cultural equivalence of meaning and culture-specific response styles in multicultural research, the study has contributed methodologically to the design of more culturally sensitive instruments by providing future researchers with suggestions to manage the methodological challenges of multicultural research. Implications for the design of culturally responsive environmental learning activities are discussed and recommendations for future research are presented.

Declaration by author

This thesis is composed of my original work, and contains no material previously published or written by another person except where due reference has been made in the text. I have clearly stated the contribution by others to jointly-authored works that I have included in my thesis.

I have clearly stated the contribution of others to my thesis as a whole, including statistical assistance, survey design, data analysis, significant technical procedures, professional editorial advice, and any other original research work used or reported in my thesis. The content of my thesis is the result of work I have carried out since the commencement of my research higher degree candidature and does not include a substantial part of work that has been submitted to qualify for the award of any other degree or diploma in any university or other tertiary institution. I have clearly stated which parts of my thesis, if any, have been submitted to qualify for another award.

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Publications during candidature

Book chapter:

Mann, J.B. & Vernon, C.L. 2013. Using aquariums and their visitor experiences to promote ecotourism goals: issues and best practices. In: *International Handbook on Ecotourism*. Eds: Ballantyne, R. & Packer, J. Edward Elgar, Glos, 452-463.

Academic publication:

Mann-Lang, J. B., Ballantyne, R. & Packer, J. (2016): Does more education mean less fun? A comparison of two animal presentations. *International Zoo Yearbook* 50: 155–164.

Conference abstracts:

Mann, J.B., Ballantyne, R. & Packer, J. (2015, June). *Can we eat it – Exploring the cultural challenges in marine ecotourism in Africa.* Paper presented at the Best EN Think Tank XV, Kruger National Park, South Africa.

Mann, J.B., Ballantyne, R., Packer, J. & Harris, G. (2015, July). *Penguin Promises: Encouraging visitor to uShaka Sea World to take action for the environment.* Poster presented at the Visitor Studies Association 28th Annual Conference, Indiana, USA.

Mann-Lang, J.B., Ballantyne, R. & Packer, J. (2016, September). *The changing face of tourism in South Africa - celebrating diversity.* Paper presented at Tourism Education South Africa, Cape Town, South Africa.

Mann-Lang, J.B., Harris, G., Ballantyne, R. & Packer, J. (2016, September). *Penguin Promises – Encouraging effective conservation action.* 9th International Penguin Congress, Cape Town, South Africa.

Mann-Lang, J.B. Ballantyne, R. & Packer, J. (2016, September). The changing face of tourism in South Africa - celebrating diversity. Tourism Education South Africa Conference, 21 – 23 September, Cape Town, South Africa.

Mann-Lang, J.B. Ballantyne, R. & Packer, J. (2016, October). People for conservation – how a better understanding of cultural diversity amongst visitors can make zoos and aquariums better agents of change. 71st World Association of Zoos and Aquariums Annual Conference, Puebla, Mexico.

Mann-Lang, J.B. Ballantyne, R. & Packer, J. (2016, October). Celebrating diversity – how a better understanding of cultural diversity amongst visitors can help us to tell our conservation stories. 23rd Biennial Conference of the International Zoo Educators Association. Buenos Aires, Argentina.

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Contributions by others to this thesis

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None

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CHAPTER 1 INTRODUCTION

Personal background to this thesis

In 1992 I started work in the aquarium field. Armed with a Master's Degree in Ichthyology, I was ready to teach the world about our marine environment. My first guided tour of an aquarium was a complete failure; I spent 30 minutes carefully explaining the ultrastructure of fish otoliths, lateral lines and fish respiration to a group of rural African children from an inland province. When I stopped to take a breath one brave youngster asked "Is there water in those boxes?" I looked at him in disbelief, then slowly exhaled and started my guided tour again, this time starting with the basics of what an aquarium is. Mortified though I was by that experience it taught me a wonderful lesson—get to know your audience before you start to share your knowledge. Now, over 22 years later, this thesis represents a continuation of my long search to better understand aquarium visitors.

1.1   Environmental Crisis: Setting the scene

Between human need and human greed, environmental destruction is probably the most serious challenge facing humanity today. Burgeoning populations and a materialistic lifestyle mean that humanity is facing the over-exploitation of almost all natural resources, widespread habitat degradation and a looming water and energy crisis, while rampant development is destroying the natural assimilative capacity of ecosystems (Oskamp, 2000; Rockstrom, 2009). These impacts, along with the overarching effects of climate change, are threatening human survival on earth in ways that are only starting to be understood (Flannery, 2005; Hansen, 2009; Steffen et al., 2015).

The key challenge facing the environmental movement is the need for changes in the lifestyle of humans, as environmental issues can only be addressed through a shift in individual attitudes and behaviour (McKenzie-Mohr & Oskamp, 1995; Oskamp, 2000). Aquariums and zoos, because of their accessibility and popularity, have the potential to play a valuable role in encouraging environmentally responsible behaviour in visitors by building emotional connections with animals, providing appropriate information and empowering visitors to make wise environmental behaviour decisions (Fraser & Wharton, 2007; WAZA, 2005). In fact, around the world, aquariums and zoos have the potential to positively impact on the conservation awareness and environmental behaviour of over 700 million people annually (Gusset & Dick, 2011), almost 10% of the world's current population of over seven billion.

However, in order for this potential to be realised, it is essential to have an understanding of visitors to aquariums and zoos, and the current impact that such facilities have on environmental learning and adoption of environmentally sustainable behaviour.

1.2 The research problem

Increasingly, tourism sites, particularly those associated with wildlife (either captive or wild), are required to justify their existence (Ballantyne, Packer, & Hughes, 2009; Frost, 2011; Hutchins & Thompson, 2008; Marino, Lilienfeld, Malamud, Nobis, & Broglio, 2010). General claims related to conservation and educational benefits are no longer acceptable, and unless wildlife tourism sites or experiences are able to provide empirical evidence of their value, their existence will continue to be questioned. Thus, rigorous research is needed to demonstrate the value that wildlife tourism has to environmental learning and conservation, in its broadest sense. In addition, the primarily Western visitors to aquariums and zoos in the past are not the visitors of the future, and building a better understanding of the needs of multicultural visitors, and the influence of culture on their on-site experiences and learning, will contribute to improving the influence of aquariums and zoos in the future.

A number of areas require greater research attention if aquariums and zoos are to meet the needs of visitors, as well as their own conservation, education and economic imperatives. These include building a better understanding of the factors that facilitate learning in an educational leisure setting, and advancing the theoretical understanding of the impact of visitors' experiences on their environmental learning. While learning has traditionally been associated with formal education, there has recently been an increase in research on learning that takes place outside of the formal education system. The term 'free-choice' learning has been used to describe learning that is driven by the needs and interests of the learner and not the curriculum (Falk & Dierking, 2000). Free-choice learning, that which occurs outside of formal education, is addressed in this study. In particular, the relationship between visitor characteristics and their environmental learning during a visit to an educational leisure setting remains an important focus area in the literature (Ballantyne et al., 2007; Dawson & Jensen, 2011; Khalil & Ardoin, 2011; Ogden & Heimlich, 2009). As learning outcomes represent the unique combination of what a visitor brings to a facility and their experiences while at the facility, it is clear that a better understanding of these factors is essential if learning through leisure experiences is to be optimised (Ardoin, Wheaton, Bowers, Hunt, & Durham, 2015; Falk, Ballantyne, Packer, & Benckendorff, 2012).

Despite recessions, natural disasters, terrorism attacks and social uprisings, the travel and tourism sector, which includes aquariums and zoos, has exhibited year on year growth over the last decade (World Travel and Tourism Council, 2011). Accounting for almost 9% of global GDP, travel and tourism is one of the world's largest industries and continued growth is anticipated over the next ten years (World Travel and Tourism Council, 2011). In addition to increasing demand, the face of international tourism is changing. The aging populations of 'traditional' source markets in the West are slowly being replaced by the rise of the middle class in emerging markets (World Travel and Tourism Council, 2011). The fast growing economies of countries such as Brazil, India and China are starting to impact on international tourism as increasing affluence in these countries creates opportunities for international travel by citizens, while the increased accessibility of these regions results in more international visitors to previously less popular destinations (World Travel and Tourism Council, 2011). The important role of cultural diversity in tourism has been recognised through the steady increase in research orientated towards the cultural components of tourism over the last decade (Butler & Richardson, 2014; Hughes, Ballantyne, & Packer, 2014; Ji, Anderson, Wu, & Kang, 2014; Kang & Moscardo, 2006; Xu, Cui, Ballantyne, & Packer, 2012). While the number and diversity of international tourists is increasing, the needs of tourists are also changing. Many modern travellers are more discerning, seeking a wider range of experiences than the traditional, passive 'coach' tours, or 'sun bed' beach stays of the past. Increasingly, tourists want to include a learning component in their tourism experience (Burger, Dohnal, Kathrada, & Law, 2001; Falk, et al., 2012).

While research on tourism, and ecotourism in particular, is a wide and growing field (Ballantyne & Packer, 2013), research into the characteristics of visitors and the influence of those characteristics on their experiences, as well as the unique aspects of environmental learning within the travel and tourism context, has been largely neglected (Falk et al., 2012). A study of tourism-related research in the Southern African Development Community (SADC) revealed that while over 300 papers were published in this field between 2000 and 2010, few investigated the characteristics of tourists in southern Africa, or their experiences of environmental learning (Rogerson & Rogerson, 2011; Visser & Hoogendoorn, 2011).

Unfortunately, our ability to fully understand the value that educational leisure settings, such as aquariums and zoos, have for environmental learning is constrained by our ability to assess learning. Practically, more sensitive instruments and procedures to measure environmental learning outcomes, such as knowledge gained, changes in attitude, affective outcomes and motivation to participate in environmentally responsible behaviour, are needed (Ballantyne & Packer, 2009; Falk & Storksdieck, 2005; Hughes, 2011; Storksdieck, Ellenbogen, & Heimlich, 2005). Research instruments capable of capturing the characteristics and experiences of visitors from a diversity of cultures are also needed for the increasingly multicultural society in which we live.

In addition to the above focus areas for which additional research is required, it is clear that most of the research undertaken with visitors to aquariums and zoos, to date, has been conducted in Western countries (Davey, 2006; Dierking, Burtnyk, Büchner, & Falk, 2002; Schram, 2011). There is a need to explore the factors influencing environmental learning in such facilities in non-Western countries. Visitor research in developing countries, where much of the world's remaining biodiversity is found, remains notably absent. In addition, as visitors to educational leisure settings become more diverse, a better understanding of multicultural audiences in Western countries is also becoming an important research imperative. Increasingly, the concept of cultural diversity and sensitivity is being included in general visitor research (American Association of Museums, 2008; Werner, Hayward, & Larouche, 2014). The American Evaluation Association (2011) issued a public statement on cultural competence in evaluation that called for greater 'cultural competence' in all forms of evaluation. As visitors to educational leisure settings become progressively more diverse, understanding them becomes more difficult, requiring sensitivity, respect and an open mind. Research that contributes to understanding the influence of cultural diversity on learning in educational leisure settings will support the field of visitor research internationally. South Africa is an ideal setting for research on cultural diversity in educational leisure settings as the country is home to a range of cultures and domestic tourism is an important component of the economy.

Research in environmental education in South Africa has largely been undertaken in the formal education context or in the context of adult training and there has been limited research on free-choice learning. Much research has focussed on education for sustainable development, with strong emphasis on the role of education in redressing the inequities that

resulted from past political regimes. Issues of quality and relevance have also been addressed (Lotz-Sisitka, 2008). As such there is currently a gap in the literature with respect to free-choice learning in South Africa.

1.3   Research aim and approach

Ballantyne and Packer (2011) suggest three focus areas for research on the learning processes occurring in educational leisure settings. As can be seen in Figure 1.1, learning is influenced by the pre-visit learning dispositions of the visitor (A: Entry Variables), the actual experience itself (B: The Visit) and the reinforcement of learning that happens after the visit (C: Post Visit). This research addresses the first two focus areas, namely, the characteristics of the visitor and the visit experience, and examines the influence of these factors on environmental learning.
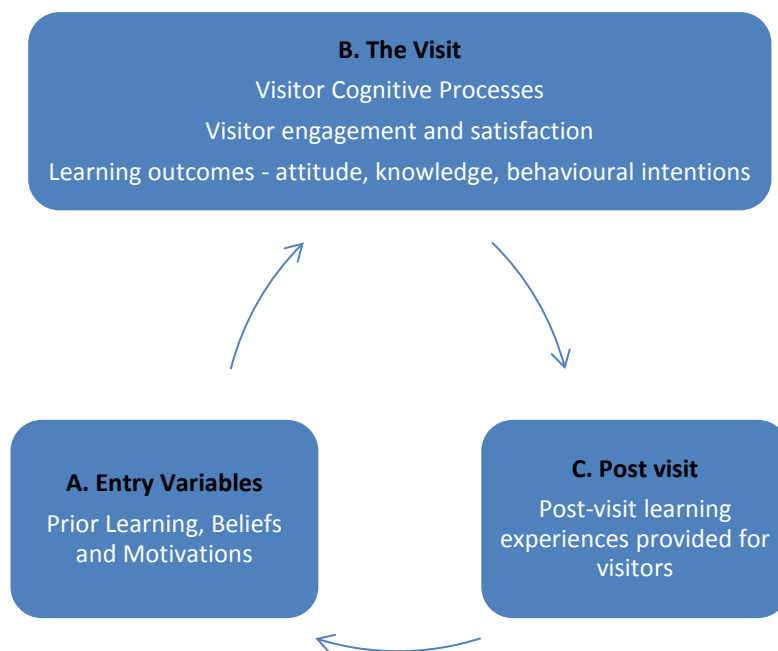
Figure 1.1 Research foci in the free-choice learning process. (Ballantyne & Packer, 2011)

The aim of this research is to build an understanding of the implications of cultural diversity for visitors' environmental learning at an aquarium in South Africa. More specifically, the study set out to explore the relationships between the cultural, demographic and psychographic characteristics of visitors and the immediate environmental learning outcomes of a visit to the uShaka Sea World aquarium in Durban, South Africa. Accordingly, the specific research aims were to:

- identify the characteristics of the major cultural groups of visitors to an aquarium in South Africa with respect to selected demographic and cultural variables, visit characteristics and psychographic variables;

- explore how the major cultural groups of visitors experience uShaka Sea World;

- investigate the impact of an aquarium visit on the environmental learning of visitors from different cultural backgrounds, taking into account the confounding effects of other demographic variables;

- assess the extent and nature of the impact of cultural background on learning outcomes.

Quantitative research methods were used to address the research aims. A questionnaire, including pre- and post-visit sections, was designed, pilot tested and refined. The pre-visit component was designed to build an understanding of the characteristics of visitors to the facility. The post-visit component focussed on the impact of the visit on visitors' environmental learning and provided an insight into their experience during their visit. The results from both the pre- and the post-visit sections were integrated to draw conclusions about the implications of cultural diversity for visitors' environmental learning at an educational leisure setting in South Africa. In all of the above, the influences of cultural equivalence of meaning and culture-specific response styles have been carefully addressed.

1.4   Significance of the research

The results of the research contribute to the growing body of knowledge that seeks to understand and enhance the role of educational leisure settings, particularly aquariums and zoos, in environmental learning. The results also add to our understanding of the implications of cultural diversity in free-choice learning.

Specifically, this research:

- draws attention to the many differences and similarities between respondents from different cultural backgrounds with respect to their demographic and psychographic variables;

- highlights the parallels and divergences in the ways in which visitors from different cultural groups experience the aquarium and learn during their experience;

- maps the interrelationships between psychographic variables, on-site experience variables and learning outcomes for visitors from different cultural backgrounds.

The research makes a methodological contribution that can be used across cultures, through its refinement of research instruments and analytic techniques that are capable of capturing the characteristics of visitors and their environmental learning. In addition, the implications of construct equivalence and culture-specific response styles for cross-cultural research are addressed in the study. This has implications for future research that explores cultural differences, thereby adding to the broader research field of learning in tourism.

Practical implications of the findings for the design of culturally responsive environmental learning experiences are discussed. Given the increasingly diverse nature of visitors to educational leisure settings worldwide, these suggestions will assist in the design of more culturally responsive and effective activities that enhance environmental learning amongst all visitors. More specifically, the results contribute to a better understanding of the characteristics of the South African visitor to nature-based educational leisure settings, and thus help other such facilities to better understand, and thereby reach, their visitors more effectively. The study contributes to the fledgling field of visitor studies in South Africa and establishes a foundation for future research, while beginning to address a current geographic gap in the literature.

In this study, the focus on cultural differences is not intended to position any cultural group as superior or inferior to another, but rather to explore and more fully understand the implications of cultural diversity for environmental learning. South Africa proudly considers itself to be a 'Rainbow Nation', celebrating the diversity of cultures that make up its population. To deny this diversity would reduce the celebrated rainbow to a homogenous grey. This thesis explores the various cultures that make up South African society today, in order to contribute towards cultural sensitivity and understanding and, ultimately, nation building.

1.5   Context of the research

The research was undertaken in the city of Durban, in the Province of KwaZulu-Natal (KZN) on the east coast of South Africa. Durban is the third largest city in South Africa, where a population of almost four million people, representative of multiple cultures, live in close proximity. With a subtropical climate, beautiful beaches and easy access to some of the oldest game reserves in Africa, Durban is a popular destination for tourists. The majority of visitors

to KZN are from other African countries, primarily Swaziland, Lesotho and Zimbabwe, or domestic tourists (Tourism KwaZulu-Natal, 2012). It is estimated that 21% of all domestic tourists in South Africa visit the province, amounting to over nine million visitors per year (Statistics South Africa, 2012).

The marine aquarium component of the uShaka Marine World complex, uShaka Sea World, was selected as the site for this research. Opened in 2004, uShaka Marine World is the largest marine theme park in Africa. Visited by 700 000-800 000 people annually, the facility is the primary tourist destination in Durban. uShaka Sea World is one of only two large aquariums in Africa and, therefore, plays a critical role in introducing the people of Africa to the marine environment and aquatic animals.

1.6   Outline of this thesis

This document consists of six main sections.

- The current chapter, which has introduced the research aims and the rationale for the research.
- Chapter Two contains a review of the relevant literature, including an overview of the environmental crisis facing humanity and the role of zoos and aquariums; an introduction to some of the theoretical approaches to understanding learning in educational leisure settings; research relevant to understanding the impact of visitor predispositions on learning in educational leisure settings and, finally, some insights into the South African context, including cultural diversity.
- Chapter Three contains a detailed explanation of the methodology.
- In Chapter Four some of the challenges associated with multicultural research are addressed in more detail. This chapter provides a background to the topic, outlines the methods used to test for cultural equivalence of meaning, and to detect and adjust for culture-specific response styles, and presents the results of these tests and the steps undertaken to prepare the data for analysis.
- The results of the study, divided according to the research objectives, are provided in Chapter Five.
- In Chapter Six the relevant issues raised in the Introduction and the Literature Review are discussed in light of the research findings. This section highlights the contributions of this research, theoretically, methodologically and practically. The

chapter includes an outline of some of the limitations of the study, provides suggestions for future research and ends with a conclusion that completes the research journey.

- The References and Appendices complete the thesis.

1.7   Relevant key definitions

It is important at the outset to define key terms to ensure clarity.

- *Educational leisure settings:* "places people go in their leisure time, which offer some form of free-choice educational experience" (Packer, 2004:14), also referred to as 'informal learning settings'. According to Packer, the term educational leisure setting "describes more accurately the way such settings are perceived by the visiting public, with the emphasis on leisure rather than on learning" (Packer, 2004:15).

- *Environmental interpretation:* "translating the technical language of a natural science or related field into terms and ideas that people who aren't scientists can readily understand" (Ham, 1992:3). In this thesis both interpretive signage and live presentations will be considered to be environmental interpretation.

- *Environmental orientation:* includes knowledge, interest, behaviour as well as various aspects of attitudes towards the environment and nature.

- *Culture*: "..the everyday practices and beliefs that individuals embody and display through behaviours and practices." (Quijada, 2008:224). "…individuals communicate their culture through language, rituals, religious beliefs, value systems, traditions, and other beliefs." (Quijada, 2008:224). It is a common way of making sense of experience based on shared history (Jacobson, 1996). Most simplistically, culture is the invisible lenses through which we view the world (Jennings, 2007).

- *Museum*: "that array of institutions that include art, history, and natural history museums; science centres; historic homes; living history farms and forts; aquariums; zoos; arboretums; botanical gardens; and nature centres" (Falk & Dierking, 2000:xi).

- *Psychographic constructs:* various psychological dimensions of individuals including their attitudes, opinions, values, concept of self, personality traits, motivations, activities and interests (Hood, 1993b).

- *Visitor experience:* "an individual's immediate or ongoing, subjective and personal response to an activity, setting or event outside of their usual environment" (Packer & Ballantyne, 2016:)

- *Zoos and aquariums*: facilities that house live animals and that are open to visitors for purposes of entertainment, education and conservation. Although aquariums house primarily aquatic animals, the distinction between zoos and aquariums is increasingly blurred as zoos often exhibit some aquatic animals and aquariums often exhibit some terrestrial species.

CHAPTER 2 LITERATURE REVIEW

Overview

This research aims to build an understanding of the implications of cultural diversity for visitors' environmental learning at an aquarium in South Africa. More specifically, the study explores the relationships between the cultural, demographic and psychographic characteristics of visitors and the immediate environmental learning outcomes of a visit to the uShaka Sea World aquarium in Durban, South Africa. Aspects of the experience, which act as mediating variables to facilitate learning, are also identified. In order to address these issues, the literature review focuses on the following four broad areas of interest.

1. **The role of zoos and aquariums in environmental learning**. Section 2.1 introduces the environmental crisis facing humanity and contextualises the role of zoos and aquariums in addressing the situation. It broadly reviews past research on visitors to zoos and aquariums and highlights gaps in current research in zoos and aquariums as educational leisure settings.

2. **Theories of learning in educational leisure settings.** Section 2.2 builds a theoretical foundation for the research through the introduction of a number of different theories and models applicable to learning in educational leisure settings.

3. **Understanding the visitor and the visit experience in educational leisure settings.** Section 2.3 focuses on the critical importance of understanding the predispositions and preferences that visitors bring with them on a visit and their impact on learning in educational leisure settings. This section reviews past research on the personal context for learning and highlights the need for a better understanding of visitor characteristics, including cultural background, in an increasingly diverse social environment. It also discusses research that has been conducted on aspects of the visitor experience that may influence learning. As cultural diversity is the focus of this research, Section 2.3 will explore some of the complexities around the concept of culture, as it pertains to visitor research.

4. **The South African context.** Section 2.4 focuses on the South African situation to provide a context for the research. This section introduces the features of the South African social environment that make the research relevant, not only to Africa, but to an increasingly multicultural world.

Finally, Section 2.5 summarises the literature review, contextualises the current research within the literature and outlines the research objectives.

2.1 The role of zoos and aquariums in environmental learning

Introduction

Over the last 20 years there has been an increasing realisation of the role that zoos and aquariums can play in addressing the current environmental crisis. This has been manifest in transformations to the underlying philosophy of zoos and aquariums, as well as their operational imperatives. This section will examine the evolving role of those facilities in conservation and will provide an introduction to research on their visitors. The research in this study focuses on an aquarium, however, the terms zoo and aquarium will be used throughout the study because most of the principles and outcomes are applicable to both types of facility.

2.1.1 The environmental crisis

The 2014 Living Planet Index clearly shows that in the last 40 years the demand for resources to satisfy the requirements of the developed world and to improve the wellbeing of people in the developing world is putting unsustainable pressure on our planet, with human use of natural resources doubling since 1966 (WWF, 2014). The Living Planet Index reveals that, between 1970 and 2014, there has been a 52% decline in vertebrate animal populations, with thousands of species facing extinction (WWF, 2014). Freshwater ecosystems are unable to sustain current levels of use and marine fisheries are facing a crisis as over 50% of the world's fish stocks are fully exploited with no room for expansion (Food and Agricultural Organisation, 2009). Atmospheric carbon dioxide (CO_2) concentrations have already exceeded the limits necessary for biodiversity and humanity alike. Unless CO_2 levels are lowered, the processes of environmental change (including melting sea ice, ice-sheet and mountain glacier collapse, sea level rise, methane hydrate releases, extreme weather events, ocean acidification, deoxygenation, shifting climate zones and biodiversity loss) will pass beyond humanity's ability for control (Hansen et al., 2005; Steffen et al., 2015). This decrease in the capacity of the planet to sustain human life is happening at the same time as human populations are burgeoning. With over seven billion people, the planet's life support systems are being stretched beyond capacity.

As the planet enters the Anthropocene, the first geological epoch to be driven primarily by human impact (Barnosky et al., 2011), it appears that the traditional approaches to

environmental problem solving, which focus on the use of science and technology to seek solutions to enable 'business as usual', may not work. The current challenge requires more than better technology; it needs fundamental changes in human thinking and behaviour (Litchfield & Foster, 2009; Saunders & Myers, 2003).

Present-day environmental challenges will affect everyone unless humanity is able to move beyond the current consumerism and growth paradigm and embrace the fundamental need for a more sustainable lifestyle (Beattie, 2010). With over 700 million visitors annually, the international zoo and aquarium community is potentially able to impact positively on the conservation awareness and environmental behaviour of almost 10% of the world's current population (Gusset & Dick, 2011). As such, their potential role in sensitising people to environmental issues is tremendous and they play an important role in the drive for a more sustainable future.

2.1.2 The history of zoos and aquariums

Zoos and aquariums have been in existence since the earliest times—when the pharaohs of Egypt collected animals for their personal entertainment and the emperors of China kept fish for cultural and aesthetic reasons. Gardens and palaces with private collections of animals were a symbol of power and wealth. During the 14th and 15th centuries these private collections evolved into cultural institutions, particularly in Europe, where global exploration with a focus on collecting and cataloguing, ensured an on-going supply of animals for these menageries. Zoological gardens (zoos), in their more modern conception, as facilities housing wild animals for public display, have attracted visitors for over a 100 years (Penn, Gusset, & Dick, 2012). Throughout most of the history of zoos their attraction has been their wild animals, which people have paid to view as a form of entertainment (Rabb, 2004; Woods, 2002).

As menageries evolved into zoos, the way animals were exhibited changed, from rows of single species in concrete boxes or cages, with animals exhibited taxonomically or geographically, to more naturalistic exhibits housing multiple species representative of ecosystems. Cages and bars have given way to moats and skilfully disguised fences, as visitors are now encouraged to immerse themselves in the wildlife experience. In an interesting paradox, as people have become more urbanised and less in touch with nature, zoos have increasingly come to represent an opportunity to regain contact with the natural environment.

In the early 1980s zoos and aquariums started to redefine their mission to include conservation and educational activities (Hutchins, 2007; Penn et al., 2012), evolving to focus increasingly on their role as both conservation and education facilities in accordance with the World Zoo and Aquarium Conservation Strategy (Barongi, Fisken, Parker, & Gusset, 2015; Rabb, 2004; Zimmermann, Hatchwell, Dickie, & West, 2007). This is possible because of their unique positioning, which enables them to be involved in multiple facets of conservation, both *in situ* (in the animal's natural environment, i.e., in the wild) and *ex situ* (out of the animal's natural environment, i.e., in the zoo). *In situ* conservation efforts include habitat protection and restoration, animal reintroduction and management, supporting local communities and providing expertise to managers in the field. *Ex situ* conservation efforts include research, captive breeding and animal rehabilitation programmes, and fundraising, in addition to influencing visitors, both directly through education programmes and indirectly as role models for sustainable living (Fraser & Wharton, 2007; Keulartz, 2015; Rabb & Saunders, 2005; Tribe & Booth, 2003).

The capacity to influence large numbers of people with a strong conservation message by providing opportunities to develop emotional connections with animals, remains a unique feature of zoos and aquariums (Conway, 2007). They are found on every continent and in almost every country of the world, from wealthy first world cities to poor, war ravaged towns. While the animals exhibited in zoos and aquariums differ, the opportunity for visitors to view and connect with wild animals remains central. Even in poor cities in developing countries, groups of school children visit the local zoo, as do families, with the zoo providing a much needed respite from the harsh realities of daily life (Mann, 2014). In the first world urban environment, zoos and aquariums provide city dwellers with a similar opportunity to relax with family and friends in a pleasant and safe environment. For both rich and poor, these facilities provide visitors with a chance to connect with nature (Rabb & Saunders, 2005) as they are able to reach across social, cultural and economic barriers and touch people throughout the world.

Zoos and aquariums are essentially Western constructs. Prior to western influence in Africa no such facilities existed. The African continent is now home to 200 zoos or zoo-type facilities in 48 countries, although most of these are colonial artefacts and very few can be considered modern facilities (Morgan, 2010). Only 28 of the zoos and aquariums in Africa belong to the regional zoo association, the Pan-African Association of Zoos and Aquaria

(PAAZA) and, of those, few have any research capacity (Kotze & Morgan, 2012). Despite vast differences in standards, African facilities reach over 8.5 million people annually (Dave Morgan, personal communication). South Africa is home to the only two large, modern aquariums in Africa, although many zoos around the continent do house some aquatic specimens. South Africa also has two large modern zoos and a number of smaller municipal zoos.

Despite an exceptionally long history, the holding of captive animals, whether in zoos or aquariums, continues to generate controversy (Frost, 2011; Gray, 2015; Milstein, 2009). The more militant anti-zoo movement started in the early 1980's (Penn et al., 2012) around the same time that zoos started to reprioritise and promote their role in conservation and education. Zoos and aquariums are increasingly scrutinised on the quality of their animal care, their real value to *in situ* and *ex situ* animal and habitat conservation and the impact of their formal and informal (free-choice) education programs (Hutchins & Thompson, 2008; Mace et al., 2007). Juggling the educational, entertainment and conservation roles of a zoo or aquarium is not easy and requires on-going management attention (Mason, 2011). In the absence of evidence in the form of reliable data, the justification for keeping animals in captivity remains subjective. The challenge facing zoos and aquariums is, therefore, to transform themselves into powerful conservation organisations (A. Zimmermann & Wilkinson, 2007) and to critically analyse and measure their effectiveness in conservation (in all facets) to honestly address the shortcomings preventing this transformation (Fraser & Wharton, 2007; Moss & Esson, 2013). Only when a zoo or aquarium's message and its actions are aligned, will their credibility as conservation organisations be fully accepted.

Although zoos and aquariums are fundamentally the same—both house wildlife in an *ex situ* situation—there are some differences between them. Zoos usually display a range of charismatic mega-fauna (elephants, lions, tigers, bears, or even kangaroos, ungulates or reptiles), while aquariums (with the exception of marine mammals and penguins) generally exhibit animals that many people regard as food. This difference gives aquariums a unique challenge—generating an emotional bond between a visitor and a fish is more difficult than building an emotional connection between a visitor and a panda bear. A number of zoos house aquariums of varying sizes, however, it is unusual to find an aquarium housing more than a few terrestrial species.

The use of the term 'aquarium' has a relatively short history, having been first used in 1853 when the first public aquarium, in Regent's Park in London, opened its doors (Brunner, 2005). The evolution of aquariums has followed a similar pattern to that of zoos, from rows of glass tanks in the walls of damp and dark concrete buildings to the modern immersive oceanariums with enormous acrylic windows and tunnels. Advances in technology have enabled aquariums to exhibit species that would have been impossible to exhibit in the early days of aquariology, thereby opening up a new world of underwater creatures for visitors to see.

Aquariums are often viewed as part of the so called 'aquarium leisure industry' (Mann & Vernon, 2013; Penning et al., 2009), rather than as serious conservation organisations. The use of aquariums as attractions in areas with high visitor flows, including tourism precincts such as regenerated inner cities and docklands, shopping malls and hotels (Frost, 2011), and the perceived emphasis on "entertainment and distance over education and intimacy" (Jarvis, 2000:87, cited in Cater 2010), detracts from the fact that many aquariums play an important role in conservation and education initiatives, despite the efforts of leaders in the aquarium industry. On the positive side, the fact that aquariums are found in areas with high visitor numbers, in a variety of settings and in all regions of the world, creates many opportunities for educational goals to be achieved amongst a diverse and multicultural audience representative of all socio-economic categories (Penning et al., 2009). Interestingly, conceptions of how aquariums are viewed around the world vary by national and cultural boundaries (Ji et al., 2014).

2.1.3 Reaching the zoo or aquarium visitor

It was in the mid to late 20th century that public education became an objective of zoos and aquariums (Sterling, Lee, & Wood, 2007). Early zoo and aquarium education focussed on formal education and the acquisition of facts, where people were taught about the animals on display, with most attention being paid to charismatic mammals or unusual species. This gave people a skewed view of nature—unless it was large, unusual, ugly or interesting in some way, it held little value. Over time, visitor interpretation and education programmes started to focus increasingly on ecosystems and on the direct effect of humans on the natural places in which the animals occurred. Recently the focus of zoo education has shifted to include the broader environment and to highlight human impact on the life support systems of planet earth. Today, most modern zoos and aquariums view conservation education as an

operational imperative and are paying greater attention to improving education programmes for both general visitors and school children.

The increasing need for more environmentally responsible behaviour to secure the future of the planet has given zoos and aquariums both greater relevance and an additional challenge. It is no longer enough to help visitors to understand ecosystems and animals and to encourage a love of nature; zoos and aquariums need to go beyond awareness and knowledge, and into the realms of behaviour change. Captive animal facilities are now being called on to use the animals in their care to engage and inspire the visitor and to focus the educational message on the broader environment with an emphasis on promoting the development of visitors' pro-conservation attitudes, knowledge and behaviour (Ardoin et al., 2015; Ballantyne & Packer, 2005a; Moss, Jensen, & Gusset, 2014; Pearson, Lowry, Dorrian, & Litchfield, 2014). This challenge requires zoos and aquariums to rethink their educational programmes and to explore new techniques for visitor education (Gwynne, 2007; Mann, Ballantyne, & Packer, 2014; Ramberg, Rand, & Tomulonis, 2002). Despite this changing focus, education about the animals and ecosystems will always be a critical component of zoo and aquarium education. After all, people are there to see the animals and enjoy themselves. The challenge is to ensure that visitors' need for animal sightings and information is met, while achieving the broader conservation goals of the facility. To address these wide educational challenges, zoos and aquariums are now increasingly incorporating social marketing techniques and an understanding of the psychology of conservation into their visitor learning programmes (MacDonald, 2015; Saunders & Myers, 2003).

The history of zoo and aquarium education has loosely followed the patterns of changes over time in theoretical approaches to learning. The behaviourist perspective guided the early days, where the transmission of facts about the animals was paramount. This process occurred either via interpretive signage around the exhibits or through staff members, often called docents or guides. In both cases the information was transmitted from the sign, or guide, to the visitor, with little regard for the individual needs of different visitors (Serrell, 1988). As exhibits changed to become more representative of nature, so too have educational techniques evolved (Table 2.1). This evolution is evident when looking at changes in interpretive signage in zoos and aquariums. Signs have evolved from bronze labels with the scientific name of the animal, through the stage of enormous panels crammed with information, to more recent styles with a minimum of content arranged around themes and

messages and presented in an entertaining and informal manner (Moscardo, Ballantyne, & Hughes, 2007; Serrell, 1988).

Table 2.1 *Evolution of animal exhibits, education techniques, strategies and goals. (Extended from WAZA, 2005)*

ANIMAL EXHIBITS	EDUCATIONAL TECHNIQUES	EDUCATION STRATEGIES	EDUCATION GOALS
1.Cages / Tanks	Taxonomic labels, animal rides	Passive	Inform
⬇			
2.Naturalistic dioramas	Animal shows, content rich interpretive signage	Instructional Teacher focussed Behaviourist	Teach facts about animals and diversity
⬇			
3.Ecosystem / Multi-species exhibits	Interactive activities, videos, minimal interpretation	Learner focussed Meaning making	Engage, stimulate and inform visitors about animals and generate concern for animals
⬇			
4.Immersion exhibits	Mobile phone tours and apps, touch screens, Websites and animation	Constructivist Conservation psychology	Inspire and empower behaviour change Issues based content
⬇			
5.Extending the visit	Websites, social media	Reflection on action	Encourage long term behaviour change

Current approaches to zoo and aquarium education appear to be consistent with the constructivist approach to learning, whereby multiple opportunities are provided to visitors to enable them to create their own understanding of the animals and ecosystems, building on their past experiences. Just as exhibits are now more representative of the ecosystems in which the animals would naturally occur, so too is zoo and aquarium education changing to be more aligned with advances in education and behaviour change theories. The relevance of zoo education is also being increasingly scrutinised, as William Conway stated, "Helping New York six-year-olds to learn about African monkeys may not help African monkeys" (Conway, 2007:14). Zoo and aquarium educators are now questioning their role and the relevance of their work, in an effort to be more effective.

It is clear that education in zoos is moving beyond simply helping visitors to learn irrelevant facts about animals and is increasingly focusing on more relevant outcomes, such as those of inspiring the behaviour changes that support a more sustainable lifestyle (Gusset & Lowry, 2014; Sterling et al., 2007). To facilitate the changing objectives for education, techniques for interpretation have also changed to include better use of technology in the form of touch screens, mobile phone tours and apps (O'Connor, 2010). Most recent has been the call to extend the impact of the visit beyond the physical time spent at a zoo or aquarium. Post-visit action resources, which utilise a range of means to reach visitors after their experience, are the focus of more recent research (Ballantyne & Packer, 2011; Hughes, Packer, & Ballantyne, 2011).

The field of environmental interpretation grew steadily throughout the 20th century, with the production of 'Interpreting our Heritage' by Tilden in 1957 defining the profession (Gross & Zimmerman, 2002). According to Carter (2001:3), interpretation is "helping people appreciate something that you feel is special", while other definitions of interpretation include the ability to "excite, delight, and awaken the senses" (Moscardo et al., 2007:3). Interpretation is usually viewed as essential in free-choice learning in educational leisure settings (Moscardo et al., 2007).

In wildlife-associated educational leisure settings, interpretation can be used to raise awareness of the special nature and fragility of a site, animal, exhibit or ecosystem, build an understanding of the connections between components of the ecosystem or exhibit (plant, animal and abiotic components) and a realisation of the interrelationships between humans

and the animal, site or ecosystem (Ballantyne, Packer, & Hughes, 2009). It can also be used to reduce the negative impacts of visitors often associated with leisure settings (banging on glass, flash photography, feeding animals or other actions that may impact on animals) and encourage voluntary compliance. However, despite widespread acceptance of the value of interpretation in tourism, there remain questions about the nature and effectiveness of interpretation as a tourism management tool (Moscardo, 2014).

In the case of a zoo or aquarium, the animals are a natural attraction and interpretation should build on the inspiration provided by the animals through explaining interesting aspects of the exhibit (animal and habitat), as well as relevant information about its conservation status and, where possible, actions that the visitor can take to assist in its protection. No matter how beautiful or awe inspiring a coral reef exhibit is, without appropriate interpretation that draws visitors' attention to the unique connections between components of the ecosystem and the linkages between coral reefs and humans, the animals in the exhibit will remain 'pretty', but irrelevant. Interpretation should provide the link between what is seen and felt, and what is understood by the visitor. Good environmental interpretation, be it in the form of a brochure, sign, presentation or a guided tour, has the potential to transform the visitor's experience from simple entertainment to one of meaning and longer term value that has the potential to build intellectual, emotional and physical connections between visitors and the environment (Ballantyne et al., 2007; Hughes & Ballantyne, 2013).

Recent research has revealed a number of the salient aspects of visitor wildlife experiences (including interpretation) that contribute the most to environmental learning (Luebke & Matiasek, 2013; Ballantyne, et al., 2011; Skibins, Powell, & Hallo, 2013). These include: the opportunity to observe animals in their 'natural' environment; opportunities for close encounters with wildlife and to observe animal behaviour; visitors' emotional engagement with animals; connecting with visitors' prior knowledge and experience; and providing time to reflect. Also important are using persuasive communication techniques (either visual or verbal interpretation) and providing linkages between conservation goals and everyday actions, together with follow up support for behaviour change.

While zoos and aquariums have evolved over the years, so too have visitors changed. In the past, those facilities were the only place to see many animals. Now the media, both mainstream and social, provide daily opportunities to experience exotic animals and places.

In the USA, the average visitor is now familiar with a wide range of species and wild places, and aware of issues of habitat loss, species extinction and global conservation (Dierking & Saunders, 2004). Zoos and aquariums have an even greater challenge today, as they compete with both mainstream and social media for the hearts and minds of visitors. However, the trump card remains their unique capacity to exhibit live animals. How to capitalise on this capacity is the focus of the relatively new field of research, namely, visitor studies.

The recognition of the need to understand the visitor, potentially the most powerful ally in the quest for conservation and a more sustainable future for the planet, is one of the more recent breakthroughs in the evolution of zoos and aquariums.

2.1.4 Visitor research in zoos and aquariums

In 1972, the first paper questioning the educational value of a visit to a zoo or aquarium was published (Sommer, 1972). In the paper Sommer noted that zoos and aquariums should determine the extent to which these facilities develop an environmental ethic amongst visitors, an observation that is probably even more relevant today than it was in 1972. Growth in visitor studies in zoos and aquariums was initially slow (Davey, 2006). In 1986 only 14% of zoos and aquariums in the USA undertook any form of visitor research, but by 1998 the percentage had increased to 67% (Stoinski, Lukas, & Maple, 1998). More recent research revealed that 35% of the 97 zoos and aquariums surveyed in the USA regularly conducted audience research between 2003 and 2008, while 47% conducted visitor research only occasionally, usually associated with special events (Luebke & Grajal, 2011). In the early days, education evaluation came in the form of visitor assessments of the acquisition of facts and scientific concepts (Ballantyne, 2004; Marinier, 1988). As education programmes evolved, so too did evaluation change from simply assessing visitor acquisition of facts to attempting to measure changes in attitude, affect and behaviour (Khalil & Ardoin, 2011).

Between the 1970s and the early 1990s, limited progress was made in the critical evaluation of the role of zoos and aquariums in conservation education (Dierking et al., 2002). Recent USA-based research into the topics studied by those facilities found that most visitor research (90%) still focuses on demographics and satisfaction, with 50% studying knowledge gains, 37% researching affective reactions to animals, and 37% studying visitors' intended conservation actions (Luebke & Grajal, 2011). Therefore, although the last 20 years have seen a substantial increase in research that investigates the visitor and the impact of a visit to a zoo or aquarium on visitors' short and longer term knowledge, behaviour and attitudes

(Schram, 2011), the field is still in its infancy, with great potential for expansion (Hatchwell, Rubel, Dickie, West, & Zimmermann, 2007; Mason, 2000; Ogden & Heimlich, 2009).

Research on visitors and environmental learning in zoos and aquariums can be divided into a number of broad focus areas, with elements of overlap. These focus areas include: visitor profiling; research focussed on exhibits such as baseline or front end studies, formative and summative studies; visitor observations; short and long term impact evaluations; and comparative research such as comparisons between visitors to different sites or between visitors and non-visitors to a single site (Table 2.2).

Table 2.2 *Broad focus areas of research on visitors and environmental learning in zoos and aquariums*

Focus area	Objectives	Methods
Visitor profiling	Understand visitor characteristics	Exit surveys, market surveys, focus groups
Exhibit evaluation—baseline or front end, formative or summative	Design and build more effective exhibits	Focus groups, informal discussions, timing and tracking, surveys, focused observations
Visitor observation	Understand visitor use of a facility/exhibit.	Timing and tracking, video observations
Short and long term impact evaluations	Determine the 'impact' of an experience on the visitor	Surveys – before and/or after a visit, comment cards, personal meaning mapping, web surveys, interviews
Comparative research	Understand the difference between visitors and 'non-visitors'	Surveys

Visitor profiling, which aims to build a better understanding of visitor characteristics such as culture, age and gender, motivations, prior knowledge, attitudes and behaviour, is undertaken in many facilities. Many studies of this nature are relatively simple and undertaken with marketing in mind, answering questions such as: Who is our visitor?; Why do they visit us, or why not? (Serrell, 1977). When conducted for the purpose of marketing, these studies often

include a satisfaction component. However, these studies are increasing in complexity as the aim becomes to better understand the visitor in order to be able to reach them more effectively with a targeted conservation 'message'. Building a better understanding of visitor characteristics through profiling is becoming increasingly important as visitors to educational leisure settings become progressively more diverse. In the American Association of Museums 'Museums and Society 2034' report, the importance of encouraging and understanding a new range of visitors is stressed (American Association of Museums, 2008).

As the zoo and aquarium industry moves beyond the 'if we build it visitors will come' mentality, research to help inform the design of new exhibits and associated interpretation is increasingly valuable. This research is usually conducted as a **baseline or front-end study**, to inform the design of an exhibit, or as **formative research**, undertaken during the planning and construction of an exhibit. **Summative research**, to determine if the exhibit is achieving stated objectives is undertaken once the exhibit is operational (Diamond, 1999; Uzzell, 1998). Most baseline, formative and summative studies are undertaken 'in house' or by external consultancies and many have not been published in academic literature (Schram, 2011; Sterling et al., 2007).

A great deal can be learnt about visitors and their use of an exhibition by observing their movements through an exhibit and their use of different elements of the exhibit. This research does not involve talking to the visitor, but merely observing their activities (Bitgood, 2002, 2006; Ross & Gillespie, 2009; Ross & Lukas, 2005). **Visitor observation** is considered to be a valid form of visitor research (Diamond, 1999; Hein, 1998; Serrell, 1998) and is commonly used to evaluate the success of an exhibit (Yalowitz & Bronnenkant, 2009). Success can be defined in many ways, including dwell time in an exhibit, use of interpretation elements, discussions with companions or other outward manifestations of interest in the exhibit.

As with visitor observation studies, **short term impact evaluations** usually focus on one facility, on one exhibit or one aspect of the interpretation of an exhibit and are aimed at determining the impact of the experience on the visitor, usually with respect to knowledge, attitudes and sometimes behaviour. This research is usually undertaken to answer the question 'is the exhibit/facility achieving its objectives?' Research ranges from a focus on visitors' recall of facts or 'change' in attitude (Lukas & Ross, 2005; Moss, Esson, & Bazley, 2010; Visscher, Snider, & Vander Stoep, 2009), to more complex work that investigates short

term impact on visitor knowledge, attitudes and behaviours, especially regarding conservation (Hayward & Rothenberg, 2004; Swanagan, 2000; Wagner, Chessler, York, & Raynor, 2009).

While a short term increase in knowledge, a more positive attitude and an intention to change behaviour is anticipated after a powerful animal experience, the durability of these changes has been questioned. The **longer term impact** of the experience is now the topic of much research, as attempts are made to determine if a visit can really change visitor attitudes and behaviours in the long term (Ballantyne, et al., 2011; Dierking, Adelman, Ogden, Lehnhardt, Miller & Mellen, 2004; Hughes, 2013; MacDonald, 2015; Mann-Lang, Ballantyne, & Packer, 2016b).

An understanding of the role of a zoo or aquarium as a part of an overall matrix of awareness raising experiences is important. One visit to a zoo or aquarium is unlikely to turn visitors into active conservationists, however, the visit builds on past experiences and lays a foundation for future experiences, which together play a role in sensitising people to the need to engage in environmentally responsible behaviours (Ballantyne & Packer, 2011; Smith, Weiler, & Ham, 2011). Building a better understanding of visitors' prior experiences in a zoo or an aquarium, their pre-visit knowledge and understanding of the role of a zoo or an aquarium as well as their learning motivations could all contribute to the design of enhanced learning experiences. When in their life-cycle (as a scholar, single adult or a parent) a person visits a zoo or an aquarium may also influence their experience and subsequent environmental learning.

It has been argued that, in order for zoos and aquariums to really influence the behaviour of visitors when they return home, it is essential that the visit be 'extended', through the provision of post-visit resources (Ballantyne & Packer, 2011; Hughes et al., 2011; Hughes, 2011). Working out how to best reach the visitor after the experience is becoming progressively more important and, as such, research into optimising the use of post-visit resources is increasingly being undertaken (Ballantyne & Packer, 2011; Hughes et al., 2011). These resources could include learning materials in the form of brochures, newsletters, websites, e-mails and social media. Research indicates that the provision of such resources can encourage visitors to participate in environmentally sustainable actions and enhance their attitudes towards wildlife (Hughes et al., 2011).

Although research shows that environmentally responsible behaviour is not necessarily rational and is often driven by factors other than knowledge, research into the emotional impact of a visit to a zoo or aquarium has only recently been undertaken (Clayton, Fraser, & Saunders, 2009; Myers, Saunders, & Birjulin, 2004; Smith et al., 2011). Despite the importance of understanding the affective component of a visit to an educational leisure setting, research that focuses on emotional impacts is not simple and requires complex measurement systems (Myers et al., 2004). As such, few studies have quantitatively addressed this challenge.

A common criticism of zoos and aquariums, as well as other ecotourism ventures, is that they 'preach to the converted' (Beaumont, 2001; Bitgood, 1992). It is only through a better understanding of the differences between visitors and non-visitors that this criticism can be addressed. **Comparative research** is valuable as it builds an understanding of the differences between people who visit zoos and aquariums and those who do not. Some visitor studies have included a comparative component, where the psychographics of visitors were compared to those of 'non-visitors' (Adelman, Falk, & James, 2000; Hood, 1993a). However, most research into environmental attitudes, knowledge and behaviours of the 'general public' has been undertaken outside of zoos and aquariums. These 'general public' studies have focused on specific topics such as ocean issues (Boyle & Mott, 2009) and climate change issues (Leiserowitz, Smith, & Marlon, 2010), or general environmental attitudes (Auster et al., 2008; Dunlap, Gallup, & Gallup, 1993; Kellert, 1980; Van Liere & Dunlap, 1980).

2.1.5 Zoos and aquariums as educational leisure settings

Packer (2004) used the term 'educational leisure settings' to describe places people go to in their leisure time, that incorporate an educational component, but that people visit primarily for pleasure and not explicitly in order to learn. In emphasis this term differs from the 'informal learning setting' described by Dierking and Falk (1998), where the focus is on learning, as well as the term 'informal science education setting' used by Yocco (2010), where science education is the primary focus.

The characteristics of an educational leisure setting, as summarised by Packer and Ballantyne (2002), include:

- The opportunity to interact with real animals, people or objects;

- Learning is voluntary, usually socially mediated and driven by the needs and interest of the visitor;

- Visitors are heterogeneous.

As these characteristics accurately describe the learning environment in a zoo or an aquarium, the term 'educational leisure setting', will be used in this thesis.

While zoos and aquariums have much in common with other educational leisure settings, there are some differences. The primary difference between a zoo or an aquarium and other educational leisure settings, such as museums or science centres, is the live animal component. The guaranteed viewing of live animals makes zoos and aquariums unique. Animals can be an asset to educators, as they attract visitors and hold their attention, or a drawback, as often the animals are so exciting that the interpretation or educational component is ignored. Another interesting difference between zoos or aquariums and more static educational leisure settings is the mobility of the 'exhibits'. Animals are free to move, hide or sleep in their enclosures and the interpretation may need to explain why an animal is not visible or active. The challenge for educators in zoos and aquariums is, therefore, to make the interpretation interesting enough to hold the visitors' attention and to use the stimulation generated by viewing the animals as a hook to encourage further engagement with the interpretation. These features of interpretation could also be applied to wildlife tourism, such as whale or turtle watching and wildlife safari experiences.

Visitors to educational leisure settings are heterogeneous, which makes effective communication with all visitor groups difficult. For this reason, many researchers have attempted to understand the various factors that influence visitor learning. Several authors have stressed that, in order to achieve the learning outcomes of an educational leisure setting, it is important to tailor the experience to the audience (Ballantyne, Packer, & Beckmann, 1998; Ballantyne et al., 2007; Reading & Miller, 2007; Storksdieck et al., 2005). Research to understand the visitor has thus been included in visitor studies for a long time. Bitgood (2002) and Ballantyne, et al., (1998), amongst other authors, have noted that the learning experience is likely to be more effective if both the media and the message are targeted at particular groups of visitors. Therefore, as a prerequisite to designing an effective visitor experience, it is essential to have a thorough understanding of the visitors' personal characteristics, including their demographic, cultural and psychographic variables.

Although most people consider learning in the context of formal education, namely, schools and tertiary educational institutions, learning is a lifelong process. The concept of lifelong learning is not new, as Confucius, over 2500 years ago, promoted the idea (Sun, 2008). If learning continues throughout an individual's life, it stands to reason that most learning must take place out of formal institutions. In fact, it has been estimated that in the USA less than five percent of an individual's life is spent in the classroom (Falk & Dierking, 2010). The term 'free-choice learning' has been introduced to describe the learning that occurs when what is learnt and how the learning takes place is voluntary, intentional and under the direct control of the learner (Arrington & Lowe, 2008; Falk & Dierking, 2000). This could include reading, watching documentaries, surfing the internet, or visiting a zoo or aquarium, museum, science centre or botanical garden. While the vast majority of research in learning has focussed on learning that takes place in formal educational settings, increasingly attention has been directed towards understanding free-choice learning. Researching free-choice learning is exceedingly complex because of the range of factors that interact to influence the learning experience: learning time (the visit) is usually brief; learners (visitors) bring a wide range of prior knowledge, interests, attitudes, motivations and expectations; the social environment is variable and impacts on the learning; learning stimuli are varied and the physical environment (the site) is usually complex and filled with distracting elements (Bitgood, 2002; Falk & Dierking, 2000). These characteristics of free-choice learning accurately describe the type of learning that takes place in a zoo or an aquarium. The term free-choice learning will, therefore, be used in this thesis to describe the learning that occurs in the educational leisure setting selected, namely, uShaka Sea World.

Summary to Section 2.1

Despite the impressive range of visitor research, there remain gaps in our understanding of zoo and aquarium visitors' learning. In particular, there remains much to learn about the impact of visitor characteristics, especially cultural diversity, on the processes of learning and decision making that occur during a visit, as well as the effect of the visit on visitors' subsequent environmental ethics and behaviours (Ballantyne et al., 2007; Ogden & Heimlich, 2009). As Serrell and Associates (2008) wisely noted, despite the best efforts, a zoo or aquarium cannot change the visitor, they can only change the exhibits, activities and setting that make up the experience to better reach the visitor. This highlights the importance of better understanding visitors' personal characteristics, prior knowledge and motivations for visiting in order to inform changes to the experience that will enhance learning.

The gaps in current research are not only thematic but also geographical, as revealed by the comprehensive review of the literature conducted by Dierking et al. (2002). Fewer than five of the almost 60 studies referenced took place outside of the USA. More recent international reviews reveal that, since 2002, there has been an increase in both the number of studies and breadth of research in the field, and the geographical spread has broadened, however, research remains focussed in Europe, the USA and Australia (Davey, 2006; Schram, 2011). While ecotourism research is increasing, there is little published research on visitors to zoos and aquariums in Africa.

Sound research, underpinned by good theory, is necessary for this field to advance. The research described in this thesis contributes to the understanding of zoo and aquarium visitor learning through exploration of the implications of cultural diversity for environmental learning. Although the research was based in South Africa, the results are applicable to educational leisure settings around the world as they increasingly diversify their audience bases.

2.2   Theories of learning in educational leisure settings

Introduction
Educational psychology literature introduces a number of theories of learning and learning models that provide a foundation to better understand visitor learning in educational leisure settings such as zoos and aquariums. This section will provide a simple overview of two theories, namely, the constructivist and sociocultural learning theories, as well as two models, namely, the contextual model and an empirical model of free choice environmental learning, as these are particularly pertinent to this study.

From the early view that learning is a simple process of filling an empty vessel with knowledge, concepts of learning have become increasingly complex. A clear, all-encompassing definition of learning is elusive and different researchers have defined learning differently, depending on their assumptions and background (Hooper-Greenhill & Moussouri, 1999). Learning is now considered to be an extremely complex process involving many counter-intuitive components (Falk & Staus, 2013). However, most educational texts consider that learning occurs when an experience (the interaction of a person with his or her environment) results in a relatively permanent change in an individual's knowledge or behaviour (Woolfolk, 2004).

Learning is about more than simply remembering facts (Falk, 2006) and can be viewed as a complex, continuous, cumulative, long term process of transformation and meaning making, as well as finding connections between past experiences and the present (Falk & Dierking, 2000). Learning is about processes as well as products, is developmental and continuous over time (Schauble, Leinhardt, & Martin, 1997). Cultural practices and perspectives within historical and socio-economic contexts influence learning (Banks et al., 2007; Gutierrez & Rogoff, 2003). Learning is also situated—where the learning takes place influences what is learnt and how learning occurs (Heimlich & Storksdieck, 2007).

