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Developing and evaluating the impact of an interpretive booklet on local and international visitors' conservation learning at Sepilok Orangutan Rehabilitation Centre

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Abstract

In recent years, global urbanisation has increasingly segregated people from the natural environment. The effects of this urbanisation have also impacted on biodiversity in every imaginable way possible. Indeed, meeting the rising demands of the human population has led to depleted forest resources and habitat loss for both wildlife and plant species. The rate of the global biodiversity loss is now at a critical level. Despite various efforts from conservationists, global support is not yet aligned with biodiversity preservation. One particular reason for this is failing to convey messages on the importance and significance of biodiversity to the masses of people (Miller, 2005).

Wildlife tourism is seen as one of the avenues that can educate and prompt people to undertake pro-environmental actions. These types of wildlife experiences have been shown to prompt positive changes in visitors' conservation learning. Numerous studies have shown that these changes are a result of the environmental interpretation received during the experience. However there are limited studies that have tested the effectiveness of interpretive designs. Systematic evaluations of the effectiveness of interpretation in influencing visitors' conservation learning are scarce within the current literature; with the majority of extant studies framed in a Western context. Limited research into interpretive materials has been carried out in wildlife settings in Asian countries, particularly those with existing habitats that are home to a large number of threatened species such as the orangutans. Further, there have been few discussions about the differences in people's knowledge about orangutans and beliefs about issues surrounding conservation of the orangutan species, particularly in relation to the support for sustainable palm oil market.

To address these issues, this study's main aim is to explore the impact of an orangutan wildlife experience and interpretation on local and international visitors' knowledge, attitudes, conservation intentions, and behaviours (i.e., conservation learning outcomes). There were four specific aims of this study. The first specific aim was to explore local and international visitors' knowledge about orangutans and existing threats to habitat loss, and beliefs about conservation behaviours linked to orangutan conservation. The second aim was to develop an interpretive intervention that builds on visitors' knowledge and beliefs about orangutans and orangutan conservation, addresses their misconceptions, and promotes behaviours that support orangutan conservation. The third specific aim was to assess the impact of the belief-based approach to interpretation on the

conservation learning outcomes of local and international visitors'. The final aim was to explore the implications of the research findings for the design of visitor interpretation to support orangutan conservation.

To achieve these aims, this study was conducted in two stages. In the first stage, an interpretive booklet was designed which was based on local and international visitors' current conservation knowledge about orangutans and threats to habitat loss, and salient beliefs pertaining to behaviours supporting orangutan conservation. The design of the interpretive booklet was based on a persuasive communication model, the Elaboration Likelihood Model (ELM). In the second stage, an experimental design was conducted to evaluate the impact of the interpretation on post-visit conservation knowledge, attitudes, behaviours and intentions (i.e., conservation learning variables).

The findings of this study found that designing interpretation based on visitors' knowledge and salient beliefs, and combining persuasive cues had a positive impact on visitors' conservation learning outcomes. Compared with participants in the control group (without booklet), participants in the treatment group (with booklet) had significantly higher conservation knowledge scores about orangutans and orangutan conservation; higher positive attitudes in relation to supporting the welfare and conservation of orangutan habitats; higher positive intentions to carry out behaviours supporting sustainable palm oil products; and an increase in on-site conservation behaviour.

This study also found significant differences in levels of post-visit knowledge, attitudes and behavioural intentions scores between local and international participants who received the intervention. International visitors had a significantly higher level of knowledge, positive attitudes and conservation intentions compared with the locals. This was particularly evident in relation to issues surrounding supporting sustainable palm oil products. Findings suggested that the intervention reinforced international visitors' knowledge, attitudes and behavioural intentions pertaining to sustainable palm oil products. Although the intervention showed positive increases in all conservation learning outcomes for local participants, these increases were not as high as for the international visitors, other than for donating to organisations.

This study highlights the importance of assessing visitors' prior knowledge and salient beliefs in order to design effective interpretation to support the conservation of orangutans. This further provides a greater understanding of designing interpretive materials using theoretical approaches that potentially reinforce visitors learning for conservation in wildlife sites. Findings in this study also show that major variations existed between local and international visitors in relation to conservation learning surrounding

orangutan conservation. This led to eight recommendations for the design of 'best practice' visitor interpretation for environmental learning and orangutan conservation.

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

Bidin, S., & Hughes, K. (2016). "*Why are you asking me about palm oil and orangutans*?" *Understanding local and international visitors' knowledge of orangutan conservation*. Paper presented at the CAUTHE 2016: *The Changing Landscape of Tourism and Hospitality: The Impact of Emerging Markets and Emerging Destinations*. Sydney: Blue Mountains International Hotel Management School.

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None.

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Australian and New Zealand Standard Research Classifications (ANZSRC)

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CHAPTER ONE: INTRODUCTION

1.1   Introduction

"As the pace of life accelerates and time becomes commoditised, the rhythms of the human enterprise grow more and more distinct from those of the natural world" (Miller, 2005, p. 2).

In the past decades, people have become more urbanised and modernised. In the 1900s, an estimated 15-29% of people in the world lived in cities (Cohen, 2006; Spence, Annez, & Buckley, 2009); now, more than 50% reside in urban areas (Dye, 2008; UN, 2014). With the increase of urbanisation has come an increased gap between humans and nature (Dallimer, Irvine, Skinner et al., 2012; Maller, Townsend, Pryor et al., 2006; Miller, 2005; Turner, Nakamura, & Dinetti, 2004). People's need to escape city life and experience nature has become increasingly more common, with nature-based tourism such as wildlife tourism providing a popular avenue for people to experience nature and wildlife.

Demand for nature-based experiences that include wildlife is also increasing worldwide, with over 700 million tourists visiting zoos and aquariums annually (WAZA, 2014). In Australia, 67.5% of tourists communicated a desire to view animals during their visit (Fredline & Faulkner, 2001). Nature-based tourism activities that include wildlife have also increased in the USA; in 2007, almost 70 million people visited wildlife and natural environmental sites (Cordell, Betz, & Green, 2008). Recent estimates shows protected areas in the world (including natural parks and nature reserves) received around eight billion visits per year (Balmford, Green, Anderson, et al., 2015). The popularity of wildlife tourism as a way to experience the natural world can probably be attributed to its role in reducing stress and increasing individuals' well-being. Research has shown that the experience of viewing wildlife contributes positively to visitors' physiological state of mind by emotionally connecting them with animals and increasing the visitor's enjoyment (Ballantyne & Packer, 2005; Schanzel, Smith, & Scott, 2004; Tisdell & Wilson, 2005; Zeppel & Muloin, 2008). Apart from the individual psychological benefits gained from wildlife experiences, a close link appears to exist between visiting wildlife sites and positive outcomes in terms of wildlife conservation. Research predominantly done in Western settings has demonstrated the role of wildlife tourism in encouraging visitors to adopt pro-conservation behaviour (Ballantyne, Hughes, Lee et al., 2018; Ballantyne, Packer & Hughes, 2009; Cooper, Larson, Dayer et al., 2015). This

includes actions such as the willingness to pay more for wildlife conservation (Dimopoulos & Pantis, 2003; Wilson & Tisdell, 2003; Zander, Pang, Jinam et al., 2014), reporting negative actions towards wildlife (Wilson & Tisdell, 2003), as well as adopting new behaviours to protect wildlife (Ballantyne, Packer, & Bond, 2007; Ballantyne, Packer, & Falk, 2011; Tisdell & Wilson, 2005). The majority of studies into wildlife tourism experiences have suggested that the interpretive components of the experience (e.g., brochures, pamphlets, signs and tour guides) contributed to visitors' conservation learning, and facilitated positive changes in their conservation knowledge, attitudes and behaviours.

Although wildlife tourism experiences that include interpretation have been shown to guide visitor's conservation learning, research has mainly been conducted in Western wildlife tourism settings. Rarely they have been conducted in Asian countries. Studies are particularly rare in Malaysia and Indonesia, despite the fact that these two countries are listed as second and third on The International Union for Conservation of Nature's (IUCN) list of countries with the highest number of threatened (wildlife and plant) species[1] (IUCN, 2016). The highest numbers of threatened species are found in Ecuador (total of 2292), Malaysia (total of 1225), and Indonesia (total of 1202) (IUCN, 2016). Since the first red data book was published in the 1960s (Vié, Hilton-Taylor, Pollock et al., 2009), the list of threatened species, ranging from large mammals to small plants has increased and the situation has become critical. In 1995, Pimm, Russell, Gittleman et al. (1995) estimated that global biodiversity loss would be ten times worse in the future, and that the rate of current extinction is already 1000 times higher than normal. Recently it was stated that the world is currently undergoing its sixth mass extinction (Ceballos, Ehrlich, Barnosk et al., 2015; Ceballos, Ehrlich & Dirzo, 2017).

These estimations were supported by a number of studies in the past decades that suggest the rapid loss of biodiversity, which includes declines in key species such as amphibians and mammals (Butchart, Walpole, Collen et al., 2010; Cardillo, Mace, Jones et al., 2005; Collins & Storfer, 2003; Stuart, Chanson, Cox et al., 2004; Watson, Shanahan, Di Marco et al., 2016).

Despite this, current efforts to sustain or increase populations of threatened wildlife species still remain restricted and fleeting, as awareness of what is at stake has not been directly channelled to the general population (Bekoff, 2013; Cardelús & Middendorf, 2013; Miller, 2005; Saylan & Blumstein, 2011). While the specifics surrounding issues of biodiversity loss may be well understood among academics, this is not the case for the general population (Bord, O'Connor &

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[1] The International Union for Conservation of Nature (IUCN) provide a comprehensive list of IUCN Red List which lists species into nine groups ranging from extinct, threatened or lower risk species (IUCN, 2016). The list of threatened species includes plant and animal species that are vulnerable, endangered or critically endangered (IUCN, 2016).

Fisher, 2000; Christie, Hanley, Lewinsohn, et al., 2015; Lindemann-Matthies & Bose, 2008). Indeed, it has been pointed out that the general public does not have enough ecological literacy[2] to understand the role of humans in environmental conservation (Jordan, Singer, Vaughan et al., 2009). Jordan et al. (2009) stated:

> "The level of ecological literacy among the general population in the US and other countries is not known, although there is widespread concern that it is too low to enable effective social responses to current problems" (p.1).

This immediately raises concern, as information about the extent and depth of people's knowledge, awareness and understanding about ecology, and how these translates to individual behaviours to address global concerns such as conserving wildlife is needed. This information can be used to promote ecological literacy using various platforms particularly wildlife tourism where these experiences provides the chance for people to connect with animals and learn about wildlife conservation. Limited knowledge about visitors' conservation learning hampers collective efforts to build effective wildlife interpretation aimed at sustaining and protecting threatened species. This is more so when there are limited research that explores the current depth and extent of conservation learning in people living in areas that have the highest proportion of threatened species, as well as countries that have high level consumption of products. Wildlife tourism is one of the platforms to explore the current depth and extent of conservation learning as these settings are visited by a range of diverse people from various countries. Consequently, if outcomes of learning through wildlife experiences and interpretation can be maximised, wildlife tourism experiences can become an important catalyst for action to conserve threatened wildlife species, particularly critically endangered species such as the orangutans.

1.2   Problem statement

Orangutans are one of the threatened wildlife species that are estimated to become extinct before 2065 based on current threats to their habitat (Abram, Meijaard, Wells et al., 2015). It is estimated by 2025, the population of Bornean orangutans will be reduced to 47 000, a sharp decline since 1973 where there was an estimated 288 500 individuals (Ancrenaz, Gumal, Marshall et al., 2016). Conservation of orangutans is not only important to avoid extinction in the wild, but orangutans are important catalysts to conserve other wildlife or plant species sharing the same habitat (Jepson & Barua, 2015). This is especially important as orangutans only occur naturally in

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[2] Orr (1992) refers ecological literacy to how people understand the complexities involved to solve an environmental problem.

Malaysia and Indonesia, two countries that have the highest number of threatened wildlife and plant species. However, to date, limited studies have explored people's knowledge, attitudes and behaviours (i.e., conservation learning) about this critically endangered species. Research about orangutans has been directed to biological aspects such as behaviour (Call & Tomasello, 1994; Cartmill & Byrne, 2007), reproduction (Galdikas & Ashbury, 2013; Maggioncalda, Sapolsky, & Czekala, 1999), and genetics (Caeiro, Waller, Zimmermann et al., 2013).

An abundance of literature has suggested that the decline in the orangutan population and the loss of its habitat is primarily caused by palm oil cultivation to cater for human population growth (Fitzherbert, Struebig, Morel et al., 2008; Nantha & Tisdell, 2009; Nellemann, 2007). Therefore, there is a push to develop and implement sustainable palm oil practices, with literature discussing the implementations and challenges surrounding sustainable palm oil (Boons & Mendoza, 2010; Laurance, Koh, Butler et al., 2010; Midttun, Nikoloyuk, Burns et al., 2010). However, discussion and research relating to the general population's knowledge and beliefs about sustainable palm oil purchases are limited. This is important to explore as people may not have an understanding about how the decline in orangutan population is connected to their everyday choices. They may also have limited knowledge to support behaviours such as responsible palm oil purchases, as well as options for purchasing alternative products other than palm oil. In addition, due to differences in social and economic standings (Koh & Wilcove, 2007), there may be differences in knowledge, beliefs, interests and awareness relating to orangutans and orangutan conservation amongst people from different countries.

This lack of research involving the public's understanding about orangutans, and their beliefs or knowledge surrounding issues related to sustainable palm oil is not surprising. Orangutans occur naturally in Malaysia and Indonesia (the world palm oil producer countries), and such research may lead to conflicting opinions about the socio-economic and environmental impacts of palm oil production. Indeed, Meijaard and Sheil (2007) argued that research surrounding biodiversity conservation is mostly quantitative research (e.g., distribution count of species), and that there is less social science research. Nevertheless, some issues need to be defined and discussed from a social science perspective if we want to advance efforts to design better interpretive and educational materials targeting the conservation of threatened species.

Wildlife tourism is one platform that can be utilised to convey conservation messages to the greater population and positively influence conservation learning outcomes. Hence, in wildlife settings, visitors' experiences can become opportunities to learn about conservation in its various aspects, particularly through interpretation. However, although research into interpretive wildlife

tourism experiences has shown that such experiences have contributed to positive outcomes in terms of conservation learning (Ballantyne, Packer, & Falk, 2011; Ballantyne et al., 2009; Falk & Adelman, 2003; Weiler & Smith, 2009), limited in-depth research has investigated *how* interpretation can be designed to best contribute to visitors' conservation learning in these settings. Principles of environmental interpretation mandate an understanding of 'who' the visitors are, as well as their current knowledge and beliefs, and then using this information to design interpretation that makes it more relevant for the visitor (Ham, 2007; Ham, 1992; Moscardo, Ballantyne, & Hughes, 2007).

Additionally, orangutan tourism in Malaysia and Indonesia has received criticism in terms of the educational and interpretive components available at orangutan sites (i.e., rehabilitation sites), with reports suggesting that educational and interpretive materials, including tour materials, have limited educational content (Russon & Susilo, 2014). Interpretive messages often includes inadequate, outdated, and inconsistent information pertaining to orangutan conservation in these rehabilitation sites (Russon & Susilo, 2014). Inadequate information displayed in interpretation materials in wildlife sites can easily send out the wrong messages to visitors, making them irrelevant and adding further confusion. For many first time visitors, orangutan sites such as rehabilitation sites in Malaysia provide the experience for visitors to observe and learn about the orangutans in a free-range natural site; hence these sites need to be designed to maximise meaning-making for local and international visitors. As little research effort has been expanded to explore the depths of people's current knowledge and beliefs with regards to orangutan conservation, interpretation at orangutan sites may have been designed without any consideration of visitors' knowledge and beliefs. If this is the case, conservation messages could well be viewed as irrelevant by visitors and thus be ineffective.

Furthermore, there is a general assumption that interpretive materials in tourism sites are designed to be 'one size fits all', even though there may be differences between visitor groups in terms of their knowledge, beliefs and attitudes towards specific issues. Recent research has suggested that there are cultural differences in visitors' interpretation preferences, expectations and environmental attitudes, particularly between Asian and Western countries (Al-muhrzi, 2015; Hughes, Ballantyne, & Packer, 2014; Packer, Ballantyne, & Hughes, 2014). Though wildlife tourism, particularly orangutan sites, receive a high number of local and international visitors, to date no attempt has been made to systematically evaluate and design effective interpretation for orangutan sites in Malaysia and Indonesia.

Because the populations of critically endangered Bornean orangutans and Sumatran orangutans are declining (Ancrenaz, 2016; Singleton, 2016), there is a need to undertake immediate and relevant studies that look into how approaches using behavioural and persuasive communication theories which can be applied to maximise the impact on visitors' conservation learning. Failure to address the issue of effective and relevant interpretation may hamper efforts to ensure the survival of the orangutans, and reflect poorly on current efforts to ensure sustainability and conservation of threatened species in Malaysia and Indonesia.

To design effective and relevant interpretation, researchers have recommended the application of behavioural and communication theories that focus on factors such as using individuals' beliefs, prior knowledge and incorporating elements of persuasion (Ham, 2008; Ham, 1992, 2013; Ham & Weiler, 2003; Hughes & Ballantyne, 2013). However, few studies have evaluated the effectiveness of such an approach in wildlife tourism settings. Therefore, there is a need to understand how interpretive messages can be designed to make them more effective, particularly for wildlife sites that receive a mixture of local and international visitors who may react differently to interpretive materials. Effective design of interpretation can influence these visitors to carry out post-visit conservation behaviours such as habitual purchase of environmentally-friendly products in supermarkets. These will eventually create demands to increase efforts for wildlife conservation through various platforms such as invoking environmental policy changes to supply certified environmental-friendly food in supermarkets chains.

These challenges have led the researcher to explore both local and international visitors' knowledge about orangutans and orangutan conservation to inform the design of an interpretive intervention. This theory-based intervention was then tested to explore its impact on the conservation learning of local and international visitors after an orangutan wildlife experience in Sepilok, Sabah.

The finding of this research will advance our understanding of how to design interpretation to positively impact on visitors' environmental knowledge, attitudes and behaviours (i.e., conservation learning) in wildlife sites. More importantly, this study will be one of the first to explore visitors' knowledge and beliefs about orangutan and orangutan conservation, as well as the differences in conservation learning between local and international populations. The findings will ultimately assist wildlife sites in designing relevant and effective interpretation to support orang-utan conservation. The aims of the study and the methodology are outlined in the next section.

1.3   Research aims and methodology

The main aim of this study is to explore the impact of an orangutan wildlife experience and interpretation on local and international visitors' conservation knowledge, attitudes, behavioural intentions, and on-site conservation behaviours. The specific aims of this study are to:

1.   ascertain local and international visitors' knowledge and beliefs about orangutans, existing threats to their habitat loss, and conservation behaviours linked to orangutan conservation;

2.   develop an interpretive intervention that builds on visitors' knowledge and beliefs about orangutans and orangutan conservation, addressing their misconceptions, and promoting behaviour that support orangutan conservation;

3.   assess the impact of the belief-based approach to interpretation on the conservation learning outcomes of local and international visitors'; and

4.   explore the implications of the research findings for the design of visitor interpretation to support orangutan conservation.

In order to address the overall and specific aims of the study, this research adopts a post positivist perspective, an approach that is often used to explore the cause and effect of theories (Mackenzie & Knipe, 2006). Literature states that environmental interpretation is effective when it is designed to take into consideration visitors' personal traits and previous experiences (Ballantyne, Packer, Hughes et al., 2007; Moscardo et al., 2007). This is consistent with existing behavioural and communication theories, which postulate that when an intervention is designed to align with individuals' current psychological traits (e.g., beliefs) using persuasive techniques, it increases the impact on individuals' knowledge, attitudes, and behaviours (Brown, Ham, & Hughes, 2010; Ham, 2009; Ham & Weiler, 2003). This study aims to test the impact of interpretation in the form of an interpretive booklet on local and international visitors' conservation learning (i.e., knowledge, attitudes, intentions, and behaviours). This will improve the potential impact of interpretation used in wildlife settings to reinforce visitors' learning about wildlife and wildlife conservation. Local visitors in this study are defined as visitors who originate from countries where orangutans are native: Malaysia and Indonesia. Thus, throughout the document, Malaysians and Indonesians are referred to as 'local visitors'.

To achieve the study aims, a two-stage research process was utilised. In the first stage, an exploratory study using a self-administered questionnaire was conducted to evaluate visitors' knowledge and beliefs about orangutans and orangutan conservation, as well as their perceptions of the current visitor experience at an orangutan sanctuary. The first stage uses the Theory of Planned Behaviour to elicit beliefs pertaining to behaviours that support orangutan conservation.   These

findings were used to design an intervention in the form of an interpretive booklet. The interpretive intervention, a booklet, was designed by using information obtained from visitors' knowledge and beliefs about orangutans and orangutan conservation after an orangutan experience. This is done after the orangutan experience to assess whether the booklet positively impacted on visitors' conservation learning. The booklet was designed based on principles outlined in the Elaboration Likelihood Model of Persuasion (Petty & Cacioppo, 1986).

In the second stage, the booklet was used to test the impact on visitors' conservation learning outcomes, namely, knowledge, attitudes, behavioural intentions, and their actual behaviours pertaining to orangutan conservation. This stage uses an experimental design by comparing a treatment group (with booklet) and a control group (no booklet). The potential impact of the booklet on visitor's conservation learning was evaluated by examining changes in knowledge and attitudes of visitors towards orangutan and orangutan conservation, as well as their behavioural intentions with regards to eight orangutan conservation behaviours (see Chapter 3, Section 3.4 for rationale guiding the behaviour):

1) joining a fundraiser to help raise funds for orangutans;
2) downloading an app to check for sustainable palm oil labellings;
3) seek more information about orangutan conservation;
4) online donations to orangutan conservation organisations;
5) becoming an active member of orangutan organisations;
6) actively seek whether products use sustainably sourced palm oil;
7) buy products that use sustainable palm oil and
8) spreading the word to others about the impact of unsustainably sourced palm oil.

The impact of the booklet on four actual visitor behaviours was also conducted through participant observation. The four on-site conservation behaviours were;

1) signing a petition;
2) on-site donations through a donation box or an adoption scheme;
3) taking a photocopied list detailing manufacturers that are members of Roundtable of Sustainable Palm oil (RSPO); and
4) taking a leaflet detailing sustainable palm oil app.