2.2.1 Constructivist learning theory

The constructivist approach to learning, built on the theories of Piaget and Vygotsky amongst others (Woolfolk, 2004), provides a good theoretical foundation to explain how visitors learn during a visit to an educational leisure setting. Constructivism emphasizes that individuals learn when they actively construct knowledge and understanding (Saypanya, 2004). Piaget's theory of cognitive development, with his emphasis on individual progression through stages of development, forms the foundation for cognitive constructivism (Krause, Bochner, & Duchesne, 2015). In the cognitive constructivist approach, individuals construct knowledge by transforming, organizing and reorganizing previous knowledge and information (Santrock, 2004). While Piaget saw the social environment as an important factor in child development, he did not believe that social interaction was the main mechanism for changing thinking (Woolfolk, 2004). Vygotsky, another important theorist in the field of cognitive development, believed that social processes are integral to learning and this belief forms the basis of social constructivism (Krause et al., 2015). Vygotsky emphasized that people construct knowledge through social interactions with others and that the content of this knowledge is influenced by culture, which includes language, beliefs and skills (Saypanya, 2004). While Piaget emphasised that educators should provide support for individuals to explore and develop understanding, Vygotsky emphasised the need to create many opportunities for learning with educators and learners together co-constructing knowledge (Santrock, 2004). From the perspective of free-choice learning, both viewpoints require 'educators' to be 'facilitators' and not 'dictators' of learning. In the context of free-choice learning the 'educators' could be considered to be people – staff members who interact with the visitors, or static 'educators' – signage, presentations, etc. Regardless of the type of 'educator', it is up to the 'learner' to decide what to pay attention to and how to incorporate the new knowledge into their previous

schema. An understanding of how learners interact with the 'educators' can help to reveal the influence of these on visitor learning.

Most discussions on learning in educational leisure settings refer to constructivism, the key principles of which suggest that individuals make sense of information for themselves as they interpret their experiences in particular situations (Woolfolk, 2004), actively using their prior knowledge and beliefs, during social interaction, to construct new knowledge. More explicitly, the four key principles of constructivism, as defined by Krause et al. (2015), are activeness in learning, self-regulated learning, the importance of social interaction in learning and finally the notion that learners build new knowledge according to their personal perspectives. Constructivism, therefore, postulates that people make their own meaning out of experiences when they are active participants in the learning process (Hein, 1998).

This approach highlights the personal nature of learning, implying that the same information or experience can be interpreted differently, based on the prior experience and beliefs of the learner (Ballantyne & Packer, 1996; Hein, 1998). Constructivist learning theory emphasises the importance of giving visitors opportunities to construct knowledge, as well as some way to validate their conclusions by presenting alternative views and different realities of the subject (Hein, 1998). This theory is, thus, considered to be useful for the study of informal learning (Anderson, Lucas, & Ginns, 2003). Constructivist learning theory is also helpful when trying to understand learning in a multicultural environment, as different cultural communities may view and explain the same phenomenon in different ways, depending on their past experience (Ballantyne & Packer, 1996). A better understanding of the entry beliefs and past experience of the visitors (learners) will help an educational leisure setting to design more effective learning experiences for a diversity of cultures.

2.2.2 Sociocultural learning theory

The sociocultural theory of learning proposes that all learning takes place within a social and a cultural environment, and that meaning emerges in the interplay between individuals acting in social contexts and the mediators (signs, tools and symbols) provided by culture, environment and history that are employed in these contexts (Hein, 1998; Schauble et al., 1997). This theory accounts for the variability as well as the commonality, in visitor learning, it focuses on both processes and outcomes and is developmental, viewing learning as changing over time (Schauble et al., 1997). From a cultural perspective, how and what is learnt is influenced by personal and contextual factors throughout life. As the development of

an individual takes place within a cultural context, mediated by other people (family, peers, etc.), through a common language, it stands to reason that the cultural context in which the development takes place will influence learning (Gutierrez & Rogoff, 2003). Associated with sociocultural theory is the assumption that learning is a function of cultural identity that learners have as members of a defined culture (Alfred, 2003). When a person learns they construct knowledge based on what they already know, situated within their historical, social and cultural contexts (Alfred, 2003). Gutierrez and Rogoff (2003) proposed an integrated view of adult learning that suggests that learning occurs as the interplay of three levels of interaction: the personal plane of the individual; the social plane as the individual interacts with others; and the community plane, in which the individual shares histories and cultural practices.

As the focus of this research is the influence of culture on adult free-choice learning in an educational leisure setting, learning is considered to be: lifelong—taking place at every life stage of an individual; life-wide—taking place in a wide variety of settings and during many different activities; and life-deep—taking place within the cultural beliefs, ideologies and values of both communities and broader society (Banks et al., 2007). Ultimately, learning in an educational leisure setting is under the control of the visitor, not the facility, although the facility can play a critical role in facilitating learning through the provision of interpretive materials, guides and other learning resources. The strong emphasis on the influence of the social and cultural environments in which learning takes place, posited by the sociocultural theory of learning, makes this theory particularly applicable to an understanding of free-choice learning.

A number of different frameworks or models, based on the theories above, have been developed to explain learning in informal environments (Bell, Lewenstein, Shouse, & Feder, 2009). These include the Falk and Dierking's (2000) Contextual Model of Learning (Falk & Dierking, 2000) and a more recent empirical model of free-choice environmental learning (Ballantyne, et al., 2011).

2.2.3 Contextual model of learning
Falk and Dierking (1992, 2000) introduced the Contextual Model of Learning in an attempt to organise and understand the complex factors influencing learning in an educational leisure setting. This framework, which was expanded in 2005 (Falk & Storksdieck, 2005), is congruent with both the constructivist (Hein, 1998) and sociocultural theories (Schauble et

al., 1997) described above. According to the framework, the myriad of factors that influence learning can be grouped into three contexts: the personal context, the sociocultural context and the physical context. Within these three contexts, 12 factors have been identified as being those most important to influence free-choice learning. The personal context includes visitors' prior knowledge, experiences and interest, as well as their motivation for the visit and the degree to which they have control over their learning. The sociocultural context addresses the critical role of other people in free-choice learning, as well as the value placed on free-choice learning within the cultural milieu. The physical context focuses attention on the physical environment in which the learning takes place. Time, the fourth dimension of the model, is important as learning takes place over time and, in order to understand learning, a visit to an educational leisure setting needs to be considered within the wider context of a person's life.

The model (Figure 2.1) views learning as the interaction and integration of the three contexts described, over time, in order to make meaning (Falk & Dierking, 2000). Within this model, learning is viewed as being self-motivated, emotionally satisfying and personally rewarding, and includes both cognitive and emotional components, with new learning being built upon a foundation of prior knowledge (Falk & Dierking, 2000).
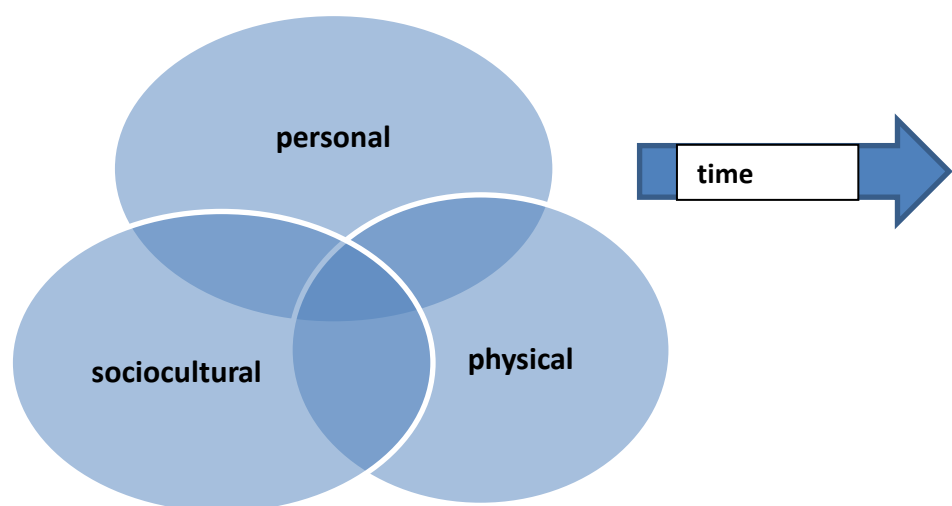
Figure 2.1 Contextual Model of Learning (adapted from Falk and Dierking, 2000)

2.2.4 An empirical model of free-choice environmental learning

To better understand the impact of some of the variables categorised in the Contextual Model of environmental learning, Ballantyne et al. (2011) used Structural Equation Modelling to identify the factors that best predicted positive long term environmental learning and environmental behaviour change outcomes. Working in four marine focussed educational leisure settings (two captive animal facilities (an aquarium and a marine theme park) and two where animals were wild (whale watching and turtle nesting and hatching), they tested the relationships between visitors' attributes, salient aspects of the experience, and short and long term learning outcomes. The empirical model emanating from their observations and analysis showed that attributes such as pre-visit environmental orientation and motivation to learn were good predictors of the long term impact of the experience (Figure 2.2). Aspects of the experience, particularly the opportunity for reflective engagement, which involved both affective and cognitive processing, were also found to influence both short and long term learning. These results suggest that, in an educational leisure setting, personal disposition (motivation to learn and environmental orientation) is a better predictor of long term learning than many other aspects of the visit experience. This supports the call for a better understanding of the visitor, if free-choice learning is to be more fully comprehended.
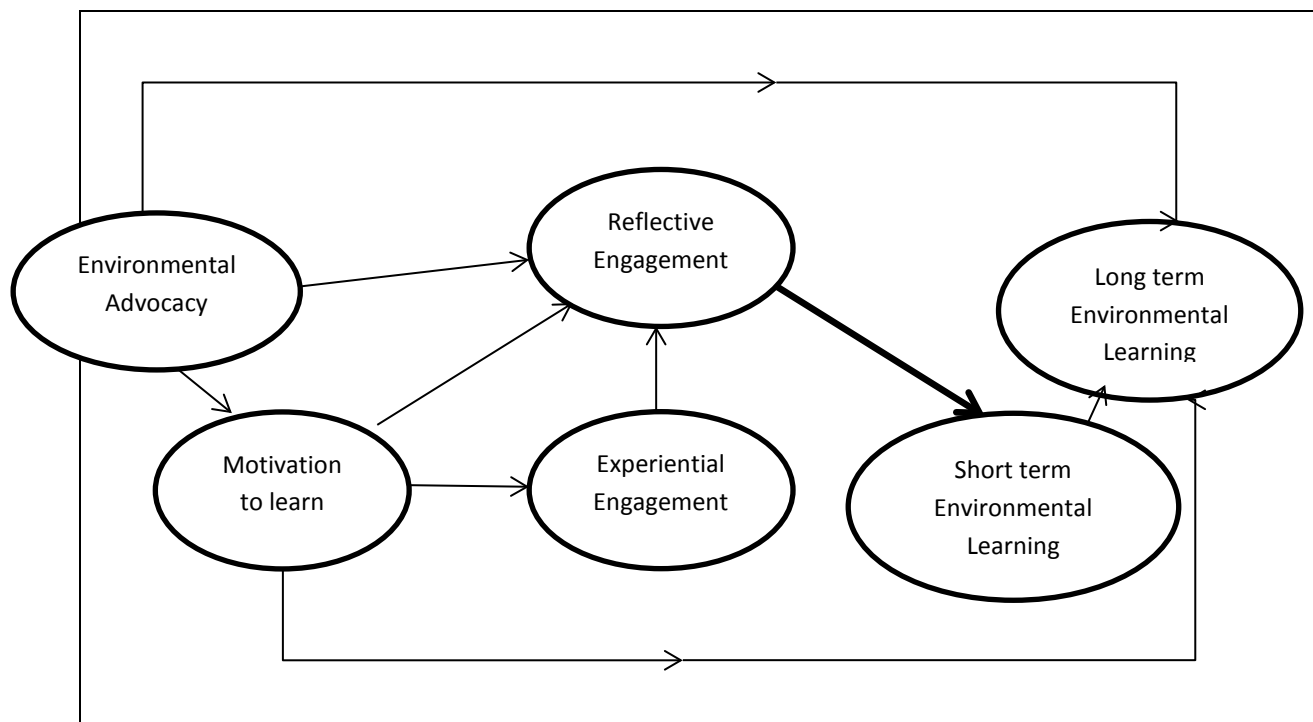
Figure 2.2 Summary of the structural equation model predicting learning outcomes (Ballantyne, et al., 2011)

Summary to Section 2.2

As discussed above, ideas about learning have evolved over time from transmission–absorption views, whereby educators were seen to fill 'empty vessels' with knowledge, to the more modern approaches of constructivism whereby learners are thought to actively construct their own meaning, integrating past experiences with current experiences in a process of ongoing construction (Hein, 1998). The constructivist and sociocultural theories of learning suggest that, in order to understand learning, it is essential to understand the learner. Understanding the learner ranges from research by psychologists to describe different learner typologies (Hein, 1998), through to broader based models of learning that seek to understand both the learner and the context in which the learning takes place (Ballantyne et al., 2011; Falk & Dierking; 2000). As building a better understanding of visitors to an educational leisure setting in South Africa is the focus of this research, it will be discussed in greater detail in Section 2.3.

2.3 Understanding the visitor and the visit experience in educational leisure settings

Introduction

The literature on learning in educational leisure settings has clearly emphasised that it is essential to understand the visitor in order to comprehend how they experience a setting, learn during a visit and subsequently behave as a result of the on-site learning experience. Visitors do not enter educational leisure settings as blank slates waiting to be educated; each comes with their own motivations, worldview, knowledge, experiences, emotions, attitudes and a host of demographic variables that are independent of the visit experience. In addition to these demographic variables are visitation variables, such as the individual's previous experience of the site and the composition of the group. Both models of learning discussed in Section 2.2 have also highlighted the fact that visitor learning is mediated by various aspects of the experience—the physical context (what visitors saw and did during the visit), their engagement with the physical context (experiential and reflective engagement) and the sociocultural context (with whom they interacted during the visit).

This section is divided into two parts. The first (2.3.1) focusses on the personal characteristics of visitors that research has found to influence free-choice learning in educational leisure settings. The second part (2.3.2) addresses aspects of the experience that are likely to

influence learning. As cultural background is the focus of this research, it will be highlighted as a key demographic variable.

2.3.1 Understanding the visitor

Visitor characteristics can be subdivided into four categories: **demographic variables**, including age, gender, education level, marital status, number of children, income, employment status; **cultural variables[1],** such as cultural background, language and place of residence; **psychographic constructs** that refer to attitudes, opinions, values, concept of self, personality traits, goals, activities and interests (Hood, 1993b); and **visitation variables,** including visit frequency and group composition.

2.3.1.1 Demographic variables

Demographics were some of the first variables explored in early visitor studies as researchers sought to understand different types of visitors (Werner et al., 2014). Demographic variables that have been found to be important in educational leisure settings include gender, age and education level (Ballantyne, et al., 2011; Moss, Jensen, & Gusset, 2016; Vernon, 2009). While some research in the USA and Australia has shown that demographics tend to be poor predictors of learning (Falk & Adelman, 2003; Falk & Storksdieck, 2005; Falk, 2006; Weiler & Smith, 2009), in a study of visitors to 30 zoos and aquariums in 19 countries, age, gender, education level were found to significantly predict respondents' knowledge of pro-environmental behaviour (Moss et al., 2016). In the USA, Vernon (2009) noted that visitor demographics impacted upon conservation learning outcomes, with women and older visitors being more receptive to conservation learning than other visitors. Reading and Miller (2007) and Lukas and Ross (2005) found that age and education levels influenced attitudes to zoos and animals. In Australia, demographic variables such as age and gender were found to influence the short term impact of a visit to a wildlife tourism facility (Ballantyne, et al., 2011).

2.3.1.2 Cultural variables

Culture is highlighted here as this research focuses on culture as an important visitor characteristic. As culture is seldom addressed in research on free-choice learning, this section provides a background to the concept of culture and addresses the importance of including culture in research on visitor learning in educational leisure settings. Findings from previous

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[1] Although cultural variables are usually considered to be demographic variables, they have been treated as a separate category here because they are a major focus of this research.

research are discussed and cultural variables that have been found to be important in educational leisure settings are highlighted. While early visitor studies merely looked at cultural identity or race, additional externally defined demographic characteristics, such as group or household composition and location of residence, are increasingly relevant (Werner et al., 2014). In the context of South Africa, location of residence (urbanisation) and language spoken are considered to be important cultural variables. Urbanisation will be addressed in this section and language will be addressed in Section 2.4.

The concept of culture

Etymologically, 'culture' is related to the idea of 'cultivate', as in 'agriculture', and is denoted as both an activity and a product (Natrajan, 2008). Culture is extremely difficult to define and there appear to be as many definitions of the term as there are researchers studying it. Simplistically, culture is an abstract concept that refers to the collection of shared beliefs and customs that provide the social mechanism enabling individuals to survive in a society (Falk & Dierking, 2000). Jacobson (1996) views culture simply as a common way of making sense of experience based on shared history, while Gutierrez & Rogoff (2003) suggest that cultural membership is based on communal routine practices and beliefs that are passed on through generations across time and space. Ogbu (1995), on the other hand, considers that a person's culture comprises the understanding they have of their universe, including its social and physical components, as well as their understanding of how to behave in their universe. This includes customary ways of behaving, the emotions underlying these behaviours, the structures and symbols that have meaning, the institutions that guide customary behaviours, and patterns of social relations. According to Falk and Dierking (2000), our perception, description and understanding of the world are all culturally and historically bound.

Lee (2003) suggests that the study of culture enables us to see the variety of perspectives from which the world can be viewed. This understanding of culture, as an invisible lens through which we interpret our world and that is worn by all of the same culture (Jennings, 2007), is a good analogy for a topic that is so often fraught with controversy. Individuals in every culture assume that everyone has much the same outlook on the world, and that personal reality is the same reality for everyone else. It is important to cultivate an awareness that everyone wears cultural 'lenses' and it takes conscious effort to see the world through the cultural lenses of another (Jennings, 2007).

Individuals become a part of a culture through a process of socialisation with shared norms and values. These group norms are shaped by a myriad of social, historical, economic, environmental and political influences. Culture is influenced at the macro level by historical and political issues that transform culture over time (Quijada et al., 2008). Most research suggests that culture is a malleable and dynamic concept, constantly changing as a result of internal and external influences (Botha, 2010; Jackson, 2011; Rogoff, 2001). Culture is, therefore, not static and it has been suggested that the diversity of cultures is a result of the adaptability of the human species to different conditions and experiences (Lee, 2008). An awareness of the dynamic nature of culture is important to avoid generalisations or stereotyping of groups of people, as culture is socially constructed and is evolving, interactional, and multidimensional, as well as contextual (Quijada et al., 2008). Perhaps the early views of culture as both an activity and a product will re-emerge as an understanding of the dynamic nature of culture gains support. Given the multiplicity of cultures in South Africa and the diversity within these cultures because of historical, political and economic influences, the view of culture as dynamic context in the making (Quijada et al., 2008), as opposed to a static grouping of people with common traits, is valuable.

Cultural variables and free-choice learning

According to Alfred (2003), an acknowledgement of the sociocultural histories, identities, biases and assumptions of learners, and how these influence learning, is essential in order to understand multicultural learning. However, research that aims to build an understanding of the influence of cultural diversity on learning needs to be grounded in the fundamental belief that diversity is essential or fundamental to the human experience and not something 'different' (Lee, 2008). Research founded on these principles will be able to produce results that are generalisable across environments and cultures, as opposed to being narrowly defined as comparative between cultures.

That culture is an emotionally charged concept with multiple opportunities for causing offence is accepted. However, equally important is the fact that "…individual development and disposition must be understood in (not separate from) cultural and historical context" (Gutierrez & Rogoff, 2003:22). All people engage in learning shaped by their cultural and contextual conditions—this means that while everyone learns, how and what they learn may differ depending on their cultural and contextual backgrounds (Diouf, Sheckley, & Kehrhahn, 2000; Merriam & Ntseane, 2008).

Culture is not equivalent to ethnicity, occupation or social class (Bell et al., 2009) and it is important not to reduce culture to racial stereotyping, as that would underestimate the heterogeneity within different cultural groups (Gutierrez & Rogoff, 2003). Despite the overall influence of culture on an individual, it would be wrong to assume that simply because someone belongs to a particular culture that that individual will behave or learn in a particular way (Gutierrez & Rogoff, 2003). Thus, a study that includes cultural variability should be approached with the view that diversity is the norm, both between and within cultures, and that no single culture can be considered to be the norm (Lee, 2008).

Although it has been noted that the cultural value placed on free-choice learning can play a significant role in the learning that occurs, there is little information to support this assertion (Falk & Storksdieck, 2005). Most researchers agree that there is a paucity of research addressing multicultural issues in free-choice learning in general (Briseño-Garzón & Anderson, 2012a; Ji et al., 2014; Kisiel & Anderson, 2010; Packer, Ballantyne, & Hughes, 2014; Werner et al., 2014). To date, most of the research in the field of free-choice learning has focussed on the individual and family levels, as though these units are isolated from the broader community. However, sociocultural influences operate at three different levels: at the broader social level, at the family level and at the individual level. Because the family and individual cannot be isolated from the broader society in which they live, research is needed to understand how the broader society influences the family and individual in their experience of an educational leisure setting (Dierking, 1998).

The importance of cultural sensitivity in evaluation research was addressed, for the first time, by the American Evaluation Association, with the publication of a public statement on 'Cultural competence in evaluation' (American Evaluation Association, 2011). The statement asserts that without understanding the influence of culture on research theory and methodology, systematic errors that threaten validity are highly likely. The influence of cultural diversity on learning, as well as the effect of cultural differences in participant response behaviour, are both gaps in current visitor studies research that need to be addressed (Werner et al., 2014).

Cultural variables and environmental attitudes

Moving beyond free-choice learning into the wider field of environmental attitudes, research into the similarities and differences among people of different cultures in attitudes and perceptions of environmental issues has been undertaken for many years, however, there

appears to be little consensus on the exact relationship between these factors (Ignatow, 2006; Johnson, Bowker, & Cordell, 2004; Oreg & Katz-Gerro, 2006; Sarigollu, 2009). A study on attitudes to animals was undertaken by Kellert (1980, 1984) in the USA. Amongst other striking differences, his finding suggested that urban 'black' people were substantially less interested in or concerned about the natural environment than 'white' people. This raises interesting questions about the influence of culture and ethnicity. Milfont, Duckitt and Cameron, (2006) found differences in environmental concerns between Asian New Zealanders and European New Zealanders, while an analysis of environmental attitudes in three countries (Brazil, New Zealand and South Africa) found that Brazilians were more concerned about the environment than South Africans or New Zealanders (Milfont, 2007). In research with Nigerian students, Ogunbode (2013) noted a lower endorsement of pro-ecological ideas than found in more Western cultural contexts. Cross-cultural studies of children's environmental concern have revealed highly significant cultural influences on environmental worldviews which were explained by experiences in nature during early childhood (Boeve-de Pauw & Van Petegem, 2011, 2012).

Analysis of data from 21 countries revealed that spiritual and ecological environmental worldviews had different social bases and that viewing environmental attitudes from a cultural perspective may assist in better understanding those attitudes (Ignatow, 2006). The role of socio-economic status in environmental perceptions has revealed contradictory results. While some researchers suggest concern for the environment is more likely in developed countries, where populations have a higher socio-economic status, other research suggests that environmental concern is equally prevalent in developing societies (Anderson, Romani, Phillips, Wentzel, Tlabela, 2007; Dunlap et al., 1993; Inglehart, 1995; Van Liere & Dunlap, 1980). Teasing out the influence of culture from socio-economic factors remains a highly relevant topic of research (Anderson, Wentzel, Romani, & Phillips, 2010).

Location of residence has been considered to be a cultural variable and urbanisation, in particular, has been thought to influence environmental attitudes. Van Liere and Dunlap (1980) noted that urban adults show more concern for the environment than rural residents. In contrast, research has shown that children growing up in a rural rather than an urban environment show greater sensitivity to ecological concepts and have reduced anthropocentrism (Bell et al., 2009). The fact that one study focused on adults while the other studies were undertaken with children may be a reason for this discrepancy. In addition, rural

African cultures have traditionally had not only a strong utilitarian attitude towards nature, but also a spiritual connection (Breidlid, 2009; Cocks, Dold, & Vetter, 2012; Ojomo, 2011). Struwig (2010) noted that place of residence (urban or rural) was one of the most important predictors of environmental attitudes in South Africa. However, there is limited information on the impact of increasing levels of urbanisation on attitudes to nature.

Cultural group as an independent variable in visitor studies

It is only relatively recently that research on the influence of culture in free-choice learning has been addressed and, to date, most studies have been undertaken in Australia, China and the USA. These studies have looked at different aspects of the visitor experience and visitor learning and revealed the aspects of the experience that contribute to visitor learning in the cultures studied. For example, a study on local visitors to a science museum in Mexico City revealed the importance of interactions between multigenerational extended family groups for learning amongst Latin American families (Briseño-Garzón & Anderson, 2012b), while a study on differences between Chinese and Western visitors' environmental learning at Giant Panda centres in China suggested that the inclusion of spiritual and cultural values in interpretation would enhance environmental learning in Chinese visitors (Chen, 2011). Research in a natural reserve in China has revealed that interpretation focussed on an 'aesthetic' approach was more appropriate for Chinese visitors than the traditional Western 'scientific' approach (Xu, et al., 2012). In research undertaken in five tourism sites in Beijing, China, Ballantyne, Hughes, Ding and Liu (2014) found significant differences between Western and Chinese visitors in interpretation requirements at man-made heritage sites, with Chinese respondents placing a greater emphasis on the role of the sites in Chinese national heritage, power and human history, than international visitors. Broadening the geographic scope, in a study in Japan the conflict between visitors expectations for entertainment, largely driven by the media, and educational values were explored (Yasuda, 2013), while research at a zoo in India revealed considerable potential to enhance visitor learning (Mallapur, Waran, & Sinha, 2008).

The few studies that have looked at attitudes towards animals and nature in educational leisure settings have revealed differences between cultures. In a study of visitors to the Denver Zoo, Reading and Miller (2007) found clear differences in attitudes to zoos and animals in the responses of visitors who classified themselves as 'non-white', when compared with those who described themselves as 'white'. Differences in environmental

attitudes were found between Chinese and Australian visitors to a nature based tourism site (Packer et al., 2014), with Chinese visitors more likely to dislike or fear animals in the wild than their Australian counterparts. The same study also noted that Chinese visitors were more environmentally aware, concerned and alarmed about the effects of climate change than Australian visitors (Packer et al., 2014).

2.3.1.3 Psychographic constructs

Doering and Pekarik (1996) used the term 'entrance narrative' to describe the internal story line with which visitors enter educational leisure settings. This entrance narrative includes the visitor's basic framework, or the way they view the world; the information that the visitor already has about the particular topic or setting; and the personal experiences and emotions that support the basic framework (Doering & Pekarik, 1996). Since Doering and Pekarik's research was published in 1996, a wide range of psychographic constructs have been found to influence visitor learning and behavioural outcomes (Adelman et al., 2000; Ballantyne et al., 2011; Falk & Storksdieck, 2005). Diverse people visit educational leisure settings for various reasons, each arriving with different levels of prior knowledge and varied interests based on their past experiences, which are then integrated as the visitor makes choices and controls their learning experience. Research undertaken at multiple facilities in the USA demonstrates that what visitors do, see and learn during a visit to a zoo or aquarium and what they think, feel, learn and do after the visit is largely determined by who they are and what they already know when they enter the facility (Ogden et al., 2004). Different people use educational leisure settings differently (Ellenbogen, 2002), and the impact of the visit depends largely on the individual (Ballantyne et al., 2011). To understand the impact of a visit to an educational leisure setting, it is thus useful to understand visitors' psychographic characteristics.

Psychographic constructs that have been found to be important in educational leisure settings include the knowledge, interest, attitudes, motivations and expectations that visitors bring with them to the visit (Falk & Dierking, 2000; Falk & Storksdieck, 2005). As the focus of this research is on environmental learning, visitors' environmental orientation, including their prior knowledge, interest and environmental behaviour, as well as various aspects of attitudes towards the environment and nature, will be specifically addressed.

Prior knowledge

Prior knowledge has long been recognised as critical to learning by both cognitive and sociocultural theorists, and features in most recent learning models (Falk & Dierking, 2000).

The knowledge and experiences of a visitor prior to their visit has repeatedly been shown to have a strong influence on what the visitor learns, both in the short and long term (Ballantyne et al., 2011; Falk & Adelman, 2003; Hein, 1998).

Several studies have shown that visitors' prior knowledge may predict their learning and subsequent action more effectively than demographic variables. An aquarium study in Baltimore found that when visitors to an aquarium were grouped on the basis of prior conservation knowledge and attitudes, significant differences in learning between groups could be discerned, enabling a better understanding of changes in visitors' environmental learning within groups (Falk & Adelman, 2003). To achieve this, Falk and Adelman (2003) reanalysed data collected from a number of earlier studies. Their aim was to determine if grouping visitors on the basis of their conservation understanding and attitudes upon entry helped to discern small changes in learning. They found that, when data for all respondents were analysed together, a significant increase in visitors' conservation knowledge was evident, however, not all respondents were at the same starting point. When the data were analysed after grouping visitors based on knowledge, interests and concerns before and after the visit and then comparing groups' entry and exit 'levels', they found changes in knowledge and interest were not significant for all groups. Individuals with minimum interest and knowledge gained the most. The research revealed that grouping visitors helped to uncover differences and exposed the uneven impacts of the experience. It has, therefore, been suggested that future efforts to investigate learning should include segmentation of visitors into categories based on prior knowledge and interest (Falk & Adelman, 2003), as although all visitors were exposed to the same elements during the visit, their on-site experience, and therefore their learning outcomes would be vastly different, depending on their pre-visit disposition (Adelman et al., 2000).

Following this suggestion, Hayward and Rothenberg (2004) grouped visitors on the basis of their conservation concern and noted that visitors with little or moderate knowledge of rainforests were significantly more likely to report having learnt something, and reported a greater increase in concern than those who entered the exhibit with more knowledge. This study was undertaken using open and closed questions, randomly interviewing people before and after their visit. However, the lower impact noted by visitors with a high self-reported prior knowledge may be due to 'ceiling effects' as some visitors scores were already so high

that there was almost no chance of their scores increasing significantly (Hayward & Rothenberg, 2004).

Prior interest

Interest, which influences attention, persistence in a task and continued curiosity, is also considered to be important when building an understanding of what motivates someone to learn in a zoo or aquarium (Falk & Dierking, 2000; Tunnicliffe & Scheersoi, 2009). It is an interest, or lack thereof, in a topic that determines what is attended to and what is ignored. Two forms of interest can be considered in an educational leisure setting: triggered situational interest—where a visitor experiences a short term curiosity stimulated by the setting; and well developed individual interest—a more stable intrinsic interest in a specific topic (Falk & Dierking, 2000; Hidi & Renninger, 2006). While individual interest is a pre-visit characteristic, situational interest, which is triggered by the immediate environment, is not. The challenge facing free-choice learning practitioners is to help people to move from situational interest to a more sustainable individual interest (Hidi & Renninger, 2006). In the case of an aquarium or zoo, it would mean moving people from the situational interest triggered by viewing the exhibits to a more sustainable interest in, for example, animals or nature.

Falk and Storksdieck (2005), using a range of seven separate measures of learning administered to the same visitors before and after a visit to a science museum, found an inverse relationship between prior knowledge and learning. The more a visitor knew on entry, the less they learned during their visit. Again, this may be an artefact of the study method, although the researchers assert that there was no evidence, either anecdotally or statistically, to support this supposition. They found interest to be better correlated with learning than prior knowledge—visitors with high levels of interest learnt more and, depending on the individuals' prior knowledge and interest, different factors influenced learning (Falk & Storksdieck, 2005).

Prior involvement in environmental (conservation) behaviour

Several studies have shown that visitors' prior involvement in conservation behaviour may predict their use of the leisure setting, their learning and subsequent action more effectively than demographic variables. Research supports the view that there is great variability in visitors' self-reported conservation behaviours on entering a zoo or aquarium, and that this variability influences learning outcomes (Dierking et al., 2004). A study of visitors to the

National Aquarium in Baltimore found that visitors not only had a better understanding of conservation than the general public, but they also considered themselves to be more active in conservation (Adelman et al., 2000). Comparison with national studies showed that aquarium visitors were more frequently engaged in conservation actions than the general public (Adelman et al., 2000), while research at Disney's Animal Kingdom found that most visitors were at least contemplating conservation behaviours before the commencement of their visit (Dierking et al., 2004). In this study, Dierking et al. (2004) grouped visitors according to pre-visit conservation behaviour. They noted that visitors bring with them a wide range of experiences, knowledge, attitudes, interests and motivations and that these differences affect the visitor experience and impact on individual conservation learning. They found no differences based on demographics with respect to conservation behaviour, which was unsurprising as 92% of their respondents were white Americans. In an Australian study of four marine wildlife tourism sites, Ballantyne et al. (2011) noted that most visitors were already engaged in environmentally sustainable behaviours prior to their visit. If most visitors, on entry, are already trying to behave in an environmentally sustainable manner at home, then the short term impact of the visit on planned environmental behaviour will be lower than expected (Dierking et al., 2004), giving support to the notion that zoos and aquariums are 'preaching to the converted' (Ballantyne, et al., 2011; Beaumont, 2001; Skibins & Powell, 2013). Therefore, a good knowledge of what visitors are already doing or planning to do will help to tailor messages that reach visitors 'where they are'. This may be particularly important within the South African context where many visitors may be on their first visit to a zoo or an aquarium. For these first time visitors their entry narrative may vary considerably from that of a repeat visitor.

Environmental attitude

Despite the many studies that have addressed the topic of environmental attitudes, there appears to be a lack of clarity about the exact definition of the term. Schultz, Gouveia, Cameron, Tankha, Schmuck and Franek, (2005) suggest that the term refers "to the collection of beliefs, affect, and behavioural intentions a person holds regarding environmentally related activities or issues" (p. 458). Attitudes cannot be observed as they are latent constructs that can only be inferred through responses to questions. A wide range of different instruments have been designed to measure environmental attitudes (Milfont & Duckitt, 2010). The New Ecological (previously Environmental) Paradigm (NEP) scale, first developed in 1978 by Dunlap and van Liere, is one of the most widely used measures of

environmental attitudes (Dunlap, Van Liere, Mertig, & Jones, 2000; Dunlap, 2008; Hawcroft & Milfont, 2010; Milfont & Duckitt, 2010). The NEP is considered to tap 'primitive beliefs' about the nature of humanity's relationship with the earth. While Dunlap et al. (2000) argue that the NEP scale measures a worldview rather than an attitude, the NEP has been treated "as a measure of endorsement of a fundamental paradigm or worldview, as well as of environmental attitudes, beliefs, and even values" (Dunlap et al. 2000:427). In the context of the current study, and in line with previous research in environmental psychology literature (Hawcroft & Milfont, 2010; Schultz & Zelezny, 1999), the NEP will be used as a measure of environmental attitude.

Although the NEP scale has been criticised for being based on a western ecological worldview, it is one of the few scales that has been used productively in non-western countries (Dunlap, 2008; Hawcroft & Milfont, 2010; Wilhelm-Rechmann, Cowling, & Difford, 2014). Despite its widespread use in environmental psychology, the scale has not been used widely in studies on environmental learning in educational leisure settings.

Connectedness to nature

Connectedness to nature is a concept that is being increasingly used by educational psychologists to predict environmental behaviour (Mayer & McPherson Frantz, 2004; Restall & Conrad, 2015; Schultz, Shriver, Tabanico, & Khazian, 2004; Tam, 2013). Connectedness to nature refers to the extent to which an individual believes that they are a part of nature (Schultz, 2002b). There are a number of different measures of connectedness to nature, with varying sensitivities for predicting environmental behaviour. Strong convergent validity has been found amongst some of the scales, although most have only been used in high income countries (Restall & Conrad, 2015; Tam, 2013). Although connectedness to nature has been shown to predict environmentally responsible behaviour, it has not often been used in the zoo or aquarium context. Bruni, Fraser and Schultz (2008) noted that a visit to a zoo promotes an implicit rather an explicit connection to nature, while Yocco (2010) suggested that zoo visitors had moderate levels of inclusion with nature and that a visit did not necessarily enhance this connectedness. Clayton, Luebke, Saunders and Grajal (2014) found that connections to animals or nature were related to responses to climate change; however, they were unable to ascertain whether the nature connectedness existed prior to the visit or was a result of the visit.

Locus of control

Locus of control, a psychological construct that predicts an individual's behaviour based on their perception of reinforcement (Heimlich & Ardoin, 2008), has been widely used in the field of environmental education (Allen & Ferrand, 1999; Cleveland, Kalamas, & Laroche, 2005; Fielding & Head, 2012). Locus of control is based on a person's perceptions of their control over their environment—individuals with an internal locus of control believe that a desired outcome can be achieved through their own efforts, while those with an external locus of control believe that 'control' is in the hands of others or simply up to chance (Bodur & Sarigollu, 2005). It has been postulated that building a strong internal locus of control can help to encourage pro-environmental behaviour, and that income and education levels are predictors of locus of control (Heimlich & Ardoin, 2008).

Visitor motivation and expectation

Research suggests that the reasons an individual visits a facility significantly impact on the learning that takes place during the visit (Falk & Dierking, 1992; Falk et al., 1998; Falk, 2006; Packer & Ballantyne, 2002; Packer, 2004; Schultz & Joordens, 2014). Of the wide variety of reasons given for a visit to an educational leisure setting, the following general categories have been identified: education (learning and discovery); entertainment; recreation; social interaction; life cycle (birthdays, etc.); sense of place (visitors like the 'facility', it is a place tourists visit, it is recommended by others); restoration (relaxation); self-fulfilment (desire for meaning and achievement); and practical issues (kill time, weather, etc.) (Adelman et al., 2000; Falk & Dierking, 2000; Falk et al., 1998; Packer & Ballantyne, 2002). In the case of zoos and aquariums, most research has shown recreation or entertainment to be the primary motivators for attendance, with visitors often wanting to both have fun and learn (Ballantyne et al., 2007; Linke & Winter, 2011; Morgan & Hodgkinson, 1999; Packer & Ballantyne, 2002).

Falk et al., (1998) used the term 'visitors' agendas' to describe the motivation for visiting a museum and the cognitive, affective or social expectations that the visitor hopes to achieve or pursue during the visit. Falk (2006) developed an approach to cluster visitors on the basis of their expectations of the visit or their 'enacted identity'. This framework classifies visitors into five groups based on their personal "identity-related motivation" (Falk, 2006:156).

The identity-related visitor model has been both praised and criticised. Rowe and Nickels (2011) suggest that the model be refined to include the motivational factors identified by

Packer and Ballantyne (2002) to more accurately capture non-dominant motivations. It was suggested that motivation is only one component of a 'situated identity', which includes a sociocultural component, and they called for a revised instrument. Dawson and Jensen (2011) criticised identity-related segmentation and suggest that demographics, in addition to psychographic and identity-related factors all contribute to building an understanding of visitors. Their arguments stem from social justice theorists who advocate "that underestimating the importance of differences between people, whether in terms of their class, ethnicity, gender, sexuality, or other factors, can create damagingly homogenous constructions where those who do not fit in are simply ignored" (Dawson & Jensen, 2011:133). Dawson and Jensen (2011) argue that Falk's (2006) identity-related motivations disregard the rich complexity, change over time, and the interrelated and developmental nature of sociocultural variables influencing visitors' experiences (Wagoner & Jensen, 2010). Both Dawson and Jensen (2011) and Rowe and Nickels (2011) call for a more inclusive approach to visitor studies that includes better use of sociocultural and demographic variables. Despite their differences, Jensen, Dawson and Falk (2011) agree on a number of points, including that a better understanding of visitors' agendas is critical in visitor research.

It is clear that the visitor's motivation to visit an educational leisure setting plays an important role in their environmental learning. Researchers have viewed motivation from different angles, depending on the focus of the research. While Falk (2006) viewed motivation in a broader context of the visit experience, which includes social and situational factors, Packer and Ballantyne (2002) emphasised the individual needs and aspirations of the visitor and Briseño-Garzón, Anderson and Anderson (2007b) focussed on the individual and collective agendas of family groups. All approaches have contributed significantly to the field of visitor studies and, depending on the context of the research; each can be used to provide valuable information.

Closely linked to motivation is visitor expectation. Learning in an educational leisure setting is inextricably bound to the environment in which the learning takes place, as the experience is generally highly reactive to the opportunities provided by the setting (Falk & Dierking, 2000). The visit experience is strongly affected by what happens before the visit, and factors such as marketing and public perceptions can enhance or detract from learning (Falk Moussouri & Coulson 1998; Falk & Dierking, 2000). For a prospective visitor to make the effort to visit an educational leisure setting, for either entertainment or learning, they first

need to know that such a facility exists and that the facility can satisfy the need for fun or learning (Falk & Dierking, 2000). It is suggested that marketing strategies that emphasise conservation and education can help to prepare visitors for maximum gain (Ballantyne, et al., 2009). Conversely, marketing that only promotes the excitement and fun of the visit with almost no emphasis on animals or education may detract from learning during a visit.

While the body of literature exploring the relationships between visitor motivation, expectation and learning in educational leisure settings is increasing internationally, little work has been done in an African context. In most developed countries, visitors to aquariums generally have an idea of what to expect from the facility. However, in South Africa many people have no prior experience of an aquarium, exemplified by the fact that the word 'aquarium' does not exist in any indigenous African language. This means that the expectations of many African visitors are often vague or incorrect (Jone Porter, personal communication). Zoos and aquariums are generally life cycle experiences—parents take their children, who then take their own children (Falk et al., 1998). A predictor of whether someone will visit a museum or zoo is their history—if they were taken to a museum as a child they are likely to take their own children. Ogbu (1995) suggests that the cultural history of the person will influence their knowledge and use of an educational leisure setting. Therefore, whether or not a particular educational leisure setting is a part of the cultural world of a potential visitor plays a large role in determining their visitation (Dierking, 1998). In the South African context this provides an interesting challenge, as many parents currently in their 30s and 40s were unlikely to have been taken to an aquarium or zoo as a child, because of the political climate 20 to 30 years ago. Many of the current generation of South African parents are visiting facilities, such as zoos and aquariums with their children, as first time visitors. In fact, many parents visit the facility after their children, who are introduced to the facility via a school visit.

2.3.1.4 Visitation variables

Although learning in an educational leisure setting is both an individual and a group experience, most visits are undertaken in groups as a part of a social experience (Dierking, 1998). Research has highlighted the importance of the social dimension of learning (Astor-Jack, Whaley, Dierking, Perry, & Garibay, 2007; Ellenbogen, 2002; Ballantyne & Packer, 2016). In addition, a visitors' prior experience of a site has also been noted to influence their learning (Moss et al., 2016; Smith, 2013). Visitation variables such as group composition,

group size and frequency of visits are, therefore, often investigated in studies on visitor learning as these visitation variables may affect the enacting of demographic, cultural and psychographic variables.

Visitor group composition

Data consistently show that families are the dominant social grouping in educational leisure settings and much attention has been devoted to understanding family group learning (Borun, Chambers, Dritsas, & Johnson, 1997; Briseño-Garzón, et al., 2007a; Briseño-Garzón & Anderson, 2012b; Ellenbogen, Luke, & Dierking, 2007). In the case of families, the visit is primarily a social event and social interaction largely shapes the experience, as well as subsequent memories of the visit (Dierking, 1998). Adult zoo visitors frequently mention that the visit was initiated for the children (Clayton et al., 2009) and "Children influence the repeat visits of family groups, the adult visitor's exhibit interest, and staying time at the exhibit" (Patrick & Tunnicliffe, 2013:38). However, although adults may view their visit as being 'for the children', adults in family groups visiting an aquarium in Canada were found to be both active learners, as well as facilitators of the experience for children (Briseño-Garzón et al., 2007a).

Frequency of visitation

The effect of multiple visits on short term environmental learning may be significant as increasing familiarity with the facility may facilitate increased learning opportunities as visitors become easier to reach and more comfortable in their surroundings (Yalowitz, 2004). Greater concern for the environment was noted amongst repeat visitors to a zoo in the USA (Lukas & Ross, 2005) and research in Australia confirmed that regular repeat visits allowed for progressive education opportunities (Smith, 2013). An ambitious study across 19 countries showed that first time visitors scored lower on knowledge of actions to conserve biodiversity than repeat visitors (Moss et al., 2016).

2.3.2 Understanding the visit experience

While a great deal of research has focussed on understanding the visitor to educational leisure settings, the influence of the various components that make up the visitor experience has been less well studied. The complexity of the concept of the visitor experience has been explored by Packer and Ballantyne (2016), who provide a comprehensive overview of the terminology, a conceptual model of the factors associated with the visitor experience and identify different facets that make up the visitor experience. The visit experience can be influenced by external

elements of the site (physical design, activities, exhibits, staff, interpretation, etc.) that are processed through the filter of the visitor's previous experiences, interests, expectations and motivations to produce an immediate subjective experience and a subsequent 'remembered experience' (Packer & Ballantyne, 2016). In the context of this research, the visitor experience is considered to be the interaction between the external elements offered by the site and the visitors' personal engagement with those elements, occurring during the visit. This section will, thus, address these two aspects of the visit experience.

2.3.2.1 External elements

Design of facility and on-site activities

The design of free-choice learning environments has been well researched (Bitgood, 2002), with topics ranging from the ambiance, lighting, size, placement of objects, colour, sound and ease of navigation, having all been found to have a profound impact on the visitor experience and the quality of learning that takes place (Falk & Dierking, 2000; Ogden, Lindburg, & Maple, 1993; Vernon, 2009). The colours, position and types of exhibits, size, position and type of labels, lighting and textures, even smells and sounds, can all communicate a message about the nature of the exhibit to the visitor and influence their personal engagement with physical elements. The difference between the bright colours and fantasy nature of a children's exhibit (such as the Splash Zone in the Monterey Bay Aquarium) and the more subdued lighting, colours and style of more traditional aquarium exhibits (such as the Sharks exhibit at the same aquarium) clearly display this difference (Figure 2.3). Changing the design of a zoo or an aquarium exhibit has been found to change visitor behaviour and learning (Moss, Esson, & Francis, 2010) and thus changes to the physical environment will influence the visitor experience (Packer & Ballantyne, 2016).

Figure 2.3 The Splash Zone (left) and the Sharks gallery (right) in the Monterey Bay Aquarium, Monterey Bay, USA.

Design of interpretive media

One of the most researched factors of design relates to the use of labels to interpret exhibits (Bitgood, Dukes, & Abbey, 2006; Diamond, 1999; Moscardo et al., 2007). The position, content, design, number and sequence of labels can influence learning in many ways (Ballantyne & Hughes, 2006; Moscardo et al., 2007; Serrell, 2006; Weiler & Smith, 2009). For example, Weiler and Smith (2009) found that increasing the number of opportunities for visitors to encounter interpretive media increased their self-reported behavioural, cognitive and affective short term outcomes.

In the zoo and aquarium context, keeper talks, animal feeds and presentations, and one-on-one interactions with trained staff members are considered to be forms of interpretation (O'Connor, 2010). Research in the USA has shown that including interpretation in public animal sessions enhanced visitors' perceptions of their experience and resulted in longer viewing times (Anderson, Kelling, Pressley-Keough, Bloomsmith, & Maple, 2003; Povey & Rios, 2002), while research at uShaka Sea World highlighted the influence of entertaining mammal presentations on visitor learning (Mann-Lang, Ballantyne, & Packer, 2016a).

Interactions between staff and visitors

A less physical but important component of the visitor experience involves the interactions that occur between visitors and staff, ranging from the service staff at the entrance, in the shops and restaurants, through to the operational staff, who may simply be wandering through a visitor area. Depending on their training and role, each group of staff members may

have a different interaction with, and impact on, the visitor (Falk & Dierking, 2000; Wagner et al., 2009). Early research has shown that well trained and enthusiastic staff can have a positive impact on visitors' learning (Wagner et al., 2009), but this needs to be studied more rigorously.

2.3.2.2 Visitor engagement

While research to measure the visitor experience is a relatively new field, work undertaken by Ballantyne et al. (2011) has highlighted the role played by various aspects of the visitor experience in both short and long term learning. Their study conceptualised the visitor experience as being composed of both reflective and experiential aspects that they termed reflective and experiential engagement (Ballantyne, et al., 2011). Reflective engagement goes beyond the concept of active engagement, awareness of multiple perspectives and alertness to new information (often referred to as mindfulness) and emphasises the importance of both cognitive and emotional processing, whereby visitors engage in "a deliberate attempt to process the events, and the associated feelings, to bring ideas to consciousness and make sense of them, to integrate them with previous knowledge and understandings, and to make choices about future actions" (Packer & Ballantyne, 2013:170). Experiential engagement captures the excitement of having a good view of live animals, seeing plenty of activity, feeling a sense of wonder or awe and having an enjoyable experience (Ballantyne, et al., 2011).

In their empirical model of free-choice environmental learning (described in 2.2.5), Ballantyne et al. (2011) found that engaging in a reflective experience during the visit significantly contributed to short term learning, and that elements of the experience, including having a good view of the animals and the excitement and enjoyment of the experience, contributed to reflective engagement. Reflective engagement was more strongly associated with both short and long term learning than the quick excitement of seeing the animals. Packer and Ballantyne (2013) suggest that reflective engagement may be the missing link between the visitor's experience and their environmental actions. Packer and Ballantyne (2016) have recently developed a multifaceted model of the visitor experience that helps to conceptualise the various facets of a visitor's experience.

Summary to Section 2.3

It is generally accepted that not only do visitors differ demographically and culturally, and enter an educational leisure setting for different reasons with different knowledge bases,

experience and interests in different social groupings, but also that each person experiences the facility in a different way, based on these intrinsic factors as well as the extrinsic factors that make up the physical components of the setting. Although evidence exists that each of these factors influences learning, the factors that have the most influence on visitor learning vary between settings, with the overall extent to which different factors influence learning being still unknown (Ballantyne, et al., 2011; Falk & Storksdieck, 2005). In fact, it is a combination of factors that together influence learning and no one factor should be considered in isolation (Falk & Storksdieck, 2005).

Many researchers have challenged environmental interpreters to better understand their visitors. This challenge is based on the premise that conceptions are largely shared by people from similar backgrounds and that it is possible to generalise about the range of concepts held by target visitor groups in relation to environmental knowledge, attitudes and behaviours (Ballantyne, 1998). Falk and Dierking (2000) stressed the importance of culture in free-choice learning and Astor-Jack et al. (2007) noted that building an understanding of visitors' social interactions, from a cultural perspective, was important in learning. Briseño-Garzón and Anderson (2012b) argued that sociocultural approaches to learning in museums were an important line of research. Despite these recommendations, little published research has included the influence of cultural factors on free-choice learning. Most of the studies investigating free-choice learning have been undertaken in facilities based in the West (Europe, USA, Australia and New Zealand). The extent to which this research can be extrapolated outside of Western cultures is unknown. Kisiel and Anderson (2010) suggest that research in non-Western contexts could either challenge or confirm some entrenched assumptions about the nature of free-choice learning, while Briseño-Garzón and Anderson (2012b) argue that work with a range of cultures is necessary "because it provides some evidence for substantiating and differentiating the current perspectives on family learning in informal contexts that predominantly emanate from research conducted in Anglo socio-cultural contexts" (p.195).

In South Africa, the complexity of understanding visitor learning is amplified by the wide variety of cultural, socio-economic and educational backgrounds of visitors. There is almost no published work that looks at environmental learning in an African zoo or aquarium. This research, therefore, aims to address this gap in the literature, as well as to use the results to improve the capacity of African zoos and aquariums to more effectively reach a cross-section

of visitors by facilitating changes to the experience that make it more enjoyable and educational for visitors from different cultural backgrounds.

2.4   The South African context

Introduction

To understand the context of the research it is important to understand the environment in which the research was undertaken. This section provides a brief background to the South African situation with respect to environmental, social and cultural circumstances. It also provides an introduction to current visitor research in South Africa, relevant to this thesis.

2.4.1 The South African Context

South Africa is a place of contrasts and extremes; a place with amazing potential facing enormous challenges. In 1994 the country went through what could only be described as a political miracle. The fact that the transformation from the old apartheid system to a new democratic government took place peacefully is quite remarkable and a testament to the resilience and patience of the South African people (Mann & Mann, 2008). However, after the euphoria surrounding the political changes, the economic, social, educational and environmental challenges have become increasingly apparent. South Africa is now struggling to distribute the wealth of the country more equitably, while keeping the economic foundation sound. Despite the progress that has been made, South Africa still has a vast disparity in wealth, with both exceptionally rich and desperately poor people, and a slowly burgeoning middle class. The following facts from Statistics South Africa (2015) help to put things into context: of the over 54 million people in South Africa, approximately 30% are younger than 15 years of age; approximately 10% of the population is HIV positive; the unemployment rate is almost 30%; South Africa has 11 official languages; literacy levels remain low. In a country that faces such enormous social and economic challenges, the environment is usually viewed as a resource to be used. Basic human needs far outweigh environmental considerations and, for many, concern for the environment is a luxury.

The historical context of South Africa has largely shaped the current social, economic and political challenges that the country faces. South Africa contains what can be seen as two parallel societies. One is comprised primarily of people of African origins, many of whom still live under circumstances similar to that found in most developing nations, while the other is largely populated by an increasingly multicultural mixture of South Africans—White, African, Indian and Coloured people—who generally have a quality of life comparable to

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many developed nations (Lumby, 2005). Along with these economic disparities are enormous educational and cultural differences.

2.4.2 Cultures in South Africa[2]

Not only does South Africa have incredible biological diversity, it is also rich in cultural diversity, a feature clearly demonstrated by the fact that the country has 11 official languages (two Germanic languages, namely, English and Afrikaans, and nine African languages). South African society is considered to be multicultural, multilingual and multi-ethnic (du Plessis & Saccaggi, 2015). Research by Valchev et al., (2013) suggests that the speakers of the 11 languages could be meaningfully grouped into three ethno-cultural groups: Black African, White, and Coloured and Indian (or Asian). However, Adams, Van De Vijver, and De Bruin (2012) propose four groups: African, Coloured, Indian and White. According to the 2001 Population Census, the most spoken first home languages are Zulu (24%), Xhosa (18%) and Afrikaans (13%) (Statistics South Africa, 2007). English is the home language of only 8% of the population, although it is the language of commerce and academia in South Africa. The education system unofficially uses English as the *lingua franca*, although this is frequently challenged (Desai, 2012). Exams for non-language subjects in the school leaving certificate are written primarily in English. People of African origin (African), those of European extraction (White), those of mixed descent (Coloured) and those whose forefathers came from India (Indian) may be considered to be culturally distinct. However, within each community there are common cultural features and all simultaneously share a common 'South African' culture.

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[2] **Note on terminology**

Cultural group describes the classification of a population group of South African citizens. The previous government used legislation to impose this type of classification to divide the South African population into distinct groups on which to base apartheid policies. Although classification of individuals along these lines may appear offensive, these classification categories are used under the new democratically elected South African government and have been incorporated into the census as acceptable terms (du Plessis & Saccaggi, 2015). This categorisation is evident in South African law which, through the Black Economic Empowerment legislation, regulates employment based on group in order to promote transformation. It remains important for research in the country to use this classification to demonstrate the effects of past discrimination, and enable monitoring of policies to address such discrimination. (Statistics South Africa, 2007). In addition, it is not possible to explore culture without reference to cultural groupings. The following categories are provided in the South African census: black African, coloured, Indian or Asian, white and other (Statistics South Africa, 2003). To simplify the reading of this thesis the following categories are used: African, Coloured, Indian and White.

2.4.2.1 South Africans of European origin (White)

Officially, Europeans first arrived in South Africa in 1652. Linguistically, culturally and historically, white South Africans can be divided into two groups, depending on their ancestors: Afrikaners, who speak Afrikaans, and whose forefathers were primarily from Germany, Holland or France; and English speakers descended from English or Irish emigrants. Approximately 9% of the population of South Africa is white and approximately 60% of them speak Afrikaans, with the majority of the remainder speaking English. Afrikaans and English South Africans share a bitter history of conflict exemplified by the Anglo-Boer wars (Griffiths & Prozesky, 2010). Afrikaans-speaking South Africans have retained a strong sense of cultural identity (e.g. shared music, language, food and popular literature), while the shared identity of most English-speaking South Africans is often manifest in support of selected sports. The changes that have taken place in South Africa have created widespread emotional and physical turmoil and, since the early 1990s, an estimated 20-25% of the White population has emigrated (Griffiths & Prozesky, 2010). This group is considered to express western individualistic values, with an emphasis on the immediate core family unit rather than the extended family (Adams et al., 2012). White South Africans have traditionally used the sea recreationally for diving, fishing (off a boat or from the shore), surfing, boating and swimming, amongst other uses. The use has, therefore, been consumptive and non-consumptive, commercial and recreational.

2.4.2.2 South Africans of Indian origin (Indian)

Making up less than 3% of the population, approximately one million people of Indian ancestry live in South Africa, most of whom live in Durban (Winship & Beighton, 2011). KwaZulu-Natal (KZN) is home to the largest population of Indian people outside of India and Durban has been referred to as the largest 'Indian' city outside of India. Indian people comprise 20% of residents in the greater Durban area. Indian people living in South Africa today are descendants of migrants from India, who moved to South Africa in the late 19th to early 20th century. Almost all South African Indians are Hindu, Muslim or Christian, with English generally being the language of choice, although the English spoken has been identified as Indian South African English (Wiebesiek, Rudwick, & Zeller, 2011) .

Considered to be broadly collectivist in nature, people of Indian origin still articulate a strong relationship with India, manifest through food, religion and popular culture such as cinema and television (Bollywood) (Singh, 2011). While cultural ties to India are strong, they are

usually rooted in South Africa economically and socially, sharing a collective cultural identity, despite feeling uncertain of their place in South Africa (Nyar, 2012). However, as in any culture, differences are found within cultural groups and Indian people are also divided by differences in religion, ethnicity, class and region of origin in India (Ojong, 2012).

Indian people have a long-standing tradition of fishing and some of the earliest commercial fishermen along the eastern seaboard of South Africa were Indian. This tradition continues today, especially during the annual sardine run along the South African east coast. However, with the exception of shore-based fishing and beach visits, they have not traditionally been associated with maritime activities.

2.4.2.3 South Africans of African origin (African)

Comprising 80% of the population of South Africa, Black African South Africans are not linguistically homogenous, but show distinct, consistent and enduring commonalities transcending geographic boundaries and ethnicity (Ngara, 2007). The major groups include the IsiZulu, IsiXhosa, SeSotho, Sepedi, Tshivenda, Setswana, Xitsonga, SiSwati and iSiNdebele. The South African black majority is increasingly urbanised, but it is primarily in the rural areas that cultural values and traditions survive today. African people living in cities generally speak English or Afrikaans, in addition to their mother tongue.

Traditionally, southern African cultures view human existence in relation to the existence of others *(ubuntu)*, with a strong sense of belonging and community participation (Merriam & Ntseane, 2008; Venter, 2004). Spirituality is important, and connectedness, which encompasses ideals of respect for human life, co-operation, mutual help, respect for elders and preservation of the sacred, is fundamental (Merriam & Ntseane, 2008). Responsibility is considered to be a collective rather than an individual issue, as exemplified by the statement "a child is a child of every adult in the community" (Ngara, 2007:8). These summaries, provided by Makgoba (1997) and Ogungbemi, (1997) help to capture the essence of African culture:

"African identity and culture are not uniform; have never been; and do not pretend to be…. The Afrocentric population is widely distributed throughout the world… Even within Africa, the north, west, east and southern parts form identifiable clusters of their own. All of these are linked by shared values that are fundamental features of African identity and culture. These, for example, include hospitality, friendliness, the consensus and common framework

seeking principle, ubuntu, and the emphasis on community rather than on the individual. These features typically underpin the variations of African culture and identity everywhere." (Makgoba 1997:198).

"In our traditional relationship with nature, man and women recognize the importance of water, land and air management. To our traditional communities the ethics of not taking more than you need from nature is a moral code. Perhaps this explains why earth, forests, rivers and wind and other natural objects are traditionally believed to be both natural and divine. The philosophy behind this belief may not necessarily be religious, but a natural means by which the human environment can be preserved. The ethics of care is essential to traditional understanding of environmental protection and conservation." (Ogungbemi, 1997:204).

Although the manifestation of traditional African culture is still evident in rural areas, as urbanisation increases, with associated problems such as crime and poverty, traditional African cultural values are being blended with Western values. Western cultural values include individualism, competition and a future time orientation (Tyler et al., 2008), as opposed to African traditional values of collectivism, co-operation and a strong emphasis on the past.

African cultural attitudes towards the marine environment vary, depending on familiarity and region of origin. However, with the exception of the amaThonga along the north eastern coast of South Africa and a few remnants of the Khoisan community, most African people are not familiar with the marine environment, and many have never seen the sea. The exception is those who make a special journey to the coast, particularly on New Year's Day, when it is considered 'cleansing' or good luck to bathe in the sea. A number of marine animals that wash up on the beach are used in traditional medicine (muthi). There is no word for an aquarium in any African indigenous language.

2.4.2.4 South Africans of Mixed origins (Coloured)

Comprising approximately 9% of the population of South Africa, the Coloured community consists of people of mixed heritage. With a rich blend of Khoisan, East, Southern and Central African, European, Malay, Indian, Indonesian, Malagasy and Asian descent, coloured people are truly representative of the ethnic diversity of South Africa. In fact, genetically, coloured South Africans have some of the highest levels of mixed ancestry in the world

(Tishkoff et al., 2009). Considered to be less collectivist than Africans', Coloured people consider themselves to be culturally distinct from other groups, sharing many religious and traditional practices of the groups from which they descended (Adams et al., 2012) and manifest now in language (Afrikaans), food and music. The Coloured community is found predominantly in the Western Cape province of South Africa (Statistics South Africa, 2007). Many of this community are engaged in the fishing industry.

Summary

Although each broad cultural grouping has been described separately above, culture is never static and changes with new generations and social conditions (Lee, 2003). In South African society this is particularly evident as different cultures become increasingly integrated. In the 20 years since the end of apartheid, a new generation of children has been educated in multicultural schools and the differences between cultures, especially in younger people in more affluent communities, is slowly decreasing. In a book titled 'The Vanishing Cultures of South Africa', Magubane (1998) laments this loss of traditional culture. Today, middle class South Africans of all races have lifestyles similar in many respects to those found in most Western countries, and in the cities, increasingly hybrid mixtures of different cultures exist. In fact, people of all cultural groups increasingly refer to themselves as 'South African' (Nyar, 2012), supporting the notion of a move from cultural views based on difference to those based on integration (Frenkel, 2011). This complexity can be summed up in the words of Frenkel (2011:15) as "the tangled and complex forms of cultural identity that mark contemporary postcolonial South Africa, where ubiquitous ambiguities destabilize the binary logic of the past".

2.4.3 Environmental Awareness and Attitudes in South Africa

There are relatively few studies that reveal the current state of environmental awareness of South Africans. South Africa was included in a global study on people's attitudes towards climate change between 2007 and 2008 (Slade & Britton, 2008). The report noted that, when compared to the global average, South Africans were concerned about climate change. Little is known about the impact of socio-economics and cultural variables on attitudes towards the environment in South Africa. Struwig (2010) provided a useful overview of attitudes to the environment in South Africa as a part of a wider study of South African social attitudes. The study noted that perceptions of the environment differed by race, geographic location, locus of control and numerous other variables, primarily influenced by the legacy of past policies

and legislation. South Africans view unemployment, HIV-AIDS, crime and poverty as the most important concerns (Roberts, Struwig & Rule, 2010), therefore, the stronger emphasis on economic growth than environmental concern amongst most South Africans is understandable (Struwig, 2010).

Anderson, et al. (2007) found a low level of environmental concern amongst all South Africans. Interestingly, the same authors, in a study of over 26,000 South African households (Anderson et al., 2010), noted that African households were more likely to notice environmental problems such as water pollution and land degradation than non-African households, however, non-African households were more likely to take action to address environmental problems. In another study, Wilhelm-Rechmann et al. (2014) used the New Ecological Paradigm (NEP) and the Inclusion of Nature in Self (INS) scales to study the environmental attitudes of South African land-use planning stakeholders. They noted low NEP ratings and high INS scores for Xhosa (Black African) participants. A study of rural residents in an impoverished area of South Africa noted that environmental concern was contextual, gendered and material in nature, largely focussing on immediate needs (air pollution, water security etc.) (Hunter, Strife, & Twine, 2010).

With a focus on cultural diversity, further research in South Africa could, provide valuable insights into the influence of personal characteristics, on environmental attitudes and awareness.

2.4.4 Free-Choice Learning Research in South Africa
Despite the relatively large amount of international research that has focussed on learning in educational leisure settings, little research has been published on visitor learning in such settings in South Africa. While some facilities have undertaken informal visitor research, these have been primarily exit surveys undertaken for marketing purposes. The cultural context described above suggests that South Africa is well positioned to provide an insight into the relationship between personal characteristics and environmental learning in educational leisure settings.

Although the field of environmental education in Southern Africa has grown exponentially since the early 1990s, most of it has focussed on formal education, in particular, education for sustainable development within the formal education framework (Peden, 2008). With the exception of some research on education in environmental education centres (Ferreira, 2003),

little attention has been given to free-choice learning. Where free-choice learning has been studied in a South African context it has focussed on environmental education as a means to address issues of social transformation (Ferreira, 2003). In the discourse surrounding the institutionalisation of indigenous knowledge in environmental education it is acknowledged that this issue is complex and multifaceted (van Damme & Neluvhalani, 2004), Within the southern African context there has been a concerted effort to view indigenous and Western knowledge as complementary rather than oppositional (O'Donoghue & Janse van Rensburg, 1999). Although there have been many studies of environmental indigenous knowledge, these have been undertaken to inform educational and conservation epistemologies rather than within the context of free-choice learning (Mokuku & Mokuku, 2004).

2.4.5 Tourism Research in South Africa

The development of the tourism sector in South Africa is considered to be critical to achieve the government's aims of economic growth and job creation. Tourism in South Africa has experienced considerable growth over the last 20 years, demonstrated by the increase in international tourist arrivals from approximately one million in 1990 to over 10 million in 2010 (Visser & Hoogendoorn, 2011). Valued at US$10 billion, South Africa was ranked 17th by the World Tourism Organisation in terms of popularity as a tourist destination (Snyman & Saayman, 2009). Domestic tourism has also grown significantly, with South Africans undertaking approximately 29.7 million trips in 2010 (South African Tourism, 2012).

For many years, the greater eThekweni municipality (Durban region of KZN) has been the traditional holiday destination for people from inland provinces, primarily Gauteng. In the past, these domestic tourists would have been White people, as few African people had the means to travel on holiday or were restricted in relation to access to certain areas (Preston-Whyte, 2001). However, Gauteng now houses the largest burgeoning middle class of wealthy African people in South Africa (Donaldson, Mehlomakhulu, Darkey, Dyssel, & Siyongwana, 2013) and African, Indian and Coloured people now make up over 80% of tourists renting accommodation on the Durban beachfront (Maharaj, Pillay, & Sucheran, 2008).

South Africa is home to 19 large national game reserves or national parks, which protect over 4 million hectares of the country's terrestrial surface (Brett, 2010). The myriad of smaller and private reserves protects thousands more hectares of land (although less than 7% of the land surface area is protected). In addition to these are an increasing number of smaller nature sanctuaries, breeding farms or rehabilitation facilities. These are focussed on breeding wild

animals or the rehabilitation of selected species and many of these provide visitors with 'hands on' experiences with animals. South Africa is also home to two large zoos, about 20 small zoos and two large aquariums.

A review of tourism research in South Africa revealed that current research is guided by four key approaches: responsible tourism, pro-poor tourism, local economic development tourism and tourism's role in small, medium and micro enterprise development, with a focus on nature-based tourism still the mainstay of South Africa's tourist offering (Visser & Hoogendoorn, 2011). An analysis (using Google Scholar citations) of tourism-related research undertaken in the southern African development community between 2000 and 2010, revealed that 28% of all papers published focussed on destination development, while other strong research foci concerned eco/nature tourism, economic issues, tourist/visitor studies and tourism planning research (Rogerson & Rogerson, 2011). Visitor/Tourist studies accounted for 13% of the 358 papers published in the 11-year period (Rogerson & Rogerson, 2011). Interestingly, an analysis of international tourism research published between 1994 and 2000 revealed that visitor studies accounted for 11% of the 2868 articles published internationally (Ballantyne, Packer, & Axelsen, 2009).

There has been a limited focus on the demographics, motivations and learning of tourists or visitors to educational leisure settings in South Africa (Boshoff, Landman, Kerley, & Bradfield, 2007; Butler & Richardson, 2014; Snyman & Saayman, 2009; Ward, Parker, & Shackleton, 2010). Research in South African national game reserves suggests that knowledge seeking is an important motive to visit a reserve (Kruger & Saayman, 2010; Saayman & Saayman, 2009) and that greater opportunities for visitor education would improve the quality of a visit (Boshoff et al., 2007). Despite this, it appears that there has been limited research on visitor learning in tourism in South Africa and few papers have, to date, addressed the topic of cultural influences in tourism (Butler & Richardson, 2014; Slabbert & Saayman, 2011; Ward et al., 2010).

Summary to Section 2.4
It is clear from the above sections that there is limited information available on the attitudes of South Africans to the environment or their general environmental awareness. No research has investigated environmental learning in educational leisure settings in South Africa. This study will take the first steps in addressing this shortfall within the context of an African aquarium.

2.5   Summary of the literature review

This literature review has positioned zoos and aquariums as educational leisure settings that have the potential to positively influence visitor behaviour and, thereby, contribute to improving the current environmental situation. This is made possible through free-choice learning that takes place during a visit. Over time, the role of aquariums and zoos has changed and expanded to the point where they are now seen as having the potential to be powerful centres for conservation through both *in situ* and *ex situ* efforts, particularly through their unique ability to reach millions of visitors, both emotively and cognitively. This connection can be leveraged to encourage the changes in behaviour needed to address some of the challenges facing the planet. However, despite the urgency of this task, there remains a great deal that is unknown about the impact of aquarium and zoo visitors' personal characteristics on how they experience their visit, what and how they learn during the visit and how their visit influences their behaviour after the visit. By improving our understanding of these factors, aquariums will be able to improve visitor experiences and learning, and thereby optimise their ability to achieve their objectives with respect to visitor learning.

There are a number of theories of learning that contribute to an understanding of the learning that can take place in an aquarium. These theories include the constructivist and the sociocultural learning theories, both of which help to explain the multifaceted learning that takes place in an educational leisure setting. The contextual model of learning and the empirical model of free-choice environmental learning presented in this review further contribute to an understanding of the processes that influence learning in educational leisure settings.

The theories and models of learning discussed in the literature review all highlight the importance of understanding the visitor, to improve the learning that can occur during an aquarium visit. A wide range of personal, sociocultural and physical factors influence learning. Each has the potential, to a greater or lesser extent, to change the visit experience and associated learning.

Despite the importance of cultural variables in free-choice learning in educational leisure settings, to date very little research has focussed on these variables. The South African context provides a good opportunity to study the influence of cultural diversity on learning in educational leisure settings. This research addresses this important gap in the literature, and provides suggestions to improve the capacity of educational leisure settings to more

effectively reach a broader spectrum of visitors by facilitating changes to the experiences that make it more enjoyable and educational for all visitors. The research also contributes toward a better understanding of the implications of cultural diversity for research in free-choice learning.

In light of the above, the overall aim of this research is to build an understanding of the implications of cultural diversity for visitors' environmental learning at an aquarium in South Africa, taking into account the effects of demographic and psychographic characteristics. Specifically, the objectives are to:

1. identify the characteristics of the major cultural groups of visitors to an aquarium in South Africa with respect to selected demographic and cultural variables, visit characteristics and psychographic variables;

2. explore how the major cultural groups of visitors experience uShaka Sea World;

3. investigate the impact of an aquarium visit on the environmental learning of visitors from each of the major cultural groups, taking into account the confounding effects of other demographic variables;

4. assess the extent and nature of the impact of cultural background on learning outcomes.

In all of the above, the influence of cultural equivalence of meaning and culture-specific response styles has been carefully addressed.

CHAPTER 3   METHODOLOGY

Introduction

This section will outline the methodology that was used to achieve the research objectives. The chapter has been divided into five sections. In the first section, the research paradigm is explained, as are some of the implications of the paradigm for methodology. This is followed by the research strategy, a description of the research site and a detailed account of the various components of the research instrument. The procedure for the administration of the questionnaire is then discussed, followed by an overview of the data analysis, including analytical and statistical procedures. The chapter ends with a short mention of several of the challenges associated with multicultural research and how some of these challenges have been addressed in this study.

3.1   Research paradigm and implications for methodology

A paradigm is "a basic set of beliefs that guides action" (Guba, 1990:17). As such, at the outset of any research it is critical to determine the paradigm that will underpin it, as the research paradigm influences the entire research process from design, through data collection, analysis and interpretation. According to Guba (1990), a research paradigm addresses issues of: ontology (the study of the nature of existence, what is the nature of reality?); epistemology (what is the relationship between the researcher and that 'reality'?); and methodology (how will the researcher find the knowledge/reality?). The answers to these questions provide the research paradigm that underpins the work.

Founded on the methods of the natural sciences, *positivism*, one of the early research paradigms, argues that the world (reality) exists externally to the researcher. It views the world as a set of empirically verifiable facts and attempts to eliminate any form of subjectivity and bias. It assumes that the reality of the world, driven by natural laws, can be revealed by science (Guba, 1990). Data are usually gathered quantitatively in order to test a hypothesis. The subjectivity of the researcher is seen as a bias that needs to be eliminated, as the research is considered to be independent of the researcher.

The positivist paradigm (sometimes termed realism) is not often used in the social sciences which generally favour a *post-positivist* approach. Post-positivism takes the view that it is impossible to completely objectively observe pure data and that no claim is ever unchallengeable. Nevertheless, post-positivists try to establish objective criteria for good

research practice (Mottier, 2005). Post-positivism (also known as critical realism) thus requires that research provides reasonable justifications for its claims and that some assertions are more justified than others (Phillips, 1990). While objectivity remains an ideal, subjectivity is seen as an unavoidable component of research (Mottier, 2005).

Guba (1990) summarises post-positivism as follows:

- Ontology – reality exists but can never be completely understood;

- Epistemology – perfect objectivity is unattainable;

- Methodology – multiple research methods are needed to overcome the inherent biases of each collection method.

Interpretivism is an anti-positivist stance that requires an understanding of the social worlds that people inhabit (Blaikie, 2004). It suggests that studying natural reality and social reality are fundamentally different, requiring different methodologies. According to the interpretivist paradigm, natural science searches for consistencies in the data to deduce laws, while social science deals with the actions (or beliefs) of individuals, emphasising the distinctiveness of humans (Gray, 2011). Interpretivism requires that the social scientist grasps the subjective meaning of social action and respects the differences between people (Bryman, 2012).

This research is situated within a post-positivist research paradigm, recognising that the data collection process is not independent of the researcher but a co-construction of knowledge in which the researcher and the research participants mutually construct meaning during data collection (Mottier, 2005). The context within which the research takes place is important, and post-positivism recognises that issues such as the social and cultural upbringing of the researcher and the participants, as well as the conditions under which the data are collected, will inevitably shape the research and the nature of the data. It acknowledges these biases, whilst remembering that every effort should be taken to remain as neutral as possible (Mottier, 2005). Post-positivist research normally relies on the collection of both quantitative and qualitative data (Guba & Lincoln, 1994), although the data collected should match the needs of the study. It is necessary to have an awareness of the potential for bias described by Mottier (2005), as well as the influence of the cultural context, in order to limit the impact of these factors on data interpretation.

3.2   Research strategy

Early attempts to document learning in educational leisure settings approached the question of visitor learning by first determining what the exhibit designers thought should be learnt and then measuring if that specific information was learnt (Balmford et al., 2007). This did not open the field to the varied range of other learning that may have been achieved but, because it was not measured, was missed (Moss & Esson, 2013; Storksdieck et al., 2005). More recent approaches have helped to limit this problem through the use of a range of techniques, including personal meaning mapping (Falk & Storksdieck, 2005), open-ended questions, and validated scales to assess learning outcomes.

While debate about the relative merits of quantitative (numeric) and qualitative (text) approaches to research continues, it is generally accepted that both can contribute towards a better understanding of visitor learning (Bitgood, 2002; Jensen et al., 2011; Roe, Mcconney, & Mans, 2014; Yalowitz & Wells, 2000). The diversity of learning environments, learners and desired outcomes means that there is no single way to evaluate learning, but rather a range of situation specific methods, ideally built on a common theoretical foundation. Because the focus of this research is on the relationship between visitor characteristics and environmental learning outcomes, the research focussed on quantitative data. A questionnaire survey was considered to be the most suitable approach to address the aim of this research as a wide range of variables could be examined in order to describe the characteristics of visitors and then explore the relationships between the variables.

It is widely recognised that research on learning in a free-choice environment is challenging (Allen et al., 2007). Not only are the individual learners (visitors) heterogeneous, but the context in which the learning takes place (the facility) usually consists of multiple components, each with a different potential to impact on the visitor. To reduce complexity and increase the likelihood of identifying relationships between variables, Allen et al. (2007) suggest the following: simplify effects (learning outcomes) into a few measurable outcomes; focus on a small number of potential causes (entry variables); and reduce the number of competing explanations. As this research used empirical data to investigate the relationship between visitors' characteristics and their environmental learning outcomes, the principles suggested to reduce complexity were applied, where possible.

The research objectives were addressed through the following five steps (Figure 3.1).

Step 1: design, pilot test and validate a questionnaire capable of gathering the quantitative data required.

Step 2: use the questionnaire to gather quantitative data, to enable the researcher to investigate the characteristics of visitors to the facility, their environmental learning and their experiences at the site.

Step 3: undertake preliminary data analysis to address issues of culture-specific response styles (CSRS) and cultural equivalence of meaning (Chapter 4).

Step 4: analyse the data in order to explore the relationships between visitor characteristics, including culture, and environmental learning outcomes and identify aspects of the experience that help explain the relationship (Chapter 5).

Step 5: integrate and interpret the results to make recommendations to improve multicultural visitor research and to enhance the environmental learning of zoo and aquarium visitors from different cultural backgrounds (Chapter 6).

1	•Design and pilot test questionnaire
2	•Gather data using the questionnaire
3	•Address issues of cultural equivalence of meaning and culture-specific response styles
4	•Analysis of data
5	•Integration and interpretation of research results
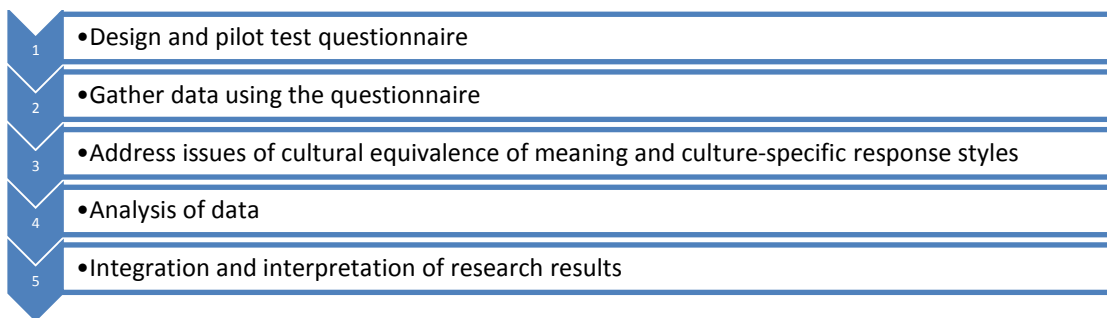
Figure 3.1 Flow-chart of the stages of research undertaken

3.3   The research site

The uShaka Sea World complex consists of the largest salt water aquarium in Africa, the only dolphinarium in Africa, a seal stadium, penguin rookery and associated Life Support Systems. uShaka Sea World is a part of uShaka Marine World, a beachfront entertainment complex that also includes a water park and a retail centre (Figure 3.2). The facility was built as part of an urban renewal project; however, it remains an isolated oasis of safety in a recreated natural setting, located in a degenerating inner city precinct. uShaka Sea World is operated by the South African Association for Marine Biological Research (SAAMBR), a

non-profit, non-government organization. Since opening in 2004, uShaka Sea World has had over 8 million visitors, of which the majority (over 92%) are South Africans.

Figure 3.2 Aerial view of the uShaka Sea World complex highlighting the dolphin, penguin and seal areas, and the underground aquarium galleries

The uShaka Sea World complex comprises two focus areas: the underground aquarium galleries and the above ground mammal and bird areas. Visitors enter the underground galleries through an iconic wrecked ship. After descending a ramp housing a skeleton of a southern right whale, visitors can stroll through five different exhibit areas, each of which focusses on a different marine ecosystem. The bottlenose dolphins are viewed by visitors during daily presentations, while pantomimes are undertaken with the Cape Fur seals. A specially designed penguin rookery houses a breeding colony of endangered African penguins.

Opportunities to learn at uShaka Sea World are varied, and include: dolphin and seal presentations; commentaries during the penguin and dive fish feeds; one-on-one personal interactions with trained guides at specific locations in the aquarium; video presentations located at various points in the facility; static interpretive signage located throughout the aquarium; and opportunities to touch selected animals. Providing visitors with a chance to

'immerse' themselves in an exhibit is one of the trademarks of uShaka Sea World and visitors have the opportunity to snorkel or dive in three of the larger exhibits. In addition, visitors have the opportunity to 'Meet a Dolphin or a Seal'. These experiences are collectively known as 'Animal Encounters' and are not included in the standard entry fee. Visitors need to book and pay for an Animal Encounter.

Summarised in the acronym ICE, the aim of uShaka Sea World is to **Inspire** visitors to care for the marine environment through the live animal exhibits, **Connect** them to the marine environment by building an awareness of the interconnectedness of life on land and in the oceans and **Empower** visitors to make the behaviour changes required to live in a more sustainable manner. In addition to encouraging visitors to *Care for nature*, three specific conservation messages are highlighted through the various modes of interpretation (dolphin and seal presentations, animal feed commentaries, interpretive signage and during personal interactions with staff members). These are:

- *Reduce, reuse and recycle*—messages about the damage of pollution to marine life, the importance of not littering and the value of recycling waste;
- *Choose your seafood* wisely—messages about why overfishing is damaging marine life, how to select sustainable seafood, and how individual decisions can decrease demand for overexploited fish;
- *We are all connected in the web of life*—messages about the interconnectedness of all living beings, how life on land is connected to the oceans and how we all depend on nature to survive.

The Eco-House, a temporary exhibit that focused on sustainable living, was in the aquarium during the period of data collection. The conservation messages of this exhibit encouraged visitors to reduce their use of resources such as water, fuel and electricity (*Save resources*).

During the period of data collection, it could be expected that visitors to uShaka Sea World would be exposed to at least one of five conservation messages. Three of these messages are related to environmentally responsible behaviours that visitors can perform after their visit, namely, *Reduce, reuse and recycle*, *Choose your seafood wisely*, and *Save resources,* while two are more general—*Care for nature* and *We are all connected in the web of life*.

3.4   Research instrument

3.4.1 Questionnaire

To address the research aim, a wide range of data was collected. An outline of the variables under investigation, namely, visitor personal characteristics (Independent Variables) that influence both the experience (Mediating Variables) and environmental learning (Dependent Variables), are presented in Figure 3.3.
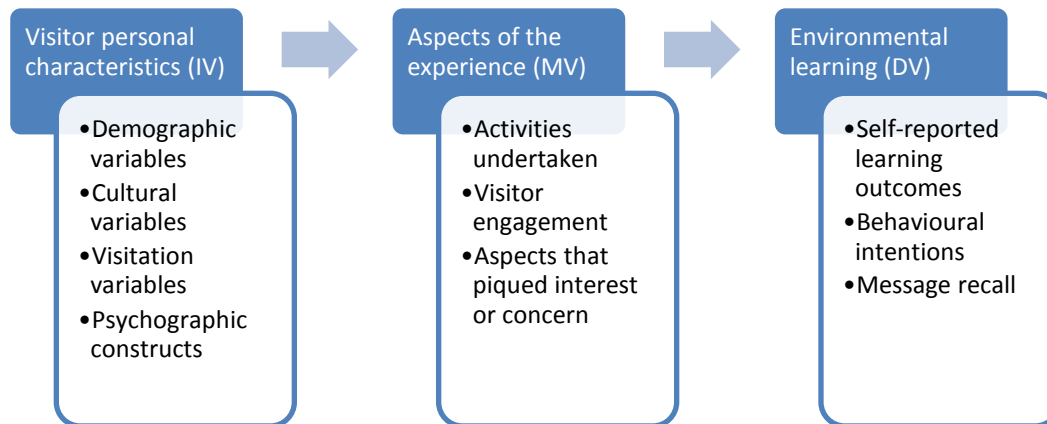
Figure 3.3 Outline of the research components for this study

Information about visitor personal characteristics was collected in a pre-visit section (completed by the visitor on arrival) while aspects of the experience and environmental learning were assessed in a post-visit questionnaire (completed just prior to departure from the site). Two types of measurement were used in the questionnaire, namely, nominal and interval scales. Most of the demographic variables were measured categorically (nominal data). Interval scales (e.g. Likert-type scales) were used to measure psychographic constructs such as attitudes and behaviour. Although Likert-type scales are not considered to be ideal interval measures (Dolnicar & Grün, 2009), they are commonly used in psychological research (Reid, 2006). A copy of the final version of the questionnaire and the participant information form are provided in Appendices 1 and 3.

A wide range of demographic, cultural, psychographic, experience and learning outcome data were collected in order to address the aims of the research. These are detailed in Table 3.1, 3.2 and 3.3 below.

3.4.1.1 Visitor personal characteristics (Independent variables)

The personal characteristics included in the pre-visit component of the questionnaire are listed in Table 3.1.

Table 3.1 *Summary of the personal characteristics (Independent variables) measured in the pre-visit section of the questionnaire (Question numbers from the questionnaire in Appendix 1)*

Visitor Personal Characteristics (IV) Pre-visit	Measurement	Question number
Demographic variables Age, Gender, Family size, Current place of residence (town size and Province), Highest level of education, Employment status	Multiple choice questions	1
Cultural variables Language spoken during childhood, Current home language, Cultural identity, Childhood place of residence (town size and province)	Multiple choice questions	1
Visitation variables Visit frequency, Group composition	Multiple choice questions	1
Psychographic constructs Motivation for visit	Visitor Motivation Scale, 20 items, 7-point scale (Packer, 2004)	5
Environmental orientation	Prior interest, 6 items, 5-point scale (Ballantyne et al., 2011) Prior involvement in environmental behaviour, 14 items, 5-point scale (Ballantyne et al., 2011)	2 3
Environmental attitudes	New Ecological Paradigm, 15 items, 5-point scale (Dunlap et al., 2000),	6
Connectedness to nature	Inclusion of Nature in Self, Single item graphic scale (Bruni et al., 2008) Nature Relatedness, 15 items, 5-point scale (Nisbet et al., 2009)	7 8
Locus of Control	3 items, 5-point scale (Fielding & Head, 2012)	4

Measurement of demographic, cultural and visitation variables

To address some of the challenges posed by multicultural research (see Section 3.7), a wide range of demographic and cultural data were collected in the questionnaire. The categorical data on demographic, cultural and visitation variables (Table 3.1) were collected through a series of tick-box type questions.

Measurement of psychographic constructs

A number of pre-existing scales were used (Table 3.1) to measure the psychographic constructs. When necessary, these were modified for the South African context and details of these modifications are provided in Appendix 2. According to Bryman (2012), the use of pre-existing scales is an accepted practice in social research, and has the advantage of enabling comparisons with previous research. However, as the scales were all designed for use in Western countries, they were assessed during the preliminary analysis to ensure equivalence of meaning. Attention was also paid to culture-specific response styles. In Chapter 4, the methods used to test for cultural equivalence of meaning and to detect and adjust for culture-specific response styles are described. The results of these tests and the steps undertaken to prepare the data for analysis are also presented in Chapter 4.

Motivation for visit

Packer's Visitor Motivation Scale (Ballantyne, et al. 2011) measures the relative importance of each of four types of motivations: learning and discovery, social contact, passive enjoyment and restoration. While Falk's (2006) identity model provides good insight into the motivations of visitors, Packer's Visitor Motivation Scale was considered to be a more appropriate tool to understand the motivation of visitors in this context. This scale has been used in a range of settings, including many wildlife tourism facilities (Ballantyne et al., 2011; Ballantyne, Packer, & Hughes, 2008).

Environmental orientation

Ballantyne, Packer and Falk (2011) devised scales to measure visitors' pre-visit environmental interest and environmental behaviour (which they termed environmental orientation), specifically for wildlife leisure settings. These scales have subsequently been adapted for use by other researchers interested in understanding the environmental interest and behaviour of visitors (Hughes, et al., 2011; Xu, 2011).

Environmental attitudes

Since the New Ecological Paradigm (NEP) scale was first developed in 1978 by Dunlap and van Liere, it has become one of the most widely used measures of environmental attitudes (Dunlap et al., 2000; Dunlap, 2008; Hawcroft & Milfont, 2010; Milfont & Duckitt, 2010). The original 12 item New *Environment* Paradigm scale was revised and improved by Dunlap et al. (2000), to make it more psychometrically sound, relevant and less sexist. Now called the New *Ecological* Paradigm (NEP) scale, the 15 items making up the scale were selected to represent five hypothesized facets of an ecological worldview: the reality of limits to growth; anti-anthropocentrism; the fragility of nature's balance; rejection of exemptionalism; and the possibility of an eco-crisis (Dunlap et al., 2000; Hawcroft & Milfont, 2010; Milfont, 2007). Each of the five facets is represented by a balanced set of pro-environment (ecocentric) and anti-environment (anthropocentric) items (Dunlap et al., 2000; Dunlap, 2008). Measuring the 'ecological worldview' of the respondent (Dunlap, 2008), the NEP is one of the most internationally accepted, valid and reliable measures of environmental attitudes available (Dunlap et al., 2000; Dunlap, 2008; Milfont & Duckitt, 2010). In addition to its reliability and validity, the NEP scale has the advantage of being relatively easy to administer, and it has been used in many countries (Hawcroft & Milfont, 2010; Khan, Khan, & Adil, 2012; Ogunbode, 2013). Despite these advantages, no scale should be used without careful consideration. Hawcroft and Milfont (2010) provide recommendations to ensure that the scale is used in such a way that the results are meaningful and comparable to other studies. These include:

- ensuring the collection of appropriate information about the sample of people surveyed;
- using appropriate statistical analyses;
- an awareness of the influence of different socio-economic variables on responses.

Although the scale has been criticised for being based on a western ecological worldview and some researchers have reported that non-western respondents have problems in the interpretation and understanding of some of the items (Khan et al., 2012; Ogunbode, 2013), it has been used productively in non-western countries (Boeve-de Pauw & Van Petegem, 2011, 2012; Ogunbode, 2013; Wilhelm-Rechmann et al., 2014).

Connectedness to nature

The Inclusion of Nature in Self (INS) scale is a single-item graphical scale that has been used to measure the extent to which an individual considers themselves to be separate from or a part of nature (Schultz, 2002b). This graphical measure consists of seven pairs of circles, labelled 'self' and 'nature'. The degree of overlap between the two circles indicates the extent to which the individual includes nature within their cognitive representation of self (Schultz, 2001). It is thought to measure the degree to which an individual's cognitive self-concept includes nature (Tam, 2013). The INS scale was used to measure connectedness with nature in a study of three zoos in New York City in the USA (Bruni et al., 2008). The INS is considered to be a relatively simple indicator of an individual's relationship with nature. This visual representation of an individual's perceived connection to nature was included to provide an alternative to the primarily 'verbal' nature of the rest of the questionnaire.

According to Nisbet, Zelenski and Murphy (2009), while the NEP adequately captures cognitive attitudes to the environment, it fails to capture the emotional components of how people feel about nature, and while the INS captures some aspects of the cognitive human-nature relationship, its single-item format limits its breadth. For this reason Nisbet, et al., (2009) developed a multidimensional Nature Relatedness Scale (NR) to assess the "affective, cognitive, and physical relationship individuals have with the natural world" (Nisbet et al., 2009:719). This scale has been used in a zoo context to measure the cognitive and emotional components of an individual's connection to wildlife (Skibins et al., 2013). The scale is divided into three components: NR-Perspective, NR-Self and NR-Experience. The NR-Perspective represents an external nature-related worldview, the NR-Self captures the ecological self or the strength of internal connection with the natural world and NR-Experience represents a physical familiarity with the natural world. This study used an adaptation of the NR Scale. In the present study the external nature-related worldview was measured using the NEP scale, therefore, the items pertaining to the NR-Perspective component of the NR scale were omitted.

Locus of Control

Environmental Locus of Control (LoC) is a term used to describe "the extent to which people believe that they have the ability to affect outcomes through their own actions" (Rotter, 1966 in McCarty & Shrum, 2001:94). To investigate perceived environmental locus of control, the simple three-item scale devised by Fielding and Head (2012) was used.

3.4.1.2 Aspects of the experience (Mediating variables)

"In general, a given variable may be said to function as a mediator to the extent that it accounts for the relation between the predictor and the criterion." (Baron & Kenny, 1986:1176). In this study aspects of the experience (mediating variables) are considered to mediate between the personal characteristics (independent variables—predictor) and visitor learning (dependent variables—criterion).

A summary of the mediating variables included in the questionnaire is provided in Table 3.2.

Table 3.2 *Summary of the data collected on aspects of the experience (Mediating variables) in the post-visit questionnaire (Question numbers from the questionnaire in Appendix 1)*

Aspects of the experience	Measurement	Question number
Activities undertaken	List of available activities, Count of number of activities undertaken	9
Visitor engagement	Experiential and reflective engagement, 12 item, 5-point scale (Ballantyne et al., 2011)	10
Aspects that piqued interest or concern	10 item, 5-point scale, Based on previous research but developed specifically for uShaka Sea World	13

Activities undertaken
Visitors to uShaka Sea World are provided with a wide range of daily activities and visitors were asked to note the activities in which they participated, using a checklist. As it is likely that what the visitors actually did during their visit will influence their subsequent learning, this was considered to be an important mediating variable.

Visitor engagement
A scale designed by Ballantyne et al. (2011) was used to measure aspects of visitor engagement during their visit. This scale has previously been found to have two dimensions, namely, Experiential Engagement and Reflective Engagement. More recent research suggests that the visitor experience is multifaceted and that learning is influenced by these multidimensional aspects of the visitor experience (Packer & Ballantyne, 2016). This more holistic understanding of the visitor experience led to the conceptualisation of a multifaceted model of the visitor experience (Packer & Ballantyne, 2016). In previous research

(Ballantyne, Packer and Falk, 2011), both experiential and reflective engagement were found to influence visitor learning.

Aspects that piqued interest or concern
As noted above, the visitor experience is multifaceted and difficult to measure therefore, an additional set of items was included in an attempt to elucidate specific aspects of the uShaka Sea World experience that piqued visitors' interest or concern. These items were designed specifically for this study, based on the specific experiences offered at uShaka Sea World. These items were not used as mediating variables, but as an independent measure of the experiences that visitors themselves perceived had influenced learning outcomes.

3.4.1.3 Environmental learning (Dependent variables)

This component of the questionnaire looked at changes in environmental awareness, understanding, attitudes and concern. It is clear that within the constraints of a questionnaire, it is impossible to measure all possible outcomes; therefore, a subset of indicators, based on previous research, was selected (Table 3.3).

Table 3.3 *Summary of the environmental learning (Dependent variables) data collected in the post-visit questionnaire (Question numbers from the questionnaire in Appendix 1)*

Environmental learning	Measurement	Question Number
Self-reported learning outcomes	8 item, 5-point scale (Ballantyne et al., 2011)	12
Behavioural intentions	14 item, 5-point scale (Ballantyne et al., 2011)	14
Message recall	Free response, Message recalled (Yes or No + Content analysis)	11

Self-reported learning outcomes
An eight-item scale, based on that designed by Ballantyne et al. (2011), was used to assess self-reported learning outcomes. This scale includes items that tap visitors' perceptions of their own learning in relation to environmental awareness, attitudes, concern and understanding.

Behavioural intentions
Behavioural intentions were measured using a scale adjusted from that developed by Ballantyne et al. (2011). Visitors were asked to rate how likely it was that they would

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increase the frequency of their participation in a range of 14 environmentally responsible behaviours.

Message recall
Visitors were asked to list up to three conservation messages that they could recall from their visit.

3.4.2 Pilot testing of the questionnaire

Pilot testing enables the detection of weaknesses in the design of the survey instrument (Cooper & Schindler, 1998). In any research that requires a questionnaire, a pilot test is considered important to ensure that the questionnaire is understood in the way that the researcher designed it and that it is both valid and reliable. Reliability is a measurement of the consistency of answers over repeated trials, either across items designed to test the same construct or across different survey times (Groves et al., 2009). Validity refers to whether the instrument measures what it is designed to measure (Cooper & Schindler, 1998).

The pilot test first involved a focus group discussion with over 30 uShaka Sea World staff members, representative of the different cultures to be included in the study. This provided the researcher with feedback on the complexity of the questions and addressed language issues. Thereafter, the questionnaire was administered to a sample of 46 visitors who were representative of the cultural groups studied in this research. The pilot data were used to uncover anomalies in the questionnaire that may hamper data analysis or interpretation. The questionnaire was refined before final administration.

3.4.3 Language considerations

Although translation is a common practice in studies of this nature (Malda, Van De Vijver, & Temane, 2010; Milfont, 2007; van Herk, Poortinga, & Verhallen, 2004), the decision regarding whether or not to translate a questionnaire requires a balance to be struck, based on the prevalence of the use of the dominant language in the sample and the potential losses of validity and reliability posed by translation. In the South African context, with 11 official languages and the difficulties associated with the translation of many of the concepts used in a study of this nature, translation was considered to be impractical. English is the language of commerce and education in South Africa, and all children learn English at school, in addition to their mother tongue. It was decided, therefore, that all questionnaires would be in English.

The data were collected by three people, each proficient in English and one or more of the other South African languages. This ensured that, if necessary, difficult questions could be translated into the participant's home language and the responses translated back into English. The data collectors were trained to ensure that the questionnaires were administered in the same way, insofar as it was reasonably practical.

3.5   Research participants and procedure

3.5.1 Questionnaire administration

The basic idea of sampling is to select some elements of a population to enable conclusions to be drawn about the entire population. The best test of a sample design is how similar it is to the characteristics of the population it represents (Cooper & Schindler, 1998). Clearly, how a sample is selected can greatly influence the results and subsequent conclusions, therefore, sample selection is important to be able to generalise from the sample to the population.

Two sampling strategies can be used, namely, probability and non-probability sampling. In probability sampling each element of the population is given a known nonzero and equal chance of selection (Cooper & Schindler, 1998). Non-probability sampling is non-random, with the probability of selection for each participant being unknown. While probability sampling may be theoretically the best sampling strategy, non-probability sampling is used for convenience, to save time and money or if the research aims call for non-probability (Daniel, 2012). It is more often used as it is more practical.

The questionnaires were administered to visitors 18 years and older, visiting uShaka Sea World. On each day of data collection, a table was set up just inside the entrance to uShaka Sea World and the data collectors remained near the table throughout the day. Participants were approached at the entrance to uShaka Sea World, the data collector introduced themselves, explained the rationale for the research and the fact that the questionnaire would take approximately 15 minutes at the start and a further 10 minutes at the end of the visit. If the potential participant was willing to proceed they were asked if they were comfortable answering the questions in English. If the visitor was not proficient in English, the data collector moved on to the next potential participant. Information for the participant was printed separately and participants were asked to confirm their consent (Appendix 3). Most visitors took the questionnaire and completed it on their own, however, in a few cases the data collector either asked the questions and filled in the answers, or remained close to the

visitor, for the purpose of clarification, while they completed the first part of the questionnaire. At the end of their visit participants returned the completed questionnaire to the data collectors at the same table. (At the time of data collection there was only one entry / exit point to uShaka Sea World). Most visitors completed the post-visit section of the questionnaire in the vicinity of the table. Each visitor who completed a questionnaire was given a small token gift, namely, an illustrated guide book to uShaka Sea World (value less than $10).

As this research investigated the influence of cultural diversity on visitor learning, it was planned to sample the four primary groups identified in South Africa, namely, African, Coloured, Indian and White (Terminology as per South African Census). To achieve this, a quota sampling strategy was proposed. Quota sampling is a non-probability sampling technique that consists of identifying the control categories and quotas of population elements (in this case cultural groups were the categories, and their relative representation within the visitor profile of uShaka Sea World was used to determine the quotas). Sample participants are then selected using a non-probability method until the quotas are filled. In this study, a 'next to pass' strategy was used, in which the data collector approached a visitor, administered a questionnaire (or was refused) and then approached the 'next visitor to pass' a selected point.

As a large number of variables were included in this research, a relatively large sample size was required to enable the statistical analyses to be undertaken. A minimum of 150 participants from each of the four major cultural groups (White, Indian, Coloured and African) was desirable in order to be able to conduct regression analyses within each group. In 2013, when data were collected, about half of uShaka Sea World visitors were White, with just over a quarter being African, 15% Indian and 9% Coloured (uShaka Visitor Surveys, 2013). To be representative of the cultural composition of the visitor population, with a minimum requirement of 150 in the smallest group (Coloureds), a target sample size of 1667 was estimated. Given the time constraints of the data collection period (it was not possible to continue data collection into the December peak holiday period), it was decided to focus only on the three largest cultural groups of visitors (White, African and Indian) thus reducing the target sample size. Data collection continued until just over 150 questionnaires had been collected from the smallest group. Due to cultural group differences in acceptance

rates (described below), the smallest group was the African rather than the Indian cultural group.

Questionnaires were distributed to 930 visitors and were completed and returned by 850 visitors (91% return rate). A total of 41 participants were removed from the original data because they had never lived in South Africa. Eight respondents only completed the demographics section and 11 respondents gave exactly the same score for each item. A further 19 respondents were, therefore, excluded from the analysis. (Those excluded were 12 females and 7 males; 9 White, 7 Indian and 3 African). As culture was an important variable, respondents who were not clearly identified as belonging to one of the three major cultural groups (White, Indian or African) were excluded from the analysis (n=42). A total of 748 questionnaires (White 392; Indian 199; African 157) were included in the final analysis.

Data collection was conducted out of peak holiday season, on 31 week-end and weekdays between August and November 2013. Visitor attendance on the days on which data were collected totalled 20,484 visitors. Therefore, 3.65% of the visitors to the uShaka Sea World on the days that data were collected completed a questionnaire. While detailed records were not kept due to a number of logistical problems, refusal rates varied depending on the time of day (higher refusal rates closer to animal presentation times) and cultural group (African visitors refused to undertake the survey more frequently than White visitors, while Indian visitors were the most eager to participate).

The demographic profile of visitors who completed the questionnaire and the profile of visitors to uShaka Sea World during the period preceding data collection are given in Table 3.4. A chi-square goodness of fit test revealed that although the percentage of White participants in the sample was close to that expected, based on visitor statistics, the percentages of Indian and African participants within the sample were not representative of the visitor population, with Indian visitors being over-represented and African visitors under-represented, χ^2 (3, N=790) = 84.606, p<0.001 (Table 3.5). This reflected the refusal and acceptance pattern noted above as more White and Indian visitors agreed to complete the questionnaire than African visitors.

Table 3.4 *Demographic profile of visitors who completed the questionnaire at uShaka Sea World and visitor profile of uShaka Sea World visitors*

Cultural Group	N	% of sample	% of uShaka Sea World visitors Source: uShaka Visitor Surveys (2013)
White	392	49.6	48
Indian	199	25.2	15
African	157	19.9	28
Other	42	5.3	9

Table 3.5 *Observed and expected frequencies (based on uShaka visitor surveys) of the major cultural groups during the months interviews were conducted*

	Observed N within sample	Expected N based on visitor statistics
White	392 (49.6%)	379.2 (48%)
Indian	199 (25.2%)	118.5 (15%)
African	157 (19.9%)	221.2 (28%)
Other	42 (5.3%)	71.1 (9%)

3.5.2 Ethical considerations

The aim of ethics in research is to ensure that no one is harmed or suffers adverse consequences as a result of the research. This research was benign and posed a little inconvenience, but no risk, to the participants. Informed consent is generally agreed to be the best mode of operation when enlisting participants to complete a questionnaire. Informed consent means the known consent of individuals to participate in research, of their own free will, without any fraud or deception or manipulation (David & Sutton, 2011). The purpose of the research was explained to each prospective participant prior to handing them the information sheet and potential participants were informed that they had the option to terminate the process at any time, should they feel so inclined. Research has shown that explaining the nature of the research and types of questions in detail, does not decrease participation rates but does assist the data collection process (Groves et al., 2009). No names or contact details were collected to ensure the anonymity of participants and personal information was limited to general socio-demographic details. To limit inconvenience to participants, the length of the questionnaire was carefully monitored during the pilot testing. Despite this, the questionnaire was long and, for some visitors, completion of the

questionnaire required a considerable investment of time. Extra care was required working with participants who were not equally literate and great emphasis was placed on ensuring that the approach of the interviewers was considerate and consistent.

3.6   Overview of data analysis: analytical and statistical procedures

Quantitative data were entered into a specially designed ACCESS data base where initial data validation was undertaken. The data were then imported into the SPSS statistical software package Version 22. Where appropriate, frequency distributions, means, minimum and maximum values and standard deviations were used to check for errors in data entry. Potential errors were then checked against the original questionnaires and corrected.

When the initial questionnaire was designed there was no information on the relative frequency of occurrence of different categories e.g., Education level or Employment status. Hence, it was decided to provide visitors with a large number of response options, rather than risk missing potentially important categories. Once the data had been analysed it became clear that some categories were less frequently selected than others, hence, the decision to consolidate some categories. Details of the recoding that was undertaken are presented in Appendix 4. The consolidation of categories made interpretation easier. However, the original data were kept, ensuring that, if necessary, the finer detail could be examined at a later stage.

A wide range of data analyses was undertaken to address the objectives of the study. Analyses of the full data set provided a broad overview of visitors in general. Most visitor research does not venture beyond such aggregate data, even though differences between groups may be studied. The results of the total sample, therefore, enabled comparisons with other research. Thereafter, the analysis was undertaken separately for each cultural group to reveal the similarities and differences between the groups.

A respondent's answers to the items in a questionnaire are influenced by temporary biases, which can be changed by altering the content or the conditions under which the data are collected (Baumgartner & Steenkamp, 2001; van Herk, Poortinga, & Verhallen, 2004), and more enduring biases which occur regardless of situation or question content. These more persistent biases are termed 'response styles' and include social desirability, acquiescence and extreme response bias. When studying respondents from different cultures, the effect of these response style biases may be amplified through the systematic influence of the culture

of the respondents, termed culture-specific response styles (CSRS). In addition to CSRS, it is also critical to address cultural equivalence of meaning in the various scales. This is undertaken to ensure that the items making up the psychographic constructs are understood by the respondents in a similar way. Testing for cultural equivalence of meaning and the influence of CSRS on the data are covered in detail in Chapter 4.

Parametric statistics were used in most cases, although it is acknowledged that rating scales such those used in this study cannot strictly be considered to produce interval data (Dolnicar & Grun, 2009; Reid, 2006). In addition, Likert-type scales seldom produce a normal distribution of data (Pallant, 2010), however, because of the large sample size, many variables and the many statistical analyses that were performed, it was considered that the use of primarily parametric statistics, such as means and Analysis of Variance (ANOVA), would enable the results to be understood more clearly than comparisons based on rank.

3.6.1 Objective 1: Identify the characteristics of the major cultural groups of visitors to an aquarium in South Africa with respect to selected demographic and cultural variables, visit characteristics and psychographic variables

Descriptive statistics, including mean, standard deviation, frequency and percentage, were used to describe the combined characteristics of the visitors and the characteristics of each cultural group. To compare the nominal characteristics of the groups, chi-square analyses were undertaken. For continuous or scaled measures, ANOVAs were used with post hoc Scheffe tests to identify where the differences were found. Scheffe tests are sensitive for complex comparisons and appropriate when there are very different numbers in each group (Pallant, 2010). Inferential statistical analysis was undertaken at $p < 0.05$, unless stated otherwise.

Latent psychographic variables, such as environmental orientation as well as motivation variables were measured through validated scales and analysed using factor analysis. In this research factor analysis was undertaken to confirm the structure of the scales drawn from previous research. This was done to ensure that their structure remained consistent, even though the wording had been adapted to the South African situation. This provided validation of the scales and uncovered some anomalies that arose as a result of cultural or language issues (Discussed in detail in Chapter 4).

Only after extensive testing for construct equivalence were composites created (Chapter 4). Each composite variable represented a different construct or concept. An example would be

the visit motivation scale, where four separate composites were created from the 20 original items, each representative of a different type of motivation. Each composite variable was evaluated for internal consistency using Cronbach's alpha. The internal consistency of the results was interpreted according to accepted standards of reliability (Field, 2013). These composite variables were then analysed descriptively and were used for the cultural group comparisons.

3.6.2 Objective 2: Explore how visitors from the major cultural groups experience uShaka Sea World

Descriptive statistics were used to summarise the activities undertaken and aspects of the experience that visitors reported had influenced their learning. Comparisons between cultural groups regarding their participation in different activities were undertaken through a series of chi-square analyses, to determine if there were any cultural differences in the types of activities undertaken.

Factor analysis, as described above, was used to create two composite variables for reflective and experiential engagement. These two variables, termed Reflective Engagement and Experiential Engagement, were then analysed descriptively and using ANOVA to reveal differences between cultural groups. To provide greater insight into the differences between cultural group responses, a series of ANOVAs were also undertaken on each individual item in the scale.

Each item on the visitors' evaluations of aspects of the experience that influenced their learning was analysed individually, as these items did not relate to the same concepts and could not, therefore, be used to create a single variable. Descriptive statistics were produced for each cultural group and ANOVA revealed differences between the cultural groups.

3.6.3 Objective 3: Investigate the impact of an aquarium visit on the environmental learning of visitors from each of the major cultural groups, taking into account the confounding effects of other demographic variables

Factor analysis, as described above, was used to create composites for post-visit environmentally responsible behavioural intentions and self-reported learning outcomes. These were first analysed descriptively to produce mean scores for each cultural group and all respondents together. These composite scores were then used to determine differences between cultural groups through a series of ANOVAs.

Visitors were asked to write down the three main conservation messages that they could remember from their visit. Message recall was analysed in two ways—the number of messages recorded (0 – 3) [termed Message Recall (0-3)] and a simple binary Yes (1 or more message was recorded) and No (No message recorded) [termed Message Recall Y/N]. When comparisons were undertaken, the dichotomous variable was used primarily because over half of the visitors did not recall any conservation message. Qualitative analysis of the content of the messages recalled was also undertaken. Messages were coded into seven categories, based on content, to enable analysis. The messages were also analysed using a chi-square test of independence (Preacher, 2001) to determine any differences in the content of the messages recalled by the different cultural groups.

Because a focus of this research was to compare the learning outcomes of the three cultural groups, it was important that the influence of potentially confounding variables was taken into consideration. In order to test for the influence of confounding variables, a series of two-way ANOVAs was used. The Eta^2 was computed to measure effect size. These analyses allowed simultaneous tests of the influence of combinations of cultural group and demographic variables. The use of two-way ANOVAs allowed the influence of cultural group to be evaluated independently of other variables, in addition to examining the interaction effects, for example, whether the influence of education level was stronger for one cultural group than another.

3.6.4 Objective 4: Assess the extent and nature of the impact of cultural background on learning outcomes

The data were analysed to: (a) assess the relative contribution of cultural group (in relation to other demographic and psychographic variables) to the prediction of learning outcomes; and (b) explore whether the pathways to learning are different for different cultural groups. The first part of this objective was addressed through a series of regression analyses (linear regression was used for the two interval level dependent variables (SLO and BI) and binary logistic regression was used for message recall). The analyses were undertaken on the total sample (with psychographic, demographic and culture as the independent variables and the learning outcomes as the dependent variables). These analyses made it possible to ascertain the importance of the variable 'cultural group' to the prediction of learning outcomes. The second part was addressed using path analyses for the two interval level variables and binary logistic regression for message recall. These analyses were undertaken separately for each

cultural group to determine if the different cultural groups showed different pathways to learning.

Regression analyses

As regression analysis enables the prediction of an outcome variable from one or more predictor variables, it was selected to assess the relative contribution of cultural group to the prediction of learning outcomes. As it is a very commonly used technique in visitor studies it will not be elaborated on here. For any form of regression analysis, sample size is an important consideration. Recommended sample size estimates vary in the literature from 10 to 20 cases per predictor (Pallant, 2010; Stage, Carter, & Nora, 2004; Suhr, 2008). When split into cultural groups (White = 392, Indian = 199, African = 157), the number of cases met the limit of 10 cases per predictor.

Path analyses

As path analysis is used less frequently in visitor research it will be discussed in more detail. One of the strengths of regression analysis is the ability to capture multiple relationships simultaneously (Ahn, 2002). However, in cases where indirect relationships play a role, or when there are multiple outcome variables, regression analysis is not suitable (Ahn, 2002). A path analysis is undertaken to provide estimates of the size and significance of hypothesised relationships among sets of variables (Stage et al., 2004). The popularity of path analysis can be attributed to a number of factors:– they provide a graphical representation of the data; they enable an analysis of both direct and indirect relationships; and they are able to estimate the strength of relationships (Menard, 2010). Path analysis was selected for use in this study as it can examine the inter-relationships between multiple variables simultaneously. Path analyses were undertaken for each cultural group separately using the software package, AMOS 23.0.0. For the development of the path models, the 14 composite psychographic constructs created during the data preparation in Chapter 4 were used as independent variables, the two continuous environmental learning constructs were selected as the outcome variables, while the three visitor experience variables were considered to be mediating variables.