The findings of this study will contribute to existing knowledge about how to develop wildlife interpretation that impacts on visitors' knowledge, attitudes and environmental behaviour. In

particular, testing the impact of the approach used in this study to design an interpretive booklet will contribute to advance knowledge about the future design of effective interpretive materials.

1.4   Outline of the document

This document consists of seven chapters. The first chapter has provided a general introduction which discusses the important role of wildlife tourism in fostering pro-conservation behaviours for visitors and individuals. Research problems that surround the issue of wildlife tourism and environmental interpretation specific to the context of orangutans are presented. This was followed by research aims, a general introduction to the method used to achieve the study aims and key definitions used in this study.

The second chapter presents the literature concerning free-choice learning and the factors that facilitate visitors' conservation learning, wildlife interpretation, and underpinning theories of behaviour change and persuasive communication that are used to foster visitor conservation learning. These three major fields of literature have contributed to our understanding of how wildlife experiences and interpretation affect conservation learning outcomes (i.e., knowledge, attitudes, and behaviours). Chapter two also provides an introduction to orangutans as a threatened wildlife species, current threats to their habitats, and issues surrounding the conservation efforts. A review of the gaps identified from the literature is also presented in Chapter two, that leads to the development of seven research questions that are relevant to the four main aims of the study.

Chapter three presents the methodology of the study. The study positions itself within the post-positivist paradigm, which is often viewed as theory-driven and explains the causal nature of phenomena. This study was conducted in two stages. Stage one was an exploratory study to explore visitor's knowledge and elicit beliefs relating to orangutans and orangutan conservation. Findings were used to develop an interpretive intervention in the form of a booklet. Stage two was conducted to test the impact of the booklet on visitor's conservation learning. Chapter three details the design, instrument, participants, sampling, procedures and data analysis for each stage.

Chapter four presents the results and discussion pertaining to stage one of the study. This chapter details results pertaining to the first aim of the study. The discussion of stage one findings is also discussed in this chapter. Chapter four also outlines the development of the intervention booklet based on the results of stage one exploratory study that elicited visitors' beliefs relating to

behaviours supporting orangutan conservation, and visitor's knowledge pertaining to orangutans and orangutan conservation.

Chapter five presents the results pertaining to testing the impact of the booklet on visitor conservation learning outcomes. The analysis focuses on the impact of the intervention on conservation learning outcomes (i.e., knowledge, attitudes, environmental behavioural intentions and observed behaviour) by comparing scores between the treatment and control groups. This chapter also examines differences in conservation learning outcomes between local and international visitors, as well as aspects of the booklet that were perceived to be the most interesting to participants.

Chapter six discusses the impact of the intervention on visitors' post-visit knowledge, attitudes and behaviours and relates findings to previous research. Differences between local and international visitors' post-visit learning outcomes are also discussed, as well as aspects of the booklet that are likely to facilitate visitors learning about orangutans and orangutan conservation. Additionally, this chapter presents eight recommended guidelines for the design of 'best practice' visitor interpretation for environmental learning and orangutan conservation.

The final chapter, chapter seven, concludes the study with a discussion of the theoretical and practical contributions of the study. Limitations of the study and suggestions for future research are also presented.

1.5 Key definitions

1. **Wildlife tourism:** "Wildlife tourism is tourism undertaken to view and/or encounter wildlife. It can take place in a range of settings, from captive, semi-captive, to in the wild, and it encompasses a variety of interactions from passive observation to feeding and/or touching the species viewed" (Newsome, Dowling, & Moore, 2005).

2. **Captive, semi-captive and non-captive wildlife tourism**
   Captive wildlife tourism includes viewing animals in man-made confinement; principally zoos, wildlife parks, animal sanctuaries and aquaria; also includes circuses and shows by mobile wildlife exhibitors (Higginbottom, 2004,). "Non-captive wildlife tourism utilises species

occurring in the wild. Semi-captive wildlife tourism involves the keeping of wildlife in relatively open large areas" (Tisdell & Wilson, 2012). Rehabilitation sites are one of semi-captive wildlife tourism in which animals such as orang-utans are trained to return to the wild.

3. **Interpretation**

Interpretation is a way of providing meanings and relationships through the use of illustrative media, first hand experiences, and original objects (Tilden, 1957). Furthermore, "…interpretation aims to present information in a way that inspires visitors to learn about the particular topic, issue or event being interpreted", (p 322.). Interpretation is delivered via a range of techniques such as brochures, signage, guided talks and self-guided media (Ham, 1992).

4. **Conservation learning in wildlife tourism**

Conservation learning in wildlife tourism "…contribute[s] to environmental conservation by raising community awareness and encouraging visitors to take steps towards more responsible and sustainable everyday behaviours (p 6.)" (Ballantyne, Packer, & Sutherland, 2011). This study uses Ballantyne, Packer, and Falk's (2011) definition of learning outcomes (in wildlife settings) as "…the deepening and expanding of personal knowledge and understanding of environmental sustainability issues; changes in awareness, appreciation and concern for wildlife; development of intentions to take or refrain from specific personal actions that have an impact on the environment; and enactment of lifestyle changes designed to support environmental sustainability" (Ballantyne, Packer, & Falk, 2011, p.3).

5. **Orangutans**

Orangutans are a threatened wildlife species who are naturally occurring in Malaysia and Indonesia. Threatened wildlife species are species that have the highest risk of becoming extinct in the wild (IUCN, 2014). There are two species of orangutans. The Bornean Orangutan (*Pongo pygmaeus*) is dispersed throughout the island of Borneo which consists of Sabah, Malaysia and also Kalimantan, Indonesia. Bornean orangutans were previously listed as 'Endangered', however this has been recently revised, with 2016 IUCN data showing that these species are now 'Critically Endangered' (Ancrenaz, 2016). The Sumatran orangutan (*Pongo abelii*), is endemic to Sumatra, Indonesia and is also listed as a 'Critically Endangered' species in the IUCN Red List (Singleton, 2016).

CHAPTER TWO: LITERATURE REVIEW

2.0   Introduction

This research aims to explore the impacts of a wildlife experience and interpretation on visitors' conservation knowledge, attitudes, intentions and behaviour. It draws upon literature from four major areas; 1) free-choice learning in wildlife settings; 2) interpretation as a way of influencing knowledge, attitudes and behaviour change; 3) theories underpinning behaviour change; 4) Orangutan conservation.

The first section presents an introduction to wildlife tourism and how such experiences encourage visitors' conservation learning (i.e., changes in knowledge, attitudes and behaviours). The second section discusses the role of interpretation as an integral component in wildlife tourism experiences. The third section discusses the underpinning theories used to design interpretive wildlife experiences and is aimed at fostering environmentally sustainable visitor behaviour. In this respect, two theories are discussed: the Theory of Planned Behaviour and the Elaboration Likelihood Model of Persuasion. These theories provide a theoretical foundation for this study, particularly in regard to the design of the interpretive booklet. The fourth section of the review presents information about orang-utan conservation learning. Finally, an overview of the research gaps and questions arising from the literature is presented, along with four research aims and seven research questions.

2.1   Introduction to wildlife tourism

Beginning with the introduction of travelling for 'leisure' purposes by the Europeans in the 1800s (Singh, 2009), tourism has been progressively associated with visiting sites for cultural, natural, recreation and entertainment experiences (Goeldner & Ritchie, 2006). Over the last few decades, the term 'tourism' has been broadened to include unique niches such as special interest tourism (e.g., geotourism, gastronomic tourism, dark tourism), traditional and cultural based tourism (e.g., tribal tourism, cultural heritage tourism), and activity based tourism (e.g., volunteer tourism, small ship cruising) (Novelli, 2005). In this light, ecotourism has also emerged in the 1980's as a response to the negative environmental and cultural impacts of mass tourism (Blamey, 2001; Ceballos-Lascurain, 1996) and in response to public demand for a greener side of tourism (Wearing & Neil,

2009; Wight, 2001). Ecotourism also includes the experience of viewing animals in their natural habitats or in captive sites, which is also encompassed in the term 'wildlife tourism' (Newsome et al., 2005).

Wildlife tourism is defined as, "Tourism based on encounters with non-domesticated (non-human) animals... [that] can occur in either the animals' natural environment or in captivity" (Higginbottom, 2004, p. 2). A number of authors have viewed wildlife tourism as a form of ecotourism that is only limited to non-consumptive activities (Novelli, Barnes, & Humavindu, 2006; Weaver, 2001). This includes activities such as hiking and canoeing, excluding activities such as fishing and hunting (Isaacs, 2000). Conversely, this may also extends to feeding and touching wildlife where it occurs in some wildlife tourism sites. Though feeding and touching wildlife may intensify the visitors wildlife experiences such as shown in studies exploring touching giant Pandas (Cong, Wu, Morrison, et al., 2014); these experiences are subjected to a range of risk such as diseases and injuries (to both wildlife and humans), and food dependency/habituation of the animals itself (Orams, 2002). Therefore, Fennell (2013) has argued that zoos should be viewed as consumptive based on the fact that animals were removed from the wild for the purpose of tourist viewing, although some authours have viewed that settings such as zoos are non-consumptive as zoos have important roles in education and conservation of wildlife (Higginbottom, Tribe & Booth, 2003). Despite these differing opinion, wildlife tourism may only be considered as a form of ecotourism if it focuses on human relationships with animals and encourages people to consider the impact of human activities (including feeding and touching) on the animal behaviours and habitats (Figure 2.1).
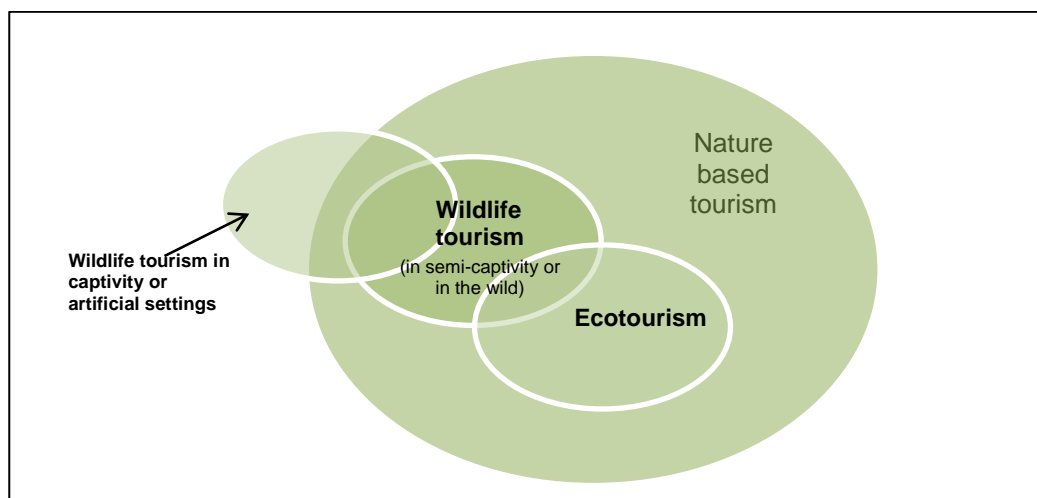
Figure 2.1: The context of wildlife tourism

Source: Adapted from Gale & Hill (2016, p. 5), Reynolds & Braithwaite (2001) and Weaver (2001, p. 74).

In recent years, there has been increased public awareness about the continuing loss of biodiversity as a result of environmental degradation. This increased awareness is also contributed to the role of social media in circulating environmental issues that impact negatively on the existing wildlife and habitat (Hamid, Ijab, Sulaiman, et al., 2017). This has resulted in a greater appreciation of animals and an increased interest in viewing wildlife in non-captive sites (Newsome et al., 2005). Furthermore, as humans become more isolated from wildlife, wildlife tourism has gained greater popularity as tourists strive to purchase the 'experience' of gazing and seeing (Curtin, 2005). Ballantyne, Packer, Hughes, et al. (2007) found that the experience of seeing non-captive wildlife creates positive feelings which have resulted in an increase in tourist visitations to non-captive sites. Inherently, studies suggest that tourists rate experiences that provide interactions with wildlife as "high-quality" experiences (Farber & Hall, 2007), memorable and meaningful (McIntosh & Wright, 2017), and emotional experience (Ballantyne, Packer & Falk, 2011). In short, experiences with wildlife is one of the best tourist experiences available (Curtin, 2005).

Wildlife tourism serves as an important platform to encourage pro-environmental attitudes and behaviours for two main reasons. First, it is estimated that wildlife sites such as zoos, are visited by an approximately 700 million people annually (WAZA, 2014), and other sites such as national parks and nature reserves receives about eight billion visitations per year (Balmford et al., 2015). Given that the visits are from visitors from various age and groups (e.g., families, school trips, business trips), wildlife sites provide an effective platform for the delivery of conservation messages to the general public (Lindemann-Matthies & Kamer, 2006). Second, these types of experiences allow visitors to be directly exposed to interpretive materials related to the animals. This enhances the meaning-making process or increasing visitor mindfulness about the connecting messages between wildlife and conservation (Moscardo, Woods, & Saltzer, 2004).

Ballantyne, Packer, and Sutherland (2011) stated that perhaps the most important outcome of this type of tourism is that it educates visitors about threats surrounding wildlife, and enlightening tourists on the human actions that can be taken to further protect wildlife. However, the role of wildlife tourism in education has been previously criticised, particularly those involving captive sites such as zoos, as the practice of keeping animals captive are considered unethical (Jamieson, 1985; Wearing & Jobberns, 2015). On the other hand, numerous studies that have been conducted found that wildlife tourism sites (i.e., zoos and aquariums) have positively contributed toward educating people about conservation (e.g., Ballantyne, Packer, & Sutherland, 2011; Orams, 1997). This also extends to studies that include non-captive sites as well. Moscardo's (2007) study for example, concluded that there are high levels of learning in all types of wildlife settings. This

finding signifies the important role that wildlife sites play in enhancing conservation efforts to protect wildlife species, particularly those that are vulnerable and endangered.

However, studies that reported positive conservation learning outcomes were mostly conducted in captive wildlife sites such as zoos and aquariums (Adelman, Falk, & James, 2000; Falk, Reinhard, Vernon et al., 2007). These studies have also been mostly conducted in Western wildlife settings and in developed countries, where high priority has been placed on conservation related matters and environmental concerns (Steg, 2008). Wildlife studies that assess learning outcomes and effectiveness of conservation content on learning outcomes in such regions as Southeast Asia are still limited, even though the Southeast Asian region houses the highest number of threatened plant and wildlife species (Sodhi, Posa, Lee et al., 2010).

Although wildlife experiences have been shown to lead to positive conservation learning outcomes, which can be defined in terms of positive changes in knowledge, attitudes and behaviour to benefit wildlife species conservation (Ballantyne et al., 2009), these positive conservation learning outcomes are not easy to achieve as people learn differently in nature and wildlife settings, and this affects their learning outcomes (Falk & Dierking, 2000). Additionally, studies have shown that there are differences in relation to visitors level of enjoyment and emotional connection between captive and non-captive wildlife sites (Packer and Ballantyne, 2012); as well as differences in terms of learning outcomes of visitors between captive and non-captive sites (Ballantyne, Packer, Hughes, & Dierking, 2007). Zoos that exhibits a range of animals may have some limitations in providing a more specific and in-depth conservation messages compared to non-captive wildlife sites that are more focused in the conservation of a specific animal (e.g., turtle conservation centres, orangutan sanctuaries).

Therefore, an integral component that is necessary to understand the impact of wildlife experiences on conservation learning is to firstly understand how people learn, and what affects the way they learn have on wildlife experiences. In this regard, the term "free-choice learning" is heavily embedded in the literature to demonstrate that individuals learn in informal settings such as nature and wildlife settings, and the concept of "free-choice learning" provides an important foundation of this study as it provides the basis for understanding how people learn in nature and wildlife settings. Thus, the literature review will first discuss the learning process in nature and wildlife settings and the related theories that are used to demonstrate how people learn in wildlife settings.

2.2   Free-choice learning in nature and wildlife settings

The term "free-choice" learning refers to a voluntary and flexible approach to learning, as opposed to formal education where the curriculum is pre-determined (Dierking & Griffin, 2001). The term free-choice learning is often used interchangeably with the term 'free-choice learning settings' (Falk & Dierking, 2000; Hooper-Greenhill & Moussouri, 2000; Rennie & Williams, 2006) as 'free-choice learning' occurs under an individual's own free will in an informal setting.   Thus, free-choice learning is defined as:

> "*…the type of self-directed learning that regularly occurs in settings like natural parks, nature centres, natural history museums, zoos and aquariums, a wide range of community-based organizations, and through the use of print and electronic media, including the internet"* (Falk, 2005, p. 7).

Free-choice learning is an integral concept in nature and wildlife settings as these settings promote environmentally sustainable behaviours (Skanavis & Sakellari, 2012). Falk, Ballantyne, Packer et al. (2012) contended that the learning that takes place in tourism settings can bolster ethical and moral behaviour. This is because, unlike learning that occurs in formal and enclosed settings such as in a classroom, nature-based and wildlife settings provide visitors with a chance to choose what, how, and where they learn about conservation (Falk & Dierking, 2004). This allows individuals to undertake meaningful personal engagement about how they can protect the environment (Ballantyne & Packer, 2005).

Today, free-choice learning occurs not only in various outdoor and informal settings but also through different platforms that provide a free and self-directed learning such as through social media, television, family and community settings (Rogoff, Callanan, Gutiérrez et al., 2016; Takahashi, Edson & Tandoc, 2016). The availability of technology enables people to learn daily through educational TV programmes or web-based programmes (Dierking, 2014). Commonly, researchers have acknowledged that the majority of environmental learning occurs through leisure and tourism settings such as nature based parks, museums, zoos and science centres (Falk, 2005; Packer & Ballantyne, 2004).

Free-choice learning in informal settings refers to meaningful learning that involves not only from the acquisition of knowledge about science or the environment, but also from acquired knowledge that is acted upon, and how the experiences change peoples' attitudes (Dierking & Falk, 1994; Novak, 1977). This is similar to the broad goals of environmental education, which are to increase understanding, motivate and inspire people to act in a responsible way towards the environment (Hungerford, Peyton, & Wilke, 1980). Conservation learning is often discussed in

terms of how people learn about conservation and the environment freely in in outdoor, informal settings (Falk, 2005; Falk & Adelman, 2003). This type of learning, which occurs particularly in free-choice learning settings such as wildlife locations, aims to add knowledge about conservation, as well as fostering conservation attitudes and/or actions (i.e., positive changes in knowledge, attitudes, and behaviours) (Ballantyne, Packer, Hughes, et al., 2007; Falk et al., 2007; Myers Jr, Saunders, & Bexell, 2009; Packer, 2004). Therefore, research in conservation learning in natural and wildlife settings often measures changes in knowledge, attitudes and behaviours (Skibins, Powell, & Stern, 2012). In this regard, changes in knowledge, attitudes and behaviours are often explored using behaviour change theories which are specifically focused on pro-environmental sustainable attitudes and behaviours (Ballantyne & Packer, 2005) (further deliberated in section 2.4 and 2.5).

Natural areas are perfect settings for learning to occur as elements of tranquillity, space and freedom in nature parks and wilderness areas provide a motivation and stimuli for visitors to learn (Kellert, 2005), and assist people to connect with nature (Kola-Olusanya, 2005). These settings encourage individuals to build their skills to help with environmental protection (Skanavis, Sakellari, & Petreniti, 2005). Marshdoyle, Bowman, and Mullins (1982) also pointed out that early exposure to nature, such as wildlife experiences, may foster positive attitudes towards wildlife preservation. This is corroborated by other researchers that have found children's involvement in nature based outdoor activities leads to more empathetic attitudes toward the environment (Kola-Olusanya, 2005; Palmberg & Kuru, 2000). These studies suggest that adults who visit with children play a significant role in fostering positive environmental attitudes and behaviours. However, for this to happen, adults need to have the relevant knowledge and skills for environmental conservation that can be shared with younger children.

Since the mid-1990s, researchers have begun to explore learning in free-choice settings, such as wildlife and nature settings. Much of the research on free-choice learning was conducted in museums and galleries (McManus, 1987), and a variety of learning theories have been explored to gauge the understanding on how learning occurs in free-choice learning settings. One of the first of these theories is the model of experiential learning which was developed by Kolb (1984). This theory hypothesises that individuals go through four stages in a learning cycle (Figure 2.2).
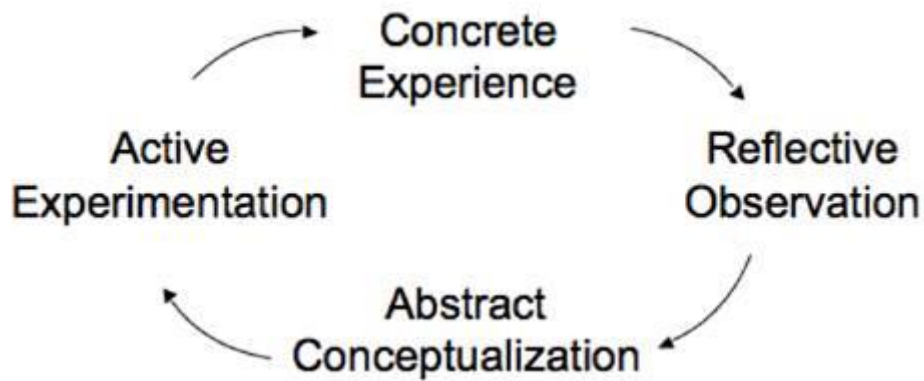
Figure 2.2: Kolb's (1984) learning cycle

The experiential learning cycle is a process where individuals' learn through experience (see Figure 2.2). This model states that when visitors reflect on their personal experiences and gain new knowledge from an experience, they learn and form new concepts (abstract conceptualisation). The forming of these new concepts will then lead to the active experimentation process, where actions, such as adopting new behaviours (e.g., recycling papers or precyling to avoid deforestation and wildlife habitat loss), are implemented in their everyday lives.