A saturated model was used for each cultural group as all possible paths were initially included. Covariance was also included as it was expected that some of the predictor variables would be significantly related to each other. Thereafter, each of the paths that were statistically non-significant were deleted hierarchically (from the least significant onwards) as the model was developed. The paths that had regression weights of less than 0.2 were also

removed hierarchically from the smallest weight upwards until only significant (p<0.001) paths above 0.2 remained. For the covariances, correlation coefficients <0.2 were also removed. The final models, thus, show the most significant relationships between the variables. Details on fit indices for path analyses are provided in Appendix 6.

Binary logistic regression

In Objective 4, the binary version of the Message Recall variable (Message Recall Y/N) was used, as the Message Recall 0-3 measure was highly skewed and not a continuous interval variable. For the first part of the objective, the predictors were demographic and visitation variables, cultural group and psychographic constructs. These were entered into the model in stages to determine the relative contribution of cultural group to the prediction of message recall. For the second part of the objective, a binary logistic regression (using the Backward Likelihood method to mirror that undertaken in the path analysis) was performed to determine which of the variables predicted the binary learning outcome, Message recall Y/N. The predictors included all of the initial psychographic and experience variables (as in the path analysis). This was undertaken separately for each cultural group.

The Hosmer-Lemeshow tests the null hypothesis that predictions made by the model fit perfectly with observed group memberships. Other statistics include the Wald statistic that indicates whether the B coefficient for that predictor is significantly different from 0. If the coefficient is significantly different from 0 then that predictor is making a significant contribution to the prediction of the outcome (Field, 2013). An odds ratio (Exp (B)) of greater than 1 would mean that as the predictor increases the odds of the outcome occurring increase, while a value lower than 1 means a decrease in odds. Cox and Snell R^2 and Nagelkerke R^2 provide an estimate of effect size (Field, 2013).

3.7   Notes on the challenges of multicultural research

One of the problems associated with research in a multicultural environment is the inherent bias of the researcher who, inevitably, is representative of only one culture. Any research is framed within a particular cultural 'world view' and is inevitably biased towards that 'world view'. There is, therefore, a need in this type of research to avoid an ethnocentric approach that uses the practices of the researcher's own society as 'norms' by which other cultures are evaluated (Diouf et al., 2000).

Cultural sensitivity is, therefore, critical in order to effectively measure psychographic and learning variables in multicultural environments. Just as the applicability of standard IQ tests or personality tests developed for the 'West' are questioned in Africa (Gelade, 2008; Malda et al., 2010; Meiring, Van De Vijver, & Rothmann, 2005; Wicherts, Dolan, & van der Maas, 2010), so too may standardised methods for the evaluation of environmental learning, the measurement of environmental attitudes or motivation scales be culturally biased and require modification in order to avoid cultural misrepresentation. In fact, the transferability of Western generated scales to Africa or the East, while regularly undertaken, has often been questioned (Ogunbode, 2013; Sekaran, 1983; Watkins, 2010).

Numerous researchers have addressed the challenges associated with cross-cultural research and a number of suggestions to decrease cultural biases have been proposed (Allen et al., 2007; Lee, 2008; Padilla, 2004; Sekaran, 1983; Van De Vijver & Leung, 1997; Watkins, 2010). Some of these challenges are mentioned below, as well as how each challenge was addressed in this study.

- Respondents need to be carefully identified, described and selected. This was addressed by ensuring that the data collectors were representative of the cultural groups likely to be encountered, were well trained and able to identify with and relate to all visitors.

- There is heterogeneity within a cultural group as well as between groups and a focus on only intergroup differences may overemphasise cultural differences, when, in fact, differences may be due to socio-economic, education or some other variables unrelated to culture (Padilla, 2004). This was addressed through the collection of a wide range of complementary demographic data and through the statistical analyses to reveal/test for possible confounding.

- Language barriers need to be addressed. This was addressed through the use of multi-lingual data collectors, by careful questionnaire design, preliminary data analysis (Chapter 4) and through an awareness of language concerns during data analysis.

- The instrument should be reliable and valid for all cultural groups. The instrument was pilot tested with representatives of multiple cultures, and validity and reliability were assessed during the preliminary data analysis in Chapter 4.

- There should be cross-cultural equivalence of meaning, especially for scales designed for Western audiences. This required careful design and pilot testing by a

multicultural team, extensive preliminary data analysis and careful construction of composite scales (Chapter 4).

- Cultural response biases are a known limitation of Likert scales (Dolnicar & Grün, 2007b, 2009; van Herk et al., 2004). The Likert-type scales were carefully explained to respondents when required and the data were rigorously analysed and treated for culture-specific response styles (CSRS) in Chapter 4.

- Culture plays a role in the prevalence of social desirability (Adida, Ferree, Posner, & Robinson, 2013; Fetvadjiev, Meiring, Vijver, Nel, & Hill, 2015; Lalwani, Shrum, & Chiu, 2009). This was addressed through the preliminary data analysis to reveal and address CSRS (See Chapter 4).

Summary

This chapter has explained the paradigm underpinning the research, the research strategy, site and methods used for the collection of the data. The ways the data were analysed was also discussed. As this study focused on the influence of cultural diversity on visitor learning, it was critical to ensure that this aspect of the research was comprehensively addressed. The next chapter, Chapter 4, provides a more detailed background to the challenges of multicultural research, with a focus on cultural equivalence of meaning and culture-specific response styles (CSRS). It also outlines the methods that were used to ensure cultural equivalence of the scales, identify CSRS and standardise the data and, in addition, presents the results of the analyses.

CHAPTER 4 PRELIMINARY ANALYSES TO TEST FOR EQUIVALENCE OF MEANING AND RESPONSE BIAS

Introduction

"Quantitative research is only as good as the data on which it is based" (Padilla, 2004:143). Hence, close attention needs to be paid to the instruments used to gather the data, as well as data analysis, particularly when working across cultures. In this study issues of cultural equivalence of meaning in the scales as well as culture-specific response styles (CSRS) needed to be addressed. This chapter provides a brief review of the literature on the influence of culture on responses to questionnaires as well as suggestions of how these can be addressed (Section 4.1). It then provides an overview of the methods used to address cultural equivalence and CSRS in this study (Section 4.2). The results of the analyses to prepare the data are described in Section 4.3, followed by a brief discussion (Section 4.4).

4.1 Background to the influence of culture on questionnaire responses

4.1.1 Cultural equivalence of meaning

According to van Herk et al. (2004), the first step in a cross-cultural assessment is to determine if the various scales are actually measuring the same constructs in all groups. This is to ensure that the respondents understand the constructs in a similar way, and is necessary in order to compare results across cultures. Without construct equivalence, cross-cultural comparisons are meaningless (He & Van De Vijver, 2012).

4.1.2 Response styles

Although it is usually assumed that respondents' answers to the items in a questionnaire are based on the content of the questions, a wide range of factors may influence answers. These include factors that are unrelated to the content (e.g., literacy, time availability, focus or interruptions during the completion of the questionnaire) or factors related to the questionnaire itself (e.g., the rating scales used, data collector effects) (Baumgartner & Steenkamp, 2001; Dolnicar & Grün, 2007a, 2009). These response sets[3] are said to operate at

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[3] Authors use the term response set (Cheung & Rensvold, 2000) as well as the term response style (Baumgartner & Steenkamp, 2001; Beuckelaer, Weijters & Rutten, 2010; Malda et al., 2010; Van Vaerenbergh & Thomas, 2013). In this thesis response style is used to emphasize the anticipated consistency of responses of an individual across questionnaire items, while response sets are considered to be more variable, operating at a situational level.

a 'situational' or 'stimulus' level as they can be changed by altering physical factors such as the language used, time of interview or the nature of the answer formats and are, therefore, temporary as under different conditions a different response set may be obtained (van Herk et al., 2004; Van Vaerenbergh & Thomas, 2013).

In addition to the response sets mentioned above, it is well known that different people use answer formats in different ways, regardless of the situation or the content of the questions. These so called response styles are revealed through "a respondent's tendency to respond to survey questions in certain ways regardless of the content" (i.e. what the items were designed to measure) (Van Vaerenbergh & Thomas, 2013:195). Some response styles appear to be relatively stable, regardless of temporary or easily changed factors and these more enduring responses may be termed response styles, operating at the respondent level (Baumgartner & Steenkamp, 2001; van Herk et al., 2004). Several response styles have been identified, all of which have the potential to bias data (Table 4.1). These include: extreme response style (ERS); acquiescence response style (ARS); disacquiescence response style (DRS); net acquiescence response style (Directional Bias) (NARS); response range (RR); midpoint response style (MRS); and noncontingent response style (NCR) (Baumgartner & Steenkamp, 2001; Van Vaerenbergh & Thomas, 2013). Of these, the most commonly addressed are ARS, DRS, ERS and MRS (Dolnicar & Grün, 2007b; Van Vaerenbergh & Thomas, 2013). When comparing respondents from different cultures the effects of these response styles may be amplified if response styles vary systematically with the culture of the respondents, i.e., if response styles are culture-specific.

Table 4.1 *Common response styles: description, impact on data and methods for detection (Based on styles identified by Baumgartner and Steenkamp, 2001)*

Response style	Description	Impact on data	Detection using count procedures
Acquiescence response style (ARS)	A tendency to agree rather than disagree with items, regardless of content	Inflates observed means	Responses of 4 and 5 counted and divided by total number of responses
Disacquiescence response style (DRS)	A tendency to disagree with items regardless of content	Deflates observed means	Responses of 1 and 2 counted and divided by the total number of responses
Net acquiescence Response style (NARS)	A tendency to show greater acquiescence than disacquiescence [ARS-DRS]	Inflates variance	Subtract disacquiescence response style (DRS) from acquiescence response style (ARS)
Midpoint response style (MRS)	A tendency to overuse the midpoint of the scale regardless of content	Decreases variance	Count all 3s and divide by total
Extreme response style (ERS)	A tendency to select the extreme points on the scale, regardless of content	Skews the frequency distribution to the ends of the scale, increases standard deviation and decreases correlation	Count all 5s and divide by total (Extreme high) Count all 1s and divide by total (Extreme low)
Noncontingent responding (NCR)	A tendency to respond to items carelessly or randomly	No *a priori* hypothesis about the impact on the data	"Sum of absolute differences between responses to pairs of items, where the items in each pair are maximally correlated, have similar

			means across respondents, and are keyed in the same direction" (Baumgartner & Steenkamp, 2001:145)
Response range (RR)	A tendency to use a narrow or wide range of responses	If large can inflate variance	Standard deviation of a person's responses

Past research has found that the cultural background of a respondent can affect their responses to a questionnaire in a systematic way, resulting in a culture-specific response style (Harzing, 2006; Hui & Triandis, 1989). Response styles have been explored across a range of cultures in different countries (Bachman & O'Malley, 1984; Baumgartner & Steenkamp, 2001; Fischer, 2004; Hui & Triandis, 1989; Johnson, Kulesa, Cho, & Shavitt, 2005; van Herk et al., 2004; Watkins, 2010). While the results are varied, most studies have identified cultural response styles amongst respondents (Baumgartner & Steenkamp, 2001; Harzing, 2006; Reynolds & Smith, 2010; Smith, 2011; van Herk et al., 2004). He, Van De Vijver, Espinosa and Mui (2014) suggest that it may be helpful to view response styles as 'communication filters' that influence all self-reports. They suggest that this filter is related to impression management as respondents try to 'fit in'.

Response styles are a source of non-random measurement error and can inflate or deflate respondent scores, and/or increase or decrease correlations between variables, leading to unfounded deductions about differences or similarities between cultural groups. Culture-specific response style is not frequently addressed in research, either because it is not considered an important factor or because addressing the problem is beyond the scope of the research (Boeve-de Pauw & Van Petegem, 2012; Schultz, 2002a; Valchev et al., 2013). However, as many studies aim to reveal differences between cultures, it is important to address CSRS if differences between cultures are to be distinguished from artificial differences introduced as a result of CSRS (Baumgartner & Steenkamp, 2001; Dolnicar & Grün, 2007a, 2007b; He et al., 2014; Morren, Gelissen, & Vermunt, 2011, 2012; Van Vaerenbergh & Thomas, 2013).

Interestingly, there appear to be two schools of thought when approaching the subject of CSRS. While some view CSRS as a 'contaminant' of the data that should be avoided or removed (Baumgartner & Steenkamp, 2001; Cheung & Rensvold, 2000; Dolnicar & Grün, 2007a), other researchers view CSRS as an indicator of the communication style of the culture being studied and, thus, view response styles as providing valuable cultural information (Fischer, 2004; Smith, 2004; Smith, 2011). Both approaches have merit, depending on the objectives of the research being undertaken (Fischer, 2004). It should be noted that differences in response styles are not the problem, rather it is their impact on conclusions, especially in cultural comparisons (Reynolds & Smith, 2010).

In South Africa, research has compared cultural groups on personality scales, environmental attitudes and motivation at school (de Klerk, Boshoff, & van Wyk, 2009; Malda et al., 2010; Meiring et al., 2005; Watkins, McInerney, Akande, & Lee, 2003; Watkins, 1992), however, the issue of CSRS has infrequently been addressed. There is currently limited information on the response styles of different cultural groups in South Africa.

4.2 Methods to address the influence of culture on questionnaire responses

4.2.1 Cultural equivalence of meaning (Construct equivalence)

Factor analysis is commonly used to assess construct equivalence (He & Van De Vijver, 2012; Padilla, 2004; Watkins, 2010). If the outcome of the factor analysis reveals a similar factor structure for all cultural groups, cross-cultural generalisation is appropriate (Padilla, 2004). Construct equivalence is threatened if the responses from each cultural group are found to have a different underlying structure (i.e., the various items form different factors), as this suggests that different cultures have ascribed different meanings to the items (Baumgartner & Steenkamp, 2001; Padilla, 2004; Watkins, 2010). The absence of construct equivalence would require a reassessment of the constructs and, if necessary, removal of those items for which equivalence is absent, as has been done in previous research (van Herk et al., 2004).

4.2.2 Response styles

After establishing construct equivalence, it is necessary to determine the extent to which CSRS is present in the data. The seven most common response styles, as well as methods to detect each style, are described in Table 4.1. The wide range of methods to detect response styles was noted in a review by Dolnicar and Grün (2007a). Methods range from simple count procedures and analyses, such as item response theory, to complex structural equation modelling (Cheung & Rensvold, 2000; Van De Vijver & Leung, 1997; Van Vaerenbergh & Thomas, 2013).

The simplest method for the analysis of response styles is the count procedure, " Count the number of agreements, disagreements, extreme responses, and/or mid-point responses on substantive measures across an entire questionnaire" (Van Vaerenbergh & Thomas, 2013:206). Although the Van Vaerenbergh and Thomas (2013) method simply looks at all

items in a questionnaire, Baumgartner and Steenkamp (2001) caution that heterogeneous items with low correlations and little commonality should be selected for the analysis. If all the items are substantially correlated, cultural response styles and substantive differences may be difficult to separate (Baumgartner & Steenkamp, 2001; Fischer, 2004). In a study such as this one, with a focus on environmental issues, it is not always possible to find items with little commonality, as the items all relate to the environment and constructs around environmental issues. In future studies it may be prudent to include some items unrelated to the environment to help reveal CSRS.

To address the concern noted above by Baumgartner and Steenkamp (2001), in this study 11 items with Likert-type answer scales were selected to examine for bias. The 11 items selected for use in the response bias calculations included a variety of constructs (motivation, attitudes, behaviours), all of which had low inter-correlations and included two negatively-worded questions. The items all had a mean of between 2.5 and 3.8 on a 5-point scale. The frequency of each score (1 to 5) was calculated for each item within each cultural group in order to detect Acquiescence, Disacquiescence, Net Acquiescence, Middle, Extreme high, and Extreme low response styles.

4.2.3 Data standardisation

If analyses show that different cultural groups express different response styles, data standardisation can be used to reduce the influence of response bias (Fischer, 2004). This enables comparisons between the different cultural groups to be made without the influence of CSRS. However, standardisation to account for response styles may result in the loss of substantive variance (Harzing, 2006). It is possible that responses representing real cultural differences may be falsely attributed to response style differences. Thus, the method of standardisation is important.

As culture-specific response styles were detected in the data, a within-subject standardisation using means and standard deviations was undertaken whereby $y'=(x-\text{mean}_{individual})/\text{standard deviation}_{individual}$ (Fischer, 2004). The standardisation was done at an item level. This standardisation method is commonly used to remove ERS and ARS (Dolnicar & Grün, 2007a).

The following steps were followed:

- The motivation and the INS scales were pro-rated from 7-point scales to 5-point scales.

- A data file containing only those items that were rated on a five-point scale (117 items), together with the person identification numbers, was transposed, keeping the person identification numbers as the new variable names.

- An *Individual_mean_*and *Individual standard deviation* were then calculated for each person from all of the items across all constructs.

- *The Individual mean_*and *Individual standard deviation* were entered back into the original SPSS data file as new variables.

- Individual scores on each of the 117 items were standardised using the formula $y' = (x - mean_{individual}) / $ standard deviation$_{individual}$ and saved as a new variable.

An individual's standardised score on any particular item represents that individual's rating of the item in relation to their own rating of all other items. A positive score indicates that the item is highly endorsed relative to other items; a negative score indicates the item is less highly endorsed than other items; and a score of zero indicates equivalence with the individual mean of all items. Thus, any response bias (e.g., the tendency to rate all items highly) is removed at the individual level.

Fischer (2004) and Dolnicar and Grün (2007a) note several statistical reasons that within-subject standardisation based on means and standard deviations may result in spurious results, especially if factor analysis is to be conducted on the standardised data. The use of individual means can correct for ARS in the data and the use of standard deviations can correct for ERS, however, subtracting the mean may lead to ipsatived scores that reflect only relative differences (Dolnicar & Grün, 2007a). In this study, factor analysis was not conducted on the standardised data. Standardised data were used only for the cultural group comparisons.

4.3   Analysis and results

4.3.1 Check and adjust for construct equivalence

Eight psychographic constructs were considered to require testing for cultural equivalence of meaning.

4.3.1.1 Motivation for visit.

4.3.1.2 Environmental orientation.

4.3.1.3 Environmental attitudes.

4.3.1.4 Connectedness to nature.

4.3.1.5 Locus of Control.

4.3.1.6 Visitor engagement.

4.3.1.7 Self-reported learning outcomes.

4.3.1.8 Behavioural intentions.

Exploratory factor analysis (principal axis factoring) was used to test for construct equivalence, as this allowed the natural structure underlying the items to emerge and enabled the identification of differences between the cultural groups. Factor analysis was undertaken for the total sample and then independently for each of the three cultural groups. An item was considered to load onto a factor if its loading on that factor was at least .4, and was at least .1 higher than the next closest loading. If these cut-off limits were not reached it is noted in the results. During analysis an item was excluded if more than one discrepancy or cross-loading was detected across the three cultural groups. For each construct, a target was set of 90% of all possible classifications being congruent across the three cultural groups.

4.3.1.1 Motivation for visit

The Visitor Motivation Scale based on that developed by Packer and Ballantyne (2002) and Packer (2004) measured the relative importance of four different visit motivational drivers:– learning and discovery (LD), social contact (S), passive enjoyment (PE) and restoration (R).

The total sample analysis confirmed that four factors explained participants' responses to these twenty items and, with the exception of item 10 '*To spend quality time with family and friends*', these were consistent with the previous research on which this scale was based (Ballantyne, et al., 2011). In previous research, item 10 loaded with Social Contact while in this study it loaded with Passive Enjoyment.

Table 4.2 reports the factors on which each item loaded for five samples: previous research, total sample, and each of the three cultural groups in this study. The final classification used in this study is also reported. Out of a total of 60 possible classifications (20 items for each of the three cultural groups), 56 (93%) were equivalent across cultural groups. Interestingly, item 10 loaded with Passive Enjoyment for all cultural groups. The loading of this item with PE is not surprising, as social contact in South Africa is generally considered to take place at home, while visits to outside venues are more likely to be viewed as primarily for entertainment, with the social contact being a lesser motivator. It was, therefore, included in the Passive Enjoyment subscale, as suggested by the factor analysis reported above.

Table 4.2 *Comparative cultural factor analysis for visit motivation variables for the total sample and each cultural group of visitors to uShaka Sea World (LD—Learning and Discovery, PE—Passive Enjoyment, S—Social Contact, R—Restoration)*

	Previous Research*	Total Sample	White	Indian	African	Final classification
1. To discover new things	LD	LD	LD	LD	LD	LD
2. To be better informed	LD	LD	LD	LD	LD	LD
3. To expand my interests	LD	LD	LD	LD	LD	LD
4. To be mentally stimulated	LD	LD	LD	LD	<u>R</u>	LD
5. To explore the unknown	LD	LD	LD	LD	LD	LD
6. To be pleasantly occupied	PE	PE	PE	PE	<u>LD</u>	PE
7. To feel happy and satisfied	PE	**PE/R**	PE	PE	<u>LD</u>	PE
8. To have fun	PE	PE	PE	PE	PE	PE
9. To be entertained	PE	PE	PE	PE	PE	PE
10. To spend quality time with family and friends	S	PE	PE	PE	PE	PE
11. To enjoy myself	PE	PE	PE	PE	PE	PE
12. To build friendships with new people	S	S	S	S	S	S
13. To interact with others	S	S	S	S	S	S
14. To meet new people	S	S	S	S	S	S
15. To develop close friendships	S	S	S	S	S	S
16. To recover from the stress and tension of everyday life	R	R	R	R	R	R
17. To find some peace and tranquillity	R	R	R	R	R	R
18. To get away from the responsibilities of everyday life	R	R	R	R	**R/S**	R
19. To relax physically	R	R	R	R	R	R
20. To relax mentally	R	R	R	R	R	R

* Packer and Ballantyne 2002 and 2011   <u>Underlined</u> – unexpected loading, **Bold** – Cross Loading

The motivation for visit composites used in this study are based on Table 4.2. Learning and discovery (five items: 1-5), passive enjoyment (six items: 6-11), social contact (four items: 12-15) and restoration (five items: 16-20). No items were excluded. Scale reliability was good for all four scales, total sample, and for each cultural group (Cronbach alpha >0.790).

4.3.1.2 Environmental orientation

The total sample factor analysis confirmed that three factors explained participants' responses to the 20 items in the scale, and these were generally consistent with previous research (Ballantyne, et al., 2011). Ballantyne et al. (2011) termed the three factors:

- Environmental Practices (EP)—items related to relatively low commitment environmental behaviours.
- Environmental Curiosity (EC)—items related to an interest or curiosity about the environment.
- Environmental Advocacy (EA)—items related to higher commitment environmental behaviours.

In testing each of the three cultural groups, three factors were extracted regardless of the eigenvalues, in order to maintain comparable conditions across the three groups. Using this method, for two of the three cultural groups, factors with initial eigenvalues of 1.012 (Indian) and 1.022 (African) respectively were excluded. Table 4.3 reports the factors on which each item loaded for five samples: previous research, total sample, and each of the three cultural groups in this study. The final classification used in this study is also reported. Thus, of a total of 60 possible classifications, 50 (83%) were correctly classified. Two items (9 and 10) accounted for five of the ten miss- or ambiguous classifications, and these same two items cross-loaded in the analysis of all cases. These two items were excluded when composite variables were created to represent the three factors, thus achieving 91% (49/54) equivalence.

Table 4.3 *Comparative cultural factor analyses for environmental interest and pre-visit behaviour variables for the total sample and each cultural group of visitors to uShaka Sea World (EC – Environmental Curiosity, EP – Environmental Practices, EA – Environmental Advocacy)*

	Previous research*	Total sample	White	Indian	African	Final classification
1. Encouraged others to recycle	NEW	EP	EP	EP	EP	EP
2. Recycled bottles, cans, paper	EP	EP	EP	EP	EP	EP
3. Used 'green' non-plastic shopping bags	NO LOAD	EP	EP	EP	EP	EP
4. Bought products that are environmentally friendly	EP	EP	EP	**EA/EP**	EP	EP
5. Saved water in your home or garden	EP	EP	EP	EP	EP	EP
6. Saved electricity at home	EP	EP	EP	EP	EP	EP
7. Talked to others about the importance of the environment	EA	EP	EP	<u>EA</u>	EP	EP
8. Picked up other people's litter	EP	EP	EP	EP	**EA/EP**	EP
9. *Looked for information about the environment on TV, in print or on the internet*	*EC*	***EP/EC***	***EP/EC***	<u>*EA*</u>	***EA/EP***	*EXCLUDED*
10. *If you eat seafood, chosen seafood because it is sustainable*	*NEW ITEM*	***EP/EA***	*EP*	***EP/EA***	<u>*EA*</u>	*EXCLUDED*
11. I actively search for information about wildlife conservation	EC	EC	EC	EC	EC	EC
12. I am interested in learning about environmental issues	EC	EC	EC	EC	EC	EC
13. I would like to be more involved in conservation activities	NEW ITEM	EC	EC	EC	EC	EC
14. I enjoy spending leisure time in nature	EC	EC	EC	EC	EC	EC
15. I enjoy watching TV programmes about wildlife	EC	EC	EC	EC	EC	EC
16. *I often think about whether my actions could harm the environment*	*EC*	*EC*	*EC*	**<u>EP/EC</u>**	*EC*	*EC*
17. Plant indigenous plants	NEW ITEM	EA	**EP/EA**	EA	EA	EA
18. Done volunteer work for a group	EA	EA	EA	EA	EA	EA

that helps the environment						
19. Taken part in a beach / river or nature area clean-up	EA	EA	EA	EA	EA	EA
20. Donated money to a nature or conservation organisation	EA	EA	EA	EA	EA	EA

*Ballantyne, Packer, & Falk, 2011.

<u>Underlined</u> – unexpected loading, **Bold** – Cross Loading, *Italics* – item excluded from final composite

The three factors used in this study are based on Table 4.3: Environmental Practices (eight items: 1-8), Environmental Curiosity (six items: 11-16) and Environmental Advocacy (four items: 17-20). Items 9 and 10 were excluded. Cronbach alpha tests showed good reliability for all scales within all cultural groups (Cronbach alpha > 0.797).

4.3.1.3 Environmental attitudes

Although the dimensionality of the New Ecological Paradigm (NEP) has been hotly debated, with some researchers finding two, three or four dimensions (Khan et al., 2012), Dunlap et al., (2000) suggest that the decision to treat the NEP as a single composite or as multiple composites should be based on the results of the data in question. Previous research with multicultural respondents in South Africa (Wilhelm-Rechmann et al., 2014) used the NEP as a unidimensional scale, although their results did suggest that the scale could be multidimensional.

The 15 items in the NEP scale are worded to produce eight pro-NEP and seven anti-NEP items (Dunlap, 2008). Three factors with eigenvalues >1 were extracted from the full sample analysis. The first two factors, accounting for 40.6% of the variance, represented pro-NEP and anti-NEP attitudes respectively. The third factor consisted of only one item. When only two factors were extracted, all items clearly loaded on pro-NEP or anti-NEP attitudes (Table 4.4).

The results of the factor analyses for the total sample and each cultural group, together with the final classifications, are presented in Table 4.4. Of a total of 45 possible classifications, 35 (78%) were correctly classified. Relaxing the loading cut-off to .3 increased equivalence to 84% (38/45). Three items (items 1, 4 and 6) accounted for six of the seven remaining mis- or ambiguous classifications. These three items were excluded when composite variables were created to represent the two factors, thus achieving 97% (35/36) equivalence.

Table 4.4 *Comparative factor analysis for the NEP scale for the total sample and each cultural group of visitors to uShaka Sea World (P=Pro-NEP, A=Anti-NEP)*

	Total sample	White	Indian	African	Final classification
1.We are approaching the limit of the number of people the earth can support	*P*	*P*	*P/A*	*A*	*EXCLUDED*
3.When humans interfere with nature it often produces disastrous consequences	P	P	P	P	P
5.Humans are severely abusing the environment	P	P	P	P	P
7.Plants and animals have as much right as humans to exist	P	P	P	P	P
9.Despite our special abilities humans are still subject to the laws of nature	P	P	P	P	P
13.The balance of nature is very delicate and easily upset	P	P	P	P	P
15.If things continue on their present course, we will soon experience a major ecological catastrophe / disaster	P	P	P	P	P
11.The earth is like a spaceship (ship) with very limited room	P	P	P	A	P
2.Humans have the right to modify the natural environment to suit their needs	A	A	A	A	A
10.The so-called 'ecological crisis' facing humankind has been greatly exaggerated	A	A	A	A	A
14.Humans will eventually learn enough about how nature works to be able to control it	A	A	A	A	A
8.The balance of nature is strong enough to cope with the impacts of modern industrial nations	A	A	A	A	A
12.Humans were meant to rule over the rest of nature	A	A	A	A	A
4.Human ingenuity (cleverness) will ensure that we do NOT make the earth unliveable	*A*	*A*	*A/P*	*A/P*	*EXCLUDED*

6.The earth has plenty of natural resources if we just learn how to develop them	*A*	*A*	*A/P*	*P*	*EXCLUDED*

<u>Underlined</u> – unexpected loading, **Bold** – Cross Loading, *Italics* – item excluded from final composite. Cut-off limits not reached for 4 items

The two NEP composites used in this study are Pro-NEP attitudes (seven items: 3,5,7,9,11,13,15) and Anti-NEP attitudes (five items: 2,8,10,12,14). Items 1, 4 and 6 were excluded from the composites. Reliability was acceptable for both scales (Table 4.5).

Table 4.5 *Reliability scores (Cronbach alpha) for the total sample and each cultural group for the two NEP scales*

	Total sample	White	Indian	African
Pro-NEP	0.702	0.708	0.698	0.692
Anti-NEP	0.780	0.732	0.819	0.739

Because of the problems in answering some of the questions in this scale and to build a better understanding of the individual items, the percentage distribution for responses to each of the 15 items was examined (Appendix 5). Pro-NEP responses are represented by agreement with the eight pro-NEP statements (odd-numbered items) and disagreement with the seven anti-NEP statements (even-numbered items). Most respondents agreed with the pro-NEP statements. However, responses to the anti-NEP statements were less consistent, ranging from 10% disagreeing with item 6, '*The earth has plenty of natural resources if we just learn how to develop them*', to 48% disagreeing with item 2, '*Humans have the right to modify the natural environment to suit their needs*'. Over 20% of respondents were unsure of items 1, 4, 10 and 14, results similar to that found by Dunlap et al., (2000). The analysis of percentage distribution for the responses further supported the decision to exclude items 1, 4 and 6 from the final composites.

As the pro- and anti-NEP scales are measuring opposing constructs, it would be expected that they would be negatively correlated. A Pearson correlation between the pro- and the anti-NEP scales revealed a weak negative correlation between the pro- and anti-NEP scales for White visitors (-0.081), while for Indian and African visitors the correlation was positive (Indian 0.180 (p= 0.05) and African 0.415 (p= 0.01)). The positive correlation amongst Indian and African visitors further highlights concerns associated with the use of this scale in South Africa.

4.3.1.4 Connectedness to nature (Nature relatedness)

The 15 item nature relatedness scale adapted for use in this study represents two dimensions of nature relatedness, namely, Nature Self (an internalised identification with nature, NR-Self) and Nature Experience (a physical familiarity with the natural world, NR-Experience) (Nisbet, et al., 2009). Nature Self includes nine items (eight worded positively and one worded negatively); Nature Experience includes six items (four worded positively and two worded negatively).

The total sample analysis found that three factors better explained participants' responses to these 15 items in this study. The factors Nature Self and Nature Experience (as found by Nisbet et al. (2009)) were identified, in addition to a third factor, which included the three negatively worded items. The third factor was labelled Nature Distance, as it represented visitors' personal distance from nature. It is suggested that the construct Nature Distance is particularly relevant to the South African situation, and is better suited to a context in which urbanisation is seen as progress and nature experiences are thought of as less progressive (Cocks et al., 2012). The construct may also reflect the challenges experienced by many respondents in handling negatively worded items.

For each of the cultural groups, three factors with eigenvalues greater than 1 were extracted. Table 4.6 reports the factors on which each item loaded for five samples: previous research, total sample, and each of the three cultural groups in this study. The final classification used in this study is also reported. Of a total of 45 possible classifications, 35 (78%) were correctly classified. Relaxing the loading cut-off to .3 increased the congruence to 80%. When three items (5, 7 and 11) were excluded 92% (33/36) equivalence was achieved.

Table 4.6 *Comparative factor analysis for the Nature Relatedness scale for the total sample and each cultural group of visitors to uShaka Sea World (NS – Nature Self, NE – Nature Experience, ND – Nature Distance)*

	Previous research*	Total sample	White	Indian	African	Final classification
1. My relationship to nature is an important part of who I am	NS	NS	NS	**NE/NS**	NS	NS
2. My connection to nature and the environment is a part of my spirituality	NS	NS	NS	NS	NS	NS
3. I feel very connected to all living things and the earth	NS	NS	NS	NS	NS	NS
4. I am not separate from nature, but a part of nature	NS	NS	NS	NS	NS	NS
5. I take notice of wildlife wherever I am	*NE*	***NS/NE***	***NS/NE***	*NS*	***NS/NE***	*EXCLUDED*
6. Even in the middle of the city, I notice nature around me	NS	NS	NS	NS	NS	NS
7. I always think about how my actions affect the environment	*NS*	***NS/NE***	***NS/NE***	*NS*	<u>*NE*</u>	*EXCLUDED*
8. I am very aware of environmental issues	NS	**NS/NE**	**NE/NS**	NS	NS	NS
9. My ideal holiday spot would be a remote, wilderness area	NE	NE	NE	NE	NE	NE
10. I enjoy being outdoors, even in bad weather	NE	NE	NE	NE	NE	NE
11. I think a lot about the suffering of animals	*NS*	***NE/NS***	*NE*	<u>*NS*</u>	***NE/NS***	*EXCLUDED*
12. I enjoy digging in the ground and getting dirt on my hands	NE	NE	**NE/NS**	NE	NE	NE
13. I don't often go out in nature	NE	ND	ND	ND	ND	ND
14. The thought of being deep in the bush, away from civilization, is frightening	NE	ND	ND	ND	ND	ND
15. My feelings about nature do not affect how I live my life	NS	ND	ND	ND	ND	ND

*Nisbet, Zelenski, & Murphy (2009) NE – Nature Experience, NS – Nature Self, ND – Nature Distance

Underlined – unexpected loading, **Bold** – Cross Loading, *Italics* – item excluded from final composite. Cut-off limits not reached for 1 item

Based on this outcome, three composites were created, Nature Self (six items: 1,2,3,4,6,8), Nature Experience (three items: 9,10,12) and Nature Distance (three items: 13,14,15). Items 5, 7 and 11 were excluded from the composites. Scale reliability was acceptable for the total sample and for each cultural group (Table 4.7). All three factors were used in subsequent analyses.

Table 4.7 *Reliability scores (Cronbach alpha) for the total sample and each cultural group of visitors to uShaka Sea World for the three Nature Relatedness composite variables*

	Total sample	White	Indian	African
Nature Self	.853	.849	.863	.842
Nature Experience	.690	.673	.752	.639
Nature Distance	.738	.750	.733	.649

4.3.1.5 Locus of Control

The Locus of Control (LoC) scale, developed by Fielding and Head (2012), was used to better understand visitors' perceptions of their personal control over the environment. The LoC scale consisted of three items that were used to create one composite, with the third item reverse scored (Fielding & Head, 2012). This scale was termed Locus of Control.

The factor analysis for the total sample and White visitors confirmed that one factor explained participants' responses, with the first two items forming the factor, and the third item failing to load. For Indian and African visitors the third item formed a separate factor, although loading was less than .40. Table 4.8 provides the final results for each item, for the total sample and each cultural group, and the final classification.

Table 4.8 *Comparative factor analysis for the LoC scale for the total sample and each cultural group of visitors to uShaka Sea World*

	Total sample	White	Indian	African	Final classification
My individual actions can make a difference	Internal	Internal	Internal	Internal	Internal
I can influence decisions now	Internal	Internal	Internal	Internal	Internal
I am only one person, I can't make a difference	*No load*	*No Load*	*External*	*External*	*EXCLUDED*

The Cronbach's Alpha confirmed that combining the three items into one scale was unacceptable (Cronbach Alpha=.314), due mostly to the low item-total correlations with the third (reverse scored) item. Pearson's bivariate correlations revealed that for African and Indian visitors only Items 1 and 2 correlated significantly, while for White visitors all three items were inter-correlated as expected (item 3 negatively). Cultural equivalence in understanding was not evident for item 3, highlighting the difficulty that many visitors had understanding reverse scored items. Based on the above analysis it was decided to create one composite using only items 1 and 2. This item, therefore, only represents an endorsement of an internal Locus of Control.

4.3.1.6 Visitor engagement

Visitor engagement, as defined by Ballantyne et al. (2011), was measured on the post-visit section of the questionnaire. The total sample factor analysis confirmed that two factors explained participants' responses to the 12 items, and these were all consistent with the previous research on which this scale was based (Ballantyne, et al., 2011). Table 4.9 reports the factors on which each item loaded for five samples: previous research, total sample, and each of the three cultural groups in this study. The final classification used in this study is also reported. To keep the numbers of factors consistent across cultural groups, one factor with an initial eigenvalue of 1.021 was excluded for the African group. For this scale 86% equivalence was achieved when the .3 loading was accepted. When item 6 was excluded equivalence increased to 91% (30/33).

Table 4.9 *Comparative factor analysis for Experiential (E) and Reflective (R) Engagement for the total sample and each cultural group of visitors to uShaka Sea World*

	Previous research*	Total sample	White	Indian	African	Final classification
1. I had an enjoyable experience	E	E	E	E	E	E
2. I felt a sense of awe or amazement	E	E	E	E	E	E
3. I was able to get a good view of the marine animals	E	E	E	E	E	E
4. It was exciting to see live marine animals	E	E	E	E	E	E
5. There were plenty of activities to do	E	E	E	E	E	E
6. *The experience was engaging / appealing*	*E*	*E*	*E*	***E/R***	*R* (underlined)	*EXCLUDED*
7. I found myself thinking about new ideas about animals	R	R	R	R	E/R	R
8. I discussed new information with my companions	R	R	R	R	R	R
9. I experienced something surprising or unexpected	R	R	R	**E/R**	R	R
10. The staff answered my questions	No load	R	R	R	R	R
11. I felt an emotional connection with the animals I saw	R	R	R	R	**E/R**	R
12. Something that I saw or heard made me feel sad or angry	*R*	*R*	*R*	*R*	*R*	*R*

Underlined – unexpected loading based on South African sample, **Bold** – Cross Loading, *Italics* – item excluded from final composite. *Ballantyne et al., 2011

Based on this outcome two composites were created, Experiential Engagement (five items: 1-5) and Reflective Engagement (six items: 7-12). Item 6 was excluded. Scale reliability was good for each scale and across cultural groups (Cronbach alpha >0.756).

4.3.1.7 Self-reported learning outcomes

Exploratory factor analysis revealed one factor for the full sample and each cultural group. There was, therefore, full construct equivalence for self-reported learning outcomes (SLO). Previous research also revealed one factor (Ballantyne, et al., 2011). The internal consistency of this scale was good (Cronbach alpha: Total sample=.919; White=.917; Indian=.927; and African=.901) and a composite that included all eight items in the scale was created.

4.3.1.8 Behavioural intentions

Post-visit behavioural intentions (BI) were assessed using the same items used to measure environmental practices and environmental advocacy in the pre-visit questionnaire. However, one item in the 'Advocacy' scale was different in the post-visit questionnaire. So as not to appear to be requesting money, the item '*Donated money to a nature or conservation organisation*' on the pre-visit questionnaire was not repeated on the post-visit questionnaire. Because of this change, the composite 'BI Advocacy' included three rather than four items: '*Plant indigenous plants', 'Done volunteer work for a group that helps the environment'* and *'Taken part in a beach / river or nature area clean-up'*. For consistency, the composite variable for 'BI Practices' was created using the same items as described in section 4.3.1.2 above. Scale reliability was good across all cultural groups and for the total sample (Cronbach alpha > .829 for total sample and each cultural group for both BI scales). A single composite, 'BI Composite', made up of all of the items in this scale was also constructed for use in the path analyses (Section 3.6.4). Scale reliability for all three composites across all visitor groups was good (Cronbach alpha >.928).

4.3.2 Detect culture-specific responses styles

After checking for construct equivalence it was necessary to check for culture-specific patterns in response styles. The response styles were calculated using the count procedure described in Section 4.2.2. The frequency of each score (1 to 5) for each item within each cultural group can be seen in Figure 4.1. The CSRS for each cultural group and each bias type is summarised in Table 4.10.
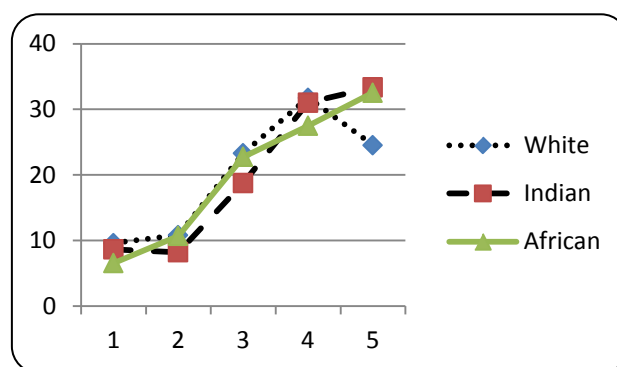
Figure 4.1   Percentage of each Likert scale response (1-5) for each cultural group based on 11 heterogeneous items

Table 4.10 *CSRS calculated for 11 heterogeneous items across scales for each cultural group*

	White	Indian	African
Acquiescence (4 and 5)/total	0.5630	0.6439*	0.6003
Disacquiescence (1and 2)/total	0.2038*	0.1684	0.1723
NARS	0.3592	0.4755*	0.4279
Middle (selection of 3)	0.2332*	0.1877	0.2274
Extreme high (5s/total)	0.2454	0.3335*	0.3254
Extreme low (1s/total)	0.0958*	0.0863	0.0653

* Highest of the three cultural groups

Based on the above, it would appear that Indian visitors tended to have a higher acquiescence and extreme response bias than other visitors. White visitors showed the highest disacquiescence associated with the lowest use of Extreme highs and highest use of extreme lows (1s). African visitors scored lowest on use of Extreme lows, showing reluctance for Disacquiescence. Previous research in South Africa has also found that African people expressed a higher ERS than White people, who were noted to 'inhibit' their responses (Watkins, 1992), while other studies have noted that greater individualism is associated with lower levels of ARS (Johnson et al., 2005). The acquiescence response bias of Indian visitors would elevate their responses which, in the absence of an understanding of response style, may lead to incorrect conclusions when cultural comparisons are made.

4.3.3 Create standardised mean individual scores

The analysis above, based on a sample of 11 items, demonstrated that different cultural groups expressed different response styles. When the individual mean scores (across all items) were compared for the three cultural groups there was a significant difference between the three groups, $F_{(2, 745)}=14.644$, $p<.000$, (Table 4.11). The post-hoc Scheffe test showed that the difference in mean scores was primarily between the White and the other two groups. There was no significant difference between the Indian and African groups. These results are consistent with the results of the CSRS analysis for Acquiescence and Disacquiescence undertaken on a subset of the items and reported above. Data standardisation, as described in Section 4.2.3, was therefore undertaken.

Table 4.11 *Mean scores across a range of 107 items for each cultural group*

	White	Indian	African
Mean	3.872	4.057	4.044
Std. Deviation	0.451	0.453	0.458

4.3.4 Use of standardised data

In preliminary data analyses both the raw and the standardised data were used to analyse the differences between cultural groups. The two data sets produced markedly different results on a number of items, and the results using the standardised data were found to be more consistent with other evidence (Adams et al., 2012; Struwig, 2010). In the raw data, for example, Indian visitors' responses were consistently the highest, regardless of content, a trend noted in other studies (Khan et al., 2012). This confirmed the strong influence of CSRS on the data. For this reason, it was decided to use standardised data for all comparisons between cultural groups that depended on the use of rating scales (i.e., psychographic variables, experience variables, self-rated learning outcomes and behavioural intentions). It was in these scales that the systematic difference in response styles between cultural groups would otherwise influence the findings.

Standardised data were not used for reporting descriptive statistics relating to the full (total) sample. These provided an overview of visitors to uShaka Sea World and enabled comparison with previous research. Standardised data were also not necessary for the more objective categorical data used to measure demographic and cultural variables, visit characteristics, and message recall. Standardised data were not used for the regression analyses in Section 5.4.

4.4   Discussion

Given the results of the various factor analyses undertaken in this section, it is clearly advisable to check for construct equivalence before applying international instruments to the South African population. While there was construct equivalence across the different cultural groups for many items, this was not the case for more complex items and instruments, a finding noted in previous research in South Africa (Meiring et al., 2005). Additionally, and again consistent with previous research, low internal consistencies were noted more amongst

African respondents than White or Indian respondents (Meiring et al., 2005). Using a mixture of positive and negative items has previously been found to pose a threat to the external validity of scales, especially when a positive response requires disagreeing with a negative statement i.e., a double negative (de Klerk et al., 2009). While these types of questions cause difficulties for many respondents, it is likely to be even more of a problem for those who are not experienced questionnaire respondents and/or whose first language is not English.

Regardless of the approaches taken to address response bias, the first step is to acknowledge its potential influence on comparisons between cultures (Harzing, 2006). From the literature review on the topic it would appear that there is no single 'correct' method to reduce CSRS bias (Beuckelaer, et al., 2010; Van Vaerenbergh & Thomas, 2013). The best that can be done is to select a correction technique based on available theory for the data under review, acknowledge that the new standardised data may bring with it an element of distortion (Dolnicar & Grün, 2007a) and use rigorous analysis to ensure appropriate interpretation.

The analysis of quantitative data in cross-cultural research is fraught with challenges. Many studies simply ignore the potential distorting effects of a lack of cultural equivalence and the presence of CSRS even though this may lead to incorrect conclusions regarding differences between cultural groups. Culturally sensitive research requires that cultural equivalence and CSRS are addressed using the best available techniques, that results are interpreted contextually and that the conclusions drawn are well justified. This chapter has addressed issues of cultural equivalence and CSRS in the data, as well as issues of reliability and validity, to ensure that the data can be confidently used in the cultural comparisons required to address the research aims.

CHAPTER 5   RESULTS

Introduction

The overall aim of this research was to build an understanding of the implications of cultural diversity for visitors' environmental learning at an aquarium in South Africa. To achieve this aim, four primary objectives were set. The results are structured according to these research objectives.

5.1   Objective 1

Identify the characteristics of the major cultural groups of visitors to an aquarium in South Africa.

5.1.1   Visitor demographic and cultural variables.

5.1.2   Visitation variables.

5.1.3   Psychographic constructs.

5.2   Objective 2

Explore how visitors from the major cultural groups experience uShaka Sea World.

5.2.1   Activities undertaken.

5.2.2   Visitor engagement.

5.2.3   Aspects that piqued interest or concern.

5.3   Objective 3

Investigate the impact of an aquarium visit on the environmental learning of visitors from each of the major cultural groups, taking into account the confounding effects of other demographic variables.

5.3.1   Self-reported learning outcomes.

5.3.2   Behavioural intentions.

5.3.3   Message recall.

5.3.4   Analysis to test for confounding.

5.4   Objective 4

Assess the extent and nature of the impact of cultural background on learning outcomes.

5.4.1   The contribution of cultural group to the prediction of learning.

5.4.2   Pathways to learning for each cultural group.

5.1   Objective 1: Identify the characteristics of the major cultural groups of visitors to an aquarium in South Africa with respect to selected demographic and cultural variables, visit characteristics and psychographic variables.

5.1.1 Visitor demographic and cultural variables

Demographic and cultural variables collected in the pre-visit section of the questionnaire were used to describe visitors. A summary of the demographic and cultural data for the visitors surveyed in this study is presented in Table 5.1. As both demographic and cultural variables were measured in the same way, they are presented together in this section.

Table 5.1 *Demographic and cultural profiles of visitors to uShaka Sea World for each cultural group and the total sample*

	White	Indian	African	Total sample	Missing
Gender					9(1.2)
Male	138 (35.8)	79 (40.1)	61 (39.1)	278 (37.6)	
Female	248 (64.2)	118 (59.9)	95 (60.9)	461 (62.4)	
Age range					1 (0.1)
<20	45(11.5)	19 (9.5)	11 (7.1)	75 (10.0)	
20-29	71 (18.1)	31 (15.6)	38 (24.4)	140 (18.7)	
30-39	105(26.8)	81 (40.7)	41 (26.3)	227 (30.4)	
40-49	102 (26)	43 (21.6)	43 (27.6)	188 (25.2)	
50-59	38 (9.7)	19 (9.5)	16 (10.3)	73 (9.8)	
60+	31 (7.9)	6 (3.0)	7 (4.5)	44 (5.9)	
Number of Children					229 (30.6)*
0	68 (24.4)	37 (25.5)	20 (21.1)	125 (24.1)	
1	51 (18.3)	33 (22.8)	24 (25.3)	108 (20.8)	
2	107 (38.4)	49 (33.8)	30 (31.6)	186 (35.8)	
3+	53 (18.9)	26 (17.9)	21 (22)	100 (19.3)	
Education					20 (2.7)
School	148 (38.8)	88 (45.2)	27 (17.8)	263 (36.2)	
Diploma	89 (23.4)	34 (17.4)	49 (32.2)	172 (23.6)	
University	144 (37.8)	73 (37.4)	76 (50.0)	293 (40.2)	
Current Occupation					51 (6.8)
Employed	268 (70.7)	139 (76)	100 (74.1)	507 (72.7)	
Pensioner/Housewife	55 (14.5)	20 (10.9)	11 (8.1)	86 (12.3)	
Unemployed	3 (0.8)	2 (1.1)	6 (4.4)	11 (1.6)	
Student	53 (14.0)	22 (12)	18 (13.3)	93 (13.3)	
<u>**Current**</u>					
Language					6 (0.8)
English	206 (52.8)	192 (97.5)	10 (6.4)	408 (54.8)	
Afrikaans	174 (44.6)	1 (0.5)	0	175 (23.5)	
African	1 (0.3)	0	140 (89.2)	141 (19.0)	
Other	9 (2.3)	4 (2)	7 (4.5)	20 (2.7)	
Province					6 (0.8)
KwaZulu-Natal	73 (18.7)	130 (66.0)	29 (18.7)	232 (31.3)	

Gauteng	172 (44.1)	46 (23.4)	55 (35.5)	273 (36.8)	
Other South Africa	125 (32.1)	13 (6.6)	63 (40.6)	201 (27.1)	
Africa	6 (1.5)	0	8 (5.2)	14 (1.9)	
International	14 (3.6)	8 (4.1)	0	22 (3.0)	
Place of Residence					29 (3.9)
Major City	214 (56.0)	105 (56.1)	67 (44.7)	386 (53.7)	
Town	143 (37.4)	77 (41.2)	53 (35.3)	273 (38)	
Rural Area	25 (6.5)	5 (2.7)	30 (20.0)	60 (8.3)	
<u>**Childhood**</u>					
Language					7 (0.9)
English	194 (49.7)	195 (99)	19 (12.3)	408 (55.1)	
Afrikaans	186 (47.7)	1 (0.5)	0	187 (25.2)	
African	0	0	133 (85.8)	103 (13.9)	
Other	10 (2.6)	1 (0.5)	3 (1.9)	43 (5.7)	
Province					23 (3.1)
KwaZulu-Natal	67 (17.8)	146 (74.9)	27 (17.6)	240 (33.1)	
Gauteng	145 (38.5)	34 (17.4)	37 (24.2)	216 (29.8)	
Other South Africa	142 (37.7)	13 (6.7)	75 (49)	230 (31.7)	
Africa	13 (3.4)	0	13 (8.5)	26 (3.6)	
International	10 (2.7)	2 (1.0)	1 (0.7)	13 (1.8)	
Place of Residence					42 (5.6)
Major City	159 (42.5)	100 (53.5)	38 (26.2)	297 (42.1)	
Town	188 (50.3)	81 (43.3)	49 (33.8)	318 (45.0)	
Rural Area	27 (7.2)	6 (3.2)	58 (40.0)	91 12.9)	

(Figures in brackets indicate percentage of valid responses in each category) *The high percentage of visitors who did not complete this question may be those without children, however, this is not clear and their data was coded as missing.

For each of the demographic and cultural variables, data for the total sample of visitors are presented, followed by an analysis of differences and similarities between the cultural groups, where relevant. Based on these data, a description of this sample of uShaka Sea World visitors and a description of each cultural group are provided at the end of this section.

5.1.1.1 Gender, Age and Number of Children

Overall more females (64.2%) than males responded to the questionnaire. Across all groups, most respondents were in the age category 30-49 years (55.6%) and the mean age category for all respondents was 30-39 years. The maximum number of children in a family was

reported to be 6, with 2 children being most commonly reported for all cultural groups. There were no significant differences among the cultural groups in any of the variables of gender, age and number of children.

5.1.1.2 Education

High school was the highest education level recorded by 36.2% of the respondents, however, this does not necessarily mean that these visitors were not well educated as they may be still studying, having not yet attained their final qualification. When adjusted for this factor, high school was the highest education level recorded by 25% of the respondents. This is shown in Figure 5.1 in which the highest education level attained, as well as the percentage of respondents who were students, is presented.
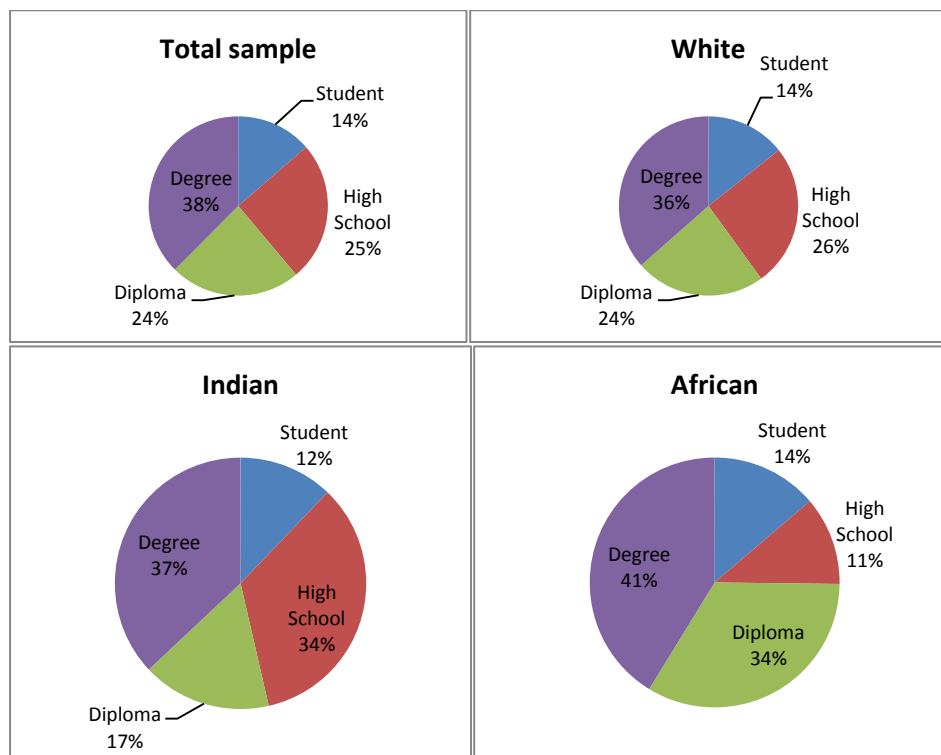
Figure 5.1 Highest education level and percentage still studying: total sample and by cultural group

A total of 62% of visitors recorded some post-school education (diploma or degree). African visitors were significantly more highly educated than those in the other cultural groups, χ^2 [4, N=728]=31.830, p<0.001, and this finding was confirmed with a one-way ANOVA, F(2, 725)=10.596, p<0.001. Of the visitors who had completed their studies, a total of 41% of the African visitors possessed university degrees, compared with 36-37% for Indian and White

visitors (Figure 5.1). No significant difference in education levels between White and Indian respondents was noted.