Kolb's (1984) experiential learning cycle is an integration of learning theories developed by earlier scholars such as Piaget, Jung and Dewey (Kolb, 1984). Kolb's model has been used much earlier in other areas, such as in management and education (Kolb, Boyatzis, & Mainemelis, 2001). Kolb's (1984) learning cycle was previously utilised to explain experiential learning that occurred within wildlife settings by Ballantyne, Packer, and Sutherland (2011). They summarised Kolb's stages as a process of experiencing, reflecting, thinking and acting. Based on qualitative responses obtained from 240 respondents in two captive, and two non-captive wildlife sites, the study found four different levels of visitor responses: 1) sensory impressions; 2) emotional affinity; 3) reflective responses; and 4) behavioural response. One of the main findings from the study was that connecting emotionally during the experience led to a greater concern for animals. (Ballantyne, Packer, & Sutherland, 2011) further pointed out that,

> "…some visitors conveyed a sense of empathy, or an emotional connection with the animals, which involved understanding and identifying with the animal's "feelings", and led them to care about the animal's well-being" (p. 4).

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While Kolb's (1984) ELT model is more focused on how individuals' learn through experience, other models of learning that have been developed have been found to be more elaborate in explaining the integration of factors, including the time factor and physical settings, during the process of learning. The Contextual Model of Learning developed by Falk and Dierking (2000) offers a further explanation about how an individual's personal context, sociocultural context and physical context (which continuously changes with time) impact on learning. This model was firstly explored in museum settings (Falk & Storksdieck, 2005). The personal context in this model of learning refers to an individual's personal and genetic history such as past knowledge, interest and beliefs (Falk & Storksdieck, 2005). As these affect what he/she learns from an experience, learning is ever-changing, lifelong and highly individual (Falk et al., 2012). Meanwhile, the sociocultural context takes into account the interaction with other social groups, such as other tourists, presenters and guides who further influence learning of individuals. The last context - physical - refers to the physical environment in which learning takes place. The physical context is important as this is where learning actually occurs. Falk and Dierking (2000) discussed that this is where individuals navigate their way through the setting and how they use the physical space to learn (e.g., through the content of the exhibitions and information). Therefore, this is where architectural design and the physical context play a role in influencing learning (Falk & Storksdieck, 2005).

The socio-cultural context that assists learning between individuals' was exemplified in a study conducted by Clayton, Fraser, and Saunders (2009) where they recorded conversations of 1,891 visitors from three zoos: Bronx Zoo, Cleveland Metropark Zoo and Brookfield Zoo. Their study found that viewing zoo animals facilitated conversations about the similarities between humans and animals, particularly amongst families. Visitors predominantly made comments about connections between humans and animals (e.g., comments about the animal state, interacting with animals, and comparing animal behaviour with humans). This study suggests that wildlife settings, which provide the chance to observe animal behaviours, allows individuals to make connections, meanings and to freely discuss issues. Clayton et al. (2009) further stated that support for conservation may be increased if zoos are able to increase visitors' empathy towards animals by encouraging discussions about them.

Another contribution to the understanding of how learning occurs in specific nature- based settings was made by Brody (2005) on the Theory of Learning in Nature. The theory is presented in a matrix (Table 2.1) and stipulates that meaningful learning occurs through direct experiences with nature over time. Brody's (2005) theory is largely influenced by previous literature in learning such

as meaningful learning (Novak, 1977). It is also largely influenced by Falk and Dierking's (2000) model, as the model also considers the influence of physical, personal and social contexts on the affective and cognitive domain (Brody, 2005). In short, this theory explains the complex process about how people will make use of new information and make decisions or reasoning based on the integration of previous and new knowledge (Brody & Tomkiewicz, 2002). Brody (2005) extended this by discussing that all aspects of acting, thinking and feelings are affected by the physical, personal and social context, and these processes are continuous over time.

Table 2.1: Theory of Learning in Nature

	1.**Physical** (setting)	2. **Personal** (individual)	3. **Social** (shared)	4.**Time** (continuum)
A. Acting Experience Sensing Readout	The setting (initial)	Personal experience	Group experience	Direct
B. Thinking Integration Invariance Causal net Knowledge system	The experience (event)	Assimilation Accommodation with prior understanding	Progressive Differentiation with shared understanding	Continuous over time
C. Feeling Attitudes Values Beliefs Value system	The Experience (event)	Assimilation Accommodation with prior affect	Progressive Differentiation with shared affect	Continuous over time

Source: Brody (2005, p. 9)

Both Brody's (2005) and Falk and Dierking's (2000) models offer a concise explanation about how individuals learn in free-choice settings, as both stipulate learning in these types of settings involves an integration of numerous factors. On the other hand, between these two models, Falk and Dierking's (2000) model has been utilised much more in free-choice settings.

In a more focused study that looks into visitors' learning outcomes, Ballantyne, Packer, and Falk (2011) developed a model that empirically tested how learning occurs specifically in wildlife settings. The model (Figure 2.3) proposed that a number of factors affected short-term and long-term environmental learning, two of which were the personal attributes that visitors bring with them (e.g., motivations, environmental interest and knowledge) and the various aspects of the wildlife experience itself (e.g., enjoyed the experience, seeing live animals) (Ballantyne, Packer, & Falk, 2011).
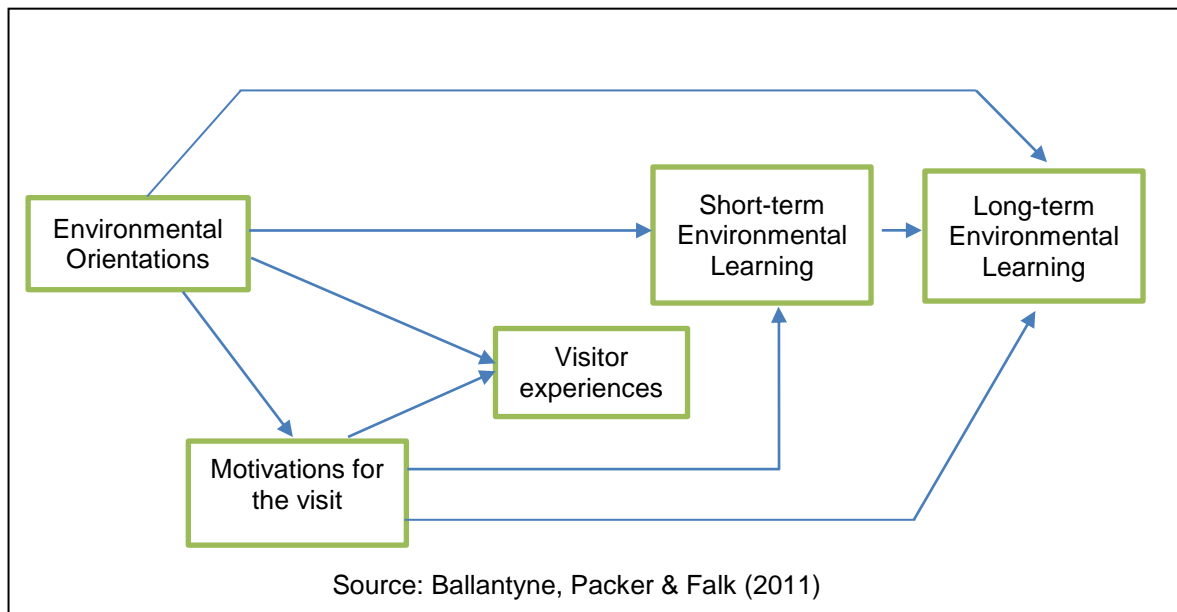
Figure 2.3: Predictors of short term learning outcomes

The research found that four variables are significant predictors of short-term learning as a result of the wildlife visit: engaging emotionally with the animals, thoughts about the animals and the environment, discussions about newfound knowledge, and feelings of happiness or sadness over environmental problems (Ballantyne, Packer, & Falk, 2011). These four present the predictors of short-term learning outcomes, such as visitors giving meaning to wildlife conservation and visitors expressing concerns about animals' well-being (Ballantyne, Packer, & Falk, 2011). The researchers noted that though these four variables were significant predictors of short-term learning, they were weak predictors of long-term environmental learning such as adopting/maintaining new environmental behaviours and attitude changes. This signified that while it may be definite that the wildlife experience impacted positively on short-term learning,

"…further research is needed to identify specific actions wildlife tourism providers can take to ensure that the immediate effects of the experience are maintained and strengthened in the long-term" (Ballantyne, Packer, & Falk, 2011, p.8).

These theories that have been reviewed so far have conceptualised our understanding of how learning in individuals' occur. A consistent message is that learning evolves through time and is ever-changing, a notion that is consistent with theories on free-choice learning (Falk & Dierking, 2000, Kolb, 1994; Brody, 2005). However, most of the research in free-choice learning environments is more focused on understanding how people learn in these types of settings

(Ballantyne & Packer, 2005). These have led to the identification of various factors that appear to facilitate positive conservation learning outcomes.

This review will continue to discuss factors that are specific to wildlife settings which facilitate learning for conservation in wildlife settings. It is noted here that this study follows the learning outcome definition by Ballantyne, Packer, and Falk (2011) where learning outcomes (in wildlife settings) can be defined as, "…the deepening and expanding of personal knowledge and understanding of environmental sustainability issues; changes in awareness, appreciation and concern for wildlife; development of intentions to take or refrain from specific personal actions that have an impact on the environment; and enactment of lifestyle changes designed to support environmental sustainability" (Ballantyne, Packer, & Falk, 2011, p.3).

2.3   Factors facilitating learning for conservation in wildlife settings

This section will discuss factors which have been identified in the literature that facilitate learning in wildlife settings. This contributes to an understanding of the study to isolate personal factors (that existed within an individual), and environmental or physical factors (that exist within the wildlife setting) that are likely to facilitate learning for conservation during the wildlife experience.

There are a plethora of factors that affect individuals' learning (Falk & Storksdieck, 2000). As described in previous discussions, these factors interact with the physical environment to contribute to the learners' outcomes (Lindemann-Matthies & Kamer, 2006). These factors include individual or personal factors attributed to an individual's personal history such as prior knowledge and experiences (Ballantyne, Packer, Hughes, et al., 2007). This is aligned with the personal or existing individual factors mentioned in learning models such as Kolb's (1984) model, where new knowledge integrates with previous knowledge (i.e., cognitive learning[3]) that originated from the work of Vygotsky (1978, 1980) and Piaget (1964), to factors attributed to the environment itself, as discussed within the "physical context or settings" in the Contextual Model of Learning (Falk & Dierking, 2004) and Theory of Learning in Nature (Brody, 2005). This includes encounters with animals in the physical setting and design of the on-site interpretation (Ballantyne, Packer, Hughes, et al., 2007).

Ballantyne, Packer, Hughes et al.'s (2007) previous review has identified a number of the factors included in this section. The discussion in this section extends (Ballantyne, Packer, Hughes, et al., 2007) review by, firstly, isolating two theme factors, that is - individual factors (i.e., factors

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[3] Cognitive learning is changes in a person's knowledge through experience (Mayer, 2011).

related to personal histories of visitors) and environmental factors (i.e., factors that relates to the current wildlife environment and experience), and secondly, including additional discussion about other factors, such as cultural differences that are emerging as one of the factors that appears to influence learning for conservation purposes in wildlife tourism settings.

2.3.1 Individual factors

2.3.1.1 Prior knowledge and prior experiences

Each individual enters a free-choice setting with idiosyncratic knowledge and prior experiences. Wellman (1990) stated that an individual's understanding of a phenomenon begins at an early age and that people understand and experience things differently. Ausubel, Stager, and Gaite (1968) previously stated that prior knowledge is the single most important factor that influences learning. This is because learning involves applying an individuals' existing knowledge so as to create new knowledge about a subject (Eraut, 2000). The concept of integration of previous knowledge to a new knowledge is viewed as cognitive growth originated from Vygotsky (1978) and Piaget's (1964) Theory of Cognitive Development. Vygotsky (1978) and Piaget's (1964) work explains how people develop their knowledge and adapt to these newfound knowledge. As people know and understand things differently (whether accurately or inaccurately), it impacts the way they process new information (Bransford, Brown, & Cocking, 2000). Therefore, prior knowledge and experiences gained over the years impacts on learning outcomes (Ballantyne, Packer, Hughes, et al., 2007; Falk & Storksdieck, 2005).

Since prior knowledge and experiences differ from one individual to another, this shapes how individuals respond to messages communicated during a wildlife experience, as well as how much they learn during the experience. In terms of environmental conservation (which encompasses all biotic-living entities and abiotic-non-living entities), the foundation of conservation actions is knowledge about the relationships between humans and nature (living and non-living entities such as plants, animals, water and soil) (McNeely, Miller, Walter et al., 1990). This specific area of knowledge is termed as 'ecological literacy'. According to Orr (1992), ecological literacy refers to how people understand the complexities of the processes and science involved so as to solve an environmental problem. This, will in turn, help individuals to understand the rationale behind conservation and protection of the environment (Berkowitz, Ford, & Brewer, 2005). Therefore, prior knowledge, which also extends to how well a person understands ecology, how it is connected to biodiversity conservation, as well as understanding the root cause of environmental problems are extremely important in helping to shape visitors' attitudes, or intent to conserve wildlife.

Knapp, Farmer and Benton (2000) stated that the understanding (of ecology) is the foundation of pro-environmental attitudes and behaviours. As cognitive learning theory suggests, new knowledge is developed from experience. Similarly, individuals' ecological literacy is based on various experiences (through formal and informal learning) that developed their knowledge about the conservation and protection of the environment. Therefore, it can be argued that knowledge is the foundation of pro-environmental attitudes and behaviour due to its role in increasing awareness about environmental problems and specific behaviours (Steg & Vlek, 2009), as well as developing individuals moral norms (Bamberg & Möser, 2007). One of the most significant meta-analysis that was conducted by Hines, Hungerford and Tomera (1986) to explore variables associated with responsible environmental behaviour found that knowledge of action strategies and knowledge of issues are two of the four precursors for intentions to engage in responsible environmental behaviour. This is supported by past and recent studies that have highlighted the role of prior knowledge as a significant predictor in pro-environmental attitudes or behaviour for various environmental issues (Cheng & Wu, 2015; Kaiser, Fwölfing & Fuhrer, 1999; Kang, Liu & Kim, 2013; Kozar & Hiller, 2013; Vining & Ebreo, 1990).

Falk and Adelman's (2003) study of aquarium visitors exemplifies how variability in visitors' prior knowledge affects the outcome of their conservation learning. Their study investigated the differences in the knowledge gained by groups of visitors with minimal, moderate or extensive pre-visit understanding of conservation issues. The study showed that knowledge increased significantly between entering and exiting the National Aquarium in Baltimore; and that visitors who came with minimal knowledge learnt the most and were more interested in conservation after the visit. Falk and Adelman (2003) further stated that,

"The creation of new understandings and attitudes depends on the successful integration of the learner's prior experiences with new experiences afforded by the physical and sociocultural context of, for example, an aquarium visit" (p. 2).

Previous experiences may also affect people's interest in learning about conservation. For example, in a study by Kruse and Card (2004), they compared the impacts of a conservation education camp programme on youths' knowledge, attitudes and behaviours. They found that youth campers with previous camping experience rated higher on knowledge and positive attitude change with regards to conservation; and that youth who had previous camping experience were also more interested in the design of the conservation education camps. Similar results were also reported by

Farmer, Knapp, and Benton (2007), who investigated the long term impact of an environmental education trip on students' environmental knowledge and attitudes. The researchers conducted in-depth interviews with 15 (of 30) students who participated in an environmental education programme in the Great Smokey Mountains National Park in the previous year. The study found that the trip had enhanced the students' long-term knowledge and contributed to developing positive attitudes toward the environment, signifying that previous experiences with this environmental education trip have made a positive impact in fostering positive learning about the environment.

These studies have shown that previous exposure to conservation-focussed experiences, as well as previous knowledge about conservation have an impact on how keen individuals are to learn, and how well they learn during a nature experience.

2.3.1.2 Motivation

The second individual factor that affects conservation learning in wildlife tourism settings is motivation. Motivation can be explained through both philosophical assumptions and physiological processes that occur in individuals (Petri & Govern, 2012). Philosophical assumptions posit that individuals are motivated to do something as a way to meet a need. Theories derived from philosophical assumptions include Maslow's hierarchy of needs (Maslow, 1943), and push and pull models to identify tourist motivations (Crompton, 1979; Dann, 1977) ; while physiological assumptions posit that humans are motivated to behave in a certain way when their brains are triggered or stimulated, leading to a response (Petri & Govern, 2012).

In travel and leisure, visitor motivations are connected with the individuals' intrinsic need to seek out various activities or experiences. Based on a number of previous studies, it is evident that visitors have a variety of different motivations (Falk et al., 2007), and that motives can vary according to different places and time. Studies have found different motivations for travel such as the need to escape, the desire to learn, seeking new experiences, an interest in social interaction and the need for entertainment (Beh & Bruyere, 2007; Hsieh, O'Leary, & Morrison, 1992; Packer & Ballantyne, 2002; Packer, 2004). Thus, identifying and understanding visitors' motives are important because motivations affect learning outcomes and how a visitor behaves in a particular situation or environment.

According to Motivation System Theory (MST), motivation impacts behaviours in three ways: 1) selective direction of behaviour by selecting whether to choose to perform the behaviour; 2) selective energization of the behaviour- the amount of effort invested in the behaviour and; 3) selective regulation of the behaviour pattern- the persistence it takes for maintaining a particular

behaviour (Ford, 1992, p. 3). Building upon the notion that motivation affects visitors' experiences, Packer and Ballantyne's (2002) study investigated motivational factors at free-choice learning sites (a museum, an art gallery and an aquarium) and identified five main motives for visiting, (Packer & Ballantyne, 2002, p.189), as follows:

- Learning and discovery (to discover new things, new information and experiences);
- Passive enjoyment (to enjoy, be happy and relaxed);
- Restoration (to recover or restore mentally and physically);
- Social interaction (to interact with family and other people);
- Self-fulfilment (to achieve something and challenge self).

Packer and Ballantyne (2002) found that when visitors prioritise learning and discovery facets, they will be more apt to be motivated to discover and experience learning. This is evident regardless of whether they were visiting an art gallery, museum or the aquarium, signifying that visitors are likely to visit these settings to learn.

Falk et al. (2007) further stated that because different groups have different motivations, they may expect different learning outcomes, and may experience and react to the visit in different ways. Furthermore, Falk and Storksdieck (2005) proposed that visitors' motivations in free-choice learning environments tended to cluster around a few identity-related attributes. Falk et al. (2007) built on this work by examining the motives of zoo and aquarium visitors and identified five different groups:

- Experience seekers: Groups whose primary satisfaction is from experiencing and viewing the site;
- Professionals/Hobbyists: Groups that feel a close connection with their hobby and the site;
- Spiritual Pilgrims: Groups that seek restoration or meditation;
- Facilitators: Groups that seek to facilitate learning of others;
- Explorers: Groups that seek to explore and learn as much as they can from the visit.

They found that experience seekers demonstrated the most substantial gain in both cognitive and affective learning (Falk et al., 2007). Beh and Bruyere (2007) also divided visitors into identity-related categories based on their motives, labelling visitors as escapists, learners or spiritualists. They found that the largest segment of visitors (42 percent) to three Kenyan National Parks' belonged to the learners segment. Individuals in this segment were motivated to learn about specific elements of wildlife and culture.

Recent discussions about the motivations of wildlife visitors' supported previous research about wildlife visitors' primary motivation to learn. From their case studies, Roe and McConney (2015) reported that from a number of 170 zoos across 48 countries, the majority of visitors' reportedly came to learn. On the other hand, although studies such as Beh and Bruyere's (2007) study found evidence that visitors' motivations to learn about nature, culture and unique attributes of the place is often high, their study did not look at whether the segments differed in terms of acquired learning. In this light, identifying different motivations for wildlife visitors' is important because it provides information about how to design products that ensure that all visitors acquire positive learning. However, what is equally important is knowing *how* different segments differ in terms of how they learn in wildlife settings, and what they acquire out of the visit. One particular interest is does the wildlife settings possess a substantial mix of domestic and international visitors ranging from different countries and/or different cultures. Research has shown that different cultures differed in learning styles and consequently, differed in outcomes of learning (Joy & Kolb, 2009; Ogbu, 1992; Yamazaki, 2005). Consequently, the differences in cultures and cultural impact on learning outcomes are considered to be important as emerging studies within free-choice learning settings, as they have affected the approach used in designing effective interpretation. This will be discussed in greater detail the next section.

2.3.1.3 Differences in cultures or visitor types

The third major individual factor that is likely to impact on visitors' learning is their cultural background. Culture is "the norms, beliefs and customs that are learned from society and lead to common patterns of behaviour" (Assael, 1992, p. 319). It "…encompasses a number of people who were conditioned by the same education and life experience" (Hofstede, 1980, p. 224). As such, different cultures perceive different subjects differently. For example, in relation to environmental concerns, high-income countries are more concerned about biodiversity loss and consumption habits, whereas, low income countries are more concerned about noise and air pollution (de Mooij, 2010). Given this, tourists may have different perspectives about environmental learning due to cultural differences, or visitor segments ranging from similar countries that share the same level of environmental concerns.

The term "cultural differences" has been criticised as culture does not only refer to nationalities as people residing in different countries may have some similarities that can be grouped as a homogenous segment (Dann, 1993). Equally, cultural difference may also refer to the

differences in environmental beliefs between two different groups (e.g., different ethics or different states) residing in the same country. As Rhyne (1995) states,

> "In thinking of cultural diversity, we may initially be inclined to think of "culture" in terms of very large, ethnic or geographical units. We probably think initially of the contrast between Western and non-Western cultures. But the difference, for example, between traditional Chinese attitudes toward conservation and those of the Japanese is surely as great as that between Western and non-Western cultures" (p. 2).

Every nation has within it multiple cultures and each nation also promotes and instils similar cultural norms within that nation. Therefore, cultural differences are not only limited to people who share the same languages or nationality, it can be argued that differences in culture depends on the context that is being studied as well. For example, international tourists who originated from different countries and local tourists who are visiting to a wildlife setting may differ culturally. International tourists, being from other countries, may have different exposure or prior knowledge or experiences with issues that makes them similar to each other but different from local visitors. Hence, in research, it is important for researchers to be clear in defining "culture" in their research. For example, researchers have identified cultural differences by referring to language groups (Reisinger & Turner, 2002), nationalities (Kozak, 2002; Pizam & Reichel, 1996), or people from developed or developing economies (Ford, Malhotra, Ulgado et al., 2005). Given that tourists from different nationalities in tourism settings possess differences in a range of variables (Kang & Moscardo, 2006), it is therefore important to define *what* cultural differences refer to in the context of the research. In this study particularly, cultural differences are referred to local visitors[4] (people who reside within Malaysia and Indonesia) and international visitors (people who reside outside of Malaysia and Indonesia).