5.1.1.3 Occupation

Most visitors reported being employed (72.7%), which is not surprising given the high entry price of the attraction. There was a significant difference between the cultural groups with respect to occupation, χ^2 (6, N=697)=13.317, p=0.038, with White visitors being more likely than other groups to be pensioners or housewives (Figure 5.2).
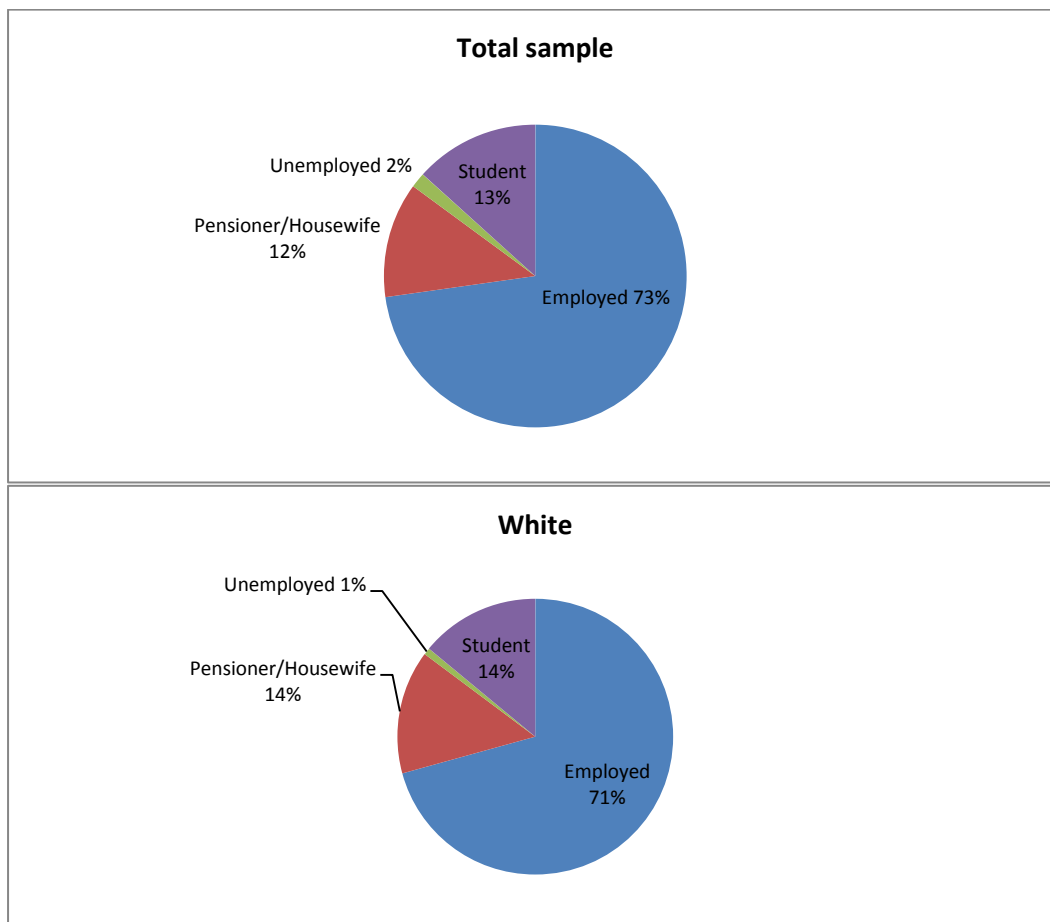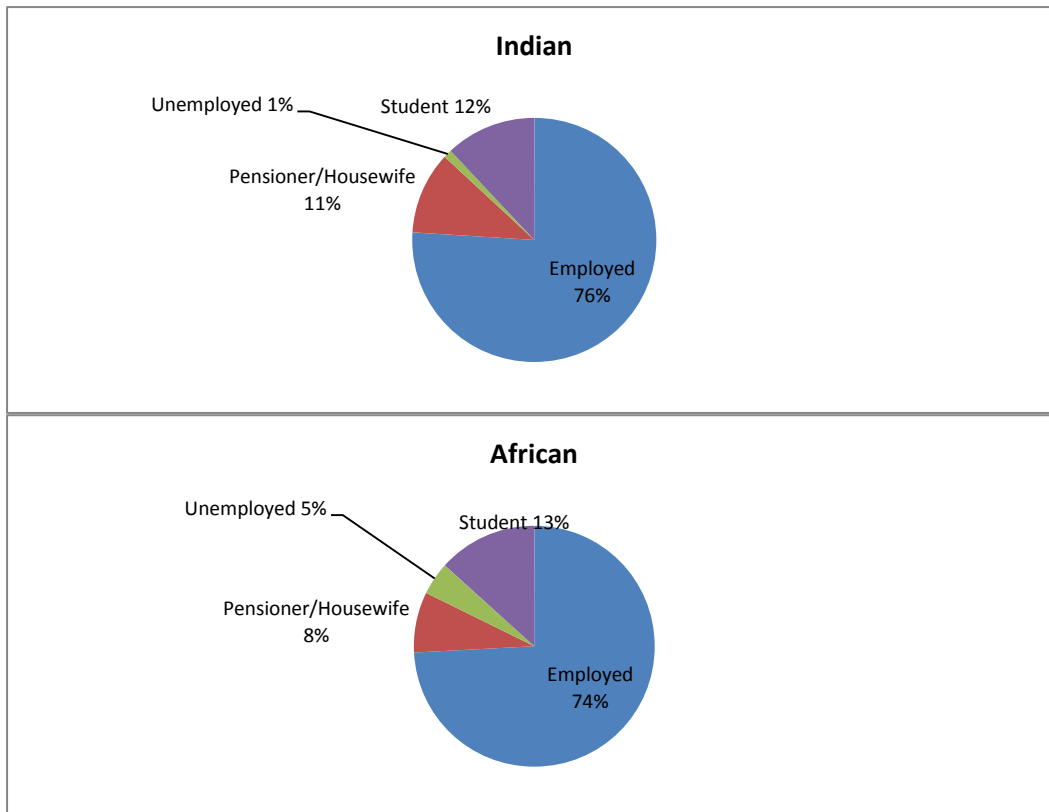
Figure 5.2 Occupation of uShaka Sea World visitors: total sample and by cultural group

5.1.1.4 Language

Current language: Overall 55% of respondents reported that they currently speak English at home, however, there was a significant difference between cultural groups in relation to current language, χ^2 (6, N=744)=807.980, p<0.001. The White respondents reported speaking primarily English (52.8%) and Afrikaans (44.6%), while English was the primary language of the Indian group (97.5%), and the African respondents reported mostly speaking an African language (89.2%, see Figure 5.3).
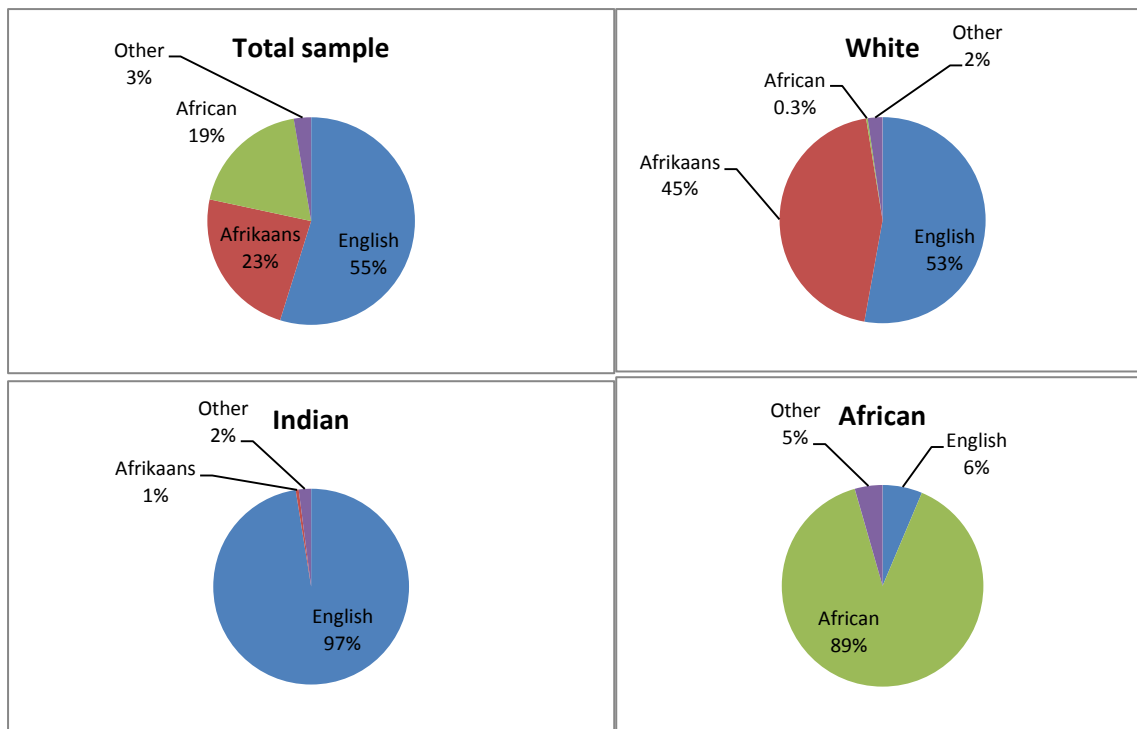
Figure 5.3 Current languages spoken by uShaka Sea World visitors: total sample and by cultural group

Childhood language: A total of 55% of the respondents reported speaking English while growing up and significant differences were noted between the cultural groups, χ^2 (6, N=742) = 794.395, p<0.001. Almost all Indian visitors (99%) spoke English while growing up, 85.8% of African visitors spoke an African language and White visitors were split into two, namely, English (49.7%) and Afrikaans (47.7%). Given the similarity of languages spoken currently and during childhood, it was decided to use only current language in subsequent analyses.

5.1.1.5 Place of residence (Town size)

As mentioned in Chapter 2, level of urbanisation can influence environmental attitudes, therefore, visitors were asked to provide an indication of their level of urbanisation during childhood and currently (rural area, town or major city). In South Africa there are only 10 major cities (with a population of over 500 000), while the rural areas generally lack services such as piped water and water borne sewage, and activities usually revolve around subsistence or commercial agriculture. Towns would be considered to be urban environments with populations smaller than 500 000. As such, it is relatively easy to distinguish between a major city, a Town and a Rural Area in South Africa.

Current place of residence: Over half of all respondents noted that they currently live in a major city. African visitors were more likely to currently live in a Rural Area compared with White and Indian visitors, χ^2 (4, N=719)=36.790, p<.001(Figure 5.4).
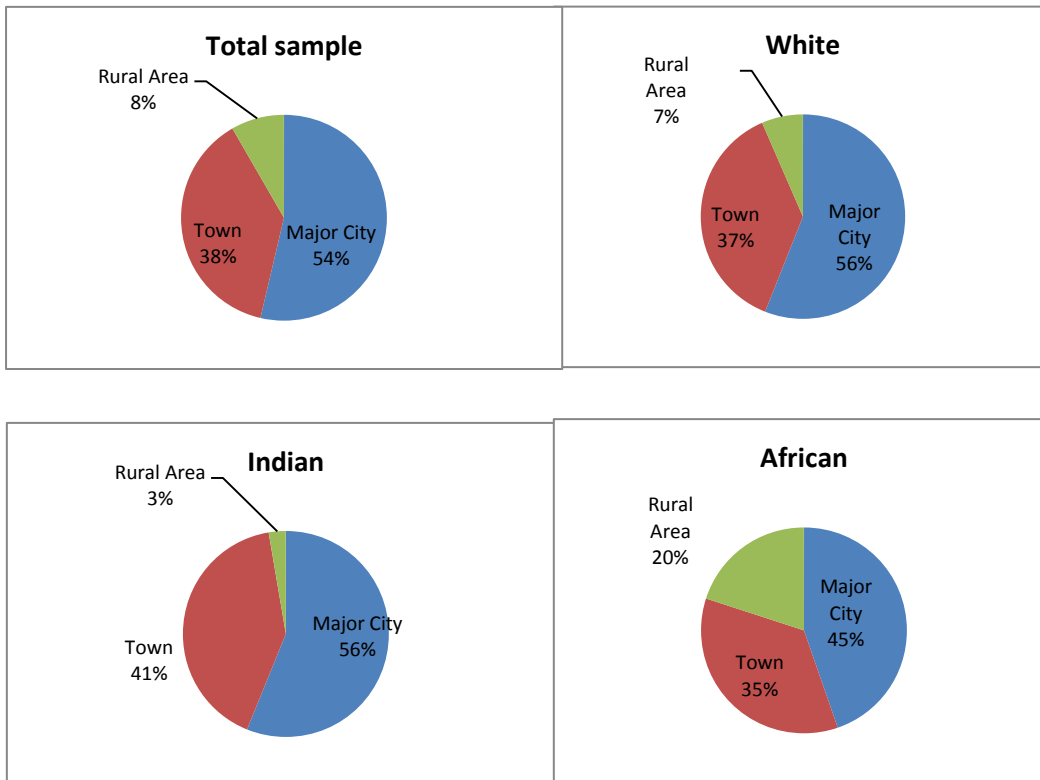
Figure 5.4 Current place of residence of visitors to uShaka Sea World: total sample and by cultural group

Childhood place of residence: Overall, there was an even split between visitors who grew up in a town and those who reported growing up in a city, while very few reported growing up in a rural area. Significantly more African visitors grew up in rural areas, than either White or Indian visitors, χ^2 (4, N=706)=126.545, p<.001 (Figure 5.5). The results show that Indian visitors are the most urbanised, followed by White and then African visitors.
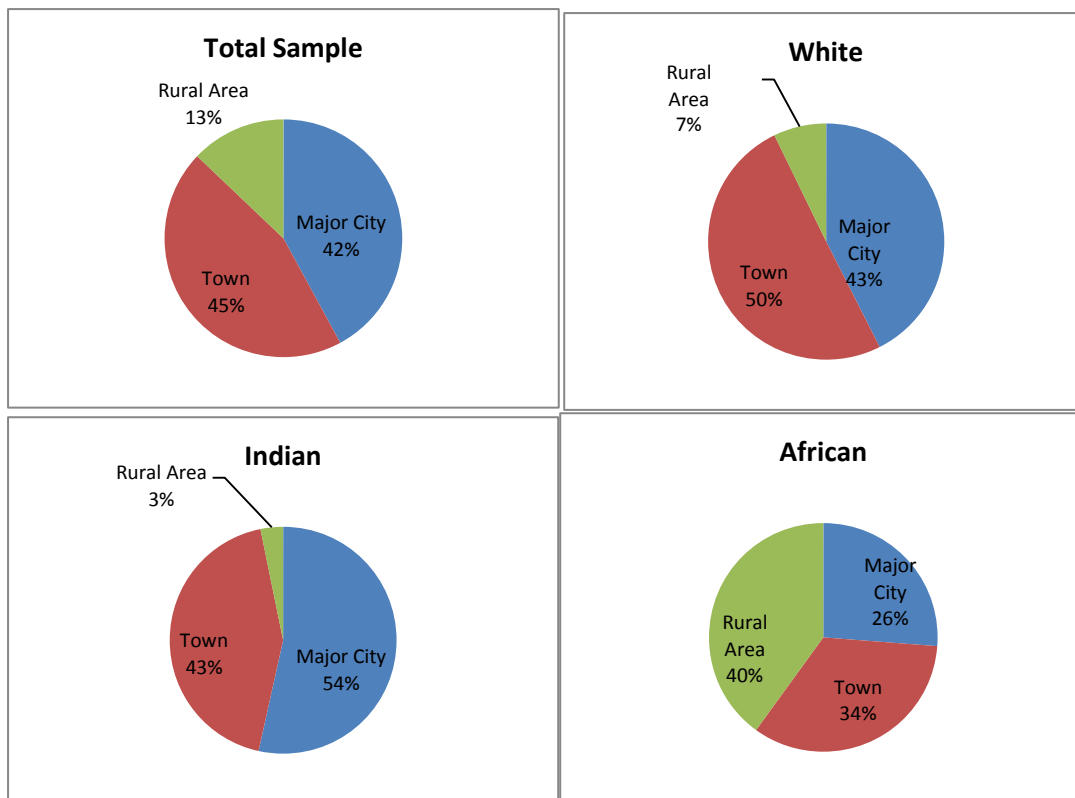
Figure 5.5 Childhood place of residence for uShaka Sea World visitors: total sample and by cultural group

Urbanisation is an ongoing phenomenon in South Africa, particularly amongst the African population, as thousands of people migrate from rural to urban areas (Struwig, 2010). These results reflect this urbanisation, as the percentage of visitors in major cities increased between childhood and the present across all cultural groups.

5.1.1.6 Provincial information

The map of South Africa in Figure 5.6 shows the position of Durban, KwaZulu-Natal (KZN), where uShaka Sea World is located. It also shows the location of the other provinces and major cities of South Africa. The market for uShaka Sea World has traditionally been divided into two groups, local KZN residents and regional tourists, primarily from inland provinces such as Gauteng (home to the two large cities of Johannesburg and Pretoria), Limpopo, Mpumalanga, North West Province and the Free State (Ann Kunz, personal communication).
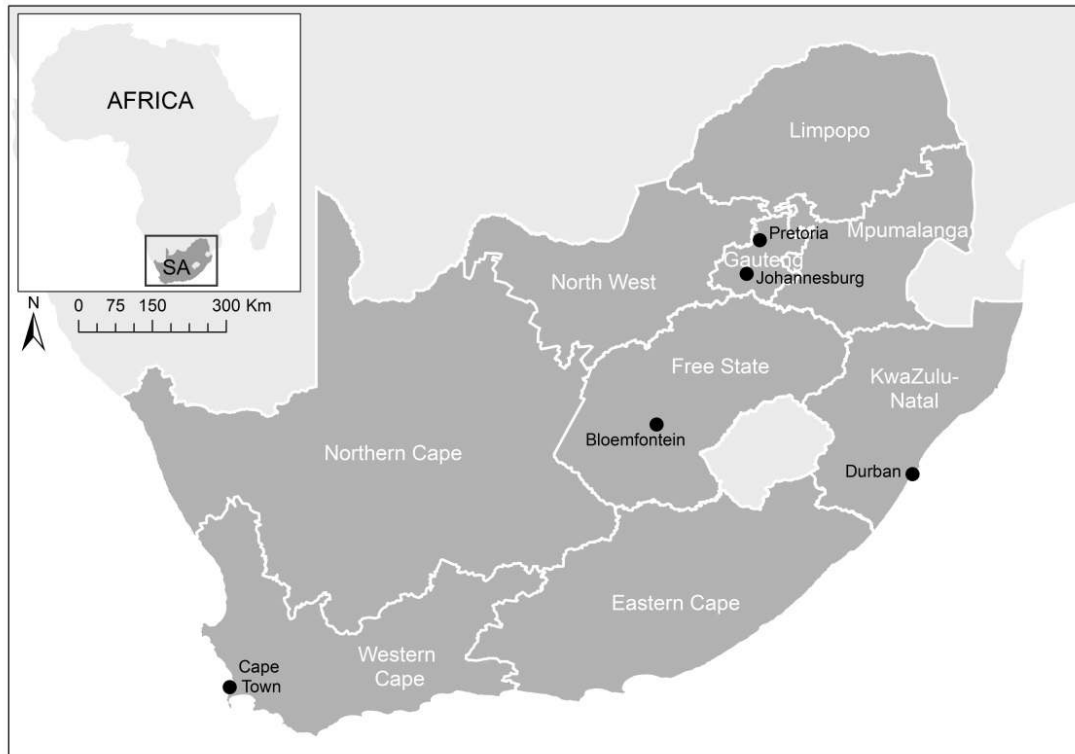
Figure 5.6 Provincial map of South Africa showing selected major cities and provinces

Current province: Overall, visitors reported currently residing in Gauteng (36.8%), KZN (31.3%) and other South African provinces (27.1%) (Figure 5.7). Analysis revealed that Indian visitors were more likely than either of the other two groups to currently live in KZN, while White visitors were more likely to live in Gauteng, χ^2 (8, N=742)=182.112, p<.001. African visitors were more likely to come from other SA provinces than either of the other two groups.
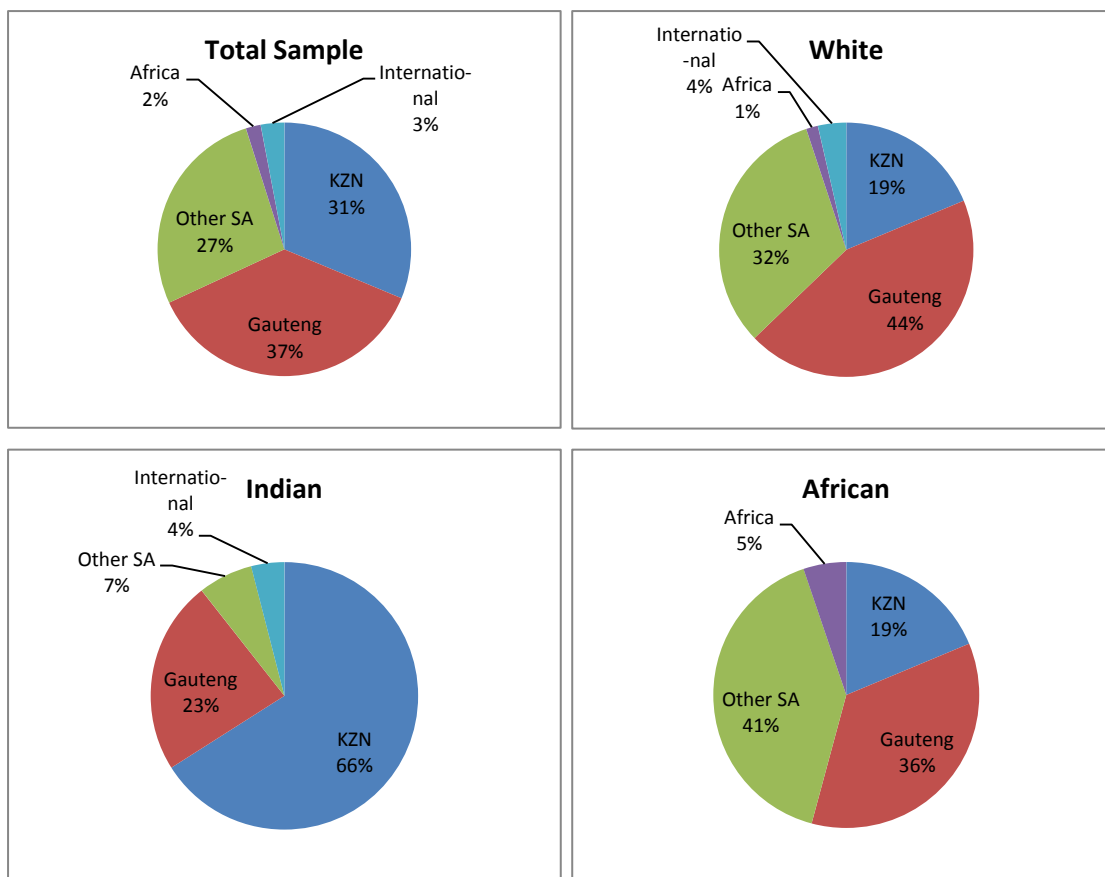
Figure 5.7 Current province of residence for uShaka Sea World visitors: total sample and by cultural group

Childhood province: The pattern for childhood home province was similar to the current residence pattern. Most Indian visitors grew up in KZN (74.9%), significantly more than White visitors (17.8%) and African visitors (17.6%), χ^2 (8, N=725)=239.516, p<.001. Most of the White and African visitors were not originally from KZN.

5.1.1.7 Summary description of all respondents

Overall, more females than males responded to the survey and most respondents were in the 30-49 years' age group. Most respondents reported that they have two children. Most were well educated; as over half possessed a post High School qualification and most were employed. Over half of the respondents currently speak English at home and spoke English while growing up. Almost a third grew up and currently live in KZN, with the remainder growing up and living outside of the province. This would indicate that uShaka Sea World visitors are primarily holiday makers from outside of KZN. Visitors are urbanised, as over half of the respondents currently live in a major city, and their upbringing was mostly urbanised.

5.1.2 Summary descriptions

5.1.2.1 White respondents

White visitors were relatively well educated, with 61.2% possessing a degree or a diploma. The primary languages spoken by the White respondents, both currently and during childhood, were English and Afrikaans. Most White respondents currently live outside of KZN, in a major city, and grew up in a town, also outside of KZN. This would indicate that White visitors are generally holiday makers to KZN, primarily from Gauteng but also other South African provinces. The fact that White visitors were more likely to classify themselves as Pensioners or Housewives, than the other two groups, may reflect the greater affluence of White visitors. White pensioners and housewives have the leisure time and the means to visit the facility without being employed, a situation unlikely in most Indian and African households.

5.1.2.2 Indian respondents

A school leaving qualification was the highest education level attained by over a third of the Indian respondents, which means that their education levels were the lowest of the three groups. Almost all Indian respondents currently speak and spoke English when growing up. Most Indian visitors grew up and currently reside in KZN, and currently live and grew up in a major city. Indian visitors are, therefore, primarily local KZN residents, with a smaller percentage from Gauteng.

5.1.2.3 African respondents

African visitors were the most highly educated, with 82.2% possessing a degree or diploma. Most of the African respondents grew up speaking and currently speak an African language at home. Most African respondents do not live in KZN and most grew up outside of KZN. Forty percent of the African respondents reported growing up in a rural area and 20% currently reside in a rural area. Thus, more African visitors currently live in rural areas than White (6.5%) or Indian visitors (2.7%). Similarly, many African visitors grew up in a rural area in a province other than KZN or Gauteng. Many have now moved into towns and cities around South Africa and are primarily holiday makers to KZN.

5.1.2.4 Summary of demographic and cultural variables

With the exception of gender, age and number of children, the data show significant differences between cultural groups on all of the demographic information recorded. These

variables may influence the results and will be treated as possible confounding variables when examining the influence of cultural group on environmental learning (Objective 3). The differences are expected to have implications for the design of interpretive experiences, and will be discussed in Chapter 6.

5.1.3 Visitation variables

Data on visit variables provide valuable information that can contribute towards better understanding visitors to educational leisure settings. A summary of these variables for the full sample and each cultural group is presented in Table 5.2. Again, total visitor data are presented, followed by an analysis of the differences and similarities between the three cultural groups, where relevant. A summary of the visit variables is provided at the end of the section.

Table 5.2 *Visitation variables data for visitors to uShaka Sea World: total sample and by cultural group*

Visitation variables	White	Indian	African	Total sample
Visit frequency (5 [0.7%] missing)				
First Time	159 (40.8)	49 (24.7)	79 (51.0)	287 (38.6)
Less Once Year	99 (25.4)	37 (18.7)	13 (8.4)	149 (20.1)
Once Twice Year	101 (25.9)	64 (32.2)	39 (25.2)	204 (27.5)
More Twice Year	31 (7.9)	48 (24.2)	24 (15.5)	103 (13.9)
First time / Repeat visitors (5 [0.7%] missing)				
First Time Visitor	159 (40.8)	49 (24.7)	79 (51.0)	287 (38.6)
Repeat Visitor	231 (59.2)	149 (75.3)	76 (49.0)	456 (61.4)
Group composition (8 [1.1%] missing)				
Alone	6 (1.5)	2 (1.0)	3 (1.9)	11 (1.5)
Partner	47 (12.1)	12 (6.1)	24 (15.6)	83 (11.2)
Friends	55 (14.2)	12 (6.1)	54 (35.1)	121 (16.4)
Family	280 (72.2)	172 (86.9)	73 (47.4)	525 (70.9)

(Figures in brackets indicate percentage of valid responses in each category)

5.1.3.1 First time / repeat visitors

A total of 38.6% of all respondents were on their first visit to uShaka Sea World, while just over a quarter reported visiting the facility once or twice a year. There was a significant

difference between cultural groups with more African and White visitors being on their first visit (51% and 40.8% respectively), compared to Indian visitors, most of whom reported visiting once or twice a year, χ^2 (6, N=743)=60.553, p<.001. A one way ANOVA confirmed that Indian people visited more frequently than either White or African visitors (F(2, 742)=18.634, p<.001).

When summarised into two groups (first time and repeat visitors), it is clear that more repeat visitors responded to the survey (61.4%) than first time visitors (38.6%). Significantly more Indian respondents were repeat visitors (75.3%), compared with 59.2% of White visitors and 49% of African visitors, χ^2 (2, N=743)=26.802, p<.001. Results from the monthly uShaka Marine World surveys indicate that, for the three months during which sampling took place, an average of 50% of the respondents were on their first visit to the facility. Thus repeat visitors are over-represented in the sample.

5.1.3.2 Group composition

The facility is clearly a family destination as 70.9% of all respondents reported that they were visiting with their families. More African people visited with friends (35.1%) than either of the other two groups (White: 14.2%; Indian: 6.1%), χ^2 (6, N=740)=74.241, p<.001.

Most family groups had more adults than children in the group. Initial analysis revealed that African people visited the facility in larger groups than the other two cultural groups. However, this was the result of one or two very high group numbers. When these large groups were excluded from the analysis, it was clear that Indian people visited in larger groups (average 5.8) than either White (4.5) or African (4.6) visitors. This may be because most Indian visitors are local, and it is easier to bring a large family a shorter distance for a visit.

5.1.3.3 Summary

Most respondents were repeat visitors in family groups. The proportion of Indian visitors on repeat visits was higher than either the White or African visitors, probably because they are mostly local KZN residents. This may also account for the slightly larger group sizes of Indian visitors than either of the other two groups. In all three cultural groups, the number of adults generally exceeded the number of children. Slightly more African respondents reported visiting with friends, than either of the other groups.

There was a significant difference between cultural groups with respect to visit frequency, group composition and group size. These variables may influence the results of the other analyses and will be addressed as confounding variables during analysis in Objective 3. As with the demographic characteristics described above, differences in visit characteristics have implications for the design of interpretive experiences, which will be discussed in Chapter 6.

5.1.4 Psychographic constructs

In Chapter 4 the psychographic data gathered in the pre-visit section of the questionnaire were assessed for cultural equivalence of meaning and the influence of culture-specific response styles. These analyses resulted in the development of the final scales and sub-scales, and the standardisation of the data, to address the issue of culture-specific response styles (CSRS). In each of the following sections, data for the total sample are discussed, followed by a discussion of the similarities and the differences between the cultural groups. Unstandardized (raw) data are used for the total sample (all respondents), while the standardised data are used for the cultural group comparisons.

5.1.4.1 Motivation for visit

The Visitor Motivation Scale (Packer & Ballantyne, 2002; Packer, 2004) was used to measure the relative importance of four different motivational drivers: learning and discovery, social contact, passive enjoyment and restoration. The scale was assessed using exploratory factor analysis for cultural equivalence in Chapter 4 and four factors were found for all three cultural groups. Table 5.3 provides a summary of the means and standard deviations for the total visitor sample and the standardised means for each cultural group, for each motivation composite.

Overall, visitors rated passive enjoyment most highly, followed by restoration, learning and discovery, and social contact. White visitors scored significantly lower on social contact than the other two groups, $F(2, 706)=22.705$, $p<.001$, and African visitors scored significantly lower on a motivation to learn, $F(2, 714)=7.698$, $p<.001$, (Table 5.3). Visitors to uShaka Sea World have made a considerable investment in time and money, regardless of culture, which may explain the high percentages of scores over 4 (out of 5) for all scales (Table 5.3).

Table 5.3 *Descriptive statistics for visitor motivation*

	Total sample (all respondents)			White	Indian	African
	Mean (raw data)	Std. Dev. (raw data)	% 4 or 5	Mean (standardised data)	Mean (standardised data)	Mean (standardised data)
Social Contact	3.46	1.202	43.4	-0.62	-0.32	-0.10
Learning and Discovery	4.21	0.724	66.9	0.26	0.25	-0.07
Restoration	4.24	0.767	69.9	0.24	0.26	0.29
Passive Enjoyment	4.44	0.539	83.8	0.45	0.40	0.46

NOTE 1: The mean (standardised data) represents the relative position of the item, in relation to all other items, for the specified group. A positive score (between 0 and +2) indicates that the item is highly endorsed relative to other items; a negative score (between 0 and -2) indicates the item is less highly endorsed than other items; and a score of zero indicates equivalence with the mean of all items.

Analysis using Individual Items

While the composite items provide a good overview of visitor motivations, a closer analysis of the individual items provides further insights. The item *'To expand my interests'* was consistently rated the lowest and there was no significant difference between the cultural groups on this item (Figure 5.8). All of the items pertaining to social contact with 'new' people received lower ratings than the other items in the total sample. A significant difference was found on the following items, with White visitors scoring the lowest on the items pertaining to new social contact (e.g.,*'To build friendships with new people'*;*'To interact with others'*; *'To meet new people'*; and *'To develop close friendships),* and the highest on *'To spend quality time with family and friends'*. African visitors scored the highest on the items pertaining to entertainment and enjoyment and the lowest on*'To get away from the responsibilities of everyday life'*.
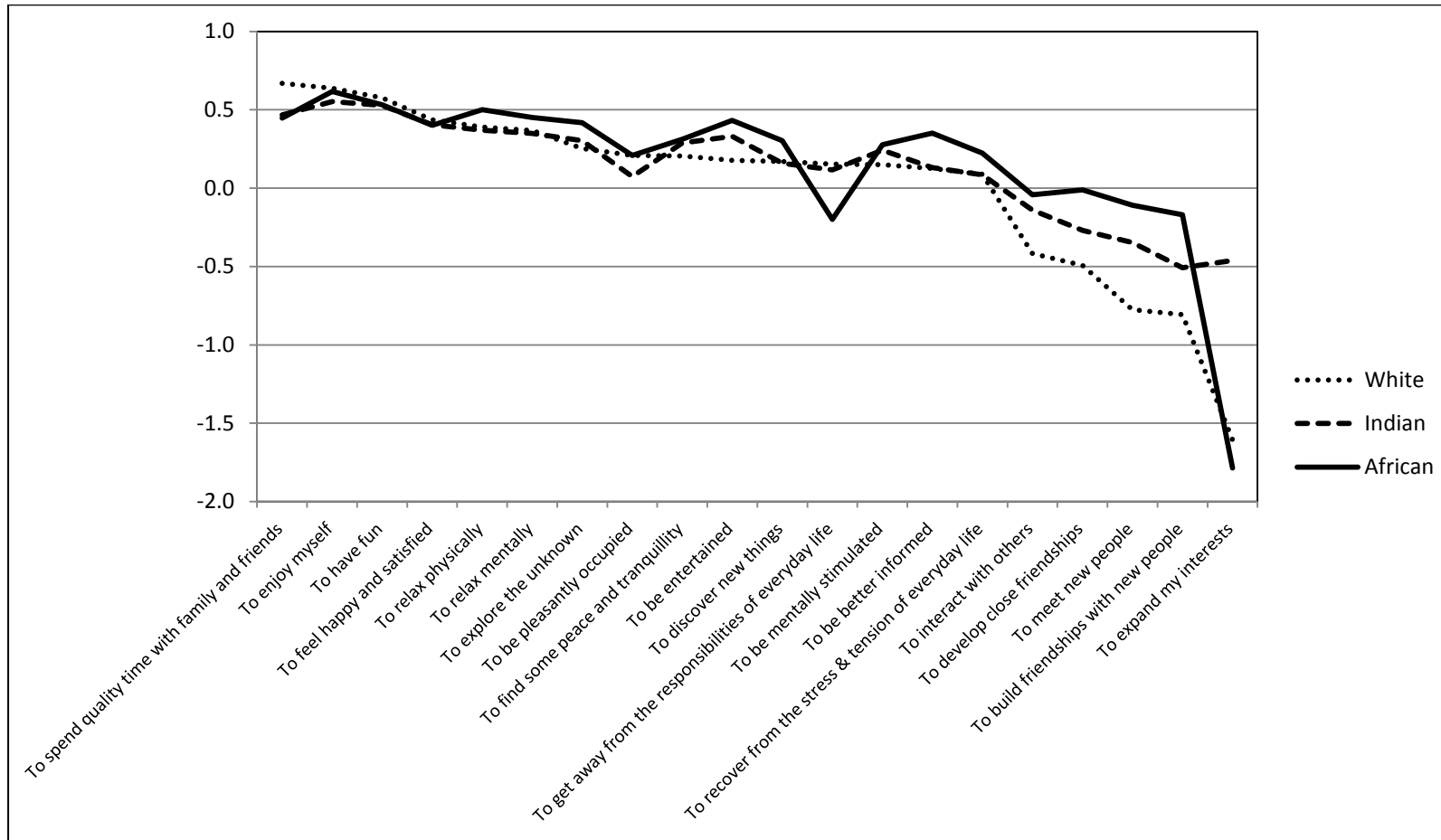
Figure 5.8 Graphic representation of the individual items in the motivation for visit scale for different cultural groups visiting uShaka Sea World based on standardised data

5.1.4.2 Environmental orientation

Based on the outcome of the exploratory factor analyses and the cultural comparisons for construct equivalence undertaken in Chapter 4, scores were calculated for each of the three environmental interest and pre-visit behaviour factors, namely, Environmental Curiosity, Environmental Practices and Environmental Advocacy. Table 5.4 provides the means and standard deviations of these three variables for all respondents and the standardised scores for each cultural group.

Table 5.4 *Raw data means and standard deviations for all respondents and standardised means for each cultural group for environmental interest and pre-visit behaviour variables*

	Total sample (all respondents)		White	Indian	African
	Mean (raw data)	Std. Dev. (raw data)	Mean (standardised data)	Mean (standardised data)	Mean (standardised data)
Environmental Curiosity	4.03	.746	0.10	0.03	0.03
Environmental Practices	3.78	.746	-0.13	-0.17	-0.28
Environmental Advocacy	2.82	1.050	-0.96	-1.12	-1.31

NOTE 1: The mean (standardised data) represents the relative position of the item, in relation to all other items, for the specified group. A positive score (between 0 and +2) indicates that the item is highly endorsed relative to other items; a negative score (between 0 and -2) indicates the item is less highly endorsed than other items; and a score of zero indicates equivalence with the mean of all items.

NOTE 2: Mean raw data scores below 3.0 on the 5-point scale are considered 'low', 3.0 – 3.5 'moderate'; 3.5 – 4.0 'high'; and above 4.0 'very high'.

5.1.4.3 Environmental attitudes

Based on the exploratory factor analysis and the cultural comparisons for construct equivalence undertaken in Chapter 4, two composites representing a pro-NEP attitude and an anti-NEP attitude were produced. Table 5.5 provides a summary of the means and standard deviations for all respondents and the standardised means for each cultural group, for each NEP subscale.

Table 5.5 *Means and standard deviations for the NEP composites for all respondents and standardised means for each cultural group*

	Total sample (all respondents)		White	Indian	African
	Mean (raw data)	Std. Dev. (raw data)	Mean (standardised data)	Mean (standardised data)	Mean (standardised data)
Pro-NEP	4.25	0.619	0.36	0.21	0.12
Anti-NEP	2.93	1.076	-1.10	-0.91	-0.52

NOTE 1: The mean (standardised data) represents the relative position of the item, in relation to all other items, for the specified group. A positive score (between 0 and +2) indicates that the item is highly endorsed relative to other items; a negative score (between 0 and -2) indicates the item is less highly endorsed than other items; and a score of zero indicates equivalence with the mean of all items.

Overall, visitors had very high pro-NEP views and low anti-NEP views, reflective of an overall pro-ecological world view. There were significant differences between the groups on both the pro-NEP and the anti-NEP subscales ($F_{(2,654)}=12.139$, $p<.001$ and $F_{(2, 688)}=22.777$, $p<.001$), respectively. White visitors were higher on the pro-NEP subscale and African visitors scored higher on the anti-NEP subscale.

These results suggest that White visitors hold the view that the current environmental crisis is human induced and that continued abuse of the environment will be ultimately detrimental to humans, while African visitors are more prone to agree with statements that reflect human dominance over the environment.

5.1.4.4 Connectedness to nature

Inclusion of Nature in Self

This simple graphical scale was used to investigate visitors' explicit self-reported connection to nature. uShaka Sea World visitors rated themselves as moderately connected to nature with a mean of 3.56 on a 5-point scale (Table 5.6). Indian visitors' INS scores were significantly lower than the other two groups ($F_{(2, 645)}=8.115$, $p<.001$).

Table 5.6 *Raw data means and standard deviations for the Inclusion of Nature in Self Scale for all respondents and standardised means for each cultural group*

	Total sample (all respondents)		White	Indian	African
	Mean (raw data)	Std. Dev. (raw data)	Mean (standardised data)	Mean (standardised data)	Mean (standardised data)
Inclusion of Nature in Self	3.56	0.947	-0.37	-0.63	-0.26

NOTE 1: The mean (standardised data) represents the relative position of the item, in relation to all other items, for the specified group. A positive score (between 0 and +2) indicates that the item is highly endorsed relative to other items; a negative score (between 0 and -2) indicates the item is less highly endorsed than other items; and a score of zero indicates equivalence with the mean of all items.

Nature Relatedness

This scale was assessed in Chapter 4 for cultural equivalence through exploratory factor analysis. The outcome revealed three factors for all three cultural groups: Nature Self, Nature Experience and Nature Distance. Overall, visitors expressed very high Nature Self scores, a high Nature Experience rating, and a low Nature Distance rating (Table 5.7). For the Nature Distance scale, a high score would indicate a higher perceived distance from nature.

Table 5.7 *Means and standard deviations for the three Nature Relatedness composites for all respondents and standardised means for each cultural group*

	Total sample (all respondents)		White	Indian	African
	Mean (raw data)	Std. Dev. (raw data)	Mean (standardised data)	Mean (standardised data)	Mean (standardised data)
Nature Self	4.09	.678	0.12	0.07	0.12
Nature Experience	3.83	.857	-0.15	-0.17	-0.40
Nature Distance	2.75	.1.139	-1.13	-1.09	-0.85

NOTE 1: The mean (standardised data) represents the relative position of the item, in relation to all other items, for the specified group. A positive score (between 0 and +2) indicates that the item is highly endorsed relative to other items; a negative score (between 0 and -2) indicates the item is less highly endorsed than other items; and a score of zero indicates equivalence with the mean of all items.

Note 2: Mean scores on the 5-point scale below 3.0 are considered 'low'; 3.0 – 3.5 'moderate'; 3.5 – 4.0 'high'; and above 4.0 'very high'.

There were significant differences between the groups on the Nature Experience and Nature Distance subscales ($F_{(2, 698)}=13.377$, $p<.001$ and $F_{(2, 701)} =7.863$, $p=<.001$), respectively. African visitors were significantly higher on Nature Distance and lower on Nature Experience than the other groups.

5.1.4.5 Locus of Control

Based on the cultural equivalence assessment of this scale in Chapter 4, a Locus of Control (LoC) composite of two items was created and analysed by cultural group (Table 5.8). There were no significant differences between the cultural groups on the LoC scale.

Table 5.8 *Means and standard deviations for the two item Locus of Control variable for all respondents and standardised means for each cultural group*

	Total sample (All respondents)		White	Indian	African
	Mean (raw data)	Std. Dev. (raw data)	Mean (standardised data)	Mean (standardised data)	Mean (standardised data)
Locus of Control	4.56	.697	0.62	0.56	0.50

NOTE 1: The mean (standardised data) represents the relative position of the item, in relation to all other items, for the specified group. A positive score (between 0 and +2) indicates that the item is highly endorsed relative to other items; a negative score (between 0 and -2) indicates the item is less highly endorsed than other items; and a score of zero indicates equivalence with the mean of all items.

5.1.5 Summary of psychographic characteristics for the total sample

The psychographic characteristics of visitors to uShaka Sea World were measured using 14 sub-scales representing five constructs. The results are summarised in Table 5.9, which provides a simple overview of the comparisons between each cultural group for each sub-scale.

Table 5.9 *Summary of results for the psychographic constructs showing where significant differences between cultural groups were noted*

Variable	Differences between cultural groups
Social Contact	African>Indian>White lowest*
Learning and Discovery	White >Indian>African lowest*
Restoration	No significant difference between cultural groups
Passive Enjoyment	No significant difference between cultural groups
Environmental Curiosity (EC)	No significant difference between cultural groups
Environmental Practices (EP)	White highest* >Indian>African
Environmental Advocacy (EA)	White highest*>Indian>African
Pro-NEP	White highest*>Indian > African
Anti-NEP	African highest*>Indian>White
Nature Self (NR-Self)	No significant difference between cultural groups
Nature Experience (NR-Experience)	White highest>Indian> African*
Nature Distance (NR-Distance)	African highest*>Indian>White
Inclusion Nature Self (INS)	African highest>White>Indian*
Locus of Control (LoC)	No significant difference between cultural groups

*Significant difference at 0.05

In the total sample, visitors expressed a high motivation for passive enjoyment, restoration and, learning and discovery. Overall, visitors are curious about the environment, and engaged in environmental practices at home, but are not very active in high commitment behaviours (advocacy). Visitors expressed a strong pro-environment attitude, with concomitant lower anti-ecological views. The Inclusion of the Nature in Self graphical scale showed a moderate

to high level of inclusion with nature, which was corroborated by the fact that, overall, visitors did not feel a distance from nature. Visitors felt a strong internalised connection to nature, reflected in their high Nature Self score, while their desire to experience nature was also high. Visitors from all cultural groups expressed a high internal locus of control, indicative of a feeling that their actions can influence the environment.

5.1.5.1 Summary of psychographic constructs for White visitors
White visitors were significantly less motivated by social contact than other visitor groups. They were the most likely to be engaged in various environmentally responsible behaviours and reported being more involved in high commitment environmental advocacy than other visitors. They felt strongly that humans are impacting negatively on the environment and that the planet is reaching the limits of its capacity to sustain human induced damage, as indicated by their strong pro-NEP ratings. The anti-NEP scores reveal that White visitors are opposed to human dominance over nature and environmental destruction. Their INS score revealed a medium connection to nature. The Nature Relatedness scale revealed that White visitors are the most likely to enjoy spending time in nature.

5.1.5.2 Summary of psychographic constructs for Indian visitors
Indian visitors' motivations were between those of White and African visitors on all four sub-scales. Indian visitors revealed an average engagement in environmentally responsible behaviours, both in practice and advocacy. They expressed concern for the environment in their positive endorsement of pro-NEP items while their anti-NEP responses were average. They revealed the lowest connection to nature on the INS, while their scores for all three nature relatedness subscales were between those of White and African visitors.

5.1.5.3 Summary of psychographic constructs for African visitors
Overall, African visitors expressed the lowest motivation for learning and discovery. They also expressed the lowest engagement in environmentally responsible behaviour and advocacy. They feel that the planet should be used for human benefit, expressed through their high endorsement of anti-NEP statements. Interestingly, when expressing an explicit and internalised connection to nature (INS and Nature Self), African visitors expressed a high feeling of unity with nature, however, their desire to distance themselves from nature was also high (high Nature Distance scores).

Summary of Section 5.1

In Section 5.1, visitors to uShaka Sea World have been described with respect to their demographic and cultural variables, and the section has provided information on visit characteristics and described selected psychographic variables, namely, motivation to visit and environmental orientation. These results have provided a better understanding of the characteristics of visitors, as well as providing an opportunity to characterise each cultural group. Similarities and differences between the three cultural groups have been highlighted. As all of these variables are likely to influence the design of interpretive experiences, they will be discussed further in Chapter 6.

5.2 Objective 2: Explore how visitors from the major cultural groups experience uShaka Sea World

To explore how the cultural groups experience uShaka Sea World, aspects of the experience were measured in three different ways in the post-visit section of the questionnaire: activities undertaken by the visitors; visitors' ratings of their reflective and experiential engagement; and self-reported appraisals of aspects of the experience that visitors felt had influenced their learning.

The results for the total sample (all respondents) are discussed prior to the cultural comparisons in each section. For the cultural comparisons of the experience variables, the analyses in Chapter 4 enabled the standardisation of the data to address CSRS. The unstandardized (raw) data were used for the total sample (all respondents), while the standardised data were used for the cultural group comparisons. Standardisation was not considered necessary for the activities undertaken.

5.2.1 Activities undertaken

A wide range of experiences are available to uShaka Sea World visitors (Table 5.10). As expected, the daily mammal presentations attracted the highest number of participants across all cultural groups. Of the other presentations, the Fish Feed attracted the lowest participation. The Touch exhibit in the aquarium was the most frequently attended facilitated experience. Visitors participating in Animal Encounters are required to pay an additional fee and, as such, participation was considerably lower. There were significant differences in the level of participation by the different cultural groups for three of the 16 activities undertaken: Ocean Walker, χ^2 (2, N=673)=16.597, p<.000; Seal Presentation, χ^2 (2, N=680)=9.072, p=.011; and Turtle Rehabilitation χ^2 (2, N=675)=8.266, p=.016. More African visitors participated in the

Ocean Walker experience; more Indian visitors watched the Seal presentation and more White visitors viewed the Turtle Rehabilitation area.

Table 5.10 *Percentage of respondents who indicated that they had participated in the activities offered at uShaka Sea World*

ACTIVITY	Total sample	White	Indian	African
Dolphin Presentation	83.1	84.1	85.9	76.5
Seal Presentation**	57.2	54.9	66.3	51.1
Touch Exhibit Inside (facilitated experience)	35.6	35.1	38.5	32.8
Penguin Feed (presentation)	34.5	31.5	37.0	39.4
Microscope (facilitated experience)	28.7	32.5	23.8	25
Touch Exhibit Outside (facilitated experience)	24.2	23.4	27.8	21.4
Turtle Rehabilitation** (facilitated experience)	22.1	26.2	16.0	18.9
Shark Feed (presentation)	17.5	15.2	22.1	17.4
Fish Feed (presentation)	14.4	13.8	15.9	13.7
Picked up a SASSI Guide	10.7	11.6	9.4	9.8
Ocean Walker (animal encounter)**	9.8	6.6	9.5	18.9
Meet a Seal or Dolphin (animal encounter)	8.9	8	10.6	9
Snorkel Lagoon (animal encounter)	6.2	6.9	5.6	5.3
Shark Cage (animal encounter)	5.5	5.8	3.9	6.8

** Activities in which a significant difference was found between the cultural groups.

NOTE: Missing data for all respondents ranged from 9-10 % (7-10% for White visitors; 7-10% for Indian visitors; and 15-17% for African visitors).

To better understand the cultural groups' participation in the various activities, the activities were grouped as follows: Presentations (Mammal presentations and animal feeds); Facilitated experiences (Activities facilitated by a trained staff member including touch exhibits, microscope and turtle rehabilitation station); and Animal Encounters (activities that were not included in the daily entrance fee).

Indian visitors' participation in the presentations was significantly higher than the other two groups ($F_{(2, 670)}=3.853$, $p=.002$) and White visitors reported slightly greater participation in the facilitated experiences (Figure 5.9). The presentations are generally passive experiences,

while the facilitated experiences require more interaction from visitors. African visitors reported slightly higher participation in Animal Encounters.
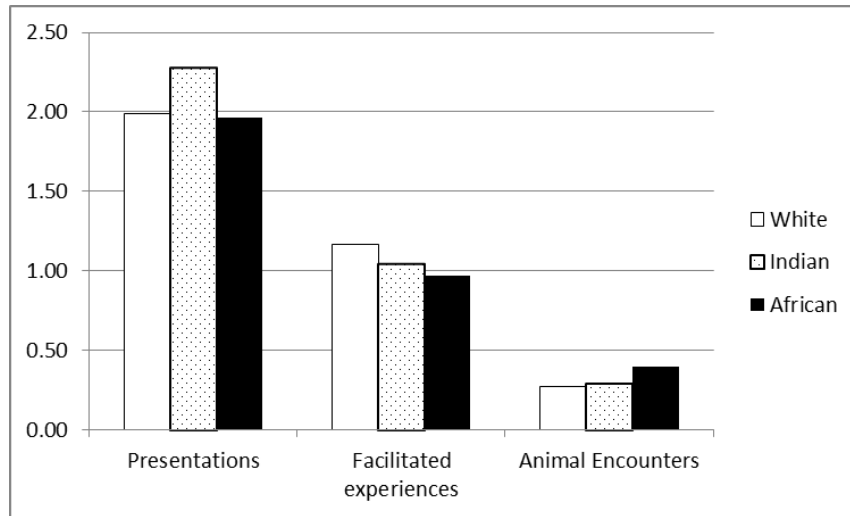
Figure 5.9 Relative participation in the various activities on offer at uShaka Sea World by cultural group

5.2.2 Visitor engagement

Visitor engagement, as defined by Ballantyne et al. (2011), was measured on the post-visit section of the questionnaire. Based on the exploratory factor analysis undertaken in Chapter 4, two sub-scales were constructed: Experiential Engagement (*excitement of seeing the animals, the many activities available, experiencing enjoyment and engagement, amazement and awe*); and Reflective Engagement (*thinking about animals, discussing information with staff and companions, feeling sad or surprised*).

Overall, visitors reported very high levels of Experiential Engagement (4.53) and a high level of Reflective Engagement (3.99) on the 5-point scale (Table 5.11). There were significant differences between the groups on both the Experiential and Reflective Engagement subscales ($F_{(2, 652)}=9.028$, $p<.001$ and $F_{(2, 605)}=5.332$, $p=.005$), respectively. White visitors' scores were higher than the other two groups on both subscales.

Table 5.11 *Means and standard deviations for all respondents and standardised mean scores for each cultural group for Experiential and Reflective Engagement*

	Total sample (all respondents)		White	Indian	African
	Mean (raw data)	Std. Dev. (raw data)	Mean (standardised data)	Mean (standardised data)	Mean (standardised data)
Experiential	4.53	.552	0.58	0.42	0.42
Reflective	3.99	.663	0.06	-0.06	-0.09

Analysis using Individual Items

When analysed on an item by item basis for the total sample, visitors rated the items pertaining to experiential engagement higher than those pertaining to reflective engagement. The data revealed significant differences between the groups on five items. White visitors rated significantly higher than the other groups on four items: '*I had an enjoyable experience*' $(F(2, 670)=9.666, p<.001)$; '*It was exciting to see live marine animals*' $(F(2, 665)=8.989, p<.001)$; '*I was able to get a good view of the marine animals*' $(F(2, 665)=3.187, p=.042)$; and '*There were plenty of activities to do*' $(F(2, 666)=9.914, p<.001)$. African visitors rated '*Something that I saw or heard made me feel sad or angry about environmental problems*' significantly lower than the other cultural groups $(F(2, 657)=4.732, p=.009)$ (Table 5.12).

Table 5.12 *Means for each item for all respondents and standardised mean scores for each cultural group for items in the engagement scale*

	Total sample (All respondents)	White	Indian	African
	Mean (Raw data)	Mean (Standardised data)	Mean (Standardised data)	Mean (Standardised data)
Experiential Engagement				
I had an enjoyable experience**	4.62	0.69	0.51	0.47
It was exciting to see live marine animals**	4.57	0.65	0.39	0.43
I was able to get a good view of the marine animals**	4.55	0.59	0.47	0.46
I felt a sense of awe or amazement	4.45	0.47	0.38	0.40
There were plenty of activities to do**	4.41	0.50	0.25	0.30
Reflective Engagement				
I experienced something surprising or unexpected	4.19	0.24	0.13	0.09
I felt an emotional connection with the animals I saw	4.03	0.10	0.07	-0.04
The staff answered my questions	4.03	0.11	-0.06	-0.01
I discussed new information with my companions	3.94	-0.02	-0.10	-0.02
I found myself thinking about new ideas about animals and their environments	3.94	-0.02	-0.11	0.02
Something that I saw or heard made me feel sad or angry about environmental problems**	3.72	-0.16	-0.30	-0.48

** Significant difference between cultural groups noted in standardised data

NOTE: The mean (standardised data) represents the relative position of the item, in relation to all other items, for the specified group. A positive score (between 0 and +2) indicates that the item is highly endorsed relative to other items; a negative score (between 0 and -2) indicates the item is less highly endorsed than other items; and a score of zero indicates equivalence with the mean of all items.

5.2.3 Aspects that piqued interest or concern

Aspects of the experience that piqued short term interest or concern were assessed with a 10 item scale. The question asked was: '*To what extent, if any, did each of the following help you to become more interested in or concerned about marine life*'. For all three visitor groups

the top three items that they felt contributed to increasing their interest in and concern for wildlife were the same, namely, '*Attending the dolphin show'*, '*Just seeing the marine animals'* and '*Being able to get close to the animals'*. '*Being able to touch the animals in the touch pools'* had the least impact for all groups (Table 5.13).

Two items revealed significant differences between the groups. African visitors noted that '*Seeing or hearing something that made me feel emotional'* contributed significantly less to developing their interest than the other two groups ($F(2, 632)=6.489$, $p=.002$), corresponding with the item in the previous scale, '*Something that I saw or heard made me feel sad or angry about environmental problems',* that African visitors also rated significantly lower than other visitors. White visitors felt most strongly that the '*Dolphin Show'* contributed to their interest ($F(2, 621)=4.891$, $p=.008$).

Table 5.13 *Means (raw data) for aspects of the experience that influenced learning for all respondents and standardised means for each cultural group (Top three items highlighted)*

	Total sample (All respondents)	White	Indian	African
	Mean (raw data)	Mean (standardised data)	Mean (standardised data)	Mean (standardised data)
Attending the dolphin show**	4.36(83.1)*	0.47	0.25	0.30
Just seeing the marine animals	4.24	0.26	0.21	0.25
Being able to get close to the animals	4.22	0.28	0.19	0.19
Attending the seal show	4.09(57.2)*	0.11	0.15	0.09
Reading information about marine life	4.04	0.06	0.08	0.01
Finding out what I can do to help marine animals	4.03	0.03	0.15	0.01
Listening to a fish or penguin feed commentary	4.00	0.01	0.06	0.01
Seeing or hearing something that made me feel emotional**	3.91	0.02	-0.03	-0.33
Talking to someone about the animals	3.84	-0.14	-0.11	-0.16
Being able to touch the animals in the touch pools	3.72	-0.19	-0.28	-0.45

*Figures in brackets are the percentage of visitors who noted that they had done the activity

** Significant difference in standardised data

NOTE: The mean (standardised data) represents the relative position of the item, in relation to all other items, for the specified group. A positive score (between 0 and +2) indicates that the item is highly endorsed relative to other items; a negative score (between 0 and -2) indicates the item is less highly endorsed than other items; and a score of zero indicates equivalence with the mean of all items.