Although there is limited literature that explores the impact of cultural differences on learning, particularly in wildlife settings, recent research have indicated that different cultures perceive things differently in other free-choice settings. Undeniably, differences between Asian and Western cultures are probably the most studied in the literature. A number of studies that investigated the experiences of tourists originating from Asian and Western societies (Aziz & Zainol, 2009; Ballantyne, Hughes, Ding et al., 2014; Choi & Chu, 2000; Hughes et al., 2014; Packer et al., 2014; Reisinger, Mavondo, & Crotts, 2009; Reisinger & Turner, 2002), have found

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[4] In this study, local visitors are regarded as visitors originating from countries where orangutans are native. Malaysia and Indonesia are also the world's major palm oil producer countries, as well as housing a high number of threatened species. Therefore visitors originating from these two countries are referred to local visitors.

significant differences in a number of variables. This ranges from responsible tourist attitudes (Kang & Moscardo, 2006), expectations of service quality (Tsang & Ap, 2007), values and motivation (Kim & Lee, 2000), and tourist risk perceptions (Fuchs & Reichel, 2004). Other differences between Asian and Western tourists were related to destination image and attributes (Reisinger et al., 2009; Stepchenkova, Kim, & Kirilenko, 2014), environmental values (Aoyagi-Usui, Vinken, & Kuribayashi, 2003), satisfaction (Choi & Chu, 2000; Wong & Law, 2003), and perceptions of hotel attributes (Mey, Akbar, & Fie, 2006). Studies in tourism contexts have also found differences in how Asians and Westerners communicate. For example, Reisinger and Turner (2002) found differences in how feelings were displayed, with Asian tourists being more sensitive and more introverted than Australian tourists. As Reisinger and Turner (2002) cautioned, Asians are particularly sensitive and place greater importance on 'face-saving', therefore, tourism providers should apply caution when criticising or delivering comments.

Cultural differences have been found to affect aspects such as visitors' preferences, motivations and awareness. This, in turn may impact how visitors learn and react in a range of tourism settings. For example, in a recent study, Ballantyne et al. (2014) found differences between Chinese and international (Western) visitors with regards to motivation and interpretive content preferences at five major tourist attractions in Beijing (the Great Wall, the Forbidden City, the Summer Palace, the Temple of Heaven and Beihai Park). In particular, their research found significant differences between the two cultural groups in their preferences for interpretive content. Chinese visitors wanted interpretation to include aspects such as Chinese culture, legends and traditional stories, and celebrities; the international tourists' or Westerners preferred information on previous history of the people who lived there (Ballantyne et al., 2014). The study has supported other studies done in Chinese heritage sites (Fu, Lehto, & Cai, 2012; Li, Sofield, Ryan et al., 2009), which found that art and literature were the centre of Chinese heritage interpretation. In these studies, results show that Chinese respondents wanted information about 'inspiring people', whereas international visitors were significantly more likely to want information about everyday life in China (Ballantyne et al., 2014).

A study by Xu, Cui, Ballantyne et al. (2013) assessed the effectiveness of current interpretive design in The Danxia Shan National Natural Reserve and Geo-Park in China. Their study explored whether current interpretive design using a 'scientific', Western approach such as including scientific facts and terms was effective in increasing the Chinese visitors' appreciation of the environmental aspects. Their study showed that the current design of 'scientific-based' interpretation was unsuccessful in increasing appreciation and understanding of the natural

environment, partly because it was not relatable to the current knowledge, interests and preferences of the Chinese visitors. This was mainly because the Chinese cultural religious and history teachings were more aesthetically-based and information tended to be presented through poems, stories and characters that the Chinese people could relate to (Xu et al., 2013). One of the respondents in Xu et al. (2013) study noted, *"We do not do research so only read a little. These* [scientific interpretation] *things do not interest us; we don't remember what has been written on the boards"* (Xu et al., 2013, p.127). The study concluded that interpretive design at the site was ineffective and needed to be better aligned with the current 'best practice' principles of interpretation, where an understanding of the audience is crucial. Xu et al.'s (2013) study is one of the few that has shown the importance of understanding the audiences' culture before designing interpretive materials.

Packer et al. (2014) provided further evidence of cultural differences with regards to environmental awareness. They studied the differences in perceptions of environmental issues between Australian and Chinese visitors at Tangalooma Island Resort in Moreton Island, Australia. It was found that Chinese tourists were significantly more aware of environmental issues, such as the relationship between humans and wildlife and global warming compared to Australians. The Chinese visitors also showed a higher connection to nature and place that was more importance when spending time in nature. Packer et al. (2014) suggested that these significantly higher levels of concern were due to rapid pollution and environmental degradation faced by the Chinese. Both Ballantyne et al.'s (2014) and Packer et al.'s (2014) study suggested the need to tailor interpretive content to suit the cultural backgrounds of target audiences.

Although these differences are hardly surprising, there has been little research into how different cultural groups learn in nature based and wildlife settings. Further studies that investigate whether learning outcomes differ between cultures and visitor types is needed, as these differences may be linked to differences in beliefs and the way in which interpretive materials are perceived. The recent studies discussed above suggest that the Western approach to designing interpretation may not be as effective for other non-Western groups, as it may not meet their current level of knowledge, interests, and attitudes particular visitor types. Consequently, this gap needs to be addressed, particularly when designing conservation-related interpretation for wildlife sites that houses threatened species in such understudied regions as Southeast Asia. Addressing this gap will increase the effectiveness of disseminating awareness of biodiversity conservation to various visitor types and cultural groups.

The studies reviewed above suggest that understanding what visitors bring with them in terms of motivation, knowledge and prior experiences is likely to assist wildlife sites to develop more effective interpretive materials and to design wildlife experiences based on these factors.

2.3.2 Environmental/physical factors

As well as factors specific to the individual, there are a number of features in the environment that are likely to impact on visitors' learning in wildlife settings. These factors are discussed below.

2.3.2.1 Opportunities to emotionally engage with the wildlife

Environmental problems such as climate change and deforestation impact animals more strongly than humans. These environmental problems that cause harm to animals (e.g., animals being killed, loss of habitat) are therefore more likely to evoke strong reactions, as animals arouse emotions and feelings in humans (Edgell & Nowell, 1989). Researchers argue that this is because people tend to ascribe human characteristics to animals and people interpret animal behaviour using human language, emotions and previous experiences (Curtin, 2010). This emotional connection, with wildlife is linked to the human affective domain, and which is likely to encourage an individual do something to protect an animal from harm (Myers, Saunders, & Birjulin, 2004), most likely as a result of being empathetic towards the animals (Myers et al., 2009).

Emotional connections with wildlife are also important in prompting conservation behaviours, such as donating to environmental causes, adhering to on-site environmental regulations, and adopting environmentally friendly actions. Ballantyne, Packer, & Falk's (2011) study which investigated short and long term conservation learning in four marine wildlife settings (an aquarium, a marine park, turtle nesting/hatching site, and whale watching sites) support the argument that emotional engagement with animals is a precursor to short term learning. Their study found that visitors who rated highly on the variables that reflect on their emotional connections with marine animals and the issues affecting these animals, were more likely to be concerned about animals and wildlife conservation.

This was also evident in Zeppel and Muloin's (2008) meta-analysis of 18 published studies on marine wildlife interpretation. They analysed the positive outcomes gained from wildlife experiences, such as the benefits to individuals (e.g., satisfaction and enjoyment, learning and education, as well as changes in attitudes, beliefs and behaviour) and benefits for the marine environment (e.g., minimising disturbances and support for long term viability to the ecosystem). Their meta-analysis indicated that empathy with animals is one of the factors that contribute to on-site behaviour changes and intentions to act in an environmentally friendly manner towards wildlife.

Zeppel and Muloin (2008) stated that wildlife experiences that generate positive emotions prompt individuals' appreciation of, and the likelihood of carrying out actions that contribute to wildlife conservation.

2.3.2.2 Type of wildlife

Conservation learning also appears to be affected by the type of wildlife encountered and whether they have certain charisma or special attributes. This is, what is considered as 'charismatic' animals seem to have a greater impact on visitors' emotions compared to other less popular wildlife species. Species popularity depends on factors such as media publicity, size, and physical attractiveness (Reynolds & Braithwaite, 2001), therefore animals that have gained popularity such as the big five-lion *Panthera leo*, leopard *Panthera pardus*, elephant *Loxodonta africana*, buffalo *Syncerus caffer*, black *Diceros bicornis* and white rhino *Ceratotherium simum* (Di Minin, Fraser, Slowtow et al., 2013). Charismatic megafaunas or flagship species "…serve as symbols and rallying points to stimulate conservation awareness and actions" (Entwistle & Dunstone, p. 56). Charismatic species are often associated with large mammals (eg., whales, rhinos) and vertebrates that possess traits such as intelligence (eg., orangutans and dolphins) and beauty (eg., birds) (Ducarme, Luque, & Courchamp, 2013). In fact, a recent study by Colléony et al. (2017) found that visitors are more likely to donate to species that possess charismatic appeal regardless of the conservation status. Previous survey conducted to assess wildlife viewers in Montana also found that large animals and bird of preys that possess special attributes were the first two types of wildlife to be observed, while butterflies and other insects, reptiles and amphibians was the least desired wildlife for observation (Martin, 1997). Young animals also appear to affect visitors' conservation learning due to their cute and cuddly characteristics (Ballantyne et al., 2007). In addition, wildlife that are categorised as rare also have the same effect (Moscardo & Saltzer, 2004; Woods & Moscardo, 2003).

Although it can be argued that people make connections to wildlife due to the need to nurture (Taylor, 2002), it can also be argued that these types of wildlife may have a greater impact on peoples' learning for conservation. In particular, whether the wildlife are viewed as "charismatic" species, or whether animals are in the stage of "infancy" , may affect visitors' conservation learning as these types of wildlife are able to evoke deeper emotional connections. Subsequently, this may lead to heightened awareness or feelings of love and willingness to care for these types of animals. Indeed, recent research by Jacobs and Harms (2014) explored effectiveness of the type of interpretation to increase visitors' conservation intentions which corroborated this notion. They found that the increased conservation intentions among visitors to protect whales were

due to the emotional content in their experimental study. They also added that this may be influenced by the fact that whales are mammals, and are considered as a charismatic species, therefore, are able to evoke higher emotions in tourists' and lead to increased feelings for the need to protect. They further stated, "Whales are charismatic species to many, and therefore our findings [increased conservation intentions] do not necessarily apply to other (less charismatic) species" (Jacobs & Harms, 2014, p. 128).

Myers et al. 's (2004) study also supported the claim that different types of wildlife can result in more positive conservation attitudes and intentions in regard to specific animals. Their study found that gorillas generated the highest emotional response, particularly to a sense of connection and love, compared with snakes and okapi. Previous research by Clayton et al. (2009) found that animals that were perceived to be similar to humans (i.e., gorilla and baboons) were likely to result in a greater tendency to care for these animals. Likewise, emotional connection with the wildlife was also observed in Russell's (1995) study on ecotourist's views of orangutans. He conducted a case-study (via interviews and informal conversations) to understand ecotourist's views on orangutans in an orangutan rehabilitation project in Tanjung Puting, Indonesian Borneo. One of the ecotourists commented,

> "The close contact with the ex-captives was such a privilege, but if I had to identify the 'best' aspect it undoubtedly was seeing them free. Not just the wild orangs but the ex-captives as well. No words can adequately express the sense of freedom I saw in their eyes. That look is absent from any orangutans that I have seen in captivity. It brings tears to my eyes just thinking about it" (Russell, 1995, p. 11).

Without a doubt, charismatic species that possess special features such as 'human-like' features and behaviour are one of the main reasons why visitors tend to be more engaged with certain animals. As Clayton et al. (2009) further stated, visitors may make connections during an experience by imagining themselves taking the place of the animals. This was evident with charismatic wildlife species in their infancy stages such as baby dolphins, baby elephants and baby orangutans (Ballantyne, Packer, Hughes et al., 2007; Moscardo, 1996; Woods & Moscardo, 2015). Similar to human babies, infant animals are perceived to be adorable (Sanefuji, Ohgami, & Hashiya, 2007) as their physical appeals leads to feeling of nurturing and caring. This theory is known as "*Kindchenschema*" (baby schema) or infant appeals (Lorenz, 1943). Therefore, infant animals are able to evoke more intense emotions during wildlife experiences compared to those in the adult

stages. Though there have been limited studies that had explored this, related studies have suggested that wildlife experiences that provide experiences (e.g., observation of mother-baby animals, drawings/artefacts of baby animals) with baby animals promote positive feelings such as feelings of altruism[5] (Fraser, 2009), heightened enjoyment (Broad, 1996) and heightened interests (Scheersoi, 2015). Thus, the combination of the type of charismatic species in their infancy stage may also be one of the factors that helped to facilitate conservation learning.

2.3.2.3 Direct experiences or interaction with wildlife

In wildlife captive settings such as zoos, apart from viewing the wildlife, visitors are often presented with opportunities to interact with animals. Visitors enjoy being close to, and touching animals (Woods, 2002). This is because encounters with animals provide a sense of comfort and restoration (Vining, 2003). Animal encounters offered in captive wildlife settings include Breakfast with Orangutans in the Singapore Zoo; swimming with elephants in Kuala Gandah Elephant Sanctuary, Malaysia; swimming with dolphins in Port Philip Bay, Australia; and petting a koala in Lone Pine Koala Sanctuary, Australia. Apart from enhancing the visitors' enjoyment, the opportunity to interact closely promotes concern for, and interest in the animals, particularly in captive sites (Hosey, 2000), apart from increased feeling of being connected with nature (Orams, 2000).

Recent research by Pearson, Dorrian, and Litchfield (2013) explored visitors' knowledge about orangutans in three Australian zoos, and found that higher knowledge is indirectly linked with positive conservation intentions. The research found that higher knowledge scores for visitors was further linked with five factors; one of them is being satisfied with viewing the activities the orangutans engage in. The study suggested that when visitors experience some form of enjoyment when they see animals in good health, it indirectly leads to a higher likelihood of visitors' wanting to protect and care for the animals. Likewise, Russell's (1995) study found that enjoyment from playing with orangutans enhanced a sense of concern for the animals.

A study conducted by Orams (1997) at Tangalooma Island Resort, Australia found that participants who enjoyed the interaction with dolphins revealed an increased desire to be more environmentally responsible. Additionally, Oram's (1997) study suggested that visitors who were exposed to an environmental education programme were more likely to carry out their intentions to engage in conservation actions than those who did not participate in the programme. Likewise, Mayes, Dyer and Richins (2004) also found positive benefits from close interaction with dolphins.

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[5] Altruism is defined as "willingness to do things that bring advantages to others, even if it results in disadvantage for yourself" (Cambridge Dictionary, 2016).

After the wild dolphin feeding experience, almost half of the visitors sampled to Tangalooma and Tin Can Bay resort in Australia states that they had participated in assisting with conservation programs (Mayes et al., 2004).

Enjoyment in interacting with animals was also observed in Kontogeorgopoulos (2009) study of elephants. By examining the differences between three semi-captive elephant sites, the researcher found that visitors were highly satisfied when they were given the chance to experience riding an elephant. Kontogeorgopoulus's (2009) study, however, did not measure changes in knowledge, attitude or behaviour of the participants after their visit. Additionally, the experience of riding elephants has been subjected to criticism from animal welfare groups (Duffy & Moore, 2011), mostly due to the use of elephants for joy rides. Certainly, there have been a number of debates and discussions surrounding the negative impacts, particularly when the experience involves feeding and touching animals (Reiser, 2017; Orams, 2002; Hughes, 2001). Orams (2002) discussed that feeding wildlife is linked with various negative consequences to the wildlife, which includes alteration of the animals' natural behaviour patterns population, dependency and habituation, aggression and health.

Visitors who experience enjoyment and satisfaction when interacting closely with animals such as feeding or touching them, may more willing to carry out behaviours that protect the animals. This is because, one of the reasons why individuals behave responsibly, or participate in an activity is due to the intrinsic motives such as personal satisfaction or enjoyment (Young, 1996). This claim, however need to be investigated further to weigh the benefits and negative consequence especially when it involves of feeding/touching animals. If the negative consequence outweighs the benefits, wildlife sites need to exercise strict regulations in relation to prohibiting visitors to feed/touch wildlife, but at the same time find ways to provide experiences that are equally entertaining and satisfying to the visitors.

Apart from feeding or touching animals, interacting with animals also includes being able to observe them in close proximity. More intense emotions are evoked when encounters are intimate and include eye to eye connections with wildlife (Curtin, 2010). Packer and Ballantyne's (2012) research compared captive and non-captive wildlife experiences and found that visitors to captive sites placed higher importance on the enjoyment aspects, and visitors to non-captive sites placed higher importance on learning. Their research also showed that non-captive experiences that focus on free-ranging animals have a greater impact on short-term learning (i.e., new knowledge and attitude change), possibly because these type of experiences are more likely to inspire a sense of respect for the animals and their natural habitat. This suggests that wildlife sites that are categorised

as non-captive need to invest more on designing spaces geared towards conservation learning. This is more important in non-captive wildlife settings that house threatened or endemic species. As these settings may have a greater impact on short-term learning, these settings are more advantaged to infer long-term conservation learning for the general public. However, more research needs to be conducted at both non-captive and semi-captive sites to explore how learning can be maximised regardless of the type of wildlife setting. If non-captive experiences have been found to have a greater impact on visitors' conservation learning and attitude change, wildlife tourism managers in captive settings may need to design experiences that mimic some aspects of non-captive settings so as to increase the positive impacts on visitors' conservation learning.

2.3.2.4 Persuasive design of interpretive materials

Numerous studies have demonstrated the capabilities of wildlife experiences to affect visitors' conservation learning (i.e., positive changes in knowledge, attitudes and behaviours). A critical component that appears to impact on positive learning outcomes in wildlife settings is the availability of experiences that include on-site interpretation (a review of studies is discussed in section 2.4). Interpretation can be designed in various ways, including personal (e.g., guided tours, presentations) and non-personal techniques such as brochures and pamphlets, self-guided trails, guided tours, displays or signs (Berkmuller, 1981; Ham, 1992). They can also be communications that is available on-site that inspires people have different perspectives surrounding the natural environment (Hughes & Morrison-Saunders, 2005). An important aspect is how well the interpretation is designed and whether it enhances the experience (Kuo, 2002). In relation to this, one focus of interpretive design that has garnered attention over the years is the inclusion of design elements that influence visitors' on-site and off-site actions. This is important, because the design of interpretive materials that include persuasive elements can create powerful and memorable experiences that can influence long-term environmentally sustainable behaviours (Ballantyne, Packer, & Sutherland, 2011).

In the context of wildlife settings, the most commonly discussed elements is the use of compelling themes (Ham & Weiler, 2003) (further discussed under principles of interpretation-section 2.4.1), and designing persuasive messages based on visitor beliefs (Ballantyne & Hughes, 2006). The latter, guided by Theory of Planned Behaviour, is a belief-based approach that is adopted in the current study. In general, studies that target behaviour change through interventions have used the Theory of Planned Behaviour to elicit participants' salient beliefs relating to the

behaviours being investigated. These beliefs are then used to design messages that attempt to persuade visitors to adopt positive behaviours, such as reducing alcohol consumption or donating money for conservation. These approaches are underpinned by behavioural change theory, and will be further reviewed in Section 2.5.1.

Apart from themes and use of beliefs, there are also a number of elements sourced from other subject areas (e.g., journalism and mass communication, social psychology, consumer research, and marketing) that can be specifically applied in designing various interpretive materials to further increase their persuasive effect. Persuasion is defined as "a symbolic process in which communicators try to convince other people to change their attitudes or behaviours regarding an issue through the transmission of a message in an atmosphere of free choice" (Perloff, 2010, p.12). Since the 1960s, researchers have explored elements that make a message more persuasive, such as the use of humour (Cantor & Venus, 1980; Markiewicz, 1974), assessing the communicator's credibility (Greenberg & Miller, 1966; McGinnies & Ward, 1980), the use of repetition (Cacioppo & Petty, 1980), analogies (McCroskey & Combs, 1969), and arguments (Kim, Kim, & Marshall, 2016). Three relevant elements that guided the design of persuasive interpretive contents in this study are 1) structuring persuasive messages; 2) the type and persuasive message content and; 3) including persuasive visuals.

Structure of persuasive messages

Persuasive messages can be structured in a number of ways. They can be written as one sided (e.g., argument based on positive facts only), two sided (argues both negative and positive facts) (Hovland, Lumsdaine, & Sheffield, 1949), or focused on drawing a conclusion (stating which path audiences need to pursue) on an issue (Perloff, 2010). Argumentative messages, especially two sided arguments, convey the advantages and disadvantages of a subject to the audience. For example, visitors can be presented with two sides of an argument on purchasing or using palm oil products that highlight the advantages (e.g., palm oil products are cheaper) and the disadvantages (e.g., loss of wildlife habitats).

Messages can also be structured through the use of framing and can be framed either positively or negatively (Levin, Schneider, & Gaeth, 1998). A study by Meyerowitz and Chaiken (1987) focused on negative and positive messages when conducting breast self-examination, and found that using a persuasive pamphlet which argues the negative effects of not doing breast self-examination was more effective in influencing individuals to perform breast self-examination than pamphlets that argued the positive effects of performing self-examinations. However, the opposite

was found by Mazzotta and De Rosis (2006) who reported that messages which emphasise the positive effects of healthy eating are more persuasive. It is unclear which technique is more effective. It is envisaged that conducting a prior assessment of salient beliefs will provide further indication about whether to use negative or positive framing of messages.

Type of persuasive message content

The type of message content can also further persuade the audience. Contents can instil feelings of fear, guilt or provide visitors with further evidence to strengthen a statement. Evidence-based messages (Figure 2.4) use factual assertions, quantitative information, or statements by trusted individuals to substantiate a claim (Perloff, 2010). Evidence-based messages are widely used to promote public health (Brownson, Baker, Leet et al., 2010; Michie, Johnston, Abraham et al., 2005), as people are able to see the evidence related to the positive outcomes of carrying out healthy behaviours, such as increased lifespan due to cutting down of smoking behaviours. In environmental conservation campaigns, evidence-based messages such as describing the extent of forest degradation (Figure 2.4) can strengthen the campaign for forest conservation or environmental campaigns (WWF, 2016).
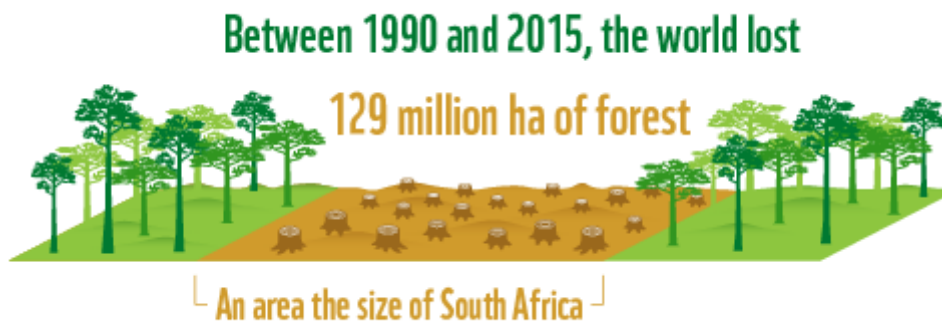
Source: WWF (2016)

Figure 2.4: Examples of using evidence based content to increase persuasion

The content of the message can also be designed based on guilt or fear appeals. Guilt is proposed to influence behaviour by arousing negative emotions in individuals; these negative emotions will predispose individuals to reduce this negative feeling of guilt by performing an act (Hibbert, Smith, Davies et al., 2007). Guilt appeals in messages are mainly observed in advertising (Coulter & Pinto, 1995; Huhmann & Brotherton, 1997). Examples include when advertisers persuade people to engage in positive behaviours, such as philanthropic behaviour (Hibbert et al., 2007), health and safety (Agrawal & Duhachek, 2010; Hullett, 2004), and environmental purchases (Dahl, Honea, &

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Manchanda, 2003; Peloza, White, & Shang, 2013). This approach is based on the basic premise that it will lower individuals' self-esteem if they don't engage in the desired behaviours (Burnett & Lunsford, 1994).

There are three different types of guilt appeals that can be used in persuasive messages. These include reactive guilt, anticipatory guilt (Rawlings, 1970), and existential guilt (Izard, 1977). Existential guilt is seen as the most suitable type of guilt appeals to incorporate into wildlife interpretation. Existential guilt appeal is defined as: "a consequence of a discrepancy between one's well-being and of others" (Izzad, 1977 in Cotte, Coulter, & Moore, 2005, p. 2). By targeting the negative consequences of an individual's lack of action, this type of message will persuade audiences to act based on the guilt that individuals feel when they know they can help others to feel better, and yet do not act.

Another type of appeal, fear appeals, are used to scare people by giving the illusion that negative consequences may happen if people do not adhere to the advertised message. These are common occurrences in environmental campaigns. Previous research by Shelton and Rogers (1981) found that showing the brutal movements of industrial whaling gave the illusion of fear which heightened people's intentions to save the whales. However, O'Neill and Nicholson-Cole (2009) found that fear appeals were ineffective when influencing pro-environmental behaviour towards climate change. These show that fear appeals work differently based on the issue at hand, or based on different populations. Perloff (2010) cautions that fear did not necessarily produce an attitude change as individuals perceive the extent of fear differently. Boster and Mongeau (1984, p. 375) added that, "…what appears to be a highly-arousing persuasive message to the experimenter may not induce much fear into the recipient of the persuasive message". As people have different thresholds of what they fear (e.g., fear of heights, fear of diseases), such appeals may not be successful. If individuals do not believe that these fear-arousing messages pose a severe threat to them personally, they may not be easily persuaded. This is why it is important to conduct prior assessment to identify how a population views or perceives an issue before designing any messages.

Persuasive visuals

Images are often used to evoke emotional responses (Andrews, van Baaren, & van Leeuwen, 2013). In his study, Andrews (2008) investigated how images used in social campaigns can be a powerful persuader in changing individuals' attitudes and behaviour. Two of the techniques commonly used in social campaigns and advertising, anthropomorphism and metaphors, are discussed below.

Anthropomorphism is a term that is used when people characterise or describe non-living things or animals using human characteristics (Andrews et al., 2013). In studies involving animals, this term is used to suggest that the views that animals have are similar to human-beings (Daston & Mitman, 2013). Andrews et al. (2013) suggested that people feel closer to brands or products that are associated with humanlike characteristics (e.g., advertisement of cars with human eyes and mouth), while Depoe (2014) stated that anthropomorphism helps to connect with audiences because it establishes similarities between human and non-humans. For example, Figure 2.5 shows the image of a lion displaying humanlike feelings of worrying about current environmental problems, sending out the message that "if animals could talk".

Orangutans are often associated with anthropomorphism (Weiss, Inoue-Murayama, King et al., 2012). For example, orangutans are referred to as, "…our beautiful red-haired brothers and sisters" and "…among our cousins" by various sources particularly NGOs (Depoe, 2014, p. 122). This tendency to anthropomorphise orangutans is seen as an effort to connect with audiences and prompt them to think about protecting the orangutans (Depoe, 2014).

Figure 2.5: Examples of anthropomorphism used in social campaigns

(Source: Andrews et al., 2013; WWF, 2014)

Metaphors can also be used to compare and provide arguments. "A metaphor involves transferring and substituting words and phrases so as to create new ways of viewing old realities" (Boozer, Wyld, & Grant, 1990)p. 64). Lakoff and Johnson (1980) previously argued that the only way for people to understand complicated issues are through metaphors. In environmental interpretation, metaphors can be used to describe complex ideas and to make information more entertaining to the audience (Ham, 1992). Metaphors are usually used to provide intensity in the language of the message (Perloff, 2010). Research by Glucksberg, Gildea, and Bookin (1982) showed that it is

impossible for people to ignore metaphors that are used in a message as they will need to process the information. Often, images are used to present a metaphor to help audiences to make connections (see Figure 2.6).

Figure 2.6: Image of the earth as a melting ice-cream to present a metaphor of climate change

(Source: Andrews et al., 2013; WWF, 2014)

Research reviewed in this section pointed that there are different factors at play that facilitates visitors' learning for conservation. Interpretation was determined to play a vital role in facilitating learning for conservation. The next section further discusses several definitions of interpretation and reviews studies that demonstrate the positive impact of wildlife interpretation.

2.4   Interpretation in wildlife settings

Moscardo, Woods, & Saltzer (2004) concluded that, "… interpretation is a critical component of visitor experiences and satisfaction" (p.253). However, few studies have specifically explored the effectiveness of interpretation delivered in nature-based or wildlife sites in helping to increase knowledge, or positively changing attitudes (Zeppel & Muloin, 2008). In this light, while a number of wildlife studies have provided evidence of the positive impacts, few have theoretically discussed *how* to design interpretation, or conduct experimental studies to test effectiveness of interpretation

using different types of designs (Moscardo et al., 2004). Moscardo (2007) previously noted that wildlife sites need to place more emphasis on the presentation of conservation related contents. The study also highlighted Bright and Pierce's (2002) previous statement that the content portrayed by non-captive wildlife sites tended to focus on animal itself, rather than content that focuses on habitat loss or conservation of animals. This signifies the important role of designing effective interpretation in these settings (Orams, 1994), and this requires the carrying out of experimental studies that test design of interpretation and its contents. Prior to designing effective interpretation, it is integral to understand the definition and underpinning principles of interpretation.

2.4.1 Definition and principles of interpretation

Interpretation was first formally defined by (Tilden, 1957) as,

> "*An educational activity which aims to reveal meanings and relationships through the use of original objects, by first-hand experience, and by illustrative media, rather than simply to communicate factual information*" (p. 3).

Based on Tilden's (1957) definition of interpretation, this study has also presented a number of other definitions of interpretation. These definitions are presented in chronological order in Table 2.2. A feature frequently addressed in these definitions is the ability of interpretation to enhance the audiences' understanding by making meanings or translating information about the object or site.

Table 2.2: Definitions of interpretation

Sources	Definition of interpretation
American Association of Museums, as cited in (Alderson & Low, 1985, p. 3.)	"Interpretation is a planned effort to create for the visitor an understanding of the history and significance of events, people, and objects with which the site is associated".
Alderson & Low (1985, p. 5)	"Interpretation is an attempt to create understandings. (It) include not only the spoken, written, and audiovisual communications received from the interpretation staff, but also a variety of sensory and intellectual perceptions gleaned through the quality of restoration, authenticity of furnishings, and effectiveness of exhibits".
Ham (1992, p.3)	"Environmental interpretation involves translating the technical language of a natural science or related field into terms and ideas that people who aren't scientist readily understand".
Beck and Cable (2002, p.2)	"Interpretation "give[s] meaning to a 'foreign' landscape or event from the past or present. What is being translated (say glaciation of Yosemite Valley, ecosystem dynamics at Yellowstone, or events surrounding the battle at Gettysburg) may well be 'foreign' to substantial numbers of visitors".
Ward and Wilkinson (2006, p.2)	"Interpretation is the translation of language or information from one source to another in order to facilitate comprehension and understanding. Interpretation assumes a short, usually one-time exposure to a message. It addresses the modern reality of an audience that is easily distracted, time-constrained, and free to pay as much or as little attention to a message as the communicator inspires".
Moscardo et al. (2007, p.4)	"…interpretation is to translate ideas and concepts into a format that captures, engages, entertains, and inspires audiences".
National Association for Interpretation (2014)	"Interpretation is a mission-based communication process that forges emotional and intellectual connections between the interests of the audience and the meanings inherent in the resource".

A number of prominent authors have outlined principles that should be used to achieve quality interpretation. As one of the pioneers in environmental interpretation, Tilden (1957) outlined six main principles of interpretation:

1. Any interpretation that does not somehow relate to what is being displayed or being described as something within the personality or experience of the visitor will be sterile. Information, as such, is not interpretation.

2. Interpretation is revelation based upon information, but they are both entirely different things. However, all interpretation includes information.

3. Interpretation is an art which combines many different types of arts whether the materials presented are scientific, historical or architectural. Any art is in some degree teachable.

4. The chief aim of interpretation is not instruction, but provocation.

5. Interpretation should aim to present a whole rather than a part and must address itself to the whole person rather than any phase.

6. Interpretation addressed to children (up to the age of 12) should not be a dilution of the presentation to adults, but should follow a fundamentally different approach. To be the best it will require a completely separate programme.

(Source: Tilden, 1957, p. 14)

These principles of interpretation describe interpretation as a type of education that is more flexible, and thus, more suited to be applied in free-choice settings, where the audience learns voluntarily; as opposed to education that is conducted in formal settings such as the classroom and where the audiences are non-voluntary.

Moscardo et al. (2007) further developed the principles of interpretation based on Tilden (1957), Ham (1992) and mindfulness principles (Moscardo, 1992). Their six effective principles are:

1. Interpretation must make a personal connection with, or be relevant to, the intended audience.

2. Interpretation should provide or encourage novel and varied experiences (be different and engaging).

3. Interpretation should be organised with clear, easy-to-follow structures (sequential order to assist understanding).

4. Interpretation should be based on a theme.

5. Interpretation should engage visitors in the learning experience and encourage them to take control of their own learning.

6. Interpretation should demonstrate an understanding of, and respect for the audience (e.g., understanding of the visitors' personal information such as level of knowledge and attitudes) (Source: Moscardo et al., 2007, p. 5-12)

The principles of environmental interpretation often assert the need for a strong theme to increase its effectiveness (Ham, 2013). "A theme is a whole idea, a belief, an inference or connection that the mind makes" (Ham, 2003, p. 5). In 1992, Ham developed a model called EROT which states that there are four basic principles to achieve a quality interpretation:

1. Interpretation is enjoyable / pleasurable;
2. Interpretation is relevant;
3. Interpretation is organised;
4. Interpretation has a theme.

The EROT model was developed based on a thematic approach to interpretation, and can be applied to either oral or written presentations (Ham, 1992). Although Ham's EROT model was not developed until 1992, prior studies had researched the effectiveness of designing interpretation by using a theme. For example, a study by Thorndyke (1977) demonstrated the success of communicating to audiences when a theme is presented. Thorndyke (1977) conducted four experiments to relay a story to an audience: 1) a theme was presented before a story; 2) the theme was presented at the end of a story; 3) the theme was presented in the middle of a story; and 4) no theme was presented. He found that the version of the story where the theme was presented first had the biggest impact on audience comprehension and memory. This suggests that a theme must be presented earlier in wildlife interpretation to assist visitors' meaning-making process. In 2007, Ham altered the EROT framework to the TORE framework to convey the importance of having a strong theme in interpretation to increase its effectiveness (Ham, 2013).

Ham (2008) further developed the TORE Model of Thematic Interpretation which stated that there were four essential characteristics of interpretation – Thematic, Organised, Relevant and Enjoyable, as detailed in Figure 2.7. Ham (2007) asserted the need to convey interpretation messages through a strong theme, which was organised in such a way that it was easy to be processed by the audience. At the same time, the theme must be relevant to what the audience care about, and at the same time, to instil enjoyment.
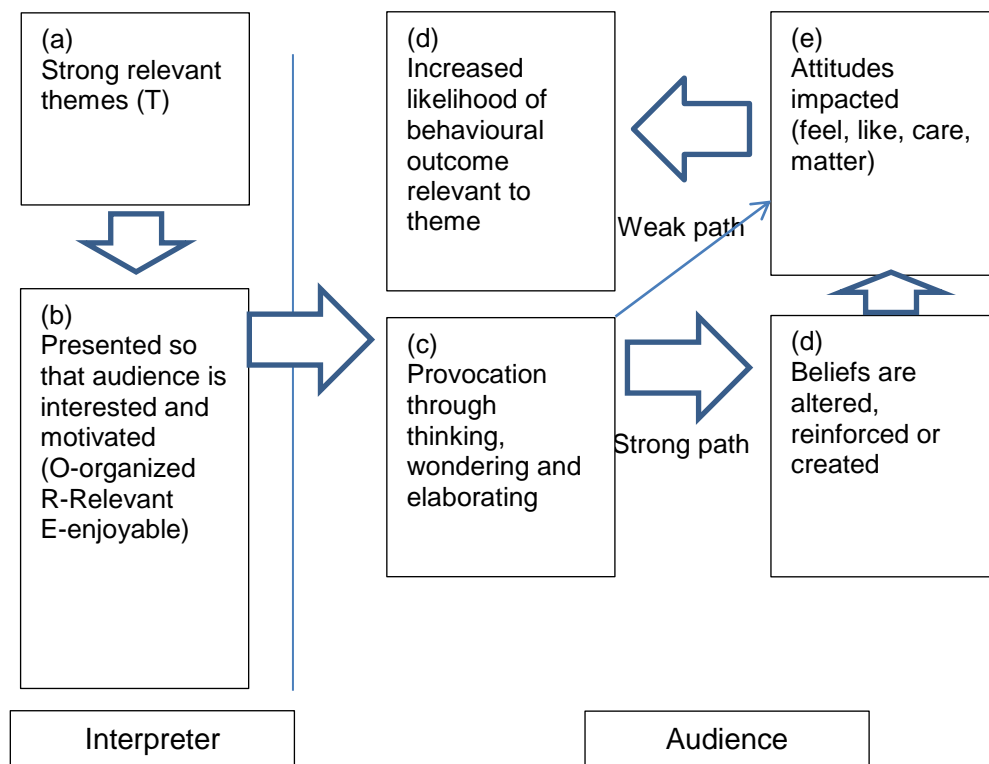
(Source: Ham, 2007)

Figure 2.7: The TORE Model of Thematic Interpretation

The TORE model elaborates how the development of a strong, relevant theme in interpretation further reinforces audiences' beliefs. These beliefs, in turn, are related to attitudes and further impacts on behaviour. This model is linked to the Elaboration Likelihood Model of Persuasion (ELM) (Petty & Cacioppo, 1986) and the Theory of Planned Behaviour (Fishbein & Ajzen, 1975). The TORE model further specifies how the application of these two theories is applied in interpretation. Strong themes (T) encourage provocation, thinking and elaboration which relates to a deeper message elaboration and processing in ELM. Strong themes impact on the individual's beliefs and attitudes which in turn increases the likelihood of behaviour change, as predicted by the Theory of Planned Behaviour. Strong themes that are compelling can persuade and manipulate an audience to think, elaborate, feel and behave (Ham & Weiler, 2003). Ham and Weiler (2003) argued that strong themes in interpretation are closely related to provocation or persuasion, a crucial factor in designing interpretive materials in free-choice learning setting.

Ham (2013, p125-129) noted that strong themes in nature interpretation can be achieved by using several techniques, such as:

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i.   Linking universal concepts or symbolic connections (e.g., *With every sip of this wine, the toil and blood of our ancestors become part of you*)

ii. Using metaphors (e.g., *Chuck Berry is the architect of rock and roll*)

iii. Using personal language by incorporating the word 'you' (e.g., *You can save your soil*)

iv. Using analogies (e.g., *To understand how volcanoes work, think of a covered pot of boiling water*)

v.   Using short themes/one sentence theme (e.g., *pesticides kill*)

vi. Using two sentences themes for more complicated issues

vii. Using every day conversional language (informal language)

Unlike education programmes that only focus on communicating facts, interpretation seeks to provide meanings and translate terms and ideas into simple language that laypeople can understand. Ham (1992) asserted that people have a misconception that interpretation is simply an educational tool that is used in park and recreational settings; however interpretation is more than presenting facts, it assists understanding and appreciation of a message. There is always a moral to be learned in interpretation (Ham, 1992).

Since the present concern of this study is to evaluate the impact of interpretation on visitors' conservation learning, this review will now focus on research conducted in wildlife tourism settings that has explored the impact of interpretation on visitors' knowledge, attitudes and behaviours.

2.4.2 Impact of interpretive wildlife tourism experiences on conservation learning

The awareness of the global biodiversity crisis has led to a number of discussions and studies conducted in the area of nature and biodiversity conservation. These studies have addressed the need to overcome the challenges to foster responsible and environmentally friendly lifestyles that will eventually conserve biodiversity (Davidson, 2011). Past studies on wildlife tourism, have mainly addressed the effectiveness of these types of experiences to foster conservation awareness for wildlife conservation. However, as previously stated, there are limited studies that have been conducted to assess conservation learning in other regions apart from Western wildlife sites. In fact, Ardoin, Wheaton, Bowers et al. (2015) review of the impact of nature based tourism (NBT) (which also includes wildlife settings) found that two-thirds of the studies they examined for determining outcomes of conservation learning were conducted in Australia (out of 32 countries in the research sites).

Historically, studies of conservation learning started in the 1970's with the assumption that knowledge leads to attitude and behaviour change (Kollmuss & Agyeman, 2002). The main assumption or "traditional thinking" was that the act of conservation should start with knowledge gain (Berkes & Turner, 2006; Hungerford & Volk, 1990). However, this was soon disputed, as research found that knowledge alone does not lead to attitude and behaviour change. Previous models addressing responsible environmental behaviours included the General Responsible Model of Environmental Behaviour (GREB) (Hines, Hungerford, & Tomera, 1987). The model suggested that knowledge itself did not lead to responsible behaviour change, instead, it was a combination of factors that included knowledge. These included knowledge of issues and action strategies, locus of control, attitudes, verbal commitment, an individual's sense of responsibility and situational factors (Hines et al., 1987).

In response to proposed models such as Hines et al.'s (1987) GREB, wildlife interpretation studies sought to explore the impacts on environmental knowledge, attitudes and behaviour (i.e., conservation learning). A meta-analysis of 70 environmental interpretation studies that investigated the impact of interpretation on environmental learning found that past studies reported that there were six main outcomes: attitudes, awareness, behaviour, intentions, knowledge and satisfaction. Twenty-five of these studies reported positive learning outcomes in more than one construct. Moreover, knowledge and attitude change were the most measured construct in these studies (Skibins et al., 2012).

For the purpose of this review, studies that specifically focused on wildlife interpretation were extracted from Skibins et al.'s (2012) meta-analysis to provide a chronological presentation of *when* and *what* outcomes were evaluated over the years (Table 2.3).

Table 2.3: Interpretive wildlife studies that evaluated conservation learning outcomes

	YEAR			Learning Outcomes
1980's	**1990's**	**2000-2010**	**2010-Current**	
None	Cole, Hammond, and McCool (1997); Orams (1997)	Adelman et al. (2000); Engels and Jacobson (2007); Falk and Adelman (2003); Falk and Storksdieck (2005); Moscardo (2007); (Powell & Ham, 2008) Tisdell and Wilson (2005)	Ballantyne, Packer, and Falk (2011); Hughes, Packer, and Ballantyne (2011); Pearson et al. (2013)	**KNOWLEDGE** (changes after exposure to interpretive experience)
None	(Cole et al., 1997); Orams (1997)	Adelman et al., 2000; Falk and Adelman (2003) Christensen, Rowe, and Needham (2007); Falk et al. (2007); Hughes and Saunders (2005) Lukas and Ross (2005); Povey and Rios (2002); Powell and Ham (2008); Tisdell and Wilson (2005); Zeppel and Muloin (2008).	Ballantyne, Packer, and Falk (2011); Hughes et al. (2011); Pearson et al. (2013)	**ATTITUDES** (positive feelings/attitude towards wildlife protection)
None	Orams, 1997	Ballantyne and Hughes (2006); Falk et al., 2007; Hockett and Hall (2007); Powell and Ham, 2008; Smith, Broad, and Weiler (2008); Swanagan (2000); Tisdell and Wilson, 2005; Weiler and Smith (2009).	Ballantyne, Packer and Falk (2011); Hughes et al., 2011;Hughes, 2013;Jacobs and Harms (2014) Pearson et al., 2013	**INTENTIONS** (intent to carry out conservation behaviours)
None	Orams, 1997;	Adelman et al, 2000;	Ballantyne, Packer and Falk (2011); Hughes et al., 2011; Hughes, 2013;	**BEHAVIOUR** (self-reported conservation behaviour changes or observation of behaviour changes)

The earliest study in regards to the impact of interpretation on learning outcomes was completed in the 1980's by Knopf (1981); and Oliver, Roggenbuck, and Watson (1985). However these studies were not done in a wildlife setting. Early research in the 1990s specifically examined impacts of wildlife interpretation were conducted by Orams (1997) which evaluated the impact of interpretation on knowledge, attitudes, behaviour intentions and actual behaviour change.