Open-ended comments

Very few visitors responded to the '*other, please specify*' option for the question '*To what extent, if any, did each of the following help you to become more interested in or concerned about marine life*'. Comments included: '*The emotion displayed in what people were saying*'

(White, English, Female, 20-29); *'Seeing children enjoy the experience had a big positive impact'* (African, African language speaker, Male, 30-39); *'Seeing a creature I had never even heard of'* (White, English, Female, 30-39); and *'Seeing turtles being fed'* (Indian, English speaking, Male, 20-29).

Summary to Section 5.2

uShaka Sea World provides visitors with a range of experiences, most of which are included in the entry fee. Of these activities the daily mammal presentations were reported as being the most popular and attracted the highest number of visitors, with the dolphin presentation being the most attended activity. The other presentations, including those associated with animal feeds, were less well attended. Indian visitors viewed more presentations than the other two cultural groups while African visitors participated in more Animal Encounters. White visitors participated in more of the facilitated experiences, which included a range of activities in which a trained staff member interacted with a visitor, usually showing them an animal that the visitor was able to touch or view under a microscope.

Consistent with previous research, visitors from all cultural groups rated experiential engagement more highly than reflective engagement. White visitors reported higher scores on both aspects of the experience. Not surprisingly, it is clear that a visit to uShaka Sea World revolves around viewing animals, with visitors reporting that the top three items that they felt had contributed to their learning all related to viewing animals. Overall, the cultural groups were similar in their perceptions of what influenced their learning, although African visitors placed less importance on an emotional response as a contributor to their learning.

5.3 Objective 3: Investigate the impact of an aquarium visit on the environmental learning of visitors from each of the major cultural groups, taking into account the confounding effects of other demographic variables

The previous two sections explored the differences between the three cultural groups in relation to their demographic, cultural, visit and psychographic characteristics (Section 5.1) and the ways in which they experienced uShaka Sea World (Section 5.2). This section investigates the impact of an aquarium visit on the environmental learning of visitors from each of the three cultural groups, taking into account the confounding effects of other demographic variables.

Visitors' environmental learning was assessed in the post-visit section of the questionnaire in three ways, namely, environmentally responsible behavioural intentions, self-reported learning outcomes and recall of conservation messages. This section provides the results for each of the measures of environmental learning in turn. It is clear that more than one demographic variable will influence environmental learning. In Section 5.1, significant differences between cultural groups were noted on all of the demographic characteristics, with the exception of gender, age and number of children. In addition, significant differences were noted between the cultural groups on the following visit characteristics: frequency of visitation, group composition and group size. To tease out the influence of culture on learning from the other variables, it was necessary to address construct confounding (5.3.4).

As was undertaken in the previous two sections, raw data were used to describe the total sample (all respondents), while standardised data were used for the cultural group comparisons. For each variable the overall visitor profile is first described, prior to an analysis of the similarities and differences between the cultural groups.

5.3.1 Self-reported learning outcomes

Self-reported learning outcomes (SLO) were measured using the scale developed by Ballantyne et al. (2011). In the exploratory factor analyses to test for cultural equivalence in Chapter 4, it was found that the scale measured one construct. Table 5.14 reports the mean score and standard deviation for the total sample and standardised means for each cultural group. The mean SLO for all respondents was high at 4.27. No significant differences were found between the cultural groups.

Table 5.14 *Mean score and standard deviation for Self-reported learning outcomes for all respondents and standardised means for each cultural group*

	Total sample (all respondents)		White	Indian	African
	Mean (raw data)	Std. Dev. (raw data)	Mean (standardised data)	Mean (standardised data)	Mean (standardised data)
Self-Reported Learning Outcomes	4.27	.628	0.28	0.32	0.28

NOTE: The mean (standardised data) represents the relative position of the item, in relation to all other items, for the specified group. A positive score (between 0 and +2) indicates that the item is highly endorsed relative to other items; a negative score (between 0 and -2) indicates the item is less highly endorsed than other items; and a score of zero indicates equivalence with the mean of all items.

Analysis using individual items from the self-reported learning outcomes scale

When each item in the scale was analysed separately, a significant difference was noted on one item, '*Some of my beliefs have changed as a result of my visit*' ($F(2, 660)=11.250$, $p<.001$), with White visitors rating this item lower than the other two groups (Figure 5.10).
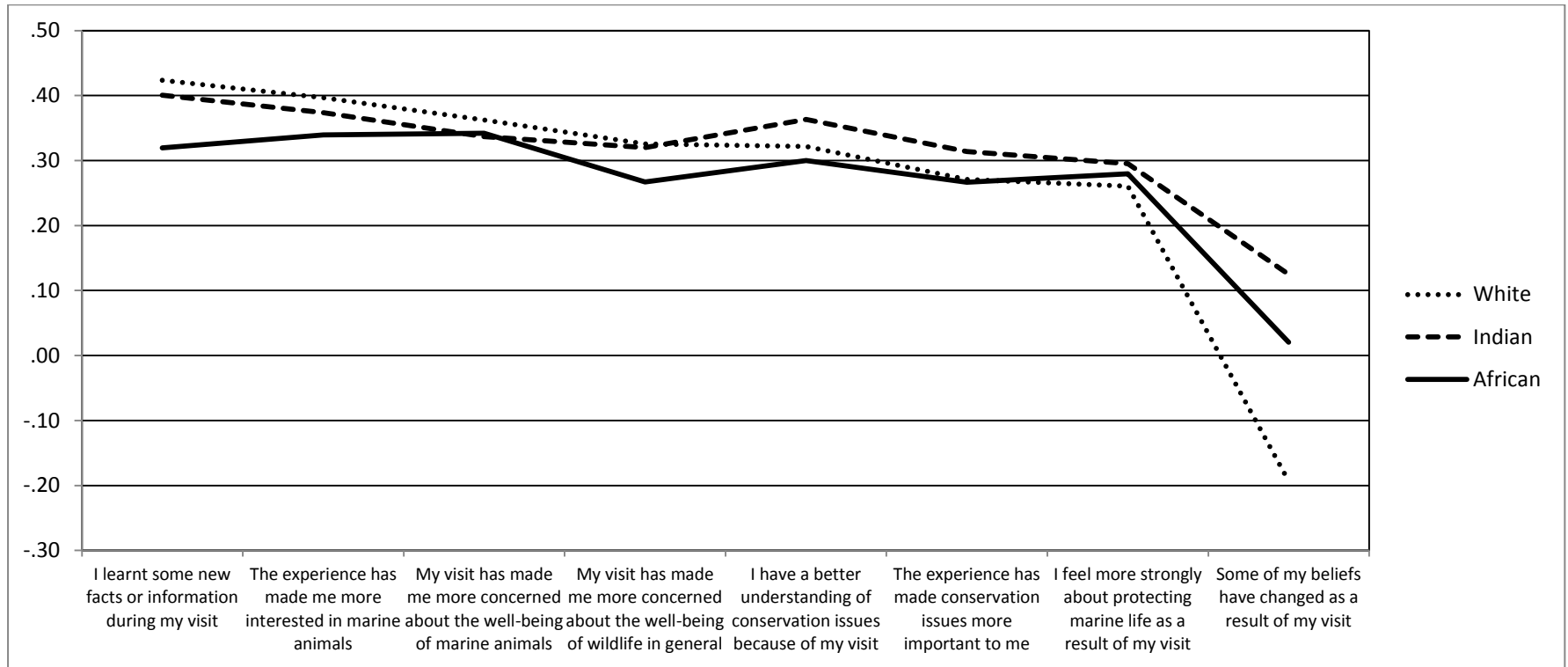
Figure 5.10 Item by item standardised data for self-reported learning outcomes for the three cultural groups of visitors to uShaka Sea World

5.3.2 Behavioural intentions

Visitors were asked to indicate which of a series of behaviours they would undertake more frequently as a result of their visit to uShaka Sea World. Two subscales were created as described in Chapter 4: Behavioural Intentions (BI) Practices and Advocacy. Table 5.15 reports the mean scores and standard deviations (raw data) for the two BI subscales, as well as the full scale (BI Composite) for the total sample, and standardised means for each cultural group.

Table 5.15 *Means and standard deviations for Behavioural Intentions subscales and composite scale for all respondents and standardised means for each cultural group*

	Total sample (all respondents)		White	Indian	African
	Mean (raw data)	Std. Dev. (raw data)	Mean (standardised data)	Mean (standardised data)	Mean (standardised data)
BI Practices	4.34	.743	0.30	0.46	0.44
BI Advocacy	4.06	.991	-0.01	0.26	0.27
BI Composite	4.27	.762	0.22	0.42	0.39

NOTE: The mean (standardised data) represents the relative position of the item, in relation to all other items, for the specified group. A positive score (between 0 and +2) indicates that the item is highly endorsed relative to other items; a negative score (between 0 and -2) indicates the item is less highly endorsed than other items; and a score of zero indicates equivalence with the mean of all items.

Overall, visitors felt that their experience had encouraged them to increase the frequency with which they would engage in the environmentally responsible behaviours of Practices and Advocacy, although the score for Practices was higher than for Advocacy. White visitors rated significantly lower intention to change Practices and Advocacy than other groups (Practices, $F(2, 649)=8.977$, $p<.001$; Advocacy, $F(2, 683)=13.356$, $p<.001$). As White visitors rated the highest pre-visit environmentally responsible behaviours, it is not surprising that they would express the lowest intention to increase their participation in environmentally responsible behaviours, as they already consider themselves to be undertaking such behaviours. By contrast, the Indian and African visitors' exposure to new environmental behaviours may have prompted them to consider engagement in new behaviours.

The results for the composite behavioural intention scale reflect the above, with White visitors reporting significantly lower intention to change their behaviour than Indian and African visitors ($F(2, 642)=13.403$, $p<.001$).

5.3.3 Message recall

Visitors were asked to list up to three conservation messages that they could recall from their visit. Just under half of the visitors to uShaka Sea World recorded at least one conservation message (46.1%), with 28.7% able to report 3 messages. More of the White visitors than Indian and African visitors could recall at least one message (Table 5.16). A chi-square test revealed a borderline significant difference between the cultural groups for Message Recall using a binary (did (Y) or did not (N) recall a message) variable (χ^2 (2, N=746) =5.927, p=.052), with more White visitors recalling a message than Indian or African visitors.

Table 5.16 *Percentage of respondents who recalled 0-3 messages, by cultural group*

Number of messages recalled	White	Indian	African	Total
Did not record any messages	49.7	57.4	59.9	53.9
Recorded at least one message	50.3	42.6	40.1	46.1
Recorded 1 message	9.9	8.6	7.0	9.0
Recorded 2 messages	6.9	8.1	12.7	8.4
Recorded 3 messages	33.4	25.9	20.4	28.7

Nature of Conservation Messages Recalled

The data were content analysed to investigate whether different cultural groups recalled different types of messages. A total of 794 messages were recalled (some visitors recorded up to three messages) and these were coded to enable analysis of the most prevalent messages (Figure 5.11). The five messages outlined in Chapter 3, namely, C*are for nature*, *Reduce, reuse and recycle, Choose your seafood wisely, We are all connected in the web of life* and *Save resources*, were recalled by visitors, as described below.

Care for nature

Messages about concern, care, respect, love, protection and conservation of animals and the environment were recalled by 25% of visitors. There was no significant difference between the groups in their recall of this type of message using a chi-square test for independence. Some of the messages recalled by visitors that reflect this concern for nature included:

- *'The environment today is our future'* 30-39-year-old, African male.

- *'The earth is precious with all the wisdom from nature and animals. We are all indebted to look after the earth'* 40-49-year-old, African male.

- *'Treasure everything, you don't know when it won't be there'* 30-39-year-old, White female.

- *'It is very important that mankind preserves the environment'* 40-49-year-old, African male.

- *'Conservation of natural resources is important for the present and future generation'* 30-39-year-old, African male.

Reduce, reuse and recycle

Messages about the damage of pollution to marine life, the importance of not littering and the value of recycling waste were recalled by 49% of visitors. White visitors recalled these types of messages more frequently than visitors from other groups (χ^2 (2, N=748)=12.925, p<.001). The following illustrate these messages:

- *'Recycling is vital for the environment'* 40-49-year-old, African male.

- *'Recycle bottles, cans and paper'* 30-39-year-old, Indian male.

- *'Keep water areas clean from rubbish'* 30-39-year-old, White female.

- *'Do not litter—dangerous to nature'* 20-29-year-old, White female.

- *'Recycling is an integral part of environmental preservation'* 40-49-year-old African male.

- *'Littering around our beaches affects our marine world'* 30-39-year-old, African male.

- *'Littering is a concern, recycle and reuse'* 30-39-year-old, White female.

Choose your seafood wisely

Only 7% of visitors recalled a message about sustainable seafood. White visitors recalled messages about sustainable seafood significantly more frequently than other visitors (χ^2 (2, N=748)=8.678, p=.013). The following is an example of messages that related to sustainable seafood:

- *'Buy sustainable sea food'* 30-39-year-old, Indian male.

- '*Getting to know what fish are good to eat/not eat*' under 20-year-old, White male.
- '*Fish under threat – not to eat at restaurants*' 40-49-year-old, White female.
- '*Our oceans are being overfished and abused*' 40-49-year-old, Indian male.

We are all connected in the web of life

Less than 1% of visitors recalled a message about the interconnectedness of life. These are listed below:

- '*Everything you do affects the things around you*' 40-49-year-old, Indian male.
- '*Sea life is crucial for our planet*' 30-39-year-old, White male.
- '*We are all connected*' 30-39-year-old, White male.
- '*Life is interconnected*' 40-49-year-old, African male.
- '*We are all a part of the web of life*' 40-49-year-old, White female.
- '*Web of life*' 30-39-year-old, White male.

Save resources

Messages that specifically mentioned decreasing use of water, fuel or electricity were noted by 5% of visitors. There was no significant difference between the groups in their recall of messages about resource use.

- '*Saving the resources at home helps the ocean*' 30-39-year-old, White male.
- '*Avoid waste of energy*' 30-39-year-old, Indian female.
- '*Save petrol, electricity and water*' 20-29-year-old, Indian female.
- '*Switch off the cell phones*' 30-39-year-old, African female.
- '*Saving electricity helps marine life too*' 20-29-year-old, Indian female.

In addition to the five focus messages of uShaka Sea World, visitors also recalled, as conservation messages, specific *Facts* about animals or the environment or the need to learn more or teach others*, Educate and learn*.

Facts

Overall 12% of visitors noted specific facts that they had learnt about animals or the environment. There was no significant difference between the groups in their recall of facts. Factual type statements included:

- *'Sharks are an endangered species'* 40-49-year-old, White female.
- *'I learnt a little about sharks and the difference between the black tip and spinner shark'* 60+ year old, White male.
- *'Sharks do not eat people but just bite'* 30-39-year-old, African male.

Educate and learn

A small percentage (1-2%) noted the need to educate others or the need to learn more. There was no significant difference between the groups in their recall of these types of messages. The following illustrate messages pertaining to educating others or learning:

- *'Tell others about seriousness of ecological crisis'* 20-29-year-old, White female.
- *'To tell others about the importance of environment'* 20-29-year-old, African female.
- *'Learn about marine creatures'* 40-49-year-old, Indian male.
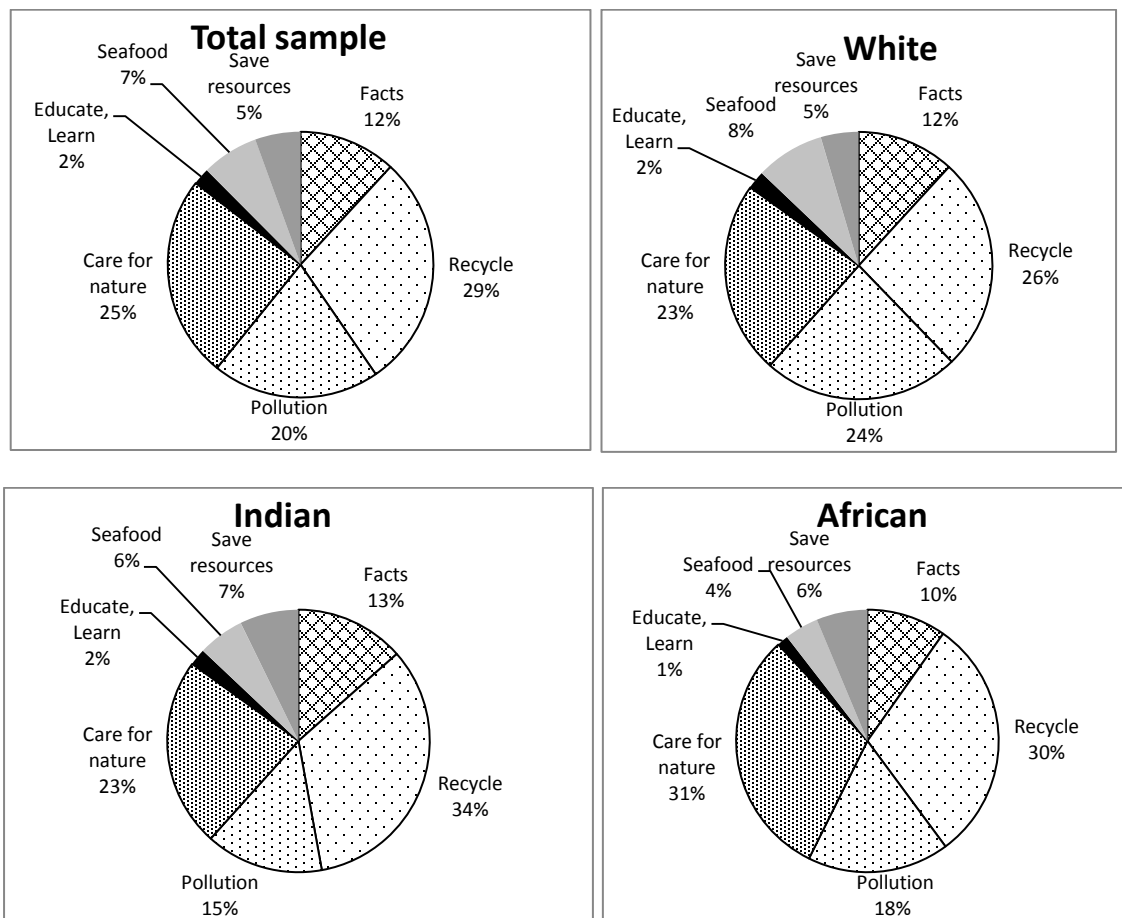
Figure 5.11 Types of messages recalled: total sample and each cultural group (percentage of people who recalled each type of message)

5.3.4 Correlations between learning variables

The measures of learning used in this study tap behavioural intentions (BI Practices and Advocacy), visitors' own perceptions of their learning (SLO), and ability to recall conservation messages (Messages recall). Self-reported learning outcomes and the behavioural intentions (BI) scales used similar response formats and may be considered to be more subjective measures, while the ability to recall messages might be considered a more objective measure, thereby providing a valuable additional indicator of learning. However, it should be noted that the three measures also differ in content, with Message recall focussing on more cognitive aspects of learning, Self-reported learning outcomes focussing on more affective aspects (including attitude change), and behavioural intentions focussing on behavioural aspects.

Bivariate correlations were used to investigate the relationships between the three types of environmental learning measures, to better understand these measures and as a further check on their validity as indicators of learning. For the total sample, and for all cultural groups, the self-rated scales (Self-reported learning outcomes (SLO and BI Composite) were strongly[4] inter-correlated while recall of messages was positively but either weakly or not significantly correlated with SLO and behavioural intentions (Table 5.17). The low correlations between the self-report scales (self-reported learning and behavioural intentions) and message recall suggests that knowledge of conservation messages is not strongly related to affective and behavioural measures of learning. A visitor may gain some new information, without changing their attitudes or behaviour. The high correlations between the two self-rated learning measures may, however, be an example of common-method variance[5].

Table 5.17 *Correlations between the different measures of environmental learning within the total sample and within each cultural group*

Variable pair	Total sample	White	Indian	African
SLO-BI	.632**	.645**	.580**	.566**
SLO-MR	.088*	.117*	.112	.062
BI-MR	.077	.111*	.129	.023

*Correlation is significant at the 0.05 level **Correlation is significant at the 0.01 level

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[4] Correlations of .1 are considered small; .3 medium; and .5 large (Field, 2013)

[5] "Variance that is attributable to the measurement method rather than to the constructs the measures represent" (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003:879)

To gain a fuller understanding of the learning factors associated with the recall of messages, the correlations between message recall (Y/N) and individual SLO items were examined using point biserial correlation (Table 5.18). Interestingly, learning items relating to a greater concern for animals and conservation issues were more strongly correlated with the ability to recall conservation messages than those items related to information gain and understanding. This applied to all three cultural groups, although correlation coefficients were strongest for White visitors. These results suggest that message recall may be better interpreted as a measure of concern and conservation awareness than a measure of knowledge gain.

Table 5.18 *Item by item point biserial[6] correlation coefficients and significance for Self-reported learning outcomes items and Message Recall Y/N for total sample and each cultural group*

	The experience has made me more interested in marine animals	The experience has made **conservation** issues more **important** to me	Some of my beliefs have changed	I feel more strongly about protecting marine life	My visit has made me more **concerned** about the well-being of wildlife in general	My visit has made me more **concerned** about the well-being of marine animals	I learnt some new facts or information	I have a better understanding of conservation issues
Total sample	.067	**.116**[**]	-.009	.069	**.149**[**]	**.107**[**]	.073	.063
White	.083	**.179**[**]	.007	.083	**.176**[**]	**.126**[*]	**.107**[*]	.052
Indian	.088	.118	.042	.093	.114	.112	-.001	.142
African	.041	-.010	.009	.069	.172	.108	.115	.073

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).

Summary

When compared to Indian and African visitors, White visitors reported significantly lower intentions to increase environmentally responsible behaviours, but their recall of conservation messages was significantly higher. No significant differences were noted between the groups in self-reported learning outcomes (Table 5.19). Messages about pollution and recycling were

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[6] A point biserial correlation quantifies the relationship between a continuous variable and a dichotomous variable (Field, 2013; Kelley & Preacher, 2012)

recalled by the most visitors, followed by messages pertaining to care and concern for nature. White visitors were significantly more likely than other visitor groups to recall messages about sustainable seafood, recycling and pollution. Messages about care and concern for nature and resource use were recalled equally by all visitor groups. The two self-rated measures of learning were strongly inter-correlated, while message recall was weakly correlated with both self-reported learning and behavioural intentions. Interestingly, the ability to recall conservation messages appeared to be more strongly correlated with concern for conservation than cognitive gains.

Table 5.19 *Summary of results for the learning and behavioural intention scales showing where significant differences between cultural groups were noted*

Variable	
Self-Reported Learning**	No significant difference between cultural groups
BI Practices**	Indian highest>African>White*
BI Advocacy**	African highest>Indian>White*
BI Composite**	Indian highest>African>White*
Message recall	White > Indian> African*

* Significant difference at 0.05 **Differences between groups based on standardised data

5.3.5 Analysis to test for confounding

It is clear from sections 5.3.1 – 5.3.3 that there were significant differences between the three cultural groups with respect to elements of their environmental learning. What is not clear is whether the differences between the cultural groups in terms of environmental learning, the focus of this study, were due to culture or the confounding variables within the demographic and visit characteristics. This section investigated whether the differences between cultural groups remained when the other variables were taken into consideration. In other words, were the differences between the groups caused by variables such as level of education, urbanisation, etc., rather than cultural group.

Each of the demographic and visit characteristic variables was analysed with cultural group in a two-way ANOVA, in order to control for the effects of confounding. Two way ANOVAs allow examination of the individual and joint effects of two variables on the construct being examined. If the effect of cultural group on environmental learning remains when the other demographic factors are taken into account, it can be concluded that the effects are not due to

confounding with these variables. Although three-way ANOVAs would have allowed for more control over confounding, it would have complicated the analysis and resulted in very small cell sizes. Results using standardised data are reported throughout this section.[7] Each of the learning variables was analysed in turn.

5.3.5.1 Self-Reported Learning Outcomes (SLO)

As no significant differences were noted between the cultural groups for the SLO variable, confounding was not tested.

5.3.5.2 Behavioural intentions

BI Practices

Using two-way ANOVAs, effect sizes and significance levels were calculated for the impact of selected combinations of demographic variables on behavioural intentions – Practices (Table 5.20). The effect of cultural group was reduced, but remained significant in the presence of a range of other demographic variables, although effect sizes were small (all less than 0.030[8]). Therefore, it is concluded that the effect noted in section 5.3.2 was not a result of confounding. Main effects for the other demographic variables ranged from .000 to .009 (all smaller than the effect for cultural group). No significant interaction effects were noted for any of the two-way ANOVAs studied.

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[7] The two-way ANOVAs were initially undertaken on both raw and standardised data. It was interesting to note that the introduction of other demographic variables reduced the effect sizes more for raw data analyses than for standardised data analyses. This suggests that some of these confounding influences were removed through the standardisation process, providing further support for the use of standardised data.

[8] Effect size: Partial Eta Squared values range from 0 to 1. Cohen's (1988) commonly used guidelines classify a value of .01 as small, .06 as moderate, and .14 and above as large.

Table 5.20 *Effect size and significance of the impact of selected combinations of variables on Behavioural Intentions—Practices, using two-way ANOVAs and standardised data*

	Effect	p
Cultural Group (1 way)	0.027	<0.001
Main effect for CG controlled for Education	0.020	0.002
Main effect for CG Controlled for Current Province	0.030	<0.001
Main effect for CG Controlled for Childhood Province	0.026	<0.001
Main effect for CG Controlled for Current Place of Residence	0.026	<0.001
Main effect for CG Controlled for Childhood Place of Residence	0.021	0.002
Main effect for CG Controlled for Occupation	0.027	<0.001
Main effect for CG Controlled for Visit frequency (First time or Repeat)	0.030	<0.001
Main effect for CG Controlled for Group Composition	0.018	0.004

(To ensure that cell sizes were acceptable the following data were combined: Place of Residence—combined Town and Rural; Occupation—removed Unemployed; Group Composition—excluded Alone)

Language was not analysed in the two-way ANOVAs because of the small cell sizes (No African visitors spoke Afrikaans, one Indian visitor spoke Afrikaans and none spoke an African language, while only one White visitor spoke an African language). To test for the possible confounding effects of language, a one-way ANOVA was conducted to examine the effect of cultural group on BI Practices for English speakers only (White English speakers n=206, Indian English speakers n=192, African English speakers n=10). This demonstrated that the effect of cultural group remained when language was controlled by holding it constant.

BI Advocacy

As above, a series of two-way ANOVAs was used to determine effect sizes and significance levels for the impact of selected combinations of demographic variables on behavioural intentions (Advocacy) (Table 5.21). The effects of cultural group were reduced, but remained significant in the presence of a range of other demographic variables, although effect sizes were small (all less than 0.039[9]). Therefore, it is concluded that the effect noted in section

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[9] Effect size: Partial Eta Squared values range from 0 to 1. Cohen's (1988) commonly used guidelines classify a value of .01 as small, .06 as moderate, and .14 and above as large.

5.3.2 was not a result of confounding. Main effects for the other demographic variables ranged from .001 to .012 (all smaller than the effect for cultural group). No significant interaction effects were noted for any of the two-way ANOVAs studied.

Table 5.21 *Effect size and significance of selected combinations of variables on Behavioural Intentions—Advocacy, using two-way ANOVAs and standardised data*

	Standardised	
	Effect size	p
Cultural Group (1 way)	0.038	<0.001
Main effect for CG Controlled for Education	0.021	0.001
Main effect for CG Controlled for Current Province	0.032	<0.001
Main effect for CG Controlled for Childhood Province	0.024	0.001
Main effect for CG Controlled for Current Place of Residence	0.038	<0.001
Main effect for CG Controlled for Childhood Place of Residence	0.027	<0.001
Main effect for CG Controlled for Occupation	0.017	0.006
Main effect for CG Controlled for Visit frequency (First time or Repeat)	0.039	<0.001
Main effect for CG Controlled for Group Composition	0.019	0.002

As above, a one-way ANOVA was conducted to examine the effect of cultural group on BI Advocacy for English speakers only. This demonstrated that the effect of cultural group remained when language was controlled by holding it constant.

5.3.5.3 Message recall

The variable Message Recall Y/N was not suitable for ANOVA. It was not possible to use 3-way chi-square analyses because of the small cell sizes produced. However, as none of the demographic or visit variables had a significant effect on the recall of messages, it is assumed that these would not have confounding effects on the results reported in Section 5.3.3.

Summary to Section 5.3

Overall, visitors felt that their visit had encouraged them to increase their engagement in environmentally responsible behaviour and they agreed strongly that their visit had made

them more interested in and concerned about nature. Despite this, only 47% were able to recall one or more conservation messages. White visitors were more likely to be able to recall a message than the other two cultural groups, but expressed the lowest intention to change their behaviour as a result of their visit, perhaps because of their higher pre-visit levels of engagement. Both Indian and African visitors expressed a high intention to change behaviour as a result of their visit. The statistical tests to assess the effects of confounding revealed that the differences between the cultural groups were not the result of confounding with other demographic variables.

5.4   Objective 4: Assess the extent and nature of the impact of cultural group on learning outcomes

The exploratory factor analyses explained in Chapter 4 produced 14 composite variables to measure visitors' entering characteristics, which were analysed in Section 5.1. In Section 5.2, three different measures of the visitor experience were analysed—Experiential and Reflective Engagement and Number of Activities. Environmental learning, analysed in Section 5.3, was measured in three ways: self-reported learning outcomes, environmentally responsible behavioural intentions, and recall of conservation messages. In this section the data are combined to: (a) assess the relative contribution of cultural group (in relation to other demographic and psychographic variables) to the prediction of learning outcomes; and (b) explore whether the pathways to learning are different for different cultural groups. The former are addressed through a series of regression analyses (using linear regression for the two interval level variables and binary logistic regression for message recall), and the latter using path analyses and binary logistic regression. Because of the nature of the analyses, raw (unstandardized) data were used in this section. Figure 5.12 provides an overview of: a) the variables used in the assessment of the relative contribution of cultural group to visitor learning; and b) an overview of the variables used to explore the pathways to learning.
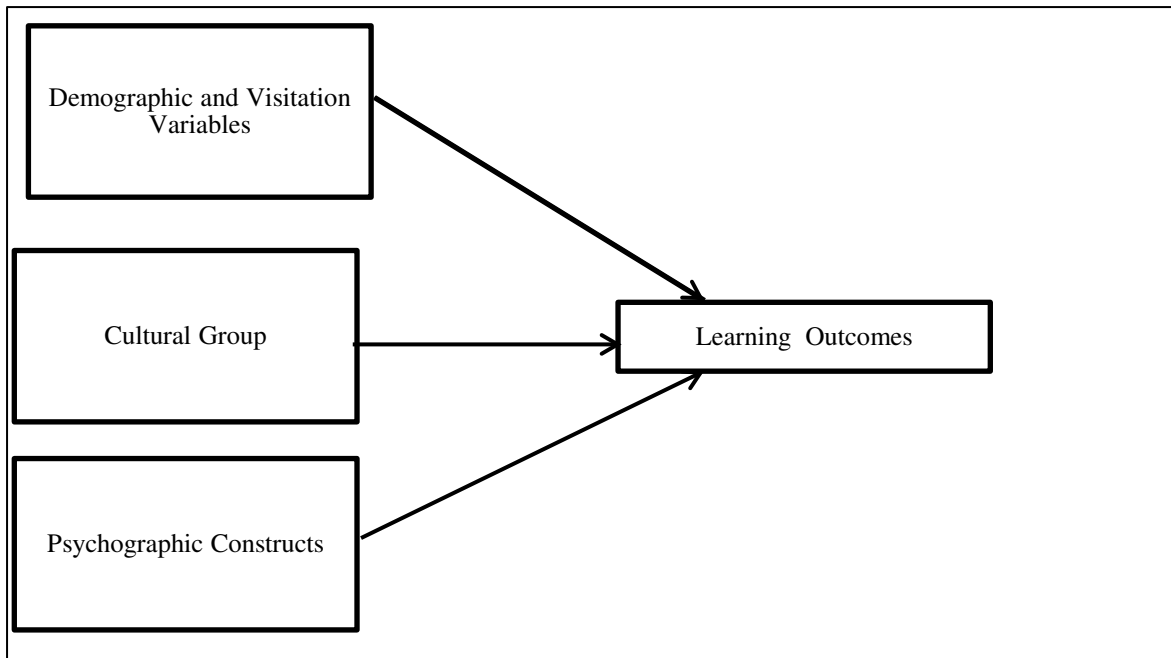
a) Variables used in the assessment of the relative contribution of cultural group to visitor learning
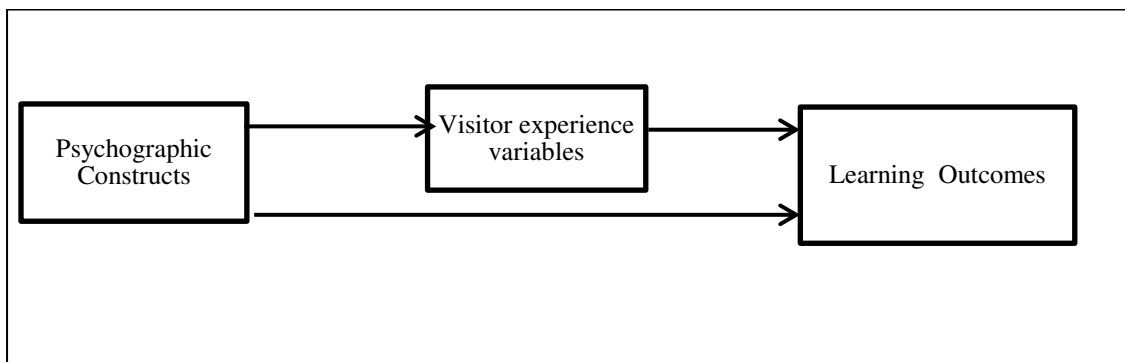
b) Variables used to explore the pathways to learning

Figure 5.12 Overview of: a) the variables used to assess the relative contribution of cultural group to visitor learning; and b) the variables used to explore the pathways to learning

5.4.1 The contribution of cultural group to the prediction of learning

To explore the relative contribution of cultural group (in relation to other demographic and psychographic variables) to the prediction of learning, a linear regression with multiple predictors was undertaken for each of the two interval outcome variables (SLO and

Composite BI[10]). The 14 psychographic constructs, culture (using two dummy variables) and selected ordinal demographic and visit characteristic variables (gender, age, education level and visit frequency) were used as predictor variables in order to assess the strength of culture as a predictor of learning. Each set of predictor variables (culture; other demographic; and psychographic) was entered separately, and the amount of variance explained (R^2) recorded (Tables 5.22 and 5.23). The sets were then combined two at a time and, finally, all three sets of variables were entered together (R^2 recorded in Tables 5.20 and 5.21). This process was repeated for each of the two interval level outcome variables.

5.4.1.1 Self-reported learning outcomes

Psychographic constructs were the best predictors of Self-reported learning (R^2=.531). Demographics (including visit frequency) added very slightly to the prediction (R^2=.538). Cultural group did not add to the variance predicted by Psychographics (R^2=.531). All three variable sets entered together (R^2=.540) was only slightly superior to Psychographics alone (Table 5.22).

Table 5.22 *Results for regression analyses undertaken to determine the relative contribution of cultural group to the prediction of self-reported learning outcomes*

Variable combination	Adj. R^2	ANOVA
Psychographics alone	.531	$F_{(14,372)}$=32.179, p<.000
Culture alone	.027	$F_{(2,636)}$=9.994, p<.000
Other Demographics (including visit frequency) alone	.064	$F_{(4,612)}$=11.491, p<.000
Demographics plus culture	.099	$F_{(6,610)}$=12.316, p<.000
Psychographics plus culture	.531	$F_{(16,370)}$=28.319, p<.000
Psychographics plus demographics	.538	$F_{(18,356)}$=25.162, p<.000
Psychographics, demographics and culture	.540	$F_{(20,354)}$=22.950, p<.000

5.4.1.2 Behavioural intentions

Psychographic variables were the best predictors of the composite for environmentally responsible behavioural intentions (R^2=.444). Cultural group added slightly to the prediction (R^2=.457). Other demographics, including visit frequency, did not add to the prediction of

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[10]For clarity only, the composite BI construct was used in the final analyses as the results when each construct (Practices and Advocacy) was analysed separately revealed similar outcomes.

environmentally responsible behavioural intentions (R^2=.440). All three variable sets entered together (R^2=.455) was slightly superior to Psychographics alone (Table 5.23).

Table 5.23 *Results for regression analyses undertaken to determine the relative contribution of cultural group to the prediction of behavioural intentions*

Variable combination	Adj. R^2	ANOVA
Psychographics alone	.444	$F(14,372)=22.974$, p<.000
Culture alone	.051	$F(2,642)=18.254$, p<.000
Other Demographics (including visit frequency) alone	.038	$F(4,616)=7.205$, p<.000
Demographics plus culture	.089	$F(6,614)=11.033$, p<.000
Psychographics plus culture	.457	$F(16,370)=21.309$, p<.000
Psychographics plus demographics	.440	$F(18,357)=17.383$, p<.000
Psychographics, demographics and culture	.455	$F(20,355)=16.641$, p<.000

5.4.1.3 Message recall

To establish the influence of cultural group on message recall, binary logistic regression was undertaken. This technique was selected as the outcome variable was binary (*No* message recalled or *Yes* a message was recalled). Each model was run independently to determine the influence of each set of variables (described above) on message recall. The analysis revealed that psychographic constructs were the best predictors of message recall with cultural group and demographics contributing only slightly more to the prediction of Message Recall (Table 5.24).

Table 5.24 *Results for logistic regression analyses undertaken in order to determine the relative contribution of cultural group to the prediction of Message Recall*

	Model	Nagelkerke R Square[11]	% correct predicted
Baseline model*			53.9
Psychographics alone	Chi-square =30.232, df=14, p=.007	.092	62.2
Culture alone	Chi-square=5.942, df=2, p=.075	.011	54.2
Other Demographics alone (including visit frequency)	Chi-square=3.742, df=4, p=.442	.007	55.2
Demographics plus culture	Chi-square=10.203, df=6, p=.116	.019	57.6
Psychographics plus culture	Chi-square=34.262, df=16, p=.005	.104	60.5
Psychographics and Demographics	Chi-square= 33.199, df= 18, p=.016	.104	62.6
Psychographics, demographics and culture	Chi-square=40.653, df=20, p=.004	.126	61.1

*This is the model prior to the addition of predictive variables, including only the intercept.

Summary for Section 5.4.1

It is clear from the three analyses above that cultural group contributed only a small amount to the prediction of learning outcomes. For each of the outcome variables, psychographic variables were the best predictors, with cultural group making only a small additional contribution to the prediction of two of the three outcome variables (Behavioural Intentions and Message Recall).

5.4.2 Pathways to learning for each cultural group

To explore the relationships between the psychographic constructs (14 variables), visitor experience (3 variables) and learning outcomes (2 self-report variables), path analysis using the software package AMOS was used. For each cultural group all predicted paths, including covariances between the psychographic constructs, were included in each initial model. Demographic variables were not included in these analyses as they contributed relatively little to the prediction of learning outcomes (Section 5.4.1). Message recall (Y/N) was analysed separately, using the same psychographic constructs and visitor experience variables

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[11] Nagelkerke's R^2 is a form of the coefficient of determination for logistic regression and can be seen as similar to the R^2 in linear regression (Field, 2013)

in a binary logistic regression. During model development, statistically non-significant pathways were deleted hierarchically, as were paths that had regression weights of less than 0.2 (from the smallest weight upwards). In an effort to achieve parsimony, the final models were those that had the best fit indices and that only reflected significant (p<0.001) paths with regression weights or covariances above 0.2.

5.4.2.1 Pathways to learning for White visitors

Self-reported learning outcomes and environmentally responsible behavioural intentions

The final path analysis suggests that three motivation variables and one environmental orientation variable (Nature Self, NR-Self) influenced environmental learning for White visitors (Figure 5.13). Passive enjoyment motivation led to an increased level of experiential engagement, but this did not contribute directly to either learning outcome. Learning motivation contributed directly to self-reported learning and indirectly to behavioural intentions through Reflective Engagement. Nature Self contributed directly to both Behaviour Intentions, and Self-Reported Learning Outcomes, and indirectly to both outcomes through Reflective Engagement. Reflective Engagement contributed to both learning outcomes; however, it influenced Self-Reported Learning Outcomes more strongly than it influenced Behaviour Intentions. Social motivation contributed to behavioural intentions directly. The three motivation variables were inter-correlated and a relationship was also noted between Nature Self and the motivation variables.

Figure 5.13. Path analysis for White visitors to uShaka Sea World reflecting relationships.
between psychographic variables, experience variables and learning outcomes. Single headed
arrows represent regression paths and are notated with standardised regression weights;
double headed arrows represent covariances and are notated with correlation coefficients.

The goodness of fit indices for White visitors shows that the final model (Figure 5.13)
provided a reasonable fit to the data. Although the chi-square statistic was significant
(χ^2=75.081, df = 11, p<0.000), this was expected given the large number of cases. The χ^2/df
ratio was slightly higher than acceptable at 6.83. The fit indices were as follows: CFI=.944,
TLI=.817, NFI=.936 and RMSEA=0 .122, CI=0.097, 0.149. The model explained half of the
variance in learning outcomes (SLO R^2=.54) and 41% of the variance in intention to change
environmentally responsible behaviour (BI R^2=.41).

Message Recall

A binary logistic regression (using the Backward Likelihood method to mirror that
undertaken in the path analysis) was performed to determine which of the variables best
predicted message recall (Y/N). The predictors included all of the initial psychographic and
experience variables (as in the path analysis). Environmental practices and learning
motivation, and both experiential and reflective engagement emerged as predictors of

message recall (Table 5.25). Membership was correctly predicted for 70.9% of the White respondents based on these four explanatory variables. The Hosmer and Lemeshow results indicated that the null hypothesis was not rejected (Hosmer and Lemeshow Chi-square=9.611, df=8, p=.293), which indicated that the model fit the data well. The Wald statistic indicated that the B coefficient was significantly different from 0 for four variables, suggesting that those four predictors all made a significant contribution to the prediction of the outcome. The odds ratio (Exp (B)) was greater than 1 for three of the four variables, meaning that, for those variables, as the predictor increases the odds of the outcome occurring increase.

Based on the data in Table 5.25 the following conclusions were drawn: White visitors with a higher pre-visit engagement in Environmental Practices, lower levels of learning motivation, and who reported higher levels of reflective and experiential engagement were more likely to recall a conservation message. The negative relationship between learning motivation and message recall is difficult to explain, especially as learning motivation was a positive predictor of other learning outcome measures. When learning motivation was entered into the model without the other predictors the relationship between learning motivation and message recall was not significant. Learning motivation only emerged as a significant negative predictor during model selection when all of the variables were entered simultaneously. It is possible that the high covariances between learning motivation and the other predictor variables may have contributed to unreliable estimates in this case.

Table 5.25 *Final binary logistic regression coefficients predicting message recall from psychographic and experience variables for White visitors*

	B	S.E.	Wald	df	Sig.	Exp (B) (Odds)	95%CI Lower	Upper
Environmental Practices	.558	.245	5.175	1	.023	1.747	1.080	2.825
Learning Motivation	-.748	.259	8.336	1	.004	.473	.285	.786
Experiential Engagement	.981	.358	7.514	1	.006	2.668	1.323	5.381
Reflective Engagement	.739	.296	6.214	1	.013	2.094	1.171	3.744
Constant	-6.053	1.541	15.423	1	.000	.002		

The relationships between the variables of importance to message recall discussed above are depicted graphically in Figure 5.14, to enable comparison with the path diagrams. Solid lines indicate a positive relationship; a dashed line indicates a negative relationship. For the purpose of creating this graphical representation, the relationships between psychographic variables and engagement variables were determined using path analysis; relationships between the predictors and message recall were determined using logistic regression.

Figure 5.14 A simple diagram to explain the relationships between the variables of importance to message recall for White visitors. Solid line indicates a positive relationship; dashed line indicates a negative relationship.

5.4.2.2 Pathways to learning for Indian visitors

Self-reported learning outcomes and environmentally responsible behavioural intentions

For Indian visitors, two motivation and three environmental orientation variables influenced learning outcomes (Figure 5.15). As with the White visitors, a motivation for passive

enjoyment influenced experiential engagement, which did not directly influence either learning outcome. Experiential Engagement contributed to Reflective Engagement, as it did for White visitors; however Reflective Engagement only influenced self-reported learning and not behavioural intentions. The Nature Self factor contributed directly and indirectly to Self-Reported Learning via reflective engagement. However, unlike the White visitors, for Indian visitors Nature Self did not contribute directly to Behavioural Intentions (BI). Instead, Locus of Control and pre-visit engagement in Environmental Practices contributed to behavioural intentions for Indian visitors. Locus of Control also contributed directly to self-reported learning outcomes. Interestingly, restoration motivation was a stronger predictor of self-reported learning outcomes than learning motivation. (Learning motivation was removed from the final model as it had a standardised regression weight of .19). Significant covariance pathways were found between the two motivation variables and between Nature Self and Environmental Practices.
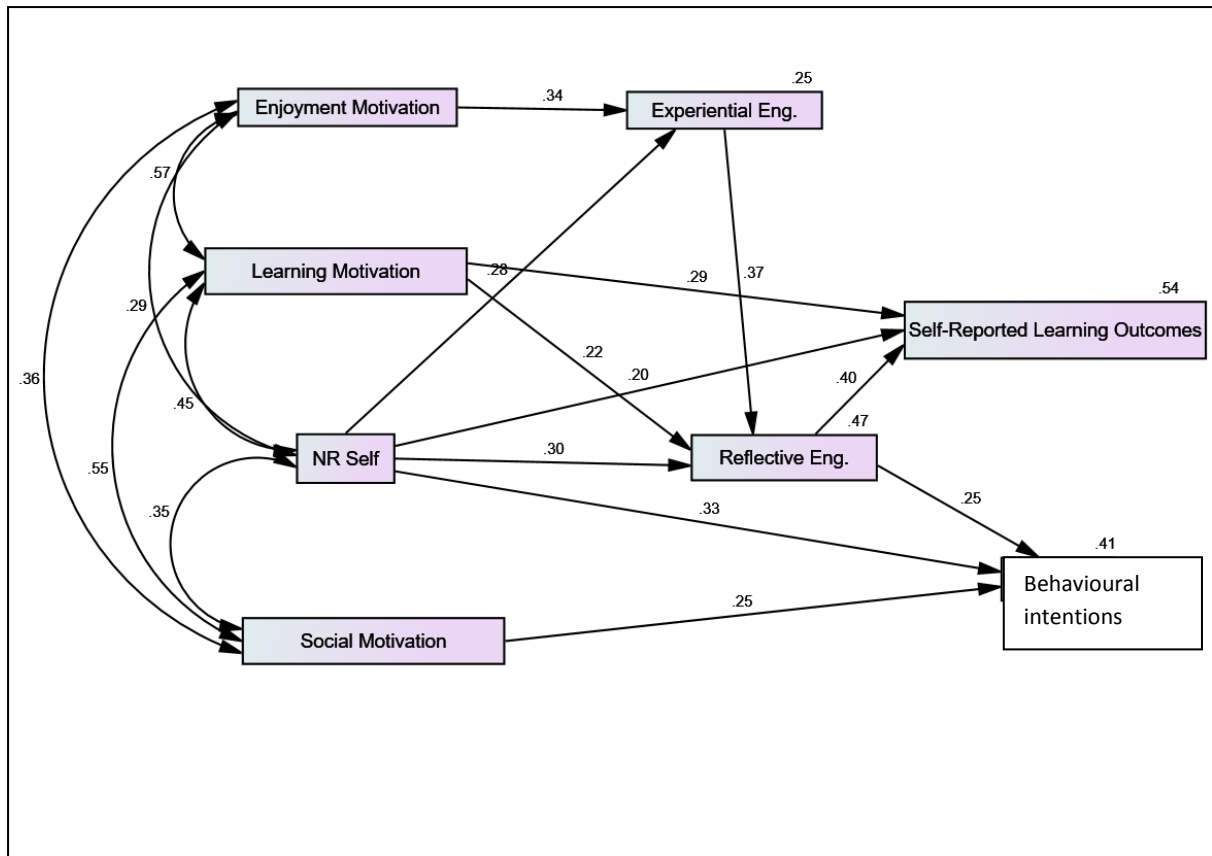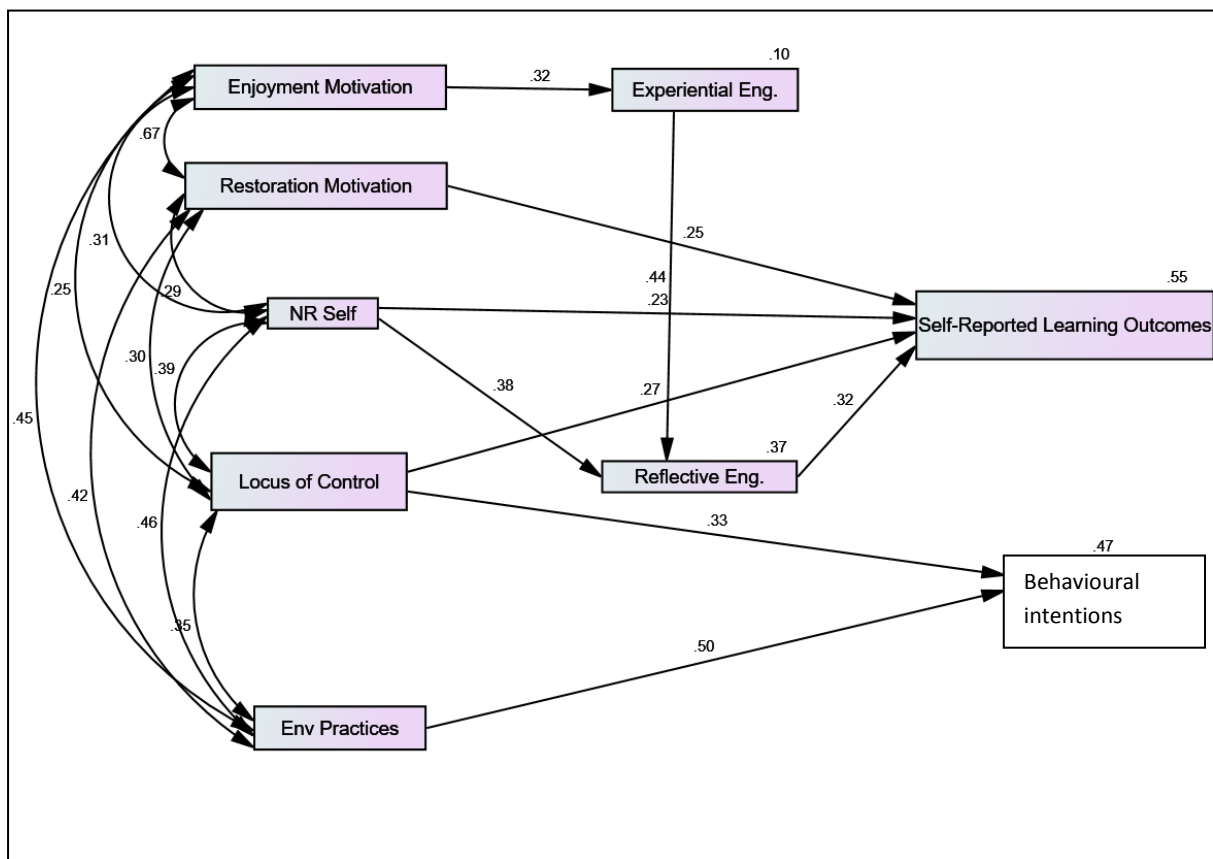

Figure 5.15. Path analysis for Indian visitors to uShaka Sea World reflecting relationships between psychographic variables, experience variables and learning outcomes. Single headed arrows represent regression paths and are notated with standardised regression weights; double headed arrows represent covariances and are notated with correlation coefficients.

The goodness of fit indices for Indian visitors show that the final model (Figure 5.15) provided a good fit to the data. Although the chi-square statistic was significant, χ^2=44.033, df=17, p<0.000, with 199 cases this is to be expected. The χ^2/df ratio was 2.6, which is acceptable. The fit indices were as follows: CFI=.954, NFI=.93, TLI=.878, RMSEA=0 .090 and CI=0.058, 0.123. The model explained about half of the variance learning outcomes (SLO, R^2=.55 and composite BI, R^2=.47).

Message Recall

A binary logistic regression was undertaken to determine which of the variables predicted message recall. Four psychographic variables emerged as predictors of message recall (Table 5.26). Interestingly, for Indian visitors none of the experience variables were significant predictors of message recall. Membership was correctly predicted for 72.6% of the Indian respondents based on these four explanatory variables. The Hosmer and Lemeshow test (Chi-square= 6.744, df=8, p=.564) indicated that the model fits the data well.

Based on the data in Table 5.26, the following conclusions were drawn: Indian visitors with higher pre-visit engagement in Environmental Practices and who reported higher levels of internal Locus of Control were more likely to recall a conservation message; on the other hand, Indian visitors with a higher motivation for passive enjoyment and a higher distance from nature were less likely to recall a message.

Table 5.26 *Final binary logistic regression coefficients predicting message recall from psychographic and experience variables for Indian visitors*

							95%CI	
	B	S.E.	Wald	df	Sig.	Exp (B) (Odds)	Lower	Upper
Environmental Practices	1.349	.473	8.122	1	.004	3.854	1.524	9.748
Nature Distance	-.818	.241	11.551	1	.001	.441	.276	.707
Locus of Control	1.348	.635	4.510	1	.034	3.851	1.110	13.368
Passive Enjoyment Motivation	-1.789	.671	7.096	1	.008	.167	.045	.623
Constant	-1.068	2.847	.141	1	.708	.344	-1.068	2.847

The relationships between the variables of significance for message recall in Indian visitors are shown in Figure 5.16. Covariance relationships between psychographic variables were

determined using path analysis and relationships between all predictors and message recall were determined using logistic regression.
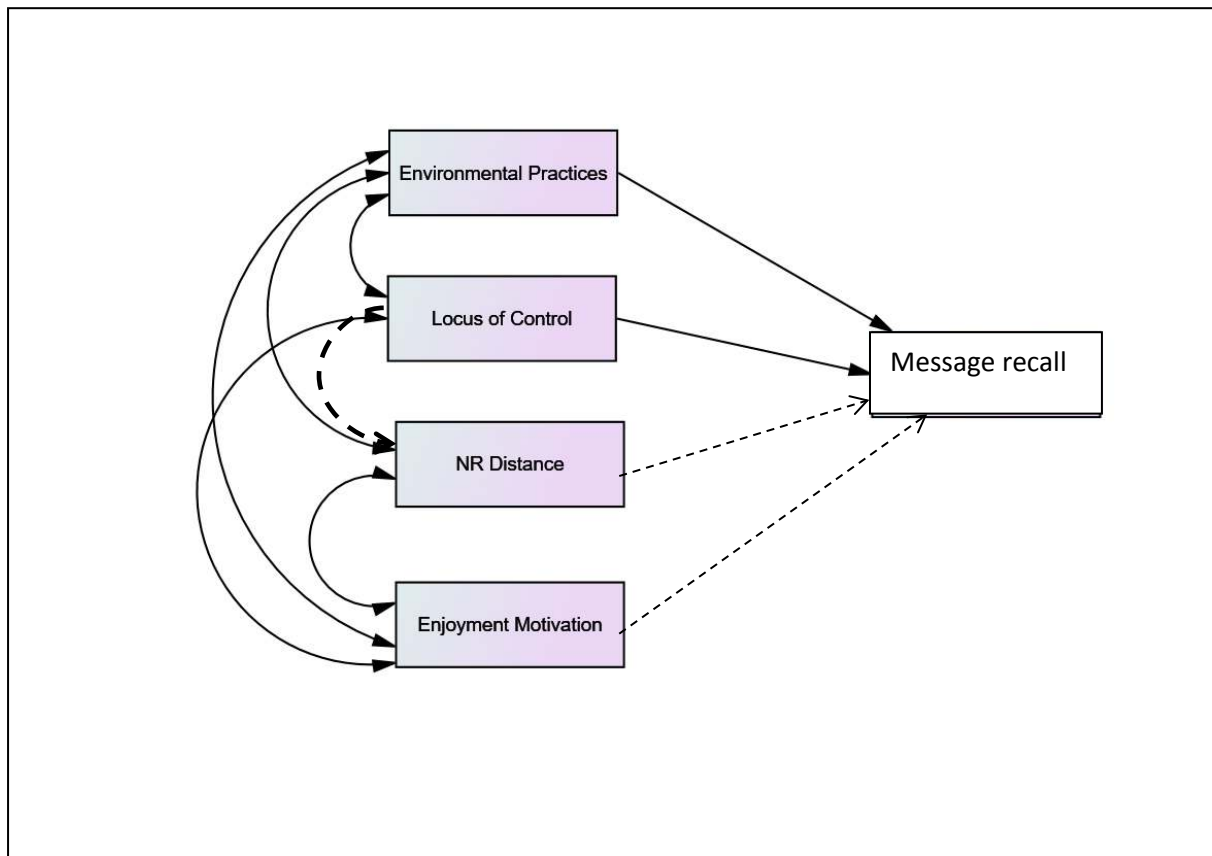
Figure 5.16 A simple diagram to explain the relationships between the variables of importance to message recall for Indian visitors. Solid line indicates a positive relationship; dashed lines indicate a negative relationship.