Orams (1997) conducted a study to evaluate the differences of the impact of interpretation on knowledge, attitudes, intentions and behaviour between two groups of visitors at Tangalooma, Australia. One group were exposed to an interpretation programme aimed to increase knowledge, enjoyment and prompt behaviour changes, while another group were not exposed to an interpretation programme. Results showed that the interpretation during the experience impacted on conservation learning (changes in knowledge, attitudes, intentions and self-reported behaviour) in participants. A follow-up interview conducted after the experience (within 2-3 months) evaluated changes in self-report behaviours such as trying to get more information about dolphins, picking up rubbish, becoming more involved in environmental issues and donating to an environmental organisation. Significant differences between the treatment and control groups were reported in four out of five behaviours that were measured.

Orams's (1997) study concluded that the interpretation programme prompted increases in conservation knowledge, attitudes, and behaviours. He stated,

> "Although the type of behaviour change prompted in this study does not directly benefit the Tangalooma dolphins; these changes benefit the marine environment indirectly and, through this, the animals that live in it" (Orams, 1997, p. 10).

Likewise, Adelman et al. (2000) found changes in knowledge, attitudes, perception and behaviours in visitors after exiting an aquarium in Baltimore. Visitors were exposed to a number of interpretive components such as live animal displays and staff presentations. Six to eight weeks after the experience, self-reports by the visitors reported changes such as being inspired to visit other aquariums, being reminded about the experience when visiting other institutions; telling other people about the visit; and sharing stories about the visit. Adelman et al. (2000) however found that these changes did not translate to specific action. This could be attributed to the lack of post-visit reinforcement of conservation messages.

The majority of studies done between the 2001 and 2010 have evaluated the impacts of wildlife interpretation with regards to a combination of positive changes in knowledge, attitudes and behaviour. Tisdell and Wilson (2005) assessed interpretation's impact on visitors' learning

outcomes (knowledge, attitudes and behaviour intentions) at Mon Repos Conservation Park. They found that after the visit, visitors were more knowledgeable with regards to threats to turtles which prompted them to be aware of the actions and consequences of their behaviour towards protecting the turtles. Eighty-seven percent of the participants are convinced about the importance of taking actions that support turtle conservation, indicating a positive attitude to turtle conservation. Further analysis shows that visitors are willing to change their behaviour to benefit turtle conservation such as not buying or consuming turtle products.

Likewise, in a three year long-term study involving 12 zoos and aquaria in North America, Falk et al. (2007) studied changes in feelings, values, and attitudes of more than 5,500 visitors. The study found that zoo and aquarium visits strengthened visitors' environmental values, enhanced environmental attitudes and changed the way that visitors thought about their actions in protecting their environment. After the visit, more than half of the visitors (54%) reconsidered their role in promoting conservation, indicating that there was a positive change in conservation behavioural intentions.

Powell and Ham's (2008) study of visitors' donation behaviour in the Galapagos Islands also extended their understanding of wildlife tourism's impact on conservation knowledge, attitudes and behaviours. The wildlife experience in Galapagos is mediated by naturalist guides with a minimum of 12.8 years guiding experience. Prior to visitation, 74% of participants indicated that they had never or rarely made donations (Powell & Ham, 2008). After visitation, 70% of participants indicated that they had moderate and/or strong intentions to donate. The researchers found that tourists who made donations to the Galapagos Conservation Fund (GCF) ascribed their behaviour to their enjoyment and knowledge gained during the trip, as well as to positive attitudes towards the conservation of the Galapagos Islands. However, due to the policy of the site that kept donations confidential, this study was unable to measure whether stated behavioural intentions to donate was converted into actual behaviour.

Recent research in the area of wildlife tourism also provided further evidence about the impact of interpretive wildlife experiences on conservation learning outcomes. For example, Hughes et al. (2011) explored if there were any changes in families' conservation knowledge, attitudes and behaviour after a visit to the Mon Repos Conservation Park turtle rookery. Families who received post-visit interpretive support materials (such as weekly email updates and printed kits) were significantly more likely to report long-term positive changes in conservation knowledge and attitudes. They are also more likely to introduce behaviour change such as learning to look after frogs and keeping cats indoors to protect other small wildlife. Hughes et al. (2011) concluded that

long-term positive changes in environmental knowledge, attitudes and behaviour occurs if adequate post-visit support is provided.

Pearson et al.'s (2013) study that looked into the linkage between environmental knowledge, attitudes and behavioural intentions to conserve orangutans also corroborated the positive impact of interpretive wildlife experience. Their study found that after exposure to orangutan exhibits and signage that explained threats to survival, visitors reported higher levels of knowledge about orangutans and increased positive attitudes towards orangutans, plus higher intentions to carry out specific conservation behaviours (e.g., donating to orangutan organisations and avoiding timber and oil palm products).

Studies reviewed so far have indicated that there were positive conservation learning outcomes of visits to interpretive wildlife settings. However, some studies that have been done in wildlife settings contradict the 'simple' argument that interpretation impacts on conservation learning. Moscardo (2007) compared visitors' experiences in captive, non-captive and a controlled site (non-captive wildlife but the experiences were controlled) in 10 Australian and New Zealand wildlife sites. She found that while visitors indicated a high level of learning from the experience, this mainly related to learning facts about wildlife or conservation status. It was rare for visitors to link what they had learnt to actual animal care behaviours. Moscardo (2007) suggested that information provided at many wildlife tourism sites raises awareness and understanding of conservation issues, but fails to help visitors make a link between their own personal actions and conservation of wildlife species.

In some cases, the way a site is designed may be more important than the interpretation itself. This was evident in Hughes and Morrison-Saunders (2005) study that compared the impact of interpretation between two sites, Tree Top Walk (TTW) and Penguin Island. Visitors to the TTW site revealed a more eco-centric attitude (a view that nature is more important) while visitors in Penguin Island shifted their attitudes towards a more anthropocentric attitude (view that humans are more central than other animals/organism). While both sites have existing interpretive programmes, Hughes and Morrison-Saunders (2005) concluded that results of their study suggested that the design of the site influences the attitude shift, rather than the interpretation's exposure:

"…*the character of the site experience significantly affects the influence of conservation themed interpretation on visitors. The restricted passive observation experience of the TTW was associated with ecocentric shifts in attitude. The diverse and interactive recreational*

activities at Penguin Island were associated with a greater emphasis on conserving natural areas for their utility to humans." (p. 171)

The researchers claimed that their study demonstrated the difficulty that managers face in communicating a strong conservation message if the features of the site do not complement the conservation message.

To summarise, most studies assessing the impact of interpretive wildlife experiences on conservation learning appear to show some positive outcomes (i.e., positive changes in visitors' knowledge, attitudes, increased positive behavioural intentions and actual behaviour). These are consistent with learning theories and how people learn in free choice settings and the outcomes of learning are tied to changes in knowledge, attitudes and behaviours. Consequently, the studies that were discussed in this section have led to the conclusion that interpretation has a definite and integral impact on conservation learning in wildlife settings. However, to date, few studies have investigated and theoretically discussed *how* the interpretation was designed and *what* it is within the interpretation that actually prompted changes in conservation learning. A gap also exists in terms of *how* interpretation has different impacts on different visitor types or cultural groups, and whether this necessitates the need for different types of designs to cater for the differences. In this regard, studies that explored *how* interpretive contents could be designed mostly relied on theories of behaviour changes and persuasive communication theories. These theory-driven approaches have informed the basis for the design of studies that are aimed to influence visitors' behaviour (Curtis, Ham & Weiler, 2010). Thus, the discussion now moves forward to discussing two relevant theories used in this study. These theories have been previously used to design interpretive materials. The proceeding section will examine the effectiveness of these approaches to prompt changes in attitudes and behaviour.

2.5   Theories underpinning behaviour change and persuasive communication

A range of behaviour change theories have been developed over the years in an attempt to explain the behaviour change process. Many of these were based on the premise that behaviour is closely linked to an individual's beliefs (Ajzen & Fishbein, 1980; Bandura, 1977; Becker, 1974; Rogers & Prentice-Dunn, 1997). According to behaviour change theories, targeting these underlying beliefs will encourage behaviour change. This is because, to achieve positive outcomes in an individual's conservation learning, there is a need to define the behaviour in question, and the underlying beliefs

associated with performing the behaviour. One of the most commonly used theories of behaviour change in relation to pro-environmental behaviour is the Theory of Planned Behaviour.

2.5.1   The Theory of Planned Behaviour

One of the earliest and widely disseminated theories relating to human behaviour change is the Theory of Reasoned Action (TRA) developed by Fishbein and Ajzen (1975). This theory proposed that behaviour was directly caused by behavioural intention (i.e., the intent or decision to behave specifically towards an object). The intention to perform the behaviour was determined by two main components which were attitude towards the behaviour and subjective norms (Fishbein and Ajzen, 1975). These, in turn, were influenced by behavioural beliefs (an individual's belief about the consequences of his or her behaviour) and normative beliefs (an individual's belief about how society and peers look upon the behaviour).

As an extension to the TRA, the Theory of Planned Behaviour was further developed with the addition of one construct, perceived behavioural control. In the Theory of Planned Behaviour (TPB), perceived behavioural control refers to the perceived ability to perform the behaviour (Ajzen, 1991). As illustrated in Figure 2.8, perceived behavioural control is guided by an individual's belief about whether he/she has the knowledge, opportunity, ability, skill and resources to perform the behaviour (Ajzen, 1991).
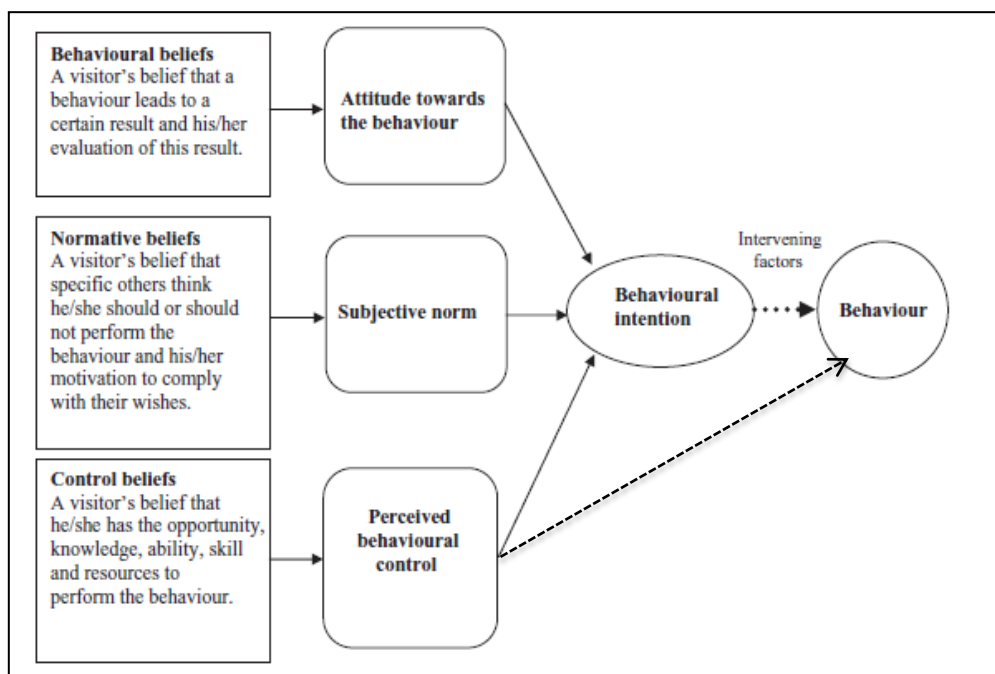
Figure 2.8: Overview of the TPB

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A person who is more confident with their ability to perform certain behaviour will be more likely to perform the behaviour compared with a person who doubts their own abilities, even though initially they both have strong intentions to perform the behaviour. Hence, according to this theory, positive perceived behavioural control may also directly affect behaviour.

An important facet of this theory is that there are underlying beliefs guiding attitudes, subjective norms and perceived behavioural control. In general, beliefs are generally defined as "*a state or habit of mind in which trust or confidence is placed in some person or thing*"; while attitudes are generally defined as a "*state of readiness to respond in a characteristic way*" or "*a feeling or emotion toward a fact or state*" (Merriam-Webster Dictionary, 2017). A person's beliefs about the object, and what that person thought should be acted on the object, leads to a general attitude towards that object (Fishbein, 1967). In short, a person expresses their beliefs about an object through their attitudes (Anderson & de Silva, 2009). Based on these understanding, Fishbein (1967, p. 257) defines attitudes as a "learned predispositions to respond to an object or class of objects in a favourable or unfavourable way". Therefore, research that looks at designing effective interpretation or interventions to change people's behaviour often addresses the underlying beliefs. This is based on the rationale that an effective intervention can be developed if it addresses the beliefs (behavioural, normative and control) surrounding the targeted behaviours (Fishbein, Triandis, Kanfer et al., 2001).

However, as posited by the TPB (Figure 2.8), a favourable attitude towards a specific behaviour is not an indication that a person will have positive intentions towards an object, or vice versa. These is due to the influence of other form of beliefs as well, that is normative beliefs and control beliefs. These beliefs are influenced by personal and environmental factors (Curtis, Ham, & Weiler, 2010). As discussed previously, beliefs may also differ between cultures, which are due to how beliefs and values are shaped in a society (de Mooij, 2010).

The Theory of Planned Behaviour and its predecessor the TRA postulate that beliefs are the foundation of behaviour (Ajzen, 1991; Ajzen & Driver, 1991; Ajzen & Fishbein, 1980). The design of interpretive materials in wildlife tourism targets beliefs that facilitate conservation learning, as a person's decision to change behaviour is often related to beliefs about that behaviour (Hughes & Ballantyne, 2013). This concept is related to the principle of compatibility, when people's attitudes and behaviour correlate highly with each other (Ajzen, 2005). Ajzen and Fishbein (2000) posited that attitudes and behaviour are guided by the same beliefs that guide the attitude and behaviours in question. Therefore, based on this principle, an assessment of visitors' beliefs, attitudes and behaviour must refer to the same context.

Identifying visitors' beliefs, particularly the most 'salient'[6] is important in the design of effective conservation messages. Ham (2007) stated that once "salient beliefs" to carry out a particular behaviour are identified, interpreters can produce effective wildlife interpretation to target those beliefs. Middlestadt (2012) defined salient beliefs as, "a relatively small subset of beliefs about behaviour that are readily accessible and that are activated spontaneously without much cognitive effort" (p. 83). Salient beliefs provide an understanding of the underlying factors that might deter or prompt behaviour change. Fishbein, Middlestadt, and Hitchcock (1994) stated that,

> "The more one knows about the precise underlying factors influencing the decision to perform (or not to perform) a given behaviour, the greater the probability that one can develop successful interventions to modify that behaviour" (p. 2).

Several studies have used beliefs to design interventions that have shown to positively impact on visitors' conservation learning (Brown et al., 2010; Curtis, Weiler, & Ham, 2006; Hughes, Ham, & Brown, 2009; Lackey, 2003). These studies used a 'belief elicitation phase' to elicit salient beliefs with regards to behavioural, normative and control beliefs. This process allows researchers to identify underlying beliefs about why an individual will or will not perform a behaviour. By measuring salient beliefs, one can also identify the underlying reasons why people hold certain views towards a subject (Ajzen, 2002).

2.5.1.1 Belief elicitation based on TPB

A number of studies have used the Theory of Planned Behaviour to design interventions aimed at changing behaviours in different areas, such as health, wildlife conservation and information technology (Bai, Middlestadt, Joanne Peng et al., 2009; Brown et al., 2010; Curtis et al., 2006; Giles, Connor, McClenahan et al., 2007; Hughes et al., 2009; Lackey, 2003; Limayem, Khalifa, & Chin, 2004). Specifically, these studies have employed the belief elicitation phase to elicit salient beliefs with regards to behavioural, normative and control beliefs. This approach is also termed the formative approach or formative elicitation research (Curtis et al., 2010). Curtis et al. (2010) further stated that this is an important first step to be conducted if this theory is to be used in different settings, different behavioural contexts and with different populations. The authors further added that if this step is not conducted, and if the research opts to generalise the beliefs by adopting or "importing" beliefs from other studies, the research may report beliefs that do not represent a

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[6] Merriam-Webster Dictionary defines salient as "very important or noticeable".

population. Ajzen (2002) stated that a generalisation can only be made if the behaviour is performed by taking into consideration all relevant contexts (e.g., time, place). Therefore, it is unlikely that beliefs in a population can be assumed to be the same, as the time factor makes it plausible for beliefs to change (Curtis et al., 2010). However, despite the fact that eliciting beliefs are important in order to deepen our understanding of certain behaviours (particularly environmental behaviours), many authors has voiced concerns that the elicitation phase has been often overlooked and understudied (Downs & Hausenblas, 2005; Fishbein & Middlestadt, 1995; Hughes, Weiler, & Curtis, 2012).

The belief elicitation phase is conducted by selecting a small sample (about 25 people) from a population intended to be studied and using open-ended questions (via questionnaire or interviews) to uncover underlying beliefs with regards to behavioural, normative and control beliefs (Francis, Eccles, Johnston et al., 2004; Middlestadt, Bhattacharyya, Rosenbaum et al., 1996). Specifically, this phase allows researchers to obtain essential information about beliefs that are linked to how people behave. The beliefs elicited are then used as a guideline to design future interventions, as well as developing TPB questionnaires (Francis et al., 2004).

Interventions using TPB are principally designed to change intentions by targeting an individual's beliefs about a particular behaviour. Studies that design interventions and measure their impact are important in answering three integral questions: 1) does the intervention work in changing behaviour? 2) how well does the intervention work if it is applied in practice? and 3) how does the intervention work in changing behaviours? (Michie & Abraham, 2004). According to Fishbein and Ajzen (2011), interventions using TPB are designed to achieve two distinct outcomes: 1) to influence people to form an intention and; 2) to influence people to act on an intention. Based on the former, salient beliefs with regards to normative, behavioural and control beliefs need to be evaluated to find out which beliefs are the strongest in influencing people's behaviour change. With the latter, researchers need to find out the barriers preventing people from engaging in their preferred behaviour.

There are a number of studies that have illustrated the use of behaviour change theories, such as the TPB, so as to design interventions that successfully alter behaviour. For instance, in safety related behaviour for example, Quine, Rutter, and Arnold (2001) designed an intervention in the form of a booklet based on the behavioural, normative and control beliefs (TPB) pertaining to helmet use when cycling, which was elicited from an earlier study (Quine, Rutter, & Arnold, 1998). Each member of the treatment group was given a booklet containing persuasive messages based on beliefs while each member of the control group received a similar booklet but without messages

that reflected beliefs. The experimental study showed that the theory-based interventions were successful in influencing participants to maintain long-term use of helmets (for five months). Other behaviours have also been successfully altered using TPB, such as reducing speed when driving (Stead, Tagg, MacKintosh et al., 2005), healthy eating (Gratton, Povey, & Clark-Carter, 2007), performing self-examination (Brubaker & Fowler, 1990) and drinking alcohol (French & Cooke, 2012). These studies suggest that beliefs are the precursor to behaviour change, as theorised by the TPB.

While the TPB posits the use of beliefs as the basis for behaviour change, studies have shown that beliefs in different populations differ depending on the context of the subject being studied. For example, beliefs have been found to differ between social classes on religious values (Hodge, 2002), between cultures in breast cancer issues (Hubbell, Chavez, Mishra et al., 1996), between genders and age group on food choices (Dennison & Shepherd, 1995), and between different organisations concerning privacy of organisation information (Stone, Gardner, Gueutal et al.). Therefore, it can be argued that while belief assessment is important, it is also equally important to consider the groups or population that are being studied. For example, in regard to wildlife conservation behaviour, it may be irrelevant to assess beliefs in a group of wildlife conservationists. With or without intervention, these groups may already be highly likely to engage in behaviours that promote wildlife conservation. This can be related to the notion of "preaching to the converted", in which conservation messages are communicated to those whose conservation attitudes or behaviours are already high (Nabhan, 1995).

Additionally, Curtis et al. (2010) argued that it is important to elicit these beliefs from the same population to the one being studied. Their study elicited beliefs pertaining to using alternative transportation from two Australian parks, Cradle Mountain, Tasmania and the Grampians, Victoria. Both sites have a strong presence of national park staff. Respondents at Cradle Mountain reported that the national park staff were an important social influence in promoting the use of alternative transportation, whereas, respondents in the Grampians mostly indicated that their use of alternative transportation was not pressured by anyone. Thus, while the behaviours (using alternative transportation) seem to be identical, the population's beliefs (in this case normative beliefs) differed due to differences in visitor profiles and sites (Curtis et al., 2010).

While the studies reviewed to this point have shown the importance of the underlying beliefs as proposed by the TPB, other studies have highlighted the importance of measuring different variables in the TPB model. Lo, Chow and Cheung's (2012) research to assess behavioural intentions to support turtle conservation by 776 college students in China, found that their perceived

social expectations (subjective norms) were the strongest predictor to support intentions for turtle conservation (e.g., donating and volunteering for turtle conservation), followed next by specific attitudes and perceived behavioural control. Their findings showed that normative beliefs were an important facet for supporting turtle conservation in younger people because younger people were largely influenced in their actions by their peers and family. Fielding, McDonald, and Louis (2008) found that the intentions to engage in behaviour relating to environmental activism were best predicted by positive attitudes and a strong sense of normative support for environmental activism. Likewise, research by Tonglet, Phillips, and Bates (2004) identified attitudes as a strong predictor for engaging in recycling behaviour.

One of the main concerns about TPB is the reliance on self-reporting (Armitage & Conner, 2001), which may affect the validity and reliability of results (Ajzen, 2002). This has much to do with issues surrounding the Social Desirability Bias (SDB) which refers to respondents' tendency to respond to questions not based on their honest opinions, but based on what society thinks what is proper (Grimm, 2010). Using self-reports is often unavoidable, particularly when the aims of the study are to measure long-term behaviour changes in individuals. It is impossible to observe everyday behaviours of every individual; hence researchers often have to rely on statements of intentions and self-reporting about engaging in behaviour. SDB also occurs when it comes to protecting nature. This is more so when individuals are measured in a hypothetical situation that provides them a chance to give a positive response because they want to portray the impression of a more 'virtuous' attitude toward protecting the environment (Trudgill, 1990).

Additionally, although the Theory of Planned Behaviour has been used to explain behaviour change as well as to design effective interventions, there is often a gap between respondent's stated intentions and their actual behaviour. This has been viewed as the intention-behaviour gap (Darker, French, Eves et al., 2010; Mohiyeddini, Pauli, & Bauer, 2009; Sheeran, 2002; Sniehotta, Scholz, & Schwarzer, 2005). Carrington, Neville, and Whitwell (2010) stated that while most people intend to be ethical, actual performance of behaviour is usually hampered by intervening factors such as constraints. This was previously identified in the literature as barriers or gaps that deter individuals from performing pro-environmental behaviour (Gifford, 2011; Kollmuss & Agyeman, 2002; Lorenzoni, Nicholson-Cole, & Whitmarsh, 2007; Quimby & Angelique, 2011). To overcome this problem, researchers should also aim to observe actual on-site behaviour changes following stated intentions (Carrington et al., 2010), and if actual behaviours cannot be observed, "…self-reports of past behaviours, hypothetical future behaviours, or causes of behaviour are not necessarily accurate" (Baumeister, Vohs, & Funder, 2007). Therefore, in the context of wildlife sites,

researchers could observe actual on-site visitor behaviour that demonstrates pro-conservation behaviours such as giving donations. This will inherently provide more credence to the research as it does not entirely rely on self-reporting of behavioural intentions and researchers would be able to provide proof that reports of positive intentions may or may not lead to actual behaviour. Long term investigation of visitor behaviour change, unfortunately, may still need to rely on self-reporting.

This section has discussed how the TBP has been used to elicit beliefs as a basis for designing persuasive communication messages. One of the persuasive communication theories commonly used to explore the underlying process of how messages are processed and how they influence attitudes is the Elaboration Likelihood Model of Persuasion (Perloff, 2010). This model is discussed in the next section.

2.5.2   The Elaboration Likelihood Model of Persuasion

The Elaboration Likelihood Model (ELM) was developed by Petty and Cacioppo (1986) to explain persuasive communication (Figure 2.9). Unlike behaviour change theories such as the TPB, this model does not explain the variables involved in behaviour change processes, but rather provides an explanation of how individuals process a persuasive communication message, and how this is linked to attitudinal changes in individuals. The ELM is based on the premise that persuasion involves two routes or "dual routes" to process messages, through the central route and the peripheral route (Petty & Cacioppo, 1986).

The ELM posits that when individuals follow the central route when they are actively thinking and processing the pros and cons of a message; when they follow peripheral routes they spend limited time and rely on simple cues such as likability and credibility of a source to make a decision (Petty & Brinol, 2010; Petty & Cacioppo, 1986; Petty, Cacioppo, & Goldman, 1981; Petty, Cacioppo, & Schumann, 1983). In this situation, when a person spends more time thinking about the message, the likelihood is that it is going to result in a favourable attitude towards the message is high. A change in attitude through the central route will purportedly retain a stronger persistence due to the stronger elaboration, while changes in attitude made through the peripheral route are more likely to be short-lived. Consequently, messages that are elaborated through the central path are more likely lead to changes in attitudes and behaviour (Cialdini, Petty, & Cacioppo, 1981; Petty & Cacioppo, 1986). The central path occurs when a message is considered to be of high personal relevance to an individual, and they tend to think and elaborate about the message. Central cues rely on information such as a person's motivations, prior knowledge, beliefs, experiences and/or values

to make it relevant (Perloff, 2010; Petty & Cacioppo, 1986; Petty, Priester, & Brinol, 2002; Petty & Wegener, 1999). These dual routes of persuasion are explained in Figure 2.9.

Audience Factors	Processing Approach	Persuasion Outcome
Central Route		
High motivation and ability to think about the message	Deep processing, focused on the quality of the message arguments	Lasting change that resists fading and counterattacks
Low motivation or ability to think about the message	Superficial processing, focused on surface features such as the communicators attractiveness or the number of arguments presented	Temporary change that is susceptible to fading and counterattacks
Peripheral Route		

Persuasion Attempt

Message

Source: Petty & Cacioppo (1986)

Figure 2.9: The elaboration likelihood model of persuasion

In contrast, when the messages mean little to individuals, they will focus on other aspects. These are called peripheral cues. Mills (1999) stated that individuals will focus on peripheral cues when:

1. There is no time to think about an issue.
2. There is too much information.
3. There is a belief that a decision is not that important.
4. There is limited information to make decisions based on logic and facts.
5. There is already an automatic, readily generated response towards a challenging issue.

The peripheral route occurs when an individual is unmotivated to elaborate the arguments, and hence, focuses on other aspects that might be of interest such as the source's credibility or attractiveness (Petty et al., 1983). For example, a person may then make decisions based on messages communicated from a credible and reliable source, such as an expert (Petty et al., 1983).

Another example of the use of peripheral cues is the use of celebrity appeal (Erdogan, 1999). Celebrity endorsement and promotional characters (e.g., cartoon images) are particularly

effective in influencing children and young people. This is due to the fact that younger people's attention are automatically drawn towards attractive visuals and images (Wicks, Warren, Fosu et al., 2009).

A number of authors have stated that although this model has its own merits in providing a descriptive process of persuasion and attitudinal changes through dual routes, there have been critiques based on its assumptions. One of the noted arguments is that the ELM assumes that individuals' are unable to process messages simultaneously through the central and peripheral routes (Stiff, 1986). Stiff (1986) was the one of the first authors to argue this, stating that the model portrays the fact that individuals' are only able to process a message through a central or peripheral route. A discussion by Kitchen, Kerr, Schultz et al. (2014) stated that this argument was further tested and has inherently led to the conclusion that both central cues (message arguments) work with peripheral cues to form attitude change. Therefore, in some cases, an individual may also use both central and peripheral cues to process a message (Stiff, 1986).

Studies which have applied ELM show varying results. For example, a study to measure behavioural intentions and actual behaviour to exercise by Jones, Sinclair, Rhodes et al. (2004) measured intentions to exercise in a sample of 450 psychology students. It was expected that persuasive messages should impact on the positive behavioural outcomes for exercising. The study however found no association between using persuasive and non-persuasive messages, both from credible and non-credible sources. This could be because the sample consisted of well-educated psychology students who are already aware of the benefits of exercise and already had strong beliefs about exercise. Jones et al. (2004) further suggested that their study may have yielded different results if the messages were targeted at populations that have less knowledge about the benefits of exercise, as this may make them more responsive (or elaborate more) to understand the benefits and changing their attitudes towards exercising.

A study by Gotlieb and Swan (1990) tested the effects of processing an advertisement for a legal service using messages that included two experimental conditions; 1) price savings (central cue) vs. no savings; 2) high source credibility (using a law college professor testimonial) and low source credibility (using car salesman testimonial). These experiments were tested with subjects who had experienced legal services (with product experience), and had experienced legal service (no product experience). Based on the proposition of the ELM, subjects who had previous experience and were attracted to price savings should be motivated to process the advertisement through their central route. Therefore in their study, Gotlieb and Swan (1990) hypothesised that source credibility (peripheral cue) would only have an effect when an experienced subject was

motivated with the notion of price savings. Findings in their study supported this hypothesis. They found that,

> "…when subjects were offered a price savings (higher motivation to process) and they have product experience (enhanced ability to process the message) a highly credible source had a more positive effect on attitude" (Gotlieb & Swan, p.227).

These results showed that the role of source credibility had significantly increased positive attitudes to the legal services only when the issue at hand was relevant to individuals. Gotlieb and Swan's (1990) study showed that the use of peripheral cues is only effective when people are motivated to process a message, or have high involvement with an issue at hand. This suggests that intervention messages must be designed with consideration of the factors that can increase relevancy or motivations to process the messages (i.e., central cues). Therefore, it can be argued that peripheral cues such as including source credibility may only be secondary.

However, in certain situations, both central and peripheral cues are equally important to impact on attitudes or behaviour. A study on changing attitudes towards snakes by Morgan and Gramann (1989) found that when children were educated with factual information that targeted beliefs about snakes (central route) and was accompanied by direct contact (peripheral route), positive changes in attitudes towards snakes was observed. However, when provided with a chance of direct contact with the snakes without providing factual information, there were no changes in attitude towards snakes. This was due to the fact that simply asking students to touch snakes (direct contact) without providing positive facts was pointless as the students had no information that they could use to further process the message that would eventually reduce their existing negative beliefs (e.g., snakes are slimy, if I touch a snake I will die). Morgan and Gramann (1989) further stated,

> "This contradicts intuitive claims for the effectiveness of "hands-on" opportunities in promoting attitudinal change in children. To get the most out of direct contact, it appears necessary to supplement this experience with factual information, at least in this case" (Morgan & Gramman, 1989, p. 8).

Other findings have supported ELM by looking at how attentive individuals are when a message is presented. For example, a study by Cole et al. (1997) investigated the effectiveness of a message on bulletin boards in a wilderness site to communicate information regarding low-impact practices in the area. A total of 506 subjects were observed in terms of the hikers' attention and retention to the messages. The findings of the study suggested that too much information on the bulletin prevents hikers from further processing information. Though attention increased when

relevant messages were communicated, they affected the depth of message elaboration if the messages were too crowded. Furthermore, this study found that hikers took less than 25 seconds to view the messages. This further suggested that individuals may turn to peripheral cues when processing messages if they were faced with too much information overload, which deters them from further processing information through the central path of the ELM.

These studies that have been discussed have concluded that both central and peripheral cues play a role in message elaboration and processing, suggesting that interpretive interventions should incorporate both central and peripheral cues to maximise elaboration. Recent studies that have applied ELM have covered various subjects, such as health related issues (Angst & Agarwal, 2009; Chiang & Jackson, 2013), banking (Zhou, 2012) and information technology (Lee, 2012). In addition, there have been several tourism studies that have incorporated theoretical principles of ELM when designing conservation messages. These studies were based on the premise that ELM can be a useful approach to design persuasive messages alongside the TPB (Quine et al., 2001). The findings of these studies showed that this approach was successful in prompting attitude and behaviour change, as they fitted together in constructing strong persuasive arguments. This was based on the proposition that beliefs are the underlying precursor to attitude and behaviour change. Therefore, interventions should design persuasive messages based on the individual's beliefs to enhance elaboration. The next section reviews studies in wildlife interpretation that have used this approach.

2.5.3 Application of behavioural and persuasive communication theories in wildlife interpretation

A number of authors in the field of wildlife and nature interpretation have emphasised the need to design experiences and interpretation based on beliefs and persuasion (Ballantyne, Packer, Hughes, et al., 2007; Ham, 2007; Ham, 2013; Ham & Krumpe, 1996; Ham & Weiler, 2003). Behavioural theories, such as the Theory of Planned Behaviour (Ajzen, 1991; Ajzen & Fishbein, 1980) have been used to identify beliefs on the premise that these were the underlying precursor to behaviour change; while communication theories such as the Elaboration Likelihood Model of Persuasion (Petty & Cacioppo, 1986) have used these identified beliefs as the basis to design persuasive messages.

A study conducted by Hughes et al. (2009) designed interpretive signage in two sites, Badger Weir picnic area and Yellagonga Regional Park, Australia. The study's findings demonstrated that the effectiveness of using beliefs and persuasion in interpretation. The

researchers conducted a survey to elicit salient beliefs of visitors using the Theory of Planned Behaviour and subsequently designed persuasive messages that targeted visitors' normative beliefs about keeping their dog on a leash and not feeding the birds. Hughes et al.'s (2009) study showed that visitors' compliance with regulations on feeding birds and keeping dogs on leashes increased when they were presented with persuasive conservation messages which targeted their salient beliefs. Likewise, a study conducted by Ballantyne and Hughes (2006) also designed and tested interpretive warning signs targeting bird feeding. Their study used a front-end formative approach where they identified beliefs, attitudes and behaviours with regards to the behaviour of feeding birds, between visitors' who feeds birds (regardless of warning signs) and non-feeders. This information was used to develop an intervention that was successful in deterring visitors from feeding the birds.

Similar positive results were reported by Brown et al. (2010) who designed persuasive communication targeting the action of picking up litter at the Russell Falls Track in Mt Field National Park, Tasmania, Australia. The study incorporated beliefs and persuasive communication techniques to design signage to encourage visitors to pick up litter during their visit. Brown et al. (2010) conducted a belief elicitation phase by using the TPB, and subsequently designed persuasive signage based on ELM that targeted behavioural beliefs by communicating the message of "setting a good example to others". The study found those exposed to the signage were significantly more likely to pick up litter than those who were not.

More recently, Steckenreuter and Wolf (2013) designed and tested the impact of signage targeted at the behaviour of paying user fees at Kamay Botany Bay National Park, New South Wales, Australia. They used a three-phase approach by firstly eliciting salient beliefs based on TPB, designing interventions in the form of two interpretive signs, and systematically testing the impact by comparing three treatment conditions: 1) days where no signage was presented (control treatment); 2) days where visitors were presented with intervention signage targeting two types of beliefs, behavioural and normative belief; and 3) days where visitors are presented with signage targeting only one behavioural belief. The intervention signage was also designed using principles of ELM, where both messages targeting beliefs that served as a basis for central route processing, while the logo of the national park served as the basis for the peripheral route. Steckenreuter and Wolf (2013) found that the non-compliance rate for paying user fees decreased on days where visitors were presented with signage that communicated messages based on beliefs. This further asserted the importance of eliciting visitors' prior salient beliefs to design effective interpretation.

Their study shows that messages that are designed which are based on visitors' beliefs were significantly more effective in increasing compliance in paying user fees.

The effectiveness of using persuasive communication and beliefs to influence behaviour was also evident in Kratochvil and Schwammer's (1997) study on aquarium visitors. In this study, three different signs were tested to evaluate which signs were the most effective in reducing people knocking on glass aquarium walls using three different signs (*Knocking kills fish*, *Only loonies would knock*, *Please do not knock on the glass*). The sign that stated "*Only loonies would knock*" were most effective in reducing knocking. Kratochvil and Schwammer's (1997) study communicates the effectiveness of using persuasive messages based on a normative belief (belief that relates to the importance of being viewed by other people). Visitors in this study may appear to place importance on being viewed as a good and ethical person by society, hence demonstrating the effectiveness of the signage "*only loonies would knock*".

The studies reviewed so far have used the application of beliefs and persuasion theory to increase the effectiveness of interpretive materials. Although limited, these studies have addressed Moscardo et al.'s (2004) criticism that "…there has been virtually no theoretical discussion about how to design effective wildlife interpretation" (p. 222). In order to develop effective interpretation, interpreters need to apply behaviour change and persuasive communication theories, follow 'best practice' interpretation principles, and choose appropriate interpretive tools (signs, talks, display etc.). As the current study proposes to use an interpretive booklet[7] as an intervention, the next section will focus on the effectiveness of brochures[8] (booklets) as a medium to change visitors' knowledge, attitudes and behavioural intentions.

2.5.4 The use of brochures as a tool to influence visitors' knowledge, attitudes and behaviours

Studies that have used brochures as a form of interpretive intervention reported mixed results pertaining to their impact on knowledge gain, or positive changes in attitudes and behavioural intentions. One pertinent finding from the studies reviewed is that in many cases, a brochure was an effective communication medium based on *how* and *what* message was contained in the brochure. Therefore, it can be argued that regardless of which tools that were used in interpretation (e.g.,

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[7] Merriam-Webster dictionary defined brochures as "a small, thin book or magazine that usually has many pictures and information about a product, a place, etc." (Merriam-Webster, 2016). Booklets are also synonym to brochures or pamphlets (Merriam-Webster, 2016).
[8] The review discussed the effectiveness of "brochures" instead of "booklet" as most studies used the term "brochures" instead of booklet.

signage, brochures or talks), the content of the messages was central to determine the effectiveness of its impact on visitors' conservation learning.

Most studies that have used brochures asserted the need to evaluate prior knowledge, experiences or beliefs in the design. Moscardo (1999) conducted a field experiment to find out the effectiveness of a brochure with passengers going on a boat trip to the Great Barrier Reef. She designed and evaluated the effectiveness of the brochure under three main conditions: 1) brochure was handed out to each passenger; 2) brochure was handed out to each passenger groups, and 3) brochures were left out for passengers to collect at a selected location. Participants were clustered into treatment groups (received and read brochures) and control groups (did not receive brochures). The results indicated no significant differences with regards to knowledge between the experimental and control group. Moscardo (1999) argued that this may be because visitors may already know about the Great Barrier Reef and endangered species. She emphasised the importance of identifying prior knowledge and experiences of visitors before designing interpretive brochures.

Furthermore, a study by Andereck (2005) evaluated the effectiveness of brochures on visitation to Glendale, Arizona found that brochures were ineffective in impacting actual visitation behaviour. In other areas, the use of brochures as a form of intervention also did little to affect attitudes or behaviours. In their experimental study on the development of health education materials to prevent alcohol abuse, Whittingham, Ruiter, Castermans et al. (2008) observed that there was a lack of increase or change in alcohol behaviours, even though their study compared the original version and modified brochures based on cognitive psychological theory. The study focused on aspects such as text coherence, illustrations and pop-out effects. Although the brochure increased knowledge of alcohol abuse in participants, it did not significantly decrease alcohol behaviour. Similarly, a study by Goossens (1995) compared the impact of four versions of a brochure, and found no significant difference in encouraging respondents to source further information regarding a travel site, despite using the concept of enactive imagery, where images were used stimulate the thought of actually being there (Goossens, 1995).

It must be noted that both Whittingham's and Goossens studies did not evaluate relevant salient beliefs before designing the intervention. As Whittingham et al. (2008) studied the effects of increased knowledge on alcohol behaviours, conducting a belief elicitation phase to seek reasons why participants indulged in alcohol and the beliefs regarding the negative consequences of alcohol, and using the findings to design the brochure may have improved its effectiveness. Whittingham et al. (2008, p. 9) noted, "It is possible that participants did not feel that their drinking behaviour is abusive and were thus less inclined to change their opinions with respect to their own drinking

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behaviour". In this regard, conducting an elicitation phase to probe reasons why they think that drinking behaviour was not abusive may have yielded relevant information that could have been included in the brochure.

Although brochures remain a popular and one *o*f the most used sources of external information (Andereck & Caldwell, 1994; Hsieh & O'Leary, 1994), there has been limited research evaluating their effectiveness. Hodgson (1993) stated, "It is therefore clearly vital to understand consumer requirements from brochures before being able to judge whether a brochure is effective (p. 51.)". Thus, it can be argued that brochures are likely to be more effective when they consider visitors' prior knowledge, prior experiences and beliefs. These inform the design of the current intervention that focuses on orangutan conservation. The next section focuses on orangutans, as conservation of this critically endangered species is the focus of the present study.

2.6   Orangutans

2.6.1   Introduction to the orangutans

Orangutans can be viewed in three types of setting: wild sites where they live naturally such as in the Kinabatangan floodplains in Sabah; semi-captive sites such as in rehabilitation sites[9] where they are partially influenced by humans; and captive sites such as zoos where they are entirely influenced by humans. Orangutans are exclusively distributed throughout the Borneo Island (Sabah, Sarawak and Kalimantan) and in Sumatra. These sites are located in Sundaland, one of the 25 biodiversity hotspots in the world (Myers, Mittermeier, Mittermeier et al., 2000). The orang-utan species has garnered attention over the years due to their humanlike features and behaviours compared to other primate species (Schwartz, 1987), and the fact that they are a critically endangered species (Figure 2.10).

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[9] Orangutan rehabilitation sites are sites that aimed to train orangutans that are captured (e.g., previously captured as pets or found in plantations) back into the wild (Russons, 2009).

Figure 2.10: The Orangutan

(Source: WWF, 2017)

In wildlife tourism, orangutans fall under the primate tourism niche alongside other apes such as the gorilla and chimpanzee. There are various reasons why conservation efforts to protect orangutans are being actively and furiously campaigned for. First, the orangutans present a symbol of history and evolution. Current threats are pushing the orangutan species to extinction (Acrenaz et al., 2016). Second, orangutans are viewed as a flagship species (WWF-Malaysia, 2014). Conserving flagship species will automatically impact on the conservation of other less popular wildlife that share its habitat (Ballantyne, Packer, Hughes, et al., 2007). Thirdly, orangutans are important to maintain ecological balance, and play important roles in seed dispersal (Blackburn, Alavi, Lady, et al., 2017; Corlett, 2017).

The popularity of viewing orangutans in semi-captive sites in Malaysia and Indonesia is mostly attributed to the recommendations of travel sites such as *Lonely Planet* and *TripAdvisor*, which stated that sightings of orangutans in semi-captive settings are often guaranteed. This is because rehabilitation centres such as in Sepilok and Semenggoh in Borneo have feeding times, where orangutans that are undergoing rehabilitation are fed by park personnel. This often guarantees sightings of the orang-utan and lures large numbers of visitors to these sites. The

Semmengoh orangutan site in Sarawak averages about 70,000 tourists per year (Zander et al., 2014), while in Sabah, where there is an existing orangutan sanctuary in Sepilok, the total number of visits in 2013 reached about 3.3 million (Sabah Tourism, 2014).

Despite the success and popularity of these rehabilitation sites, they often lack educational components (Russon & Susilo, 2014). Education at these sites usually only informs visitors about the rules and regulations in relation to viewing orangutans; themed interpretation and persuasive communication designed to impact on tourists' environmental behaviour is rare. Moreover, limited research has been done to identify the knowledge and awareness of visitors with regards to orangutans and the human threats to their survival (Pearson et al., 2013).

2.6.2 Threats to orangutan habitats posed by palm oil plantations

Like all critically endangered wildlife listed in the IUCN red list, orangutans are one of the many species that are on the brink of extinction (Ancrenaz, 2016; IUCN, 2014; Singleton, 2016). The main threats to primate species such as orangutans are habitat fragmentation, habitat loss, poaching, and hunting for illegal pets (Husson, Wich, Marshall et al., 2009; Marshall, Ancrenaz, Brearley et al., 2009; Meijaard, Wich, Ancrenaz et al., 2012). Though many factors contributed to these threats (e.g., forest fires, illegal hunting), tropical forest clearance for other uses such as plantation and developments is viewed as the major cause for habitat fragmentation and habitat loss which has caused biodiversity loss in the Southeast Asian region (Goossens, Chikhi, Jalil, et al., 2005; Sodhi et al., 2004; Wich & Marshall, 2016). Recent distribution reports indicate that survival of the orangutan is lower in Sumatra compared with Borneo. There are only six remaining populations in Sumatra compared to 32 in Borneo (Hussons et al., 2009).