5.4.2.3 Pathways to learning for African visitors

Self-reported learning outcomes and environmentally responsible behavioural intentions

For African visitors three motivation and three environmental orientation variables influenced learning (Figure 5.17). There were more similarities between the Indian and African pathways to learning than between White and African pathways. For both African and Indian visitors, restoration motivation contributed directly towards Self-Reported Learning Outcomes and, in both, Locus of Control influenced behavioural intentions directly. In African visitors, both mediating variables contributed to environmental learning, with experiential engagement contributing directly to self-reported learning, and indirectly to Behavioural Intentions via reflective engagement. A motivation for passive enjoyment and a high level of Nature Experience led to an increase in reflective engagement. Nature Self

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contributed to self-reported learning both directly and indirectly via experiential engagement. Social motivation contributed directly towards behavioural intentions, a path that was also found in White visitors. The correlation coefficient between Nature Self and Nature Experience and between the various motivation variables ranged from medium to large[12].
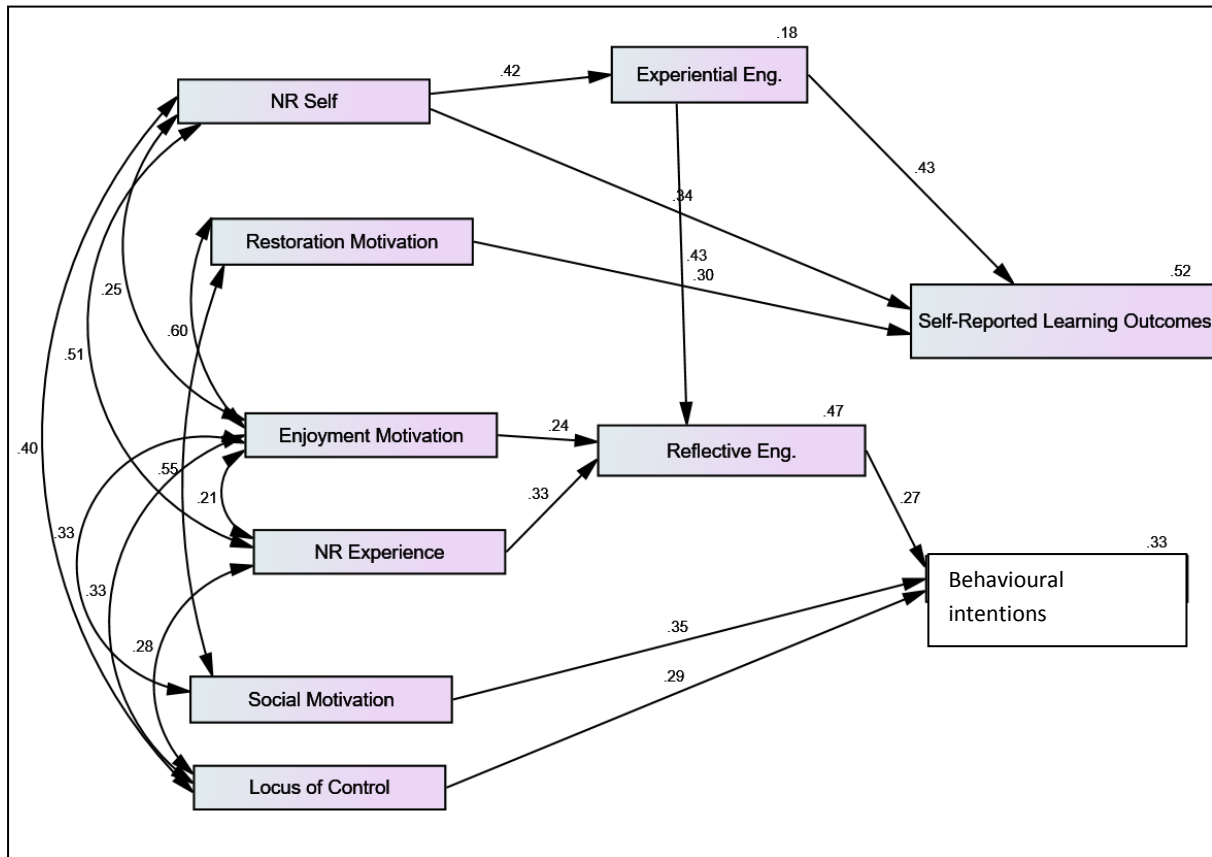
Figure 5.17. Path analysis for African visitors to uShaka Sea World reflecting relationships between psychographic variables, experience variables and learning outcomes. Single-headed arrows represent regression paths and are notated with standardised regression weights; double-headed arrows represent covariances and are notated with correlation coefficients.

The goodness of fit indices for African visitors show that the final model (Figure 5.17) provided an acceptable fit to the data. The chi-square statistic was significant, $\chi^2 = 62.439$, df=25, p<0.000, the χ^2/df ratio was an acceptable 2.50, and the fit indices were as follows: CFI=.922, TLI=.835, NFI=.880, RMSEA=0 .095 and CI=0.065, 0.125. The model explained

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[12] According to Cohen (1988) and Field (2013) correlations of .1 are considered small; .3 medium; and .5 large in the social sciences.

half of the variance in self-reported learning (R^2=.52) and 33% of the variation in behavioural intentions (R^2=.33).

Message Recall

In the binary logistic regression, two psychographic variables and one engagement variable emerged as predictors of message recall (Table 5.27). Membership was correctly predicted for 74.5% of the African respondents based on these three explanatory variables. The non-significant Hosmer and Lemeshow test (Chi-square= 8.585, df=8, p=.379) indicated a good fit between the data and the model. Based on the data in Table 5.25 the following conclusions were drawn: African visitors with a higher internal Locus of Control and who reported higher levels of experiential engagement were more likely to recall a conservation message; however, a higher desire to experience nature (Nature Experience) decreased the likelihood of recalling a message. Figure 5.18 shows the relationships between the variables of significance for message recall in African visitors.

Table 5.27 *Final binary logistic regression coefficients predicting message recall from psychographic and experience variables for African visitors*

	B	S.E.	Wald	df	Sig.	Exp (B) (Odds)	95%CI Lower	Upper
Nature Experience	-2.254	.768	8.615	1	.003	.105	.023	.473
Locus of Control	1.221	.686	3.169	1	.075	3.390	.884	13.003
Experiential Engagement	1.640	.799	4.219	1	.040	5.157	1.078	24.668
Constant	-3.668	3.380	1.178	1	.278	.026		

The relationships between the variables of significance for message recall in African visitors are shown in Figure 5.18. Covariance relationships between psychographic variables were determined using path analysis; relationships between all predictors and message recall were determined using logistic regression.
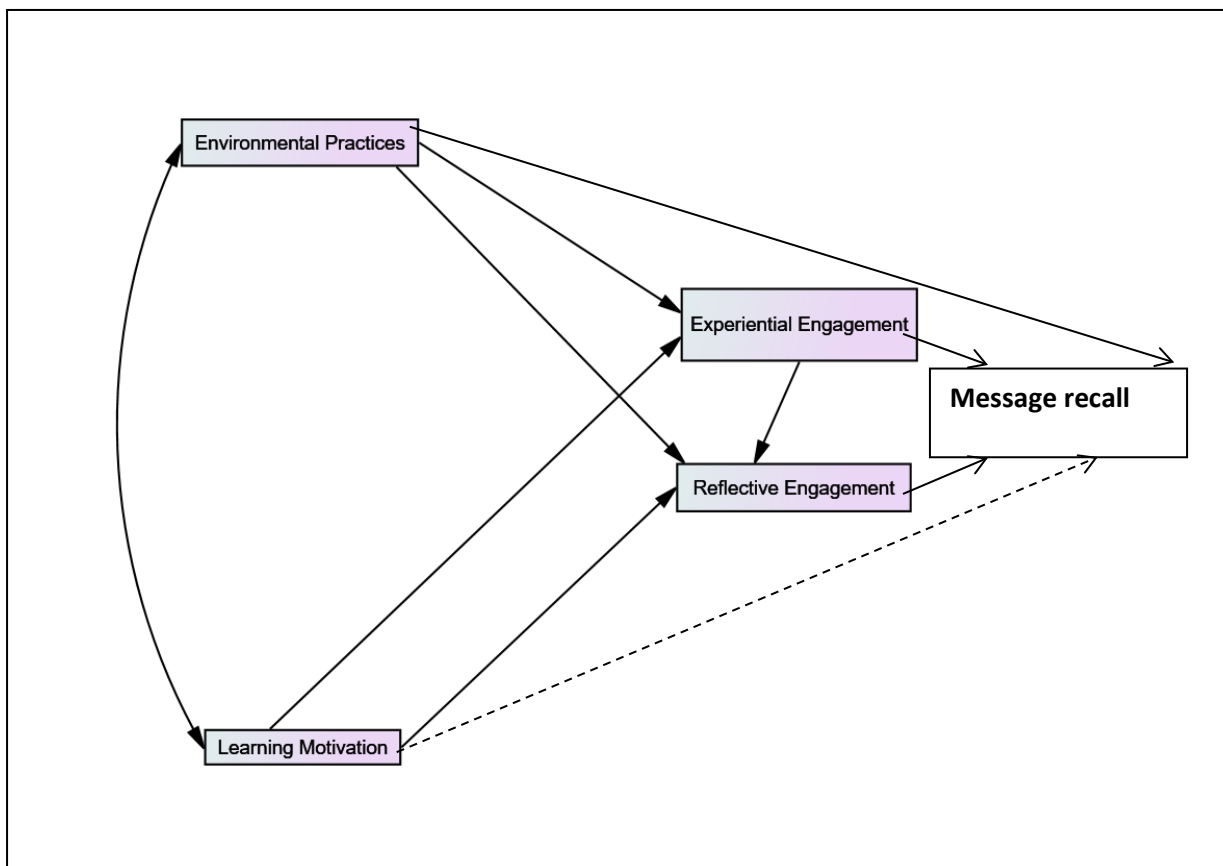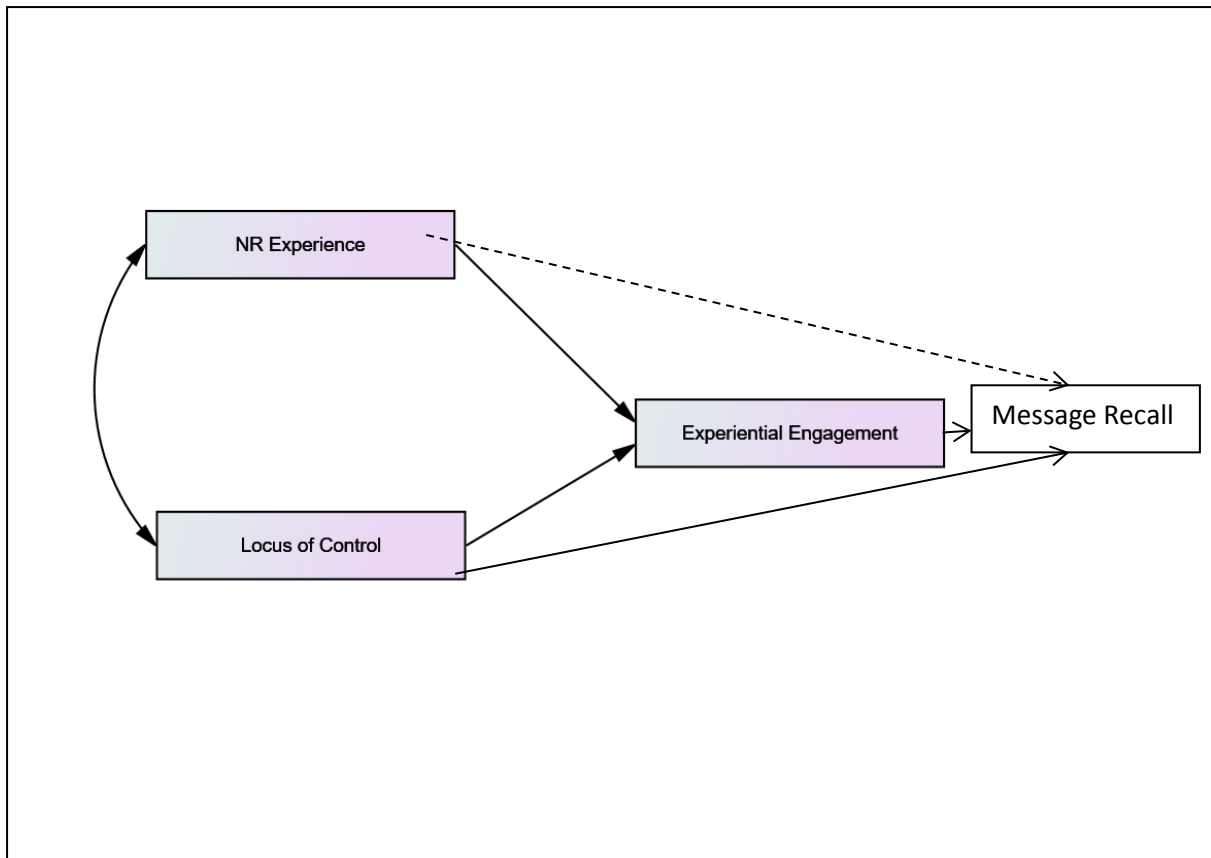
Figure 5.18 A simple diagram to explain the relationships between the variables of importance to message recall for African visitors. Solid line indicates a positive relationship; dashed line indicates a negative relationship.

Summary to Section 5.4

The models above suggest that the assumptions proposed in the theoretical framework (Figure 3.2) are a sound approximation of the relationships found in the data, i.e., that the models do represent the data. However, it must be remembered that the models are only a rough approximation of reality and that a wide variety of factors will influence how each individual learns during their visit. Path analyses do not distinguish which of the paths is more correct or the direction of the effects (Stage et al., 2004). Notwithstanding the above, these path analyses do provide a first insight into environmental learning in the three cultural groups of visitors to uShaka Sea World.

The analyses indicate that there are both similarities and differences in the pathways to learning for the three cultural groups. In particular, motivational variables appear to be the most significant predictors and were related to all three learning outcomes, directly and/or indirectly in all three visitor groups. Interestingly, while learning motivation in White visitors

influenced self-reported learning, restoration motivation influenced self-reported learning in both Indian and African visitors. A motivation for passive enjoyment influenced experiential variables for White and Indian visitors, and reflective engagement for African visitors. Social motivation influenced behavioural intentions in both White and African visitors. Of the environmental orientation variables, Nature Self was the only variable that influenced learning in all three groups. Amongst African and Indian visitors, Locus of Control emerged as significantly influencing behavioural intentions. Interestingly, for Indian visitors their pre-visit engagement in environmental practices influenced their environmental intentions, while in African visitors, their desire to experience nature (NR-Experience) influenced their reflective engagement. In all three cultural groups, experiential engagement influenced reflective engagement, with the influence strongest for African visitors and lowest in Indian visitors. Unexpectedly, the number of activities did not appear in any of the models, suggesting that the number of activities in which a visitor participates is less important than their engagement in those activities.

Summary to Chapter 5

Limited research has been undertaken on the influence of culture on environmental learning in educational leisure settings, despite the increasing diversity of visitors to such facilities. The results show both similarities and differences between cultural groups with respect to demographic and cultural variables, visit characteristics and psychographic variables. The results presented in this study have illustrated that different cultures experience the facility in slightly different ways and their environmental learning outcomes also differ. Specifically, the path models show that the pathways to learning are slightly different for each of the three cultural groups. The research has, therefore, enabled a better understanding of the implications of cultural diversity for visitors' environmental learning. In the next section, the results of this study will be integrated and discussed in the light of previous research. Relevant contributions to theory, methodology and practice will be addressed.

CHAPTER 6   DISCUSSION AND CONCLUSIONS

Overview

Based on personal experience of over 22 years working in the zoo and aquarium industry, it is clear that visitors to zoos and aquariums are becoming increasingly diverse. However, the influence of visitor cultural diversity on the design of environmental learning experiences in educational leisure settings has thus far received little attention in the literature. This study aimed to build an understanding of the influence of cultural diversity on the way visitors to uShaka Sea World experience the site, and to explore the implications of cultural differences for the design of visitor environmental learning experiences. Accordingly, this research focussed on:

- Identifying the characteristics of the major cultural groups of visitors to uShaka Sea World in South Africa with respect to selected demographic and cultural variables, visit characteristics and psychographic variables;
- Exploring how the major cultural groups of visitors experience uShaka Sea World;
- Investigating the impact of an aquarium visit on the environmental learning of visitors from each of the major cultural groups, taking into account the confounding effects of other demographic variables; and
- Assessing the extent and nature of the impact of cultural group on learning outcomes.

In this chapter the research findings are integrated across the four objectives. Cultural group variations in South African visitor characteristics, experiences and environmental learning are discussed in Section 6.1, including both similarities (Section 6.1.1) and differences (Section 6.1.2). Thereafter, the theoretical, methodological and practical implications of the findings to visitor research in general are addressed (Sections 6.2-6.5). These include:

- Insights regarding the communication of conservation messages and the use of message recall as a measure of environmental learning (Section 6.2).

- The complex role of nature connectedness in environmental learning (Section 6.3).

- The methodological implications of construct equivalence and culture specific response styles in multicultural visitor research (Section 6.4).

- Practical implications of the findings for the design of culturally responsive environmental learning experiences (Section 6.5).

Limitations of the study and suggestions for future research are provided in Sections 6.6 and 6.7. The chapter concludes with a summary of the contributions of the findings to the original research aim, as well as the wider field of visitor research, and returns to the personal narrative from the introduction (Section 6.8).

6.1 Cultural group variations in visitor characteristics, experiences and environmental learning

Building an understanding of a site's visitors is necessary to inform the design of experiences that meet visitors' needs and achieve the facility's desired environmental learning outcomes. Although there is evidence that the primarily Western visitors of the past are being replaced by more multicultural audiences (Ji et al., 2014), the design of most learning experiences at educational leisure facilities, including uShaka Sea World, has been based primarily on Western perceptions of the environment, learning and leisure experiences. Clearly there is potentially a disjuncture between the expectations and experiences of the visitors, who are increasingly from non-Western cultures, and the primarily Western design of the facilities.

As noted in the literature review, a study based on comparisons between cultural groups needs to acknowledge that there are both differences and similarities between cultures, as well as differences between individuals within cultural groups, and that culture is not static (Gutierrez & Rogoff, 2003; Lee, 2008). This study revealed both similarities and differences between the cultural groups on various demographic and psychographic characteristics, as well as experience variables and learning outcomes. A summary of these differences and similarities is presented in Figure 6.1.

Total sample

30 - 49 years of age, Female respondents

Overall well educated, Employed

Family groups

Motivation for Enjoyment & Restoration

Curious about the environment

Positive Nature Self - internalised connection to nature

Internal locus of control

High self-reported learning outcomes

Pathways to learning - Enjoyment influenced engagement, Experiential engagement influenced reflective engagement, Nature Self influenced self-reported learning, Reflective engagement influenced learning

White visitors

Urban; Gauteng; Domestic tourist

Well educated; English / Afrikaans

Repeat visit; Low motivation for social contact

Highest pre-visit environmental behaviour

Strong Pro-NEP; Lowest Anti-NEP; Medium INS;

High Nature Experience; Low Nature Distance

Engaged in more facilitated activities

Highest experiential + reflective engagement

Lowest Behavioural intentions Practices & Advocacy

Highest message recall

Pathways - Learning & social motivation, and Practices important

Indian visitors

Urban; KZN; Local visitor

Least educated; English

Repeat visit;

Mid environmental behaviour

Mid Pro-NEP; Mid Anti-NEP; Lowest INS

Mid Nature Experience; Mid Nature Distance

Engaged in more presentations

Lowest experiential engagement; Mid reflective engagement

Highest Behavioural intentions Practices;

Mid Behavioural intentions Advocacy

Mid message recall

Pathways - Restoration, LoC , Practices &NR-Distance important

African visitors

Urban/Rural; Gauteng; Domestic tourist

Well educated; English / African

First visit; Low motivation for learning

Lowest pre-visit environmental behaviour

Lowest Pro-NEP; Highest Anti-NEP; Highest INS

Lowest Nature Experience; Highest Nature Distance

Engaged in more animal encounters

Mid experiential; Lowest reflective engagement

Mid Behavioural intentions Practices;

Highest Behavioural intentions Advocacy;

Lowest message recall

Pathways - Social &restoration motivations, LoC &NR-Experience important

Figure 6.1 Similarities (Total sample) and differences (White, Indian and African) between cultural groups of visitors to uShaka Sea World

Previous research has produced conflicting results on the influence on environmental learning of demographics such as cultural group, age, gender, education or socio-economic status, and psychographics such as motivation for the visit and environmental orientation (Ballantyne, et al., 2011; Falk & Storksdieck, 2005; Vernon, 2009). In this study, the influence of a wide range of cultural, demographic and psychographic variables on visitor learning was explored. It was found that there were differences between the cultural groups on a range of learning outcomes, and these could not be explained by confounding with other demographic variables, or by culture-specific response styles. Cultural group was, however, a relatively weak predictor of learning outcomes. Psychographic variables, particularly motivational variables and connection to nature, were much stronger predictors of learning. The results of this study suggest that, while culture does have an impact on environmental learning, psychographic variables explain much of this effect, as well as explaining a significant amount of additional variance. The influence of cultural, demographic and psychographic variables on environmental learning and, therefore, on the design of learning experiences, is discussed further below.

6.1.1 Similarities between visitors from different cultural backgrounds

Demographic and visit characteristics. Most visitors could be considered to be relatively affluent by South African standards, as they were well-educated, employed and could afford the relatively high entrance fee of the facility. In common with previous research (Dierking & Falk, 1994; Ellenbogen et al., 2007; Hyson, 2004), most visitors were in family groups.

Psychographic characteristics. The high motivation for enjoyment amongst visitors from all cultural groups is in accordance with international studies that show that visitors to zoos and aquariums primarily want to be entertained (Ballantyne, et al., 2011; Linke & Winter, 2011; Morgan & Hodgkinson, 1999; Packer & Ballantyne, 2002; Ryan & Saward, 2010). The high scores for restoration in the South African sample may reflect the prevailing mood of anxiety in the country (Roberts et al., 2010). A visit to uShaka Sea World is an opportunity to relax in a relatively secure place, free from the safety concerns common in most of South Africa. Although there were some differences between cultural groups, all respondents endorsed a motivation for learning and, to a lesser degree, for social contact, a finding also in common with other studies (Ballantyne, et al., 2011; Ballantyne, et al., 2007; Falk, et al., 1998; Morgan & Hodgkinson, 1999; Packer & Ballantyne, 2002). Visitors from all cultural groups expressed higher levels of curiosity about the environment than were noted in previous

research using the same scale (Ballantyne, et al., 2011). Interestingly, visitors from all cultural groups reflected an internalised connection to nature, reflecting views such as *'My connection to nature and the environment is a part of my spirituality'* and, across all cultural groups, endorsement of this view was high in comparison with previous research (Nisbet et al., 2009). The overall internal locus of control noted amongst respondents supports previous research in which better educated, more affluent South Africans expressed a higher internal locus of control than most other citizens (Struwig, 2010).

Environmental learning. All respondents endorsed items that addressed the cognitive aspects of learning, such as *'I learnt some new facts and information during my visit'* and *'The experience made me more interested in marine animals'*. Items addressing more affective aspects such as *'My visit has made me more concerned about the well-being of marine animals'* and *'I feel more strongly about protecting marine life as a result of my visit'* were also supported.

Pathways to learning. The pathways to learning also reflected some similarities between the visitors (Section 5.4.2). For all respondents, motivations influenced the experience during the visit and subsequent learning, a finding in common with previous research (Ballantyne, et al., 2011; Falk et al., 1998; Falk, 2006; Packer & Ballantyne, 2002; Schultz & Joordens, 2014). Visitors' motivation for passive enjoyment influenced engagement (either reflective or experiential) which, in turn, influenced learning. Reflective engagement (representing cognitive and affective processing of the experience, (Ballantyne, et al., 2011) significantly predicted learning amongst all respondents, and was influenced by experiential engagement (representing the excitement and enjoyment of the experience, and viewing or being close to the animals). Visitors' internalised connection to nature significantly influenced their self-reported learning, either directly or indirectly, via experiential or reflective engagement. These results support previous research where experiential engagement predicted reflective engagement and reflective engagement strongly predicted short term learning (Ballantyne, et al., 2011). The relationship between visitors' connectedness to nature and learning is discussed in more detail in Section 6.3.

6.1.2 Differences between visitors from different cultural backgrounds

In this study, the division of visitors according to cultural background enabled the detection of differences between cultures in psychographic and experience variables and the influence of these on environmental learning (Figure 6.1). Without this separation, the characteristics of

the most prevalent cultural group (White visitors in the current study) would have dominated the results, and much valuable information would not have been revealed. This is a problem that is often encountered in multicultural research (Padilla, 2004). The differences between the cultural groups provide valuable insights into the influence of psychographic and demographic variables on environmental learning that can be used to guide the design of visit experiences that build on visitors' existing belief systems. This section will describe the characteristics, experiences and environmental learning of each cultural group in turn and will initiate the discussion of the implications of the findings for the design of more effective environmental learning experiences, a discussion that is elaborated in Section 6.5.4

6.1.2.1 White visitors

Demographic and visitation variables. The high levels of urbanisation and residency in Gauteng of White visitors is consistent with local population statistics (Tourism KwaZulu-Natal, 2012). Over half of the White visitors were repeat visitors, visiting on holiday with their families. White visitors included two language groups, predominantly English-speaking and predominantly Afrikaans-speaking.

Psychographic constructs: Motivation, environmental orientation and nature connectedness. In common with previous research, White visitors' primary visit motivations were passive enjoyment, restoration and learning. Interestingly, their motivation for social contact was the lowest of the three cultural groups, indicating that they were less interested in interacting with new people outside of their immediate family group. White visitors were more likely than other groups to report that they were engaged in environmentally responsible behaviours prior to their visit, a finding supported by previous research in South Africa where White respondents were the cultural group most likely to take action to address environmental problems (Anderson et al., 2007). White visitors' connectedness to nature responses suggest that they feel a physical familiarity with nature, enjoy being in nature and actively seek nature-related experiences. This is supported by research undertaken in South African national parks, where over 90% of visitors were from the White cultural group (Butler & Richardson, 2014). The responses of White visitors were similar to those of other Western nations, where respondents with a higher internal connectedness to nature reported higher engagement in environmentally responsible behaviours and higher endorsement of pro-environmental attitudes (Nisbet et al., 2009). Interestingly, White visitors' connectedness to nature is high, despite high levels of urbanisation.

Activities and experiences. White visitors' higher participation in facilitated experiences may be reflected in their significantly higher scores for both experiential and reflective engagement. Facilitated experiences can be both exciting (by getting close to animals) and encourage reflection, through discussing information with a staff member. White visitors' strong endorsement of the dolphin show as contributing to their interest may be because White visitors, as repeat visitors to the facility, see dolphins as an integral part of the visit experience.

Environmental learning outcomes. White visitors were significantly less likely than the other two groups to express an intention to engage in more environmentally responsible practices and advocacy after their visit. This is probably because they already considered themselves to be engaged in environmentally responsible behaviours prior to their visit. This so called 'ceiling effect' has been noted in previous research where visitors who arrive with high levels of knowledge and engagement in environmental behaviours express lower knowledge gains or intentions to engage in additional behaviours (Ardoin et al., 2015; Dierking et al., 2004). White visitors were also significantly less likely than other visitors to feel that the visit had changed their beliefs. This could also be caused by the above-mentioned ceiling effect, or could perhaps be related to the high number of repeat visitors among this group. Somewhat contradictory was the fact that White visitors recalled significantly more conservation messages than the other two visitor groups. This may reflect a greater familiarity with a 'free response' answer format. However, it may also suggest that visitors who are more familiar with environmental concerns are primed to notice such conservation messages and recall them when asked to do so. Message recall is addressed in more detail in Section 6.2.

Pathways to learning. The path models for White visitors (Section 5.4.2) suggest that a motivation for enjoyment and learning, a connection with the natural world as well as experiential and reflective engagement all positively influence environmental learning. The influence of experiential engagement on self-reported learning and behavioural intentions, via reflective engagement, and the direct influence of reflective engagement on all three learning outcomes are important findings. Appropriate modifications to the various activities that make up the visit experience can increase both experiential and reflective engagement and thereby increase environmental learning. Pre-visit environmental practices positively predicted message recall both directly and via experiential and reflective engagement. This supports the suggestion above that visitors who were more familiar with environmental

behaviours were more likely to recall a conservation message, because of their familiarity with such messages. These findings suggest that, in order to encourage learning amongst White visitors, experiences that encourage reflection be explored. In addition, by providing opportunities for emotional contact with animals, facilities could enhance personal connectedness to nature and thereby encourage learning.

6.1.2.2 Indian visitors

Detailed studies of Indian visitors to educational leisure settings outside India have seldom been reported, probably because they generally do not make up a significant proportion of a visitor profile. As KwaZulu-Natal is home to one of the largest densities of Indian people outside India, it provides an opportunity to understand and address the characteristics and needs of this cultural group. However, it is important to recognise the fact that South African People of Indian Origin (PIO) straddle two worlds—India to which they are bound by food, religion and popular culture, and South Africa, their physical home and economic foundation (Singh, 2011). Their characteristics are, therefore, likely to express this duality of East and West.

Demographic and visitation variables. Most Indian visitors were local residents who grew up and currently live in the urban centres of KwaZulu-Natal (Durban and Pietermaritzburg), with a smaller percentage being holiday makers from the urban centre of Gauteng. In common with previous research (Wiebesiek et al., 2011), Indian visitors in this study were exclusively English speaking. The relatively close proximity of most visitors to uShaka Sea World probably accounted for the higher percentage of repeat visitors and larger group sizes. Indian visitors reported the lowest levels of education amongst the visitor groups, an unexpected finding given the high priority placed on education in most Indian families.

Psychographic constructs: motivation, environmental orientation and nature connectedness. In common with other groups, Indian visitors expressed a high desire for enjoyment, followed by restoration, learning and social contact. Both Indian and African visitors were less likely to report that they were engaged in environmental practices and advocacy than White visitors. However, both Indian and White visitors expressed support for an ecological worldview. Indian visitors expressed the lowest connection to nature across different measures. This, combined with their average desire to experience nature and average distance from nature, may be reflective of their urban lifestyle. This is unlike White visitors who, despite urbanisation, expressed a high desire to experience nature.

Activities and experiences. Indian visitors attended more presentation activities than other groups. Presentations at uShaka Sea World are exciting but passive experiences. They are easy to enjoy in a family group and require little effort on the part of the visitor.

Environmental learning outcomes. Indian visitors were more likely than other visitors to agree with the statement, '*Some of my beliefs have changed as a result of my visit'*. This is an interesting outcome given the relatively high percentage of Indian visitors who were on repeat visits. For Indian visitors, the experience did encourage them to think about their future engagement in environmentally responsible behaviours, a finding that supports previous research that suggests that visitors who express lower levels of engagement in environmental behaviours prior to their visit are more likely to express a desire to increase their environmentally responsible behaviour (Dierking et al., 2004).

Pathways to learning. As was noted in other visitor groups, Indian visitors' (Section 5.4.2) motivation for passive enjoyment and an internalised connection to nature, influenced self-reported environmental learning, either directly or indirectly, via experiential and reflective engagement. As was noted for African visitors, a motivation for restoration also influenced self-reported learning and behavioural intentions. A high motivation for enjoyment decreased the likelihood that a visitor would recall a conservation message and neither experiential nor reflective engagement influenced message recall. Amongst Indian visitors, pre-visit engagement in environmental practices influenced both behavioural intentions and message recall. Given Indian visitors' low levels of pre-visit engagement in environmental behaviours, this could mean that the visit encouraged those with slightly more familiarity with environmental behaviours to want to increase their environmental behaviour and, thus primed, recall them as conservation messages. Locus of control significantly influenced behavioural intentions and self-reported learning. This positive correlation between locus of control and environmental behaviour has been noted in previous research (Hines, Hungerford, & Tomera, 1987). Unique to Indian visitors, those who felt a greater distance from nature were less likely to recall a message, a finding that supports the positive relationship between internal connections to nature and learning.

These findings suggest that to enhance the environmental learning of Indian visitors, educational leisure settings should encourage opportunities for families to have fun together while they learn. As with other visitors, opportunities to encourage a deeper emotional

connection with nature amongst Indian visitors may enhance environmental learning. Providing Indian visitors with the opportunity to recover from the stress of everyday life is compatible with reflective engagement (Heintzman, 2009). In addition, the influence of experiential engagement on reflective engagement suggests that opportunities to encourage experiential engagement be explored.

6.1.2.3 African visitors

Demographic and visitation variables. Most African visitors reported that they spoke an African language, a finding that is supported by South African statistical information (Statistics South Africa, 2007). Most African visitors grew up in rural areas but have since moved to urban areas, reflecting the trend of urbanisation amongst many African South Africans (Lumby, 2005; Struwig, 2010). Most were from inland provinces and were, therefore, domestic tourists to KZN. Although African people make up the majority of local Durban residents (68%), most do not have the means to visit an expensive recreational facility such as uShaka Sea World. African holiday makers from inland provinces are likely to be more affluent than the average KZN resident, so they have the financial means to come on holiday to Durban. Despite the changes in socio-economic policies over the last 20 years (such as Black Economic Empowerment), lesser-educated White and Indian people are perhaps still more likely to be employed than African people. The higher education levels of the African respondents may reflect the fact that it is more highly educated African people who have the financial means to pay for a visit to an expensive leisure setting. Most African visitors were on their first visit to the facility and although most visited with their families, a high number also visited with friends. This may underlie the higher motivation for social contact expressed by African visitors than other visitors.

Psychographic constructs: motivation and prior knowledge. African visitors expressed significantly higher scores for the motivation items '*To explore the unknown*' and '*To be better informed*', suggesting that the ocean is a novel environment for many and that exploring it is motivating. The concept of an aquarium is familiar to most White and local Indian visitors, who are likely to have visited the facility, or a similar type of facility, during their childhood, whereas many African visitors have a limited understanding of an aquarium, especially those on their first visit to an aquarium. A common observation by uShaka Sea World staff is that many African visitors express confusion about the reality of the exhibits, viewing them as large screens or alternatively enquiring whether they have actually been

immersed under the ocean surface (Princess Ncube, personal communication). Interestingly, these queries are posed by African visitors from both KZN and other provinces, implying that living in a coastal province does not necessarily increase a visitor's understanding of an aquarium. The aquarium is, therefore, for most African visitors their first encounter with living marine animals.

Psychographic constructs: environmental orientation and nature connectedness. Although curious about the environment, African visitors expressed a low pre-visit engagement in environmentally responsible behaviours. This is supported by previous research that found, when compared to other cultural groups, far lower levels of engagement in activities such as recycling in African households (Anderson et al., 2010).

African visitors' internalised connection to, and high perceived distance from nature, as well as the low desire to experience nature, and high expressed distance from nature, may reflect both real changes in African attitudes to nature, as well as the difficulty that African visitors appear to have had in responding to negatively worded items.

It has been proposed that citizens of traditional societies concurrently hold pro-ecological and utilitarian outlooks towards the environment (Bechtel, Corral-Verdugo, & Pinheiro, 1999; Corral-Verdugo & Armendáriz, 2000). The results of this study support this finding, with African visitors expressing both a high utilitarian (Anti-NEP) view and an ecological worldview (Pro-NEP), although their endorsement of an ecological worldview was the lowest of the three cultural groups. Traditional African ethics recognise an existential bond between people and the environment (Murove, 2009) and "The holistic nature of the interrelationship between nature, human beings and the supernatural is foundational in the Xhosa knowledge system" (Breidlid, 2009:141). African visitors expressed the highest cognitive expression of unity with nature (INS), however, their perceived distance from nature was high (NR-Distance) and their desire to experience nature (NR-Experience) was low. They also demonstrated lower emotional responses to animals during their visit. Despite this, African visitors did express an internalised connection to nature (NR-Self).

These results may reflect the changing interface between African people and the environment. In the past, African people (especially those living in rural areas) have had a strong reliance on nature (growing crops, tending animals, hunting, using herbal medicines,

collecting water and fuel), however, this reliance was for survival rather than pleasure. This reliance on nature was also spiritual, as expressed in traditional medicine and religion (Jones, 2014). The New Ecological Paradigm is thought to measure a fundamental environmental paradigm. Previous research has noted that more traditional values are often associated with anthropocentric concerns (Schultz & Zelezny, 1999), therefore, the high endorsement of a utilitarian attitude towards nature found amongst African visitors in this study may reflect a deep rooted attitude of nature as a resource to be used. The responses of African visitors may be tapping the changing views of African people towards the environment as individuals move from a reliance on and close connection to nature, required for survival based on natural resources, towards distancing themselves from nature with increased urbanisation and Westernisation (Jones, 2014). This interpretation is supported by previous research that revealed a strong sense of connectedness with nature amongst rural South Africans, and that rural African people valued and understood biodiversity differently to Western people (Cocks et al., 2012). This interpretation of a duality of worldviews is reinforced by research that shows that, in Southern Africa, traditional (African) as well as scientific (Western) notions of natural phenomena exist concurrently (Breidlid, 2009).

Most African visitors are likely to be relatively recent migrants to cities (Turok, 2012). For African visitors, increased urbanisation and an overall negative perception amongst African people about conservation (Struwig, 2010; Wilhelm-Rechmann & Cowling, 2011), are potential reasons for the dualistic environmental attitude. Butler and Richardson (2014), in a study of Africans' attitudes to national parks in South Africa, also reported that many city-based African respondents were not interested in wildlife or nature and preferred city holidays to wilderness experiences. As an urban-based environmental educational leisure setting, the facility is well placed to reach African visitors with environmental messages, in an urban location.

These changing attitudes to nature support the view that culture is not static, but rather a dynamic "context in the making" (Quijada, 2008:226). Based on the high utilitarian approach to the environment expressed by most African visitors, it is suggested that concepts such as the sustainable use of resources, the vulnerability of the environment to human impact and the need for regulations to optimise human use of resources, be addressed with visitors. Supporting African visitors' connectedness to nature may encourage learning. An acknowledgement of spiritual connections to nature and the role of sacred places, people and

objects are more likely to nurture learning amongst African visitors than a purely factual, Western based scientific approach.

Activities and experiences. African visitors' slightly higher participation in animal encounters, particularly the Ocean Walker experience, may be reflective of their need for high experiential engagement.

Pathways to learning. The path model for African visitors (Section 5.4.2) was the most complex, with similarities to both White and Indian visitors. A motivation for enjoyment (common to all three groups), restoration (in common with Indian visitors) and social contact (in common with White visitors) contributed either directly or indirectly towards self-reported learning and behavioural intentions. The positive influence of nature experience on behavioural intentions and the negative influence of nature experience on message recall may explain the discrepancy in the relationship between engagement and learning outcomes. These findings suggest that enhancing opportunities for social contact and enjoyment during the visit, while encouraging African visitors to experience nature and reflect during their visit, would enhance learning. Experiencing the animals on the site may help African visitors to enhance their desire to experience nature. On the other hand, African visitors' high experiential engagement, which influenced all three learning outcomes, suggests that by enhancing the excitement and enjoyment of seeing animals, the facility can encourage both reflective engagement and learning. African visitors who feel empowered to change the environment are more likely to plan to change their environmental behaviour and remember conservation messages. This suggests that creatively supporting visitors' internal locus of control could encourage positive behavioural intentions.

To enhance learning amongst African visitors, it is suggested that the facility increase opportunities to have exciting experiences with the animals, however, this should be balanced with experiences that support a calmer, more restorative state of mind, while encouraging questioning and thinking supportive of reflection. The results indicate that opportunities that encourage social interaction, preferably those that include an introduction to and support for positive environmental behaviour, would encourage behavioural intentions. In addition, carefully crafted experiences that encourage African visitors' emotional or spiritual connections to nature may also contribute to environmental learning.

Summary

This section has provided a summary of some of the similarities and differences between visitors from different cultural groups to the research site. Of the variables studied, motivational variables and a connectedness to nature were the most reliable predictors of environmental learning amongst all visitor groups. The two experience variables were also found to be useful in the prediction of visitor environmental learning. It is clear, therefore, that psychographic variables influence environmental learning and that some of these differences can be related to cultural background. Based on these outcomes, more practical suggestions for changes to the design of activities and interpretation to improve environmental learning are provided in Section 6.5.

6.2 Insights regarding the communication of conservation messages and the use of message recall as a measure of environmental learning

In addition to general messages that encourage visitors to *'Care for nature'*, the designers of the uShaka Sea World experience have articulated four other messages that they hope visitors learn during a typical visit. Three of these messages relate to environmentally responsible behaviours that visitors can do after their visit—*'Reduce, reuse and recycle'; 'Choose your seafood wisely'*; and *'Save resources'*—while the message, *'We are all connected in the web of life'*, is less tangible. These messages are presented to visitors during different activities or are included in the interpretive signage. This section will explore, in more detail, the efficacy of the communication of these conservation messages and the use of message recall as a measure of environmental learning.

While previous research has shown that conservation messages are an important component of a wildlife tourism experience (Ballantyne, et al., 2009), the effectiveness of conservation messages in interpretation has received little attention (Moscardo, 2014). More than half of the visitors in this study did not recall a single conservation message, a finding in common with previous research (Schultz & Joordens, 2014). This suggests that visitors may find it difficult to clearly articulate their conservation learning. This could be a methodological issue—visitors did not understand the term 'conservation message', they felt uncomfortable responding in English, or they did not respond to a question that required a hand written rather than a 'tick box' type response. The use of the term 'conservation' may be problematic for African and Indian visitors who are, overall, less familiar with environmental terms, or who, as noted in previous research, attach negative connotations to the term (Wilhelm-Rechmann & Cowling, 2011). However, it could also mean that the site has not adequately

communicated the conservation messages and that visitors simply could not remember a message. The range of messages recalled did reflect the primary conservation messages of the site, although it was clear that some messages were recalled with greater frequency than others.

Messages about the damage of pollution to marine life, the importance of not littering and the value of recycling waste are the primary themes of the dolphin presentation and are also commonly mentioned in other presentations. It is unsurprising, therefore, that these messages were recalled by the most visitors. However, care should be taken in this interpretation as messages such as, *'Recycle your waste', 'Do not litter'* and *'Pollution is bad'*, etc., are familiar conservation messages outside the facility. Visitors may simply be recalling a message that they associate with the environment, rather than a message specifically heard during their visit, a phenomenon that has been noted in previous research (Smith, Broad, & Weiler, 2008). In fact, in a study of South African environmental attitudes, littering was seen as a local environmental problem by respondents from all cultural groups, far higher than any of the other environmental issues discussed (Anderson et al., 2010; Struwig, 2010). However, in both previous research and this study, White people were significantly more likely to recall a message of this nature than those from other cultural groups suggesting that cultural groups differ in their receptiveness and sensitivity to different conservation messages.

Of the total sample, about one quarter of the visitors recalled messages pertaining to *caring for and conserving* the environment or wildlife. These general messages are communicated to visitors in the interpretive signage, during various presentations, interactions with staff members and animal encounters. They are also relatively easy messages for visitors to articulate. However, further research is needed to explore exactly what the facility means by 'care for nature' and what a visitor understands by the message. It is suggested that messages about caring for nature be accompanied by appropriate behaviours that visitors can undertake to express their care and concern. This would strengthen the message and encourage environmental behaviour.

Research on seafood consumption in South Africa has revealed that relatively affluent White people are the most likely consumers of fresh fish (Landey, 2013). The higher recall of messages pertaining to *sustainable seafood* by White visitors may reflect their familiarity with seafood. If seafood is not consumed by the majority of visitors the message is unlikely

to resonate with them. This highlights the importance of tailoring messages to match the visitors' knowledge, interest and behaviour.

Messages regarding *saving resources* were presented in the temporary Eco-House exhibit and were recalled with a low frequency amongst all visitor groups. Since 2007, South Africa has experienced a lack of electricity, manifest in regular electricity supply interruptions. It was thought that these supply interruptions, together with the energy saving awareness campaign run by the local energy supplier, would have resulted in widespread awareness of the need for domestic energy saving. However, previous research in South Africa found that fewer than 25% of those surveyed engaged in any form of energy saving behaviours (Department of Energy, 2012). The results of this study suggest that neither the campaign nor the exhibit had a notable impact on visitors' awareness of energy saving as a conservation message. Either visitors did not associate saving resources with conservation, or the Eco-House exhibit did not effectively communicate this message.

The low recall of messages about the interconnectedness of life (*We are all connected in the web of life*) was unexpected as, during the data collection period, the theme of the dolphin presentation was '*The Web of Life*'. However, the message was not reinforced elsewhere on the site. A concept such as interconnectedness in nature is more abstract and thus more difficult to recall, even if highlighted during an animal presentation. Previous research has also noted that zoo visitors express confusion about abstract biological concepts (Dove & Byrne, 2014) and that knowledge of these concepts contributes little to environmental behaviours (Moss et al., 2016). This suggests that conservation messages need to be clear and tangible, and linked to environmental behaviours to enhance recall.

In addition to these messages, visitors also articulated specific facts about animals or the environment as 'conservation messages'. This may support the suggestion above that visitors did not really understand the term 'conservation message' and simply responded with what they thought that they had learnt during their visit.

A small percentage of visitors noted that sharing their new knowledge and interest with others or learning more themselves was a conservation message. This is an interesting finding as it is not a message that is consciously articulated in many educational leisure settings. It is suggested that a new message, '*Learn more and teach others*', could be incorporated into the design of future conservation messages. Encouraging visitors to build their interest in the

marine environment and share their knowledge could be powerful conservation messages that may support ongoing environmental learning.

In this study visitors who were more familiar with environmental concerns were primed to notice such conservation messages and recalled them when asked to do so. However, those visitors less familiar with the concept of conservation were less able to remember the conservation messages. It is, therefore, necessary to develop ways to enhance message recall amongst visitors who are not familiar with environmental issues.

It is clear that conservation messages need to be selected wisely to ensure that time and effort is not wasted on messages that do not contribute to environmental learning. It may be useful to exploit messages common outside of the facility and enhance visitors' understanding of those messages. However, it is also important to capitalise on the unique features of an educational leisure setting to create messages that are associated with the facility and easy to remember. The research shows that messages should be focussed and targeted on actions rather than vague concepts about caring for nature or abstract concepts about the interconnectedness of life. Providing clear connections between visitors' actions at home and animals or natural ecosystems would help visitors to see that their actions can contribute to conservation. It is suggested that it may be effective to help visitors to make a direct connection between saving a resource (e.g., electricity) and a conservation issue (e.g., loss of coral reefs caused by ocean acidification through increased CO_2 levels in the atmosphere). Visitors would thus be able to link their behaviours with 'conserving nature'. This type of messaging may also enhance visitors' understanding of the interconnectedness of the natural world.

It was interesting to note that some visitors from all cultural groups perceived that *learning more* or *teaching others* was a conservation message. This may be a useful conservation message to develop in the facility. The facility could enhance opportunities for visitors to share knowledge through providing 'photo opportunities' that incorporate clear conservation messages, by providing opportunities for social media to be used to share information or by simply providing bookmarks, stickers, magnets or pamphlets that serve as reminders of their visit or can be given to others. These would also support visitors who want to learn more as these 'take-home' resources could include details of where (websites, social media sites, as well as popular publications) visitors can find out more about various topics of interest.

The low recall of messages about saving resources suggests that either visitors did not associate these types of actions with conservation or that they do not see the ocean as a 'part of nature' or in need of conservation. It is critical, therefore, to provide visitors with explanations of the links between the oceans and human survival on earth. This may be particularly relevant as many visitors to the facility are from inland provinces, and may feel that their actions do not have an impact on the oceans. It is essential, therefore, to link visitors' personal actions to ocean conservation, and show visitors that regardless of where they live they can play a role in marine conservation.

Research into conservation communication has shown that the messenger is often as important, if not more so, than the message (Fraser, Bicknell, Sickler, & Taylor, 2009). It is critical that staff members (messengers) are well trained, credible, passionate and approachable, and investment in these individuals is needed to optimise the learning opportunities provided by the facility.

The use of message recall as a measure of environmental learning requires further attention. For visitors from all cultural groups, an item by item analysis of self-reported learning outcomes revealed that those items related to a greater concern for wildlife and conservation issues were more strongly correlated with message recall than those items related to knowledge gain. These results suggest that message recall may be better interpreted as a measure of concern and conservation awareness than a simple measure of knowledge gain. Exhibits that inspire and motivate visitors to care about conservation and nature, with interpretation that reaches visitors on an emotional level, would be more effective in enhancing learning than the simple transmission of facts, an outcome that supports previous research (Ballantyne, et al., 2011; Hughes, 2013; Skibins & Powell, 2013). The finding that message recall taps an emotional connection to nature as much as a cognitive gain suggests that future studies may explore this measure to augment other measures of care and concern for nature.

6.3   The complex role of nature connectedness in environmental learning

This study used a wide range of scales to investigate the influence of psychographic variables on learning amongst the different cultural groups. The scales included both multidimensional (NEP, NR, environmental orientation and motivation) and unidimensional scales (INS and Locus of Control), measuring primarily cognitive and affective concepts. The results suggest that not all of the scales are equally valuable in predicting environmental learning.

The New Ecological Paradigm (NEP) and the Inclusion of Nature in Self (INS) scales did not significantly predict environmental learning amongst any of the visitor cultural groups. The Visitor Motivation Scale, the Nature Relatedness scale, current engagement in environmental practices and Locus of Control all predicted environmental learning, however, there were differences between the cultural groups. Previous research has suggested that environmental behaviour cannot be fully explained by measures that focus solely on cognitive beliefs and knowledge, such as those tapped in the NEP and INS, and that emotional connections, such as those expressed in connectedness to nature, are more predictive of environmental behaviour (McPherson Frantz & Mayer, 2014; Perkins, 2010; Restall & Conrad, 2015; Tam, 2013).

Although items from only two constructs of the Nature Relatedness scale were used (Nature Experience and Nature Self), three constructs emerged from the factor analysis of the scale in this study. Two of these, Nature Experience and Nature Self, were similar to the original scale, while the third construct, termed Nature Distance, had not previously been identified. Although this third dimension may reflect the difficulty that some visitors had in responding to negatively worded questions, the fact that the three dimensions were found in all of the cultural groups suggests that the third dimension is tapping an additional component of the Nature Experience construct. The influence of connectedness to nature, as measured by the nature relatedness scale, thus warrants further discussion. Firstly, because nature relatedness was a significant predictor of learning; secondly, because few previous studies have used nature connectedness as a predictor of learning; and thirdly, because some of the contradictory results within the findings of this research provide an insight into the ways in which some cultural groups respond to nature and nature-based attractions.

The fact that the underlying constructs measured by the NR scale predicted environmental learning in all three cultural groups, suggests that the scale holds some potential for future research in the African context where both traditional and Western views are prevalent. Nature Self, a construct that reflects an internalised or more spiritual connection to nature, was predictive of learning amongst all respondents. The other two constructs, a desire to experience nature and a physical familiarity with nature (Nature Experience) and an individual's desire to distance themselves from nature (Nature Distance), also predicted learning, with a higher desire to experience nature positively predicting learning and a high desire for distance from nature negatively predicting learning.

Amongst many traditional societies, nature is often a source of wonder and spiritual enhancement (Corral-Verdugo & Pinheiro, 2009; Garfield, Drwecki, Moore, Kortenkamp, & Gracz, 2014; Ojomo, 2011), while amongst Western societies, nature is more often an object of scientific observation. African visitors expressed the least desire to go out in nature and a low physical familiarity with the natural world, yet expressed a personalised, more spiritual connection to nature. Both a personal connection to nature and a physical familiarity to nature, mediated by experiential and reflective engagement, predicted learning. However, for African visitors a higher desire to experience nature decreased the likelihood that they would recall a message. Given the relationship between connectedness to nature and spirituality, ways to introduce more spiritual links between humans and the environment, emphasising the role of nature in soothing or uplifting the spirit, could be effective in encouraging a more emotional response and thereby enhance learning amongst African visitors. Although Falk (2006) identified 'Spiritual Pilgrims' as a visitor sector based on motivation, exploring spiritual links to nature in the way it has been discussed above has seldom been addressed in visitor research. However, given the important role of spirituality in connectedness to nature, it is suggested that this concept holds considerable potential for enhancing environmental learning for some cultural groups.

White visitors' personal connectedness to nature influenced learning, however, the extent to which they enjoyed spending time experiencing nature did not influence environmental learning outcomes. It would appear that the affective elements of nature connectedness were better predictors of learning than the more physical aspects associated with experiencing nature. Indian visitors expressed the lowest personal connection to nature, and felt that they were separate from nature, although their physical familiarity with nature and distance from nature were at levels similar to that of White visitors. Amongst Indian visitors, a higher desire to distance themselves from nature was related to the recall of fewer messages. This negative relationship supports the view that message recall appears to be more related to care and concern for nature.

A visit to uShaka Sea World did not encourage African visitors to engage emotionally with environmental issues, nor did it support high levels of reflective engagement, although reflective engagement did predict behavioural intentions. Urban African visitors' need for high experiential engagement may account for their higher participation in animal encounters. This finding was unexpected but can be explained by the relatively high levels of education

and associated affluence, as well as their strong motivation for enjoyment. This was also evident in their high endorsement of experiential engagement, as the animal encounters provide participants with a high level of excitement (e.g., diving with fish or sharks). African visitors' high participation in experiential activities provides designers of such activities with an excellent opportunity to focus on those aspects most likely to enhance learning for African visitors. It is recommended therefore, that animal encounter experiences be designed to support the creation of a stronger emotional bond between participants and the animals; to support social interactions between participants; and to incorporate time during the encounter to reflect on the experience and to discuss issues with trained staff members. These activities should focus on building a personal connection between the visitor and nature, while ensuring that the activity remains exciting.

The connectedness to nature scale appears to be composed of multiple dimensions, each of which has its own unique conceptual meaning but which shares elements of overlap with other aspects (Tam, 2013). In addition, as suggested by Nisbet et al. (2009), currently available measures of environmental attitudes and actions may not be enough to explain the complex relationships between people and nature. Understanding emotional connections to nature and their influence on learning is thus complex. Recognition of the complexity of nature connectedness in the environmental learning relationship is a starting point for the development of future models, especially in multicultural contexts.

6.4 Exploring the methodological implications of construct equivalence and CSRS in multicultural visitor research

This study is contextualised in the light of the increasingly multicultural nature of visitors to leisure settings throughout the world. As was noted in the literature review, visitors to educational leisure settings are increasing in diversity. To illustrate this, more than three-quarters of visitors to uShaka Sea World in 2011, when this study started, were White. By 2015 the demographics had changed and now over half of the visitors are African (Jone Porter, personal communication). Visitor studies practitioners will, in future, be increasingly required to understand the influence of cultural diversity on their research. This section contributes towards building a greater awareness of the challenges experienced in multicultural research and highlights some suggestions that may help future multicultural visitor studies. The study revealed a number of challenges for data collection in multicultural environments. In particular, issues pertaining to the instruments for measurement, including

the scales used, cultural equivalence of meaning, the types of answer formats used and the use of reverse worded questions, are addressed in this section. The influence of culture on response styles is also discussed.

6.4.1 Instruments for measurement

As with most social research tools, the instruments currently available to measure visitors' environmental knowledge, attitudes, learning and behaviour are imprecise, partial and imperfect (Ardoin et al., 2015). These issues are amplified when the instruments are used cross-culturally. Despite this, they are currently the most commonly used tools to measure these critical concepts and many have been rigorously tested and validated across a wide range of samples. As noted in Chapter 4, cultural differences may affect responses to psychographic instruments and, thus, potentially threaten the validity and reliability of questionnaires undertaken cross-culturally (de Klerk et al., 2009; Meiring et al., 2005; Padilla, 2004; van Herk et al., 2004). The results of psychographic analyses can only be trusted if the methods used to measure these variables are sound. As was noted in this study, results that appear inconsistent or relationships between variables that appear contradictory may indicate methodological problems.