Habitat loss of orangutans continues to be a major issue threatening the remaining population. Meijaard and Wich (2007) estimated that habitat loss could lead to the extinction of the Bornean orangutan by 2050. Habitat loss of orangutans is often attributed to three factors: forest conversion for oil palm and plantation crops (Meijaard & Wich, 2007; Nadler, 1995; Nellemann, 2007); illegal logging for timber, pulp, paper and plywood (Nelleman, 2007); and forest fires (Jim, 1999; Suzuki, 1988; Swarna Nantha & Tisdell, 2009). The first two factors are caused by the need for economic and social development that is common in emerging economies[10], in which economic

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[10] Countries listed as emerging economies are Argentina, Brazil, Chile, China, Colombia, Czech Republic, Egypt, Hungary, India, Indonesia, Lebanon, Malaysia, Mexico, Nigeria, Philippines, Poland, the Russian Federation, South Africa, Saudi Arabia, Republic of Korea, Thailand, Turkey, Ukraine, United Arab Emirates and Bolivarian Republic of Venezuela (United Nations, 2017).

development is often prioritised to address issues of growing populations, poverty and demand for raw materials (Wich & Marshall, 2016).

Without doubt, the most highly discussed and popular issue with regard to the declining population of orangutans is the expansion of oil palm plantations in Malaysia and Indonesia. According to reports, the expansion of oil palm plantations in Southeast Asia (i.e., Malaysia and Indonesia) is the primary threat to biodiversity in Southeast Asia (Koh & Wilcove, 2007). In a span of 15 years (1990-2005), areas for palm oil plantations in Malaysia increased from 1.8 million ha to 4.2 million ha, while in Indonesia, it has increased by 4.4 million ha to 6.1 million ha (Fitzherbert et al., 2008). This expansion affects biodiversity by causing fragmentation of habitats, edge effects[11] and pollution (Fitzherbert et al., 2008). Malaysia and Indonesia are the world's major producers of palm oil, and this affects the orangutans directly as these animals are endemic to these countries (Koh & Wilcove, 2007; Lam, Tan, Lee et al., 2009). Production of palm oil is likely to continuously affect the orang-utans. This is because the trend for demand and supply of palm oil has been forecast to increase (WWF, 2014). Reports by the Malaysian Sime Darby, one of the producers of palm oil in Malaysia, indicate that the highest consumption of oil palm is in China, India, Indonesia and the European Union (Sime Darby, 2014) . Other reports also support the claim that the demand for palm oil will rise as countries such as China and India continue to develop.

The contribution of oil palm plantations to deforestation and habitat loss has been highly debated in the literature. In particular, the conversion of forests for palm oil production has sparked the debate of 'who is to blame'. As stated by Teoh, (2010, p.19),

> "The debate is highly polarised with the pro-development side asserting that palm oil is a highly sustainable industry that feeds the world, while the pro-conservationists have blamed the palm oil sector as being the underlying cause of deforestation and other environmental and social ills".

However, Fitzherbert et al. (2008) argued that the rate at which oil palm has caused deforestation is vague due to insufficient data. Authors such as Corley (2009) and Tan, Lee, Mohamed et al. (2009) maintained that although oil palm expansion is the cause for deforestation, it may still be the best option compared with other oils, as the rate of palm oil expansion to meet current and future demands may also be accommodated without losing more primary forest. Tan et al. (2009) argued that when compared with other vegetable oils such as soybeans, oil palm plantations require a smaller area to produce the same output. When compared with soybean oil,

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[11] edge effects refer to the effects of oil palm plantations towards the length of forest edge. It involves abiotic and biotic effects, such as increasing the forest edge to be vulnerable to wind and fire (abiotic effects) (Fitzherbert et al., 2008).

soybean oil cultivation uses an area that is 10 times larger than palm oil to produce the same volume of crude oil (Tan et al., 2009). Corley (2009) has estimated that the expansion needed to supply the projected global demand for palm oil in 2050 (equivalent to 14% of Indonesia forest) could be accommodated in three countries: Indonesia, Brazil and Colombia, which have non-forested areas such as existing grasslands and pasture areas. Therefore, it would be wise to retain oil palm plantations, but develop them sustainably or find other alternative areas for cultivation outside Malaysia and Indonesia.

To decrease the negative effects of palm oil expansion, the implementation of sustainable palm oil productions has been widely discussed. Non-governmental organisations (NGOs) such as WWF have been actively campaigning against the consumption of unsustainable palm oil and the sale of Certified Sustainable Palm Oil (CSPO) to major manufacturers and retailers. Other organisations have also been established, such as The Roundtable of Sustainable Palm Oil (RSPO). Such endeavours include co-operation among various agencies with the purpose of building a certification scheme for sustainable palm oil that involves all stakeholders within the palm oil industry (RSPO, 2014). Sustainable palm oil is defined as palm oil that is produced without negative social effects (e.g., unfair payments to workers) and environmental effects (e.g., planting oil palm in primary forest or forest with high conservation value) (RSPO, 2014).

Although certification schemes and campaigns may conserve current primary forests and the habitats of orangutans, there are few studies that have explored the general population's understanding of what it means to buy 'CSPO' products, and how this translates into a global effort to protect threatened wildlife species such as orangutans. There is also limited research that explores people's current understanding about issues surrounding conservation of orangutans (Pearson et al., 2013) and the extent to which people support conservation behaviours relating to orangutans. This reticence in knowledge about sustainable palm oil has been noted particularly in local people who are involved directly in palm oil plantations (Martin, Rieple, Chang et al., 2015). The factors that influence support for orangutan conservation and the controversies surrounding local people, sustainable palm oil and economic constraints to purchase sustainable palm oil are addressed below.

2.6.3 Factors influencing support for orangutan conservation

This section discusses the different factors influencing public support for the conservation of orangutans. These factors are as follows,

Limited interest in the purchase of certified sustainable palm oil

One of the main conservation behaviours that would ensure the long-term survival of orangutans is supporting the development and implementation of sustainable palm oil production. This requires changing consumers' behaviour and each supply chain including retailers and manufacturers. However, despite the worldwide efforts of various agencies, such as WWF and Greenpeace, there has been little success in changing the public's demand for sustainable palm oil (Wilcove & Koh, 2010). One of the main reasons for this failure is that there has been little interest in major markets (India and China) in purchasing sustainable palm oil due to its higher cost (8-15% more expensive than non-sustainable palm oil) (Wilcove & Koh, 2010) .

Awareness of nature and wildlife conservation issues

Efforts to educate the public about orangutans have mostly been channelled through international NGOs, such as WWF, The Orangutan Project (TOP), and Orangutan Foundation International (OFI). Campaigns are mainly seen in countries other than Malaysia and Indonesia, such as the '*Don't Palm us off*' campaign launched by Zoos Victoria, Australia in 2009 (ZoosVictoria, 2014). In non-Western, developing countries such as Malaysia, there have been few environmental non-governmental organisations that can communicate awareness about wildlife conservation (Koh & Wilcove, 2007). By definition, developing[12] countries mainly refers to the state of economic development that is still progressing (Chadwick, 2016). This also takes into consideration characteristics such as population growth, poverty, average income and education level (Chadwick, 2016). Vasconcellos (2014) refers to developing countries as countries with middle to low average incomes, poor welfare systems, lack of education, political instability, poverty, unemployment, and malnutrition. The United Nations (2012, p. 131) particularly refers to countries based on level of economies. UN has three categorisation, developed economies (e.g., Europe, Japam, United States, United Kingdom), economies in transition (e.g., South Eastern Europe such as Albania, Croatia) and developing economies (Africa, Asia, Latin America and the Carrribean) (United Nations, 2012). Malaysia and Indonesia is listed as developing economies.

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[12] The World Bank is no longer referring countries as "developed vs. developing", but is now classifying countries based on income groups (World Bank, 2017).

Though Malaysia and Indonesia countries are not in the category of low income countries it is categorised as developing due to its progress towards becoming the characteristics developed economies (i.e., countries with high incomes, poverty eradication, high education). Indeed, as noted by Rijksen and Meijaard (1999), nature conservation in Southeast Asia has been poorly executed from the beginning, partly in response to the countries need for social and economic development. Therefore, active campaigns, particularly against the negative effects of deforestation, have been mostly conducted by international non-governmental agencies in these countries.

The differences in the level of awareness about nature and wildlife conservation issues may also be affected by the lack of access to the media, as the majority of public knowledge about the environment come from the media (Hansen, 2011). Media, such as television and documentaries provide information to people about the status of animals and the existing threats surrounding wildlife (Smith & Broad, 2008). Studies suggest that people in different countries possess different environmental knowledge based on the availability of media. For example, Chapman (1997) discussed the differences of environmentalism and mass media between two different countries, UK and India. He concluded that an understanding of environmental concepts and knowledge between people in these two countries is different. Understanding about the environment in India is partly shaped by the ability to access media (e.g., television and newspapers), and specific knowledge about the environment (e.g., ozone holes and global warming) is limited to those who have access to the English media (Chapman, 1997). Similarly, in Malaysia, there is little use of communication in the form of media such as TV commercials, to educate the public about the effects of deforestation and promote acts of conservation. While in countries such as Australia, media coverage about wildlife conservation and threats to wildlife habitat loss is one of the highly reported issues (Lunney & Moon, 2012). This suggests that there are differences in terms of awareness of conservation issues as well as media attention between countries, particularly between developing and developed countries.

Economic and social benefits outweighing conservation benefits

Tisdell and Swarna Nantha (2007) stated that there is a delicate balance between conservation and economic benefits, particularly in relation to the use of wildlife habitat for economic development. They argued that although orangutans have little direct monetary use, there are many intangible benefits to be gained from orangutan conservation, and these benefits cannot be calculated and compared with the economic benefits. In this regard, the palm oil industry in Malaysia, which has been debated as the major cause for habitat loss, had generated RM 14.1 billion foreign exchange

(approximately USD 3.3 billion) in 2001, and includes a workforce of about 1.399 million people (Basiron & Weng, 2004). The Federal Land Development scheme (FELDA) involved 2.26 million local people who depend on the palm oil industry in Malaysia (MPOB, 2011). Wilcove and Koh (2010) asserted that since oil palm cultivations have provided social and economic benefits to Malaysia and Indonesia, it is hard to change people's perceptions and attitudes towards palm oil use. Consequently, as local people (Malaysians and Indonesians) are directly dependant on the palm oil industry; their perceptions and beliefs about palm oil may differ from those people who are not as reliant on the industry for their livelihood.

Economic constraints to purchase sustainably produced products

In general, consumers have shown socially responsible attitudes (Carrigan & Attalla, 2001). They often express a willingness or intention to support pro-environmental actions but when observed, fail to do so (Carrigan & Attalla, 2001; Carrington et al., 2010; Mainieri, Barnett, Valdero et al., 1997). This is often due to barriers or situational factors (Hines et al., 1987; Kollmuss & Agyeman, 2002). In terms of pro-environmental behaviours such as making responsible purchases, consumers may be reluctant to change purchasing behaviour if the change involves paying a higher price (Godfray, Beddington, Crute et al., 2010). The production of sustainable products such as sustainable palm oil needs to go through a certification process. The costs involved make the product more expensive and people from developing countries such as Malaysia have reportedly lower incomes than those originating from developed countries (Haron, Paim, & Yahaya, 2005; Mohamed & Yusof, 2009). Hence, based on economic constraint, local people may be unable to afford sustainable products.

2.6.4   Types of conservation behaviours related to orangutan and wildlife conservation

It has been pointed out by Ballantyne, Packer and Falk (2011) that wildlife tourism providers need to identify specific actions that can be carried out by tourist to ensure short and long term conservation of wildlife. There are limited guidelines on what behaviours or types/groups of pro-environmental behaviours are suitable for different settings (e.g., wildlife sites, nature-based sites) as well as for different environmental issues (e.g, orangutan conservation, plant conservation, climate change).

Conservation behaviours that can be carried out differ in terms of settings and context. For example, studies in settings such as at the workplace and at home focus more towards general and common types pro-environmental actions or behaviours such as recycling plastics and energy

consumption behaviours (e.g., conserving waters and electricity) (Maki & Alexander, 2017). Studies in holiday settings focus more on specific actions such as volunteering in wildlife settings.

In wildlife conservation studies, the selection of the types of pro-environmental behaviours is usually based on the scope of the study. For example, Cooper, Larson, Dayer, et al. (2015) grouped behaviours into two categories: 1) behaviours that are carried out daily such as recycling, resource conservation and green purchasing, and 2) conservation behaviours that are not carried out daily such as donating and advocating for wildlife recreation. Other studies such as Macdonald, Milfont and Gavin (2015) categorised behaviours as either acted locally (at individual level) such as purchasing sustainable products; or behaviours acted out globally (at government and organisation levels). Schultz (2011) discussed the importance of assessing pro-environmental behaviours based on its importance or prioritization, though there were no examples given on which behaviours should be prioritized.

Generally, research that looks into conservation learning within wildlife settings has assessed a range of pro-environmental behaviours. These behaviours vary in terms of whether the behaviours are general or specific. Examples of the types of conservation behaviours that have been assessed in different studies include:

1) General and habitual pro-environmental behaviours (e.g., recycling, picking up litter) (Ballantyne, Packer & Sutherland, 2011; Brown et al., 2010; Cooper et al., 2015; Hughes et al., 2011; Powell & Ham, 2008);

2) Lifestyle behaviours (e.g., buying eco-certified/eco-labelled products) (Ballantyne, Packer & Sutherland, 2011; Bergin-Seers & Mair, 2009; Cooper et al., 2015; Hedlund, 2011; Pearson et al., 2014; Karlsson & Dolnicar, 2016);

3) Information seeking behaviours (Ballantyne, Packer & Sutherland, 2011; Bergin-Seers & Mair, 2009; Furlow & Knott, 2009);

4) Philanthropic behaviours (e.g., donating behaviours, adopting animals; volunteerism) (Cooper et al., 2015; Ballantyne et al., 2007; Brouwer, Brouwer, Eleveld et al. 2016; Jacobs & Harms, 2014; Powell & Ham 2008; Skibins et al., 2013);

5) Advocating behaviours (e.g., talking about beach pollution, reminding others to engage in responsible behaviours) (Ballantyne et al., 2007; Ballantyne, Packer & Sutherland, 2011);

6) Law abiding behaviour (e.g., compliance of boating regulations in marine parks) (Aipanjiguly, Jacobson & Flamm, 2003);

7) Specific behaviours towards wildlife (e.g., avoiding shining light on egg-laying turtles; feeding wildlife)(Tisdell & Wilson, 2002; Orams, 2002; Waayers, Newsome & Lee, 2006)

As there are no definite guidelines on which type of behaviours should be included and excluded in conservation learning studies, researchers usually include a mix of general and specific behaviours that align with their own scope and study site. Similarly, this study also includes a number of general and specific behaviours related to short and long-term orangutan conservation that are further categorised into low and high difficulty levels (listed in Section 3.4).

2.7.3.1 Summary

In summary, there is little information about consumer behaviour that leads to conservation of orangutans, such as purchase of sustainable palm oil or knowledge about palm oil and its contribution to biodiversity loss. Although various organisations (e.g., Orangutan Foundations, WWF) campaign for people to adopt appropriate behaviours, (e.g., signing petitions to avoid palm oil or donating to orangutan conservation projects), limited studies have evaluated people knowledge, attitudes or behaviours with regards to their conservation behaviours. More importantly, based on previous discussions, there is a possibility that knowledge, attitudes and behaviours relating to orangutan conservation may differ between people from different countries. Based on this knowledge gap, this study sought to further our understanding about the current state of visitors' knowledge and beliefs relating to orangutan conservation within the context of learning in wildlife tourism. A further summary of the research gaps found in the literature and how this has led to the development of the research questions and aims will be discussed in the next section.

2.7   Research gaps and questions arising from the literature

The current literature has highlighted the role of wildlife tourism as a platform to educate people about wildlife conservation and inspire visitors to adopt pro-environmental attitudes and behaviour (Ballantyne et al., 2009). Learning in free-choice settings is seen as an integration of new ideas and meaning-making that eventually enhances visitors' knowledge, attitudes, behavioural intentions and behaviour (Ballantyne, Packer, & Falk, 2011; Brody, 2005; Falk & Dierking, 2004; Kolb, 1984). However, while there is a plethora of studies that have been conducted to strengthen our understanding of how learning occurs when people visit free-choice settings, within the wildlife tourism context, studies have been mainly conducted in captive settings such as aquariums and zoos (Ballantyne et al., 2009; Falk & Adelman, 2003; Falk et al., 2007). Ballantyne, Packer, Hughes, et al. (2007) have called for more conservation learning research to be done in non-captive wildlife

settings as such research will eventually contribute to our understanding of how people learn in different types of free-choice settings.

Additionally, an emerging body of research has found that there are differences between cultures in terms of how they learn and experience nature and wildlife sites (Fu et al., 2012; Hughes et al., 2014; Packer et al., 2014; Xu et al., 2013). Studies suggest that people from the same group or culture[13] develop similar variations in their beliefs and knowledge based on their exposure to the same environment (Hofstede, 1980). Researchers have suggested that cultural differences could be an important attribute to consider when assessing conservation learning, while Chang (2006) and Falk and Dierking (2012) have suggested that interpreters should design environmental interpretation that is targeted at different cultural groups.

The literature reviewed in this chapter indicates that the design of environmental interpretation influences conservation learning, and that the use of behavioural and persuasive communication theories is likely to be important (Ham, 2007; Ham, 2009). However, there is limited research that advises *what* and *how* interpretation can be designed effectively for long-term wildlife conservation behaviours, in particular wildlife sites housing threatened wildlife species. Conservation efforts to prevent orangutan extinction in the wild are now critically needed, particularly with the recent revision of the Bornean Orangutan[14] status to a "critically endangered" species (IUCN, 2016). Despite this urgency, there has been limited research that seeks to assess what people know about conservation of these animal species. This needs prioritising if we want to use wildlife tourism to influence pro-environmental behaviour to conserve and protect orangutans.

To target people's learning outcomes in relation to orangutan conservation, there is a need to know how well people are versed in issues surrounding the conservation of this species. Knowledge plays an important role in the foundation of peoples' beliefs; beliefs are the foundation of attitudes and behaviour that support long-term conservation of orangutans and their habitat. Debate surrounding orangutan conservation is often linked to the palm oil industry. However, there has been little discussion about peoples' knowledge and beliefs regarding issues surrounding sustainable palm oil consumption and its effect on the long-term survival of the orangutan species.

Past studies that have explored visitors' beliefs and knowledge about threatened wildlife species such as the orang-utans, have mostly involved studies that use Western samples from Western study sites (Pearson et al., 2013; Taylor, Miller, & McBurnie, 2016). Few studies seek to explore whether there are any differences between local and international group beliefs and

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[13] In Section 2.3.1, it was ascertained that culture also refers to differences between visitor types such as local vs international.

[14] Prior to 2016, Bornean Orangutan was classified as endangered (Ancrenaz et al., 2016).

knowledge about the conservation of specific threatened species, and how these differences affect the design of conservation related content at orangutan sites. For example, how do local and international visitors differ in their knowledge about issues surrounding threatened species such as orangutans? Do local visitors that live in Malaysia and Indonesia, countries which house orangutans, possess different beliefs and knowledge in relation to orangutans and orangutan conservation compared to international visitors? What do visitors know about behaviour that supports conservation of orangutan habitat? How do visits to orangutan sites impact on the knowledge and beliefs of visitors in relation to issues surrounding orangutan conservation?

This study aims to address these gaps identified in the literature by posing three research questions:

1. Are there any differences between local and international visitors in their knowledge and beliefs about orangutans and orangutan conservation?

2. What is the impact of the orangutan experience on visitors learning about orangutans and orangutan conservation?

3. What are the beliefs that influence engagement in orangutan conservation behaviours such as donating time and money, or supporting sustainable palm oil products?

Additionally, to date, studies of wildlife tourism have largely focused on exploring whether viewing and interacting with wildlife have an impact on visitors' conservation learning. There has been little emphasis on systematically evaluating what does and does not work in terms of designing wildlife interpretation. The application of a belief-based approach guided by behavioural theory, and persuasive communication theories to design wildlife interpretation messages for conservation of threatened species has received limited attention, despite literature in other disciplines demonstrating the effectiveness of using such an approach (Brown et al., 2010; Brubaker & Fowler, 1990; Hughes et al., 2009; Quine et al., 2001). There is also little evidence about how different visitor groups respond to conservation messages, particularly at wildlife sites that receive a high number of local and international visitors. Assael (1992) stated that people from the same culture possess similar norms, beliefs and customs that affect how they will respond and behave in particular situations. There is an emerging amount of research that support this notion, with many studies suggesting that the design of interpretation needs to take into account variations in culture (Al-muhrzi, 2015; Packer et al., 2014; Xu et al., 2013). However, what is not known is whether designing interpretation that takes into consideration the variations that exists within groups, may potentially increase conservation learning outcomes.

This study aims to explore how interpretation impacts on local and international visitors' conservation learning and provide clues as to *how* we can design interpretation that potentially increases learning outcomes for different visitor types. Based on social-psychological theories that underpin behaviour change and persuasive communication, this study uses the application of a belief-based approach (TPB) to design an intervention guided by the principles of ELM aimed to impact on local and international visitor' learning outcomes. This will be achieved by posing the second set of research questions:

4. What is the potential impact of an interpretive booklet on visitors' conservation learning and conservation behaviour?

5. Do local and international visitors differ in regards to the nature and extent of their learning from the visit?

6. Is the impact of the intervention different for local and international visitors?

7. What aspects of the booklet do visitors find most interesting?

From the research gaps and questions identified, this study aims to explore the impact of an orangutan wildlife experience and interpretation on local and international visitors' conservation knowledge, attitudes, behavioural intentions, and on-site conservation behaviours. The specific aims of this study are to:

1.   ascertain local and international visitors' knowledge and beliefs about orangutans, existing threats to their habitat loss, and conservation behaviours linked to orangutan conservation;

2.   develop an interpretive intervention that builds on visitors' knowledge and beliefs about orangutans