This research is one of the first in an African context to contribute towards the selection of scales that have the potential to measure both cognitive and affective environmental orientation amongst people from different cultural backgrounds. By guiding the selection of more appropriate measures, it is hoped that future research may be streamlined, without the loss of reliability or validity. Some of the challenges faced and addressed in the current study are outlined below, and their implications for future research are discussed.

Construct equivalence

Interestingly, some of the scales that have been tested the most rigorously across cultures, such as the NEP, INS and NR, were found in this study to have lower levels of construct equivalence than scales that have only been used in one or two cultures (Environmental orientation and behaviour, visit motivation and visitor engagement). This could be because of the complexity of the constructs in the attitudinal scales and the complex language used, as well as the lack of equivalence of meaning for concepts such as wilderness. While some NEP studies in Africa have found the scale to be reliable (Boeve-de Pauw & Van Petegem, 2012; Ogunbode, 2013; Wilhelm-Rechmann et al., 2014), other studies have noted low internal reliability in the scale for African respondents (Milfont, 2007).

Most studies on the transferability of psychometric instruments developed in the West to an African context have stressed the importance of ensuring content familiarity and note that adjustments are often required (de Klerk et al., 2009; Malda et al., 2010; Meiring et al., 2005). In the rigorous testing for cultural equivalence undertaken in this research, it was revealed that some of the scales that had good internal reliability for English or Afrikaans speaking South Africans were less effective for other language speakers, a finding also noted by Abrahams and Mauer (1999). The heterogeneity of the South African population further complicates research as there are differences within cultural groups as well as between cultural groups. Although the use of multiple scales to measure similar constructs could alleviate some of the problems described above, this may cause unnecessary repetition in a questionnaire and result in respondent fatigue. It is clear, therefore, that scales should not be indiscriminately transferred between cultures (Baumgartner & Steenkamp, 2001), but that scales ought to be rigorously assessed for construct equivalence. This would be preferable to trying to design a new scale for each culture, as no scale can be completely free from cultural influences (de Klerk et al., 2009).

Language issues

In conservation in general, as well as most studies of this nature, the language of the survey instruments and the researcher are embedded in a Western cultural milieu (Esson & Moss, 2016; Gosler, Bhagwat, Harrop, Bonta, & Tidemann, 2013). Many psychographic studies of this nature use English as the language of choice, even if it is not the first language of all respondents (de Klerk et al., 2009; Ogunbode, 2013; Wilhelm-Rechmann et al., 2014). However, it has been noted that English-language competence alters both responses and response styles (Abrahams & Mauer, 1999; Harzing, 2006). Administering the questionnaire only in English may also have excluded some respondents who were less fluent in English.

It has been suggested that the use of English in environmental education and research may be considered to be limiting, through the loss of the rich descriptors for the environment found in indigenous languages (Cloete, 2011; Cocks et al., 2012).[13] On the other hand, many of the words used in the various scales do not have equivalents in an African language (e.g., wilderness), or may have different meanings for African language speakers (e.g., bush)

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[13] For example, in Xhosa, one of the South African languages, there are 24 words to describe what would, in English, be referred to as 'bush' or 'forest'. On the other hand, the word for animal comes from the word for meat, *'nyama'*, as wild animals in Xhosa represents food, *'nyamazane'*.

(Cloete, 2011). In addition, Western perceptions of nature that focus on aesthetic beauty (the wonder of a sunrise) are inappropriate in African contexts where the same aesthetic values are not traditionally attached to natural landscapes (Cocks et al., 2012). In a study of personality descriptors, it was noted that African people used concrete descriptors of personality (e.g., hard working or talkative) more frequently than more abstract descriptors (e.g., creative or loyal) (Valchev et al., 2013). This may influence the responses of African visitors to abstract concepts such as 'ingenuity' or 'laws of nature'. While a detailed analysis of the implications of environmental language and meaning is beyond the scope of this thesis, it is important that data interpretation is sensitive to these linguistic challenges.

Response formats

Many scales used to measure psychographic constructs use Likert-type response scales. Using one primary response format may be problematic when dealing with multicultural respondents. Dolnicar and Grün (2007a), for example, noted that multiple methods of data collection should be used to decrease the possibility of data contamination by culture specific response styles (CSRS). Alternative strategies include binary responses (Yes or No), ranking scales or opposite word choices (Dolnicar, 2006; Harzing, 2006). In this study, the inclusion of the graphical INS scale provided an alternative measure, however, this scale contributed little to the final results. The inclusion of the 'free response' message recall question did provide valuable insights into differences in learning between the cultural groups.

Cultural variability in responses to reverse-worded Likert-type questions has been noted (Johnson et al., 2005; Wong, Rindfleisch, & Burroughs, 2003). In this study, scales with positively and negatively worded questions were used to avoid mindless responding and to mitigate response biases by encouraging respondents to consider each question carefully. However, low internal consistencies revealed that some respondents did not understand how to answer reverse-worded questions, a challenge that has been noted previously (de Klerk et al., 2009; Harzing, 2006; Wong et al., 2003). Scales that use reverse or negatively worded questions need careful consideration.

Data preparation

This research has highlighted the importance of thorough data preparation in cross-cultural research. This includes testing for cultural equivalence to ensure that psychometric instruments are validated and refined. Pilot testing can reveal potential sources of bias and ensure conceptual equivalence of constructs, both of which can help to refine the instruments.

Although in this study a culturally diverse focus group discussion was conducted to diagnose problems with the research instrument prior to the pilot study, this revealed only conceptual and language issues. It did not reveal issues related to cultural equivalence or CSRS. While the standardisation of data retrospectively is an accepted practice, it would be advisable to avoid as many response biases as possible through careful design and thorough pilot testing of questionnaires, although it is acknowledged that biases caused by CSRS are impossible to eliminate completely.

6.4.2 The influence of culture on response styles

It has been suggested that linguistic and cultural differences could explain differences in response styles (Harzing, 2006; Mõttus et al., 2012; Smith, 2011) and that response styles are related to communication styles (He et al., 2014). As such, response styles can provide valuable insights into the culture of different respondents. As one of the few studies in South Africa to specifically address the issues of construct equivalence and culture-specific response styles, this research can contribute to understanding the issues, their effect and how to control for them.

English speakers (White and Indian) showed higher extreme response style than non-English speakers (African), while African visitors gave central (middle) or slightly positive responses. This supports previous research that suggests that questionnaires administered in native languages elicit more extreme responses, while non-native language speakers are more likely to select a safe (middle) response (Harzing, 2006). In addition, respondents from collectivist cultures (e.g., African) give middle or slightly positive responses (Harzing, 2006). White visitors showed the highest disacquiescence bias, supporting the view that increased individualism is associated with lower levels of acquiescence response style (Johnson et al., 2005). White South African response styles conform to those of a dissident culture (high disagreement and lower agreement), while Indian and African responses were indicative of a consensus culture (low disagreement and higher agreements) (Smith, 2011). An awareness of these response styles and their cultural foundation will enable researchers to reveal real cultural differences and not merely differences in response styles.

Interestingly, previous research has identified differences amongst White, Indian and African people. In previous cross-cultural studies (Adams et al., 2012), the responses of Indian visitors were found to be more aligned with White visitors on some variables and African visitors on other variables. It has been noted that Indian people occupy an intermediate

position between White and African respondents on personality clusters focussing on personal growth (Conscientiousness, Extraversion, Intellect and Openness) and social relational functioning (Facilitating, Relationship Harmony and Soft-heartedness) (Valchev et al., 2013). In this study the responses of Indian people were similar in some respects to White, and in other respects to African visitors and the inconsistencies in Indian responses found in this study have also been noted in previous research (Struwig, 2010; Valchev et al., 2013).

Response styles are embedded in the culture, personality and values of the respondents and cannot, therefore, be easily "turned off" (He et al., 2014:13). They do, however, provide valuable information about individuals in different cultures. While CSRS were a source of considerable concern in this study, the fact that they were identified and addressed means that future studies can build on this foundation. The results of this research have provided an insight into the response styles of respondents from different South African cultures, insights that may help future researchers in the interpretation of their results.

6.5 Implications of the findings for interpretation for a multi-cultural audience

The results of the present study confirm that there are both differences and similarities between visitors from different cultural groups. While culture does influence environmental learning, psychographic constructs explain much of the variance. This highlights the importance of having an in-depth knowledge of visitors, as well as how cultural factors influence attitudes and beliefs. However, the many similarities between visitors suggest that, while it is important to be aware of the influence of culture on environmental learning, this does not mean that every exhibit, activity or element of interpretation needs to be designed for each culture. Rather designers should, armed with a good understanding of their visitors, ensure that amongst the range of activities and interpretation offered, the needs and understandings of all cultures are addressed.

In the following sections the findings of this study are used to provide some suggestions for the design of more culturally responsive environmental learning experiences. These may be informative to other environmentally focussed educational leisure settings whose visitor base is broadening to include people of multiple cultures.

The environmental learning opportunities discussed below include exhibits, activities and all elements of interpretation. Interpretation includes interpretive signage such as exhibit labels, information boards and screens, as well as interpersonal interpretation through structured and informal presentations and one-on-one interactions between staff and visitors.

6.5.1 Tailoring the experience to culturally-relevant needs and interests

The visitors in this study varied widely in their predispositions towards the environment, as well as their familiarity with environmental issues. Interpretation should, therefore, be layered – easy to understand for visitors with a low familiarity with environmental issues, while simultaneously providing those familiar with the topic, opportunities to advance their understanding. This concept of scaffolding or layering of learning (Mukute & Lotz-Sisitka, 2012; Tunnicliffe & Scheersoi, 2009) may help to ensure that all visitors, regardless of entry levels of interest or knowledge, are provided with opportunities to learn. The concept of layering of information can be applied to many of the following topics.

Catering for different levels of environmental behaviour

White visitors in this study were more engaged in general environmental practices than Indian and African visitors, amongst whom lower levels of engagement in general environmental practices such as recycling, saving water, and re-using 'green' shopping bags were noted. For higher commitment activities the differences were even more noticeable, with African and Indian visitors expressing very low levels of engagement in environmental advocacy type activities. Those who are already active in environmental behaviours could be thanked and encouraged to continue their efforts through creative signage on bins for recycling (e.g., *Thank-you for recycling – you are helping to save turtles).* For those who have not yet started to engage in such behaviours, signage on other bins may prompt them to think about their actions (e.g., *Wait – can you recycle that litter*?). This would build on previous research that recommends that providing visitors with practical information about what they can do will be more effective than general information about conservation issues (Ballantyne, et al., 2009).

In many countries around the world governments have implemented various environmental awareness programmes aimed at encouraging environmental behaviours amongst their citizens. In South Africa, recent crises with water and electricity supply, as well as the government-instituted levy on plastic shopping bags have sensitised some citizens to the importance of environmental behaviours. The results of this study suggest that these national

awareness programmes have been more effective in White communities than amongst other cultural groups. This is reflected in the relatively high levels of engagement in these relatively 'easy to do' environmental behaviours amongst White visitors. It is suggested that the designers of environmental learning experiences in South Africa build a connection between national 'environmental awareness campaigns' and organisational 'conservation messages' to encourage visitors to think about responsible environmental behaviour. One suggestion would be to work from a potentially familiar concept, e.g., the levy on plastic bags, to an unfamiliar concept, e.g., the impact of discarded plastic bags on sea turtles. Done creatively this could facilitate learning through encouraging reflection, caring and concern as well as an emotional connection to nature by showing the clear links between responsible behaviour and how it helps wildlife. It has been predicted that explaining these links will support engagement in pro-environmental behaviour (Smith, Curtis, & Dijk, 2010).

Addressing multiple languages

The topic of language is seldom addressed in formal texts on interpretation in educational leisure settings. However, the increasing cultural and associated linguistic diversity of visitors to educational leisure settings necessitates that this topic be explored. In the context of this study most African visitors reported that their home language was African and half of the White visitors reported that Afrikaans was their home language. Therefore, for a large percentage of visitors, English is not their first language. As the interpretation is currently only offered in English many visitors may select not to read the interpretation. Language issues are also likely to occur in other facilities with culturally diverse visitors. Although in the South African context it would be impractical to translate all of the interpretation into 11 official languages, it may be feasible to translate selected interpretive panels into the languages most commonly spoken by visitors or to use clear graphics that would be understood across a range of languages. Printed guides to the aquarium or audio tours for the aquarium could easily be prepared in different languages. The presence of staff capable of speaking the different languages of visitors can also enhance interpretation and thus learning.

Offering different activities to appeal to different cultural groups

An understanding of which activities influence learning for different cultural groups can help to guide the design of more effective experiences. As White visitors enjoyed engaging with staff members in one-on-one discussions, these facilitated activities should be used to encourage White visitors' curiosity about the environment, acknowledge their current

participation in environmentally responsible behaviour, and encourage further environmental behaviour.

Presentations are attended by most visitors and are thus a critical focus point for conservation messaging. Mammal presentations play a particularly important role in environmental learning as visitors can more easily connect with mammals than other marine life (Curtin & Wilkes, 2007). Mammals are, therefore, often considered to be flagship species (animals that raise awareness of conservation issues and stimulate pro-conservation behaviour, Skibins, et al., 2013). The fact that more visitors attended a dolphin presentation than any of the other activities suggests that these animals have considerable attracting power, making them a valuable asset for the communication of powerful conservation messages. Presented creatively, perhaps by incorporating a culturally appropriate story-telling approach, these presentations can be used to help address different cultural beliefs and influence behaviour.

It is clear that current activities need to be better publicised to encourage more participation, especially among Indian and African visitors. It is recommended that the use of new technology such as downloadable apps or QR codes be investigated to inform visitors of interactive opportunities and facilitate interpretation. An estimated 89% of all South Africans own a cellular phone (Pew Research Centre, 2015), suggesting that this technology is accessible to visitors. Interactive activities facilitated by staff members that include time for questions and discussion, encouraging caring and concern and not simply the delivery of facts, will enhance learning through reflective engagement.

Catering for different motivations
It is clear that visitors' motivations vary widely and ensuring that their motivations are met is critical. Techniques to cater for visitors' motivations for learning and discovery, social contact and enjoyment have been addressed in previous studies (Ballantyne, et al., 2011; Morgan & Hodgkinson, 1999; Packer & Ballantyne, 2002; Packer, 2006), however, addressing a motivation for restoration has been less frequently discussed. The high motivation for restoration in the South African sample may reflect the prevailing mood of anxiety in the country. Restoration is clearly an important aspect of a visit to an educational leisure setting in South Africa for visitors of all cultures. A high motivation for restoration was also noted amongst aquarium visitors in a previous study (Ballantyne & Packer, 2016).

Experiences in nature, including a visit to an aquarium, are considered to contribute to "the renewing of physical, psychological, and social capabilities" (Packer & Bond 2010:431). Therefore, providing visitors with opportunities for restoration by exploiting the beauty and tranquillity of the marine environment, while encouraging reflection by asking questions and discussing issues, could enhance both the experience and learning, especially as restoration motivations predicted learning amongst Indian and African visitors. It is also critical that the current image of the facility as a safe place is maintained by ensuring strict security protocols. Making sure that 'green' garden areas are easily accessible, well maintained and invite use (through the provision of benches and water fountains, etc.) would provide additional opportunities for visitors to find respite from their busy, largely urban lifestyles. Previous research indicates that repeat visitors are more open to restorative experiences (Packer & Bond, 2010), therefore offering membership to local visitors to enable them to visit frequently at a discounted rate could enable them to take advantage of the restorative opportunities. Once the excitement of seeing the animals has worn off, repeat visitors may be more inclined to use the park-like surrounds for relaxation and restoration.

The marketing material of most zoos and aquariums emphasise the fun, excitement and entertainment aspects of a visit. While this appeals to the high motivation for enjoyment and social contact of most visitors, it does not capture their motivation for restoration and learning, both of which are important. It is proposed that marketing material that emphasises the relaxing effects of viewing animals in a tranquil setting would be particularly effective in the South African context.

6.5.2 Incorporating culturally-relevant beliefs in interpretation

All visitors have a pre-existing belief system. Through building an understanding of these beliefs designers can ensure that the environmental learning opportunities build upon the most prevalent beliefs amongst their visitors.

Building on existing belief systems

In this study, African and Indian visitors expressed somewhat ambivalent attitudes towards the environment compared with White visitors. Accordingly, in order to engage more effectively with a wider range of cultures and associated belief systems in the South African

situation, it is suggested that aquarium experience designers need a better understanding of local indigenous knowledge[14] about the environment and the animals exhibited.

Most cultures have indigenous knowledge about the environment and an acknowledgement in interpretation of this cultural link may support questioning, reflection and discussion amongst visitors. This could then 'open the door' to active reflection on issues relating to environmental damage. The inclusion of traditional uses of animals or the environment in exhibit interpretation would introduce a familiar concept into an unfamiliar environment, thereby helping to bridge the gap between visitors' prior and new knowledge. However, care should be taken to ensure that this is done sensitively, to avoid alienating cultures that may have different views. It may be possible to bridge the current divide between indigenous and scientific knowledge by addressing cultural beliefs, which may be spiritual (for example beliefs about ocean creatures with powers to influence life) or physical (for example beliefs about the cleansing power of drinking sea water). This could be achieved sensitively through personal interactions with staff members and supported by appropriate interpretive displays that provoke enquiry. An example of such a belief that is common in much of Africa is that of the mermaid or water spirit that is said to inhabit the oceans and rivers. A creative exhibit designed to provoke thought and questions about the origin of the 'mermaid' that is supported by appropriately trained staff members during special 'story telling' sessions may be effective.

Traditional medicine is used throughout the world and is one of the major causes of the decline or even extinction of many species. The decimation of pangolin, rhino, tiger and sea horse populations worldwide are stark examples of how demand for traditional medicine can drive species towards extinction. The increasing cultural diversity of visitors to zoos and aquariums provides these facilities with an excellent opportunity to address traditional uses and to explain the scientific basis, or not, of the animals or plants in question. This could help to address, in a non-confrontational way, some of today's most critical conservation issues. An acknowledgement of, and sensitivity to, the cultural beliefs prevalent amongst visitors, as well as a desire to build a dialogue with those from different cultures is consistent with a constructivist approach to learning.

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[14]Indigenous knowledge systems encompass "world-views, cultural values and practices and knowledge systems derived from these worldviews and practices and related to metaphysical, ecological, economic and scientific fields" (Bredlid, 2009:141)

Most White visitors noted that the aquarium experience did not change their beliefs. To stimulate White visitors and to encourage reflective engagement, a few controversial topics could be included for them in animal presentations or interpretive signage. Stimulating cognitive dissonance, whereby visitors experience opposing thoughts or feelings about a subject (Schultz, 2014; Vining, Merrick, & Price, 2008) may encourage them to rethink pre-existing beliefs, with the new information that is provided. Topics such as alternative energy sources, fishing and hunting, or climate change are potentially controversial and may help to engage visitors already familiar with the environment being exhibited.

Incorporating traditional knowledge

Urbanisation is an international phenomenon as people move from rural areas to urban centres. In South Africa, urbanisation is considered to be progress, while living in more rural areas is believed to less desirable. The trend of urbanisation in South Africa was noted particularly amongst African visitors, most of whom grew up in rural areas but have since moved to urban areas. As most zoos and aquariums are situated in urban environments, these facilities provide visitors with an opportunity to experience the natural environment in the 'safety' of a developed urban landscape.   However, urbanisation has led to a disconnection between people and nature. For example, many people do not know where their food originates. An exhibit that shows where tinned tuna comes from and how it is harvested could help to provide this connection and introduce the concept of sustainable utilisation.

Most African visitors have a high utilitarian approach to the environment and consider nature to be an available resource to be used by humans. Despite this utilitarian approach, the concept of sustainable use is not foreign to African cultures, or other cultures that have traditional methods of managing resources. However, urbanisation has led to an increasing disconnection between traditionally limited resource use and current more commercial uses. In the marine environment the problem is exacerbated by the fact that resources are not visible (underwater) and are usually considered to be inexhaustible.

The finite nature of marine resources, the importance of sustainable use, the vulnerability of the marine environment to human impact and the need for regulations to optimise human use of resources are all critical issues that can be addressed through creative exhibits. For example, one rural African belief is that spring rains bring mussels to the intertidal rocky shores. The consequence of this belief is that if the rains bring mussels, then humans can never overexploit the mussel stocks. This belief could be addressed through discussions with

the aid of props such as models of reproductively active male and female mussels, with an explanation of the mussel life-cycle. This is an African example; however similar examples of indigenous knowledge can be found amongst most cultures (Gosler et al., 2013). Implicit in these suggestions is the need for well trained staff, representative of the different cultures that make up the visitor profile. This approach may encourage a more ecological worldview by building an understanding of the origin of and finite nature of natural resources.

Encouraging spiritual engagement

There is an increasing recognition of the importance of a spiritual or internalised connection to nature in environmental learning (Vining et al., 2008). The endorsement of an internalised connection to nature, reflecting views such as '*My connection to nature and the environment is a part of my spirituality*' was high across all South African cultural groups. Aquarium visitors' internalised connection to nature significantly influenced their self-reported learning, either directly or indirectly via experiential or reflective engagement. There is, therefore, a need to explore the spiritual aspects of nature connectedness during a visit and to use such insights in designing interpretive experiences.

Setting components that have been found to enhance spiritual experiences include *being in nature*, *being in a different environment* and *place processes* (Heintzman, 2009), each of which will be discussed below. Although natural areas are most commonly associated with spiritual experiences, it is possible to recreate components of the natural environment in an aquarium to help visitors feel that they are 'in nature'. The use of a glass tunnel through which the visitor walks, surrounded by fish on three sides, is an example of an 'immersion' experience. In nature people engage all of their senses. It may be possible to enhance the connection between visitors and the marine environment through the inclusion of other senses in the range of activities available. Creatively using sound, touch, smell and even taste may enhance a more spiritual connection to nature. It is important to note that spirituality has a different meaning in different contexts. For some visitors a guided meditation in the aquarium or a 'Zen-like' conducted tour may support their feelings of connectedness to nature, while for others a less esoteric and more tactile approach may evoke similar feelings.

Across all cultural groups '*Being able to touch the animals in the touch pools*' and '*Talking to someone about the animals*' had the least impact on their perceived learning. The low ratings for these aspects of the experience are understandable as less than half of all visitors reported participation in a facilitated experience. Most visitors would, therefore, not have

touched an animal or interacted with a staff member. However, carefully crafted opportunities to touch selected marine animals with a focus on feeling and sensing rather than learning and seeing may enhance connections to nature. For example, an exhibit in which visitors place their hands into the water and wait for a shrimp to crawl on their fingers will encourage visitors to slow down, utilise other senses, as well as encourage respect for the animals by becoming a part of the animal's environment. Internationally, the touching of rays in shallow tanks has also been very popular.

The next component of a spiritual experience pertains to being in a different environment. As visitors enter the aquarium they are immersed in a 'new' world, far removed from their everyday lives. This feeling of immersion could be enhanced by ensuring that the entrance to the aquarium is as natural or sensory as possible, allowing visitors to feel that they are descending into the ocean.

As in many educational leisure settings, the current approach to interpretation in the uShaka Sea World aquarium is a factual, Western based scientific approach. In South Africa this attracts and connects primarily with White visitors. However, given the importance of connectedness to nature in environmental learning it may be beneficial to give all visitors an opportunity to develop their spiritual connections to nature. Helping visitors to feel a sense of awe and to appreciate the wonder of the environment, in specially selected areas and through appropriate interpretation could enhance a spiritual connection to nature. Amongst many societies elements of nature are considered to be sacred. Research may reveal such sacred places, animals or objects in the marine environment and these could form the basis of new interpretive elements. This may address the third component suggested to enhance a spiritual experience – place processes.

4.5.3 Overcoming barriers to participation
One of the many challenges facing educational leisure settings is to attract a wider range of visitors (American Association of Museums, 2008). To achieve this, ways to overcome barriers to participation need to be explored.

Catering for different life experiences
As communities become increasingly diverse, educational leisure settings will need to improve their capacity to attract and cater for visitors with a range of life experiences that may not include a familiarity with the leisure setting. Previous research suggests that many prospective African visitors have a limited understanding of what they can do at wildlife

based educational leisure settings (Butler & Richardson, 2014). It was noted in the current study that the ocean is a novel environment for many and that exploring it is motivating. The challenge is how to attract new visitors to a destination with which they are unfamiliar. Therefore, how the facility is marketed is of particular importance in the South African context where visitors' expectations are largely driven by advertising. Internationally one of the predictors of visitation to an educational leisure setting is whether the individual visited the facility as a child (Falk et al., 1998; Klenosky & Saunders, 2008). This is a problem in South Africa where many African and to a lesser extent Indian people are unlikely to have had the opportunity to visit an aquarium or a zoo 20 years ago. The high percentage, particularly of African visitors, on their first visit confirms this. Based on this finding it is suggested that facilities in South Africa should explore more creative ways to attract African visitors, both school children and adults. This could include hosting specially tailored events that appeal to visitor groups who are less familiar with an aquarium or a zoo. These events should introduce the facility and encourage (through special discounts) the participants to return for a full visit with their families.

Once they have been encouraged to visit an educational leisure setting, 'novice' visitors, who have no prior experience of the facility need support to ensure that their visit is as enjoyable and meaningful as possible. For those visitors for whom an aquarium is an unfamiliar environment, particularly African visitors, interpretation (verbal and written) that explains what to expect and how to plan their day is necessary near the start of the visit. As increasingly diverse communities visit previously 'unvisited' facilities including museums, zoos, botanical gardens, nature reserves, etc., a clear introduction to what they are about to experience will help to prepare visitors for the learning possibilities of their experience and enhance their enjoyment.

Life experiences may also influence visitors' familiarity with and recall of the information provided by an educational leisure setting. In this study different cultural groups differed in their recall of messages. Pollution was seen by White visitors as an important conservation issue, however this was not the case for African and Indian visitors. It is possible to show visitors the direct impact of pollution on wild animals through exhibits and discussions on stranded animals. Many marine animals strand because of pollution; many of these animals are successfully rehabilitated through the efforts of animal care staff. Creative exhibits could highlight success stories, while showing the failures. These exhibits may show visitors the

impact of pollution in a positive, non-confrontational manner. Message recall about sustainable seafood also differed between cultural groups, suggesting a need to improve the current approach to this message. If not all cultural groups eat fish in a restaurant, informing them about how to order fish in a restaurant will be meaningless.

Overcoming financial barriers

The ranges of socio-economic levels in most communities suggest that financial barriers may hinder visitation to educational leisure settings that charge a high entry fee. Although most municipal or government funded zoos and museums are free or charge a nominal entry fee, many educational leisure settings, especially aquariums, are relatively expensive destinations. The profile of visitors in this study, namely well-educated, employed and relatively affluent, suggests that large segments of the population are being missed as they cannot afford to visit these facilities. This is supported by the fact that African people from KZN are largely under-represented in the visitor profile of uShaka Sea World. It is, therefore, important to make the facility more accessible to local African residents. It is suggested that special offers for selected local residents (based on residential address) be used to attract local visitors. Special offers for municipal workers, emergency service workers, police, etc. could also help to attract local residents. Educational Outreach Programmes, which take specimens and lessons into areas populated by people who do not traditionally visit the facility, could be initiated or expanded. In the case of uShaka Sea World, the current Outreach Programme, which has, since 1993, introduced African and Indian children to marine life, should be expanded.

6.6   Limitations of the study

Empirical research is subject to limitations that may influence the results and associated interpretation. The findings of this study should, therefore, be evaluated in light of these limitations. The limitations of the study are discussed below.

6.6.1 Research design

- Each method of data collection has strong and weak points (Hein 1998 reviews a range of these) and it is clear that no data collection method will provide all of the answers. The focus on quantitative data in this research was a limitation, however, given the nature of the study it was considered appropriate.

- Self-report data has been criticised because of its subjective nature and consequent susceptibility to various forms of bias, both on the part of the research participant and the researcher (Marino et al., 2010; Smith et al., 2008). However, it is still regularly

used to study outcomes with cognitive, affective and attitudinal components (Bell et al., 2009). While the use of rigorous quantitative data analysis helped to uncover discrepancies in the data, it is important to always interpret self-report data with caution.

- While Likert-type questions were primarily used in this study, it is acknowledged that a variety of question formats exist and that the use of different formats may increase the sensitivity of the instrument to detect subtle differences between individuals and cultural groups (Dolnicar & Grün, 2009; Reid, 2006).

6.6.2 Sampling issues

- The fact that someone is questioning a visitor may alter their experience. How and when the questionnaire is administered can also influence responses, especially with post-visit questionnaires that are completed rapidly before the visitor exits the facility. The length of the questionnaire may have influenced the responses of visitors to questions near the end of the questionnaire. While every effort was made to avoid these problems, it is acknowledged that they may have influenced the data.

- The study was conducted at a single environmental educational leisure setting in South Africa. The results, therefore, cannot be extrapolated without care to other facilities with different visitor profiles. Despite this limitation, the principles suggested in this study may contribute to improved visitor learning at other facilities in and beyond South Africa.

- As in any study of this nature, the sample can only include people who are prepared to answer the questionnaire. Those who refused to respond may have different characteristics or experiences compared to those who agreed to respond. Respondents may be visitors who were predisposed to 'learning', or those who simply wanted the 'free' gift. Education level may be a factor that influences a visitor's response to a questionnaire. Visitors with a higher education may be more likely to agree to complete a questionnaire, therefore, the sample may over-represent those with a higher education level. Overall, more repeat visitors responded to the questionnaire than first time visitors and, thus, the pre-visit environmental orientation and behaviour may have been influenced by previous visits. The results of this study should, therefore, be carefully used when generalising to all visitors.

- Data collection was conducted out of peak visitor season because of practical constraints. There may be seasonal variations in the types of visitors who visit in and out of season, although the demographic profile of visitors during the sampling period conformed to the profile during peak season.

6.6.3 Data analysis

- Despite the attention that was paid to cultural equivalence and the use of standardisation to address culture specific response styles, these remain contentious issues. In any study that involves comparisons between cultures, the criteria for comparison themselves are subject to cultural interpretations (Hein, 1998). Explaining cultural differences in environmental learning is, therefore, complex and difficult, and it is important not to overgeneralise. Although the vast diversity of the people of Africa is acknowledged, this study does provide one of the first insights into some of the differences and similarities between visitors from different cultural backgrounds with respect to environmental learning in an African educational leisure setting.

6.7   Recommendations for future research

While this research has answered many questions about the environmental learning of visitors from different cultural backgrounds in South Africa, it has also exposed a number of areas that require additional research.

6.7.1 At uShaka Sea World

For uShaka Sea World the following areas of research are suggested:

- A qualitative study, that includes interviews and other more in-depth techniques for data collection with visitors from the three cultural groups, would augment this quantitative study and provide a better understanding of some of the inconsistencies in the results.

- Research on the impact of a visit to uShaka Sea World on the longer term environmental knowledge, attitudes and environmental behaviours of visitors is needed. While this study revealed high levels of behavioural intentions across all cultural groups, whether or not this translates into more environmentally responsible behaviour at home needs to be assessed.

- Further research is needed to understand the relationship between visitors' connectedness to nature, their emotional responses to marine animals and

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environmental learning. In particular, research that addresses the value of marine mammals in effective conservation communication is recommended.

- Research to understand the use of message recall as a measure of conservation learning is also needed. In particular, it is necessary to establish if the responses reflect problems in understanding the question, cultural or individual differences in response styles or real issues of learning.

- It is also recommended that research that investigates barriers to visit amongst local White and African visitors be undertaken.

- In addition, research that more fully explores the implications of visitation variables, including both group composition and frequency of visit may help to further reveal subtle difference in visitor learning within cultural groups.

- The role of formal education in visitors' prior knowledge and subsequent learning is another area of research that warrants further attention.

- In the context of message recall, a better understanding of visitors' pre-visit familiarity with the various conservation messages may help to reveal the true extent to which the experience introduces new behaviours or merely reinforces existing knowledge.

6.7.2 In South Africa

The following areas for future research are suggested for educational leisure settings in South Africa:

- While many of the outcomes of this study are relevant to other educational leisure settings, it is recommended that the research be replicated at other facilities. This would provide a better understanding of visitors to different types of facilities and contribute towards a deeper understanding of free-choice learning amongst South Africans.

- This research revealed interesting information on the attitudes of respondents to the environment. In particular, the relationship with nature expressed by African visitors warrants further investigation. It is suggested that either the full Nature Relatedness Scale, or the revised NR-6 scale (Nisbet & Zelenski, 2013) be used instead of the

New Ecological Paradigm and the INS scales. This recommendation is made because the results suggest that connectedness to nature measures tap underlying dimensions that predict environmental learning more effectively. In addition, the nature relatedness scale appeared to be less prone to the cultural biases addressed in this study. It is recommended that, in future, questionnaires are shorter, and that the selection of the scales is informed by the need to tap an emotional connection to nature.

- Further research to evaluate cultural equivalence of meaning in question responses is needed in the South African context, as is further research on the prevalence and impact of CSRS on data collected from different South African cultures.

6.7.3 Internationally

- As visitors to educational leisure settings diversify culturally there is a need for future research to take cognisance of the implications of cultural diversity on both research methodology and data analysis. Research designed to capture diversity is needed, whilst maintaining both reliability and validity, as is research that builds an understanding of the influence and prevalence of CSRS in visitor studies.

- The important influence of emotional connections to nature on environmental behaviour has been noted in many studies (Kals, Schumacher, & Montada, 1999; Perkins, 2010; Smith, 2008). Although research appears to indicate that the affective domain drives environmental behaviour more effectively than the cognitive domain, there is still much to be learnt about how to harness emotions effectively in environmental learning.

- Research into the role of animal encounters in visitor learning requires further attention. While some research suggests that touching an animal will contribute to positive visitor outcomes (Ardoin et al., 2015), the present study questions this finding. It would be valuable to compare the learning of visitors who do and those who do not experience an encounter with an animal, and then to compare if different types of animals facilitate different learning experiences.

- Finally, geographical gaps in visitor research should be addressed by encouraging research in less developed regions of the world. Much of the biodiversity of the world is found in these regions, which also have considerable potential for growth in

ecotourism. The potential for visitor research to contribute to the development of wise and sustainable ecotourism is enormous.

- This research has revealed a number of inadequacies in the current literature. In current theories of free-choice learning, the issue of culture is only briefly addressed. It is suggested that there is a need to pay greater attention to culture, as this research has revealed the complex and sometimes subtle influence of culture on learning. As the influence of culture cannot be easily extricated from the influence of other demographic and psychographic variables it is suggested that future theorists integrate culture into models of learning more explicitly.

6.8   Conclusion

Situated in South Africa, at a confluence of European, Indian and African cultures, this study provides valuable insights into cultural group variations in South African visitor characteristics, experiences and learning. In addition to filling an important geographical gap in visitor research, the study contributes methodologically, theoretically and practically to visitor research in general.

Theoretical contributions include new insights into the complex role of nature connectedness in environmental learning and the communication of conservation messages. Through building a better understanding of the influence of cultural diversity on environmental learning in educational leisure settings, the research addresses the need for a more inclusive approach to visitor studies and interpretation (Dawson & Jensen, 2011; Rowe & Nickels, 2011).

Methodological contributions include the refinement of previously published instruments to improve construct equivalence across cultural groups and the application, within visitor studies, of techniques to manage the challenges of culture specific response bias. The research contributes towards the development of greater 'cultural competence' in evaluation, a need that was articulated by the American Evaluation Association (2011). The results of this study also provide some insights into the cultural response styles of South African respondents. This information can be used to inform future studies and, thereby, ensure that conclusions are based on real differences between cultures and are not simply a reflection of culture-specific response styles.

Practical implications of the findings for the design of culturally responsive environmental learning experiences are discussed. Given the increasingly diverse nature of visitors to educational leisure settings worldwide, these suggestions will assist in the design of more culturally engaging and effective exhibits and activities that enhance environmental learning amongst a diverse visitor group.

Globalisation is creating a world in which diversity *within* countries is becoming as normal as diversity *between* countries. An acknowledgement of this cultural diversity is the first step to ensuring that social research is undertaken sensitively, to answer questions wisely, and to build harmony through a better understanding of both differences and similarities between cultures. This research contributes to our understanding of learning in educational leisure settings amongst different cultures within a single country. However, it can be applied to educational leisure settings around the world. The results contribute to the design of educational leisure experiences that can more effectively reach visitors of all cultures. If we can reach visitors of all cultures more effectively, we have a better chance of encouraging all to care for our environment and, ultimately, this will help us all to learn to survive on planet earth.

I started this research because I wanted to better understand visitors to educational leisure settings in South Africa and to design more effective environmental learning experiences. The research journey has helped me to appreciate some of the differences between the people of South Africa and has sensitised me to the many similarities that we all share. My understanding of the influence of culture on visitor learning has deepened. In fact, taking off my 'Western lenses' and viewing our facility through the eyes of people from other cultures has helped me to grow personally and professionally. If this study encourages communicators in other educational leisure settings to explore the implications of cultural diversity on learning amongst their visitors and, through doing so, this enables them to more effectively reach all of their visitors; I feel that the time spent on this research has been worthwhile.

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1.   Getting to know you:

Your age: ❍ < 20   ❍ 20 – 29   ❍ 30 – 39   ❍ 40 – 49   ❍ 50 – 59   ❍ 60 +

Your gender: ❍ Male   ❍ Female   **How many children do you have? (Grown up or child)____**

How often do you visit uShaka Sea World: ❍ This is the first time   ❍ Once or twice per year

❍ Less than once per year ❍ More than twice a year

Who is with you on this visit: ❍ Came alone   ❍ With a partner   ❍ With friends

❍ With my family   Children Number_____   Adults Number _____

Where do you normally live? ❍ In a major city   ❍ In a town   ❍ In a rural area

Province: _____

What was the main language you spoke while you were growing up?

❍ English   ❍ Zulu ❍ Afrikaans   ❍ Xhosa   ❍ Sotho   ❍ Other

Where did you grow up? ❍ In a major city   ❍ In a town   ❍ In a rural area

Province: _____

Your home language: ❍ English   ❍ Zulu ❍ Afrikaans   ❍ Xhosa   ❍ Sotho   ❍ Other

Education, so far: ❍ Grade 10 / STD 8   ❍ Matric   ❍ Diploma   ❍ Degree ❍ Higher degree

❍ Other   Specify: _____

Your current occupation: ◯ Employed   ◯ Self Employed ◯ Pensioner

◯ Housewife   ◯ Unemployed   ◯ Student   ◯ Other

2.   **Please rate how well the following statements describe you.** (Please circle one number in each row)

	doesn't describe me at all				describes me perfectly
I enjoy spending leisure (free) time in nature	1	2	3	4	5
I often think about whether my actions could harm the environment	1	2	3	4	5
I am interested in learning about environmental issues	1	2	3	4	5
I actively search for information about wildlife conservation	1	2	3	4	5
I enjoy watching TV programmes about wildlife	1	2	3	4	5
I would like to be more involved in conservation activities	1	2	3	4	5

3.   **In the past, how often have you done the following?** (Please circle one number in each row)

	never	rarely	some times	often	always
Saved water in your home or garden	1	2	3	4	5
Recycled bottles, cans, paper	1	2	3	4	5
Picked up other people's litter	1	2	3	4	5
Used 'green' non-plastic shopping bags	1	2	3	4	5
Talked to others about the importance of the environment	1	2	3	4	5
Bought products that are environmentally friendly	1	2	3	4	5
Looked for information about the environment on TV, in print or on the internet	1	2	3	4	5
Saved electricity at home	1	2	3	4	5
Taken part in a beach / river or nature area clean-up	1	2	3	4	5
Donated money to a nature or conservation organisation	1	2	3	4	5
Done volunteer work for a group that helps the environment	1	2	3	4	5

If you eat seafood, chosen seafood because it is sustainable	1	2	3	4	5
Encourage other to recycle	1	2	3	4	5
Plant indigenous plants	1	2	3	4	5

4.   How well do these three statements describe your feelings about the environment?

	strongly disagree	disagree a little	neither agree nor disagree	agree a little	strongly agree
My individual actions can make a difference to the environment	1	2	3	4	5
I can influence decisions now, that will help protect the environment in the future	1	2	3	4	5
I am only one person, I can't make a difference to the environment	1	2	3	4	5

5.   What do you hope to get out of your visit today? How important to you are the following possible outcomes of the visit? Please circle one number for each item.

	Not important		Moderately important			Very important	
To discover new things	1	2	3	4	5	6	7
To be pleasantly occupied	1	2	3	4	5	6	7
To build friendships with new people	1	2	3	4	5	6	7
To recover from the stress and tension of everyday life	1	2	3	4	5	6	7
To be better informed	1	2	3	4	5	6	7
To expand my interests	1	2	3	4	5	6	7
To feel happy and satisfied	1	2	3	4	5	6	7
To interact with others	1	2	3	4	5	6	7
To be mentally stimulated	1	2	3	4	5	6	7
To find some peace and tranquillity	1	2	3	4	5	6	7
To get away from the responsibilities of everyday life	1	2	3	4	5	6	7
To have fun	1	2	3	4	5	6	7

To relax physically	1	2	3	4	5	6	7
To relax mentally	1	2	3	4	5	6	7
To meet new people	1	2	3	4	5	6	7
To be entertained	1	2	3	4	5	6	7
To spend quality time with family and friends	1	2	3	4	5	6	7
To explore the unknown	1	2	3	4	5	6	7
To enjoy myself	1	2	3	4	5	6	7
To develop close friendships	1	2	3	4	5	6	7

6.   To what extent do you agree or disagree with the following statements? (Please circle one number from each row)

	strongly disagree	mildly disagree	unsure	mildly agree	strongly agree
We are approaching the limit of the number of people the earth can support	1	2	3	4	5
Humans have the right to modify the natural environment to suit their needs	1	2	3	4	5
When humans interfere with nature it often produces disastrous consequences	1	2	3	4	5
Human ingenuity (cleverness) will ensure that we do NOT make the earth unliveable	1	2	3	4	5
Humans are severely abusing the environment	1	2	3	4	5
The earth has plenty of natural resources if we just learn how to develop them	1	2	3	4	5
Plants and animals have as much right as humans to exist	1	2	3	4	5
The balance of nature is strong enough to cope with the impacts of modern industrial nations	1	2	3	4	5
Despite our special abilities humans are still subject to the laws of nature	1	2	3	4	5
The so-called 'ecological crisis' facing humankind has been greatly exaggerated	1	2	3	4	5
The earth is like a spaceship (ship) with very limited room and resources	1	2	3	4	5
Humans were meant to rule over the rest of nature	1	2	3	4	5

The balance of nature is very delicate and easily upset	1	2	3	4	5
Humans will eventually learn enough about how nature works to be able to control it	1	2	3	4	5
If things continue on their present course, we will soon experience a major ecological catastrophe / disaster	1	2	3	4	5

7. Please circle the picture below which best describes your relationship with the natural environment. How interconnected are you with nature?

Completely separate   Very connected

8.   To what extent do you agree or disagree with each of the following? (Please circle one number in each row). There are no right or wrong answers.

	strongly disagree	disagree	neither	agree	strongly agree
My connection to nature and the environment is a part of my spirituality	1	2	3	4	5
I enjoy digging in the ground and getting dirt on my hands	1	2	3	4	5
I take notice of wildlife wherever I am	1	2	3	4	5
My relationship to nature is an important part of who I am	1	2	3	4	5
I am not separate from nature, but a part of nature	1	2	3	4	5
The thought of being deep in the bush, away from civilization, is frightening	1	2	3	4	5
Even in the middle of the city, I notice nature around me	1	2	3	4	5
I feel very connected to all living things and the earth	1	2	3	4	5
My ideal holiday spot would be a remote, wilderness area	1	2	3	4	5
I always think about how my actions affect the environment	1	2	3	4	5
I enjoy being outdoors, even in bad weather	1	2	3	4	5

	strongly disagree	disagree	neither	agree	strongly agree
I think a lot about the suffering of animals	1	2	3	4	5
I am very aware of environmental issues	1	2	3	4	5
I don't often go out in nature	1	2	3	4	5
My feelings about nature do not affect how I live my life	1	2	3	4	5

Thank-you for your help so far. Please enjoy your visit before you complete the next section

PLEASE ANSWER THESE QUESTIONS AT THE END OF YOUR VISIT

9. **Did you see or participate in any of the following activities at uShaka Sea World today? Please tick all that you did.**

Daily Shows and Presentations	Other Activities	Island Activities
◯ Dolphin Show	◯ Turtle Rehabilitation Area	◯ Snorkelled in the Snorkel Lagoon
◯ Seal Show	◯ Microscope	◯ Did the Ocean Walker
◯ Penguin Feed	◯ Touch Tanks Inside Aquarium	◯ Did the Shark Cage Dive
◯ Shark Feed	◯ Touch Tanks Outside Aquarium	◯ Touched a Dolphin or Seal
◯ Other Fish Feed	◯ Penguin Exhibit	◯ Touched a Penguin
	◯ Picked up a SASSI Guide	

10. **To what extent do you agree or disagree with the following?** (Please circle 1 number in each row)

	strongly disagree ☹	disagree	neither 😐	agree	strongly agree 🙂
I felt an emotional connection with the animals I saw	1	2	3	4	5
I found myself thinking about new ideas about animals and their environments	1	2	3	4	5
The staff answered my questions	1	2	3	4	5
I discussed new information with my companions	1	2	3	4	5
I experienced something surprising or unexpected	1	2	3	4	5
Something that I saw or heard made me feel sad or angry about environmental problems	1	2	3	4	5

	strongly disagree	disagree	neither	agree	strongly agree
The experience was engaging / appealing	1	2	3	4	5
It was exciting to see live marine animals	1	2	3	4	5
I was able to get a good view of the marine animals	1	2	3	4	5
There were plenty of activities to do	1	2	3	4	5
I felt a sense of awe or amazement	1	2	3	4	5
I had an enjoyable experience	1	2	3	4	5

11.   What are the three main conservation messages that you remember from your visit today?

12.   To what extent do you agree or disagree with the following statements about your experience at uShaka Sea World?

	strongly disagree ☹	disagree	neither 😐	agree	strongly agree 🙂
The experience has made me more interested in marine animals	1	2	3	4	5
The experience has made conservation issues more important to me	1	2	3	4	5
Some of my beliefs have changed as a result of my visit	1	2	3	4	5
I feel more strongly about protecting marine life as a result of my visit	1	2	3	4	5
My visit has made me more concerned about the well-being of wildlife in general	1	2	3	4	5
My visit has made me more concerned about the well-being of marine animals	1	2	3	4	5
I learnt some new facts or information during my visit	1	2	3	4	5
I have a better understanding of conservation issues because of my visit	1	2	3	4	5

13. **To what extent (if any) did each of the following help you to become more interested in or concerned about marine life?**

	Not applicable	not at all		to some extent		a great deal
Just seeing the marine animals		1	2	3	4	5
Being able to get close to the animals		1	2	3	4	5
Being able to touch the animals in the touch pools		1	2	3	4	5
Reading information about marine life		1	2	3	4	5
Finding out what I can do to help marine animals		1	2	3	4	5
Talking to someone about the animals		1	2	3	4	5
Seeing or hearing something that made me feel emotional		1	2	3	4	5
Attending the dolphin show		1	2	3	4	5
Listening to a fish or penguin feed commentary		1	2	3	4	5
Attending the seal show		1	2	3	4	5
Other(please specify)						

14. **For some people, a visit to uShaka Sea World makes them want to change some of their everyday behaviours. Please indicate whether you think you will do any of the following things more often <u>as a result of your visit here today</u>. Please use the high numbers for those behaviours you plan to change as a result of your visit, and the low numbers for behaviours that you are less likely to change.**

	Definitely will not change	Will probably not change	May do more often	Will probably do more often	Will definitely do more often
Save water in your home or garden	1	2	3	4	5
Recycle bottles, cans, paper	1	2	3	4	5
Pick up other people's litter	1	2	3	4	5
Use 'green' non-plastic shopping bags	1	2	3	4	5
Talk to others about the importance of the environment	1	2	3	4	5
Buy products that are environmentally friendly	1	2	3	4	5

	1	2	3	4	5
If you eat seafood, choose the seafood based on the Sustainable Seafood guide	1	2	3	4	5
Save electricity at home	1	2	3	4	5
Encourage others to recycle	1	2	3	4	5
Look for information about the environment on TV, in print or on the internet	1	2	3	4	5
Respect the environment	1	2	3	4	5
Plant indigenous plants	1	2	3	4	5
Take part in beach / river clean-ups	1	2	3	4	5
Volunteer to help a group that helps the environment	1	2	3	4	5
Other (please specify)					

Thank you for sharing your opinions with us. To collect your gift, please return your completed survey to the research assistant who gave it to you. By completing this survey you are helping us to improve the uShaka Sea World experience, so that our visitors have fun, and learn more about how to care for the oceans. Thank-you for helping our oceans!!

ADMINISTRATION	ADMINISTRATION
Date:	Arrival Time:
Name:	Departure Time:
Number:	Group:

APPENDIX 2 Adaptations to pre-existing scales for the South African context

Variable	Scale	Changes
Independent Psychographic Constructs		
2.Connectedness to nature	Nature Relatedness Scale (Nisbet et al., 2009)	Nature Perspective excluded and minor word changes for South African context (*woods* replaced with *bush*, *unpleasant* replaced with *bad*)
4.Environmental interest and engagement in environmental behaviour	Ballantyne et al., 2011	Added 4 items: '*Encourage others to recycle*'; '*If you eat seafood, chosen seafood because it is sustainable*'; '*Plant indigenous plants*'; '*I would like to be more involved in conservation activities*' Excluded 1 item: '*Carpool (drive a fuel efficient car)*'
Mediating Variables		
Experiential and reflective aspects of the experience	Ballantyne et al., 2007; 2011	Minor word changes for South African context (replaced *reflecting* with *thinking*, replaced *life* with *animals*, *see* replaced with *do*)
Dependent Variables		
Self-reported learning outcomes	Ballantyne et al., 2011	Minor word changes for South African context (replaced *life* with *animals*, replaced *meaningful* with *important*)
Behavioural intentions	Ballantyne et al., 2011	As 4 above with '*Donate money*' removed

uSHAKA SEA WORLD VISITOR SURVEY

We would like to get to know our visitors – so that we can make your experience even better.

Dear Visitor,

I am conducting research into visitor learning at uShaka Sea World. This research will help us to improve the uShaka Sea World experience, so that visitors have fun, and learn more about how to care for our environment.

I would be very grateful if you would be willing to spend some time with me to honestly answer a few questions about your visit today. The questions are quite simple and most do not require written answers, they just need you to tick boxes. The questionnaire is in two sections and it will take about 10 minutes to complete each section. If you would like me to stay beside you while you answer the questions, I am happy to assist you, now and at the end of your visit. If not, please return the completed questionnaire to me at the end of your visit.

Your participation is entirely voluntary. If you do not want to continue answering the questions at any stage, you are free to stop and return the uncompleted questionnaire to me. Completing this survey is an indication of your consent to be a respondent in this study.

The questionnaire is completely confidential and you will not be asked for your name. All responses will be strictly confidential and will not be used by anyone else.

A summary of the research finding will be posted on the uShaka Sea World website so that everyone can access the results.

To thank-you for completing the survey, we will give you a special uShaka Sea World souvenir book.

Thank-you for agreeing to be a part of this exciting research project. Your assistance will help us to develop better experiences for our visitors.

If you have any questions about this research please contact me at the following address: Mrs Judy Mann, uShaka Sea World, jmann@seaworld.org.za

This research has been approved by the School Ethics Officer Associate Professor Ian Patterson at the University of Queensland, Brisbane, Australia. If you have any concerns about your participation in the study please contact ian.patterson@uq.edu.au

APPENDIX 4 Recoding of demographic variables

The following consolidation was undertaken during recoding:

Original categories	Final Categories
Province of Current or Childhood Residence **12 Options**	**KwaZulu-Natal**; **Gauteng**; **Other South African provinces**; **Other Southern African countries**; and **International** (either born in South Africa and currently living overseas or currently living in South Africa but born elsewhere)
Language **English, Afrikaans, Zulu, Xhosa, Sotho, Other**	**English**, **Afrikaans**, **African languages** and **Other**
Education **Grade 10 / STD 8, Matric, Diploma, Degree, Higher degree**	**School** (10 – 12 years formal education), **Diploma** (13 – 15 years formal education), and **Degree** (15 + years formal education). In order to separate those visitor still studying from those who have completed their schooling a new category (**Still Studying**) was created using information from the Occupation (Student) question.
Occupation **Employed, Self-employed, Pensioner, Housewife, Unemployed, Student, Other**	Employed and Self Employed were collated into one variable **Employed**; Housewife and Pensioner (not economically active i.e. no salary but some form of income) were recoded into one group (**Pensioner/Housewife**); while **Unemployed** (not economically active with no income) remained a separate category.
Conservation Messages	If one conservation message was noted the value was 1, two messages were scored as a 2 and three messages as a 3. If no message was noted it scored a 0.

APPENDIX 5 Frequency distributions for the New Ecological Paradigm Scale Items

Percentage agreement with each item *SA – Strongly Agree, MA – Mildly Agree, U- Unsure, MD – Mildly Disagree, SD – Strongly Disagree, N = number of responses** Agreement with the eight odd-numbered items (Highlighted) and disagreement with the seven even-numbered items indicate pro-ecological responses.

	*SD	MD	U	MA	SA	N
1. We are approaching the limit of the number of people the earth can support**(Limits)	5.5	3.2	23.6	31.3	36.5	713
2. Humans have the right to modify the natural environment to suit their needs (Anti-anthro)	28.1	20.5	14.8	18.9	17.7	708
3. When humans interfere with nature it often produces disastrous consequences (Balance)	6.2	4.9	8.1	22.6	58.2	713
4. Human ingenuity (cleverness) will ensure that we do NOT make the earth unliveable (Anti-exempt)	9.1	10.8	27	27.9	25.1	712
5. Humans are severely abusing the environment (Eco-crisis)	4.2	3.2	7.2	30.5	55	696
6. The earth has plenty of natural resources if we just learn how to develop them (Limits)	5.4	5.1	11.3	29	49.3	708
7. Plants and animals have as much right as humans to exist (Anti-Anthro)	1.4	2.1	6.1	15.4	75	707
8. The balance of nature is strong enough to cope with the impacts of modern industrial nations (Balance)	25.9	19.8	16.8	16.1	21.3	713
9. Despite our special abilities humans are still subject to the laws of nature (Anti-exempt)	1.8	2.4	12.4	30.1	53.4	712
10. The so-called 'ecological crisis' facing humankind has been greatly exaggerated (Eco-crisis)	31.2	15.5	22.1	16.1	15	714
11. The earth is like a spaceship (ship) with very limited room and resources (Limits)	5.9	8.6	17.3	31.6	36.5	709
12. Humans were meant to rule over the rest of nature (Anti-anthro)	30.4	12.1	14.3	18.9	24.3	708
13. The balance of nature is very delicate and easily upset (Balance)	3.1	5.2	12.7	25.4	53.5	706
14. Humans will eventually learn enough about how nature works to be able to control it (Anti-exempt)	11.9	11.8	26.2	25.8	24.4	714
15. If things continue on their present course, we will soon experience a major ecological catastrophe / disaster (Eco-crisis)	4.2	3.3	11.2	24.1	57.2	706

APPENDIX 6 Fit indices for path analysis

Fit indices, which indicate how well the model fits the data from the correlation matrices, are important (Stage et al., 2004). For a good model fit the chi-square statistics should not be significant, however, even a well-fitting reduced model will differ significantly from the full model for sufficiently large sample sizes (Stage et al., 2004; Wuensch, 2013). Marsh and Hocevar (1985) suggest that a χ^2/df ratio of between 2 and 5 may suggest a reasonable fit, with the smaller the figure the better. It is recommended that at least two goodness of fit indices be used (Stage et al., 2004). For the Normed Fit Index (NFI) a value between .90 and .95 is acceptable. Hu and Bentler (1999) suggest that for the comparative fit index (CFI) and the Tucker Lewis Index (TLI) values above 0.95 suggest a good fit (The closer to 1 the better). For the root mean square error approximation (RMSEA) a value less than 0.06 is recommended, although <0.08 is acceptable (Hu & Bentler, 1999). Although these 'rules of thumb' have been used extensively, more recent work has noted that the 'rules' may be overly strict and may result in Type 1 errors (incorrect rejection of an acceptable model) (Marsh, Hau, & Wen, 2004), while CFI and TLI have been found to worsen with increasing numbers of variables in a model (Kenny & McCoach, 2009). According to Kenny and McCoach (2009) theoretically interesting and complex models should not be discounted simply because the goodness-of-fit indices do not meet current specifications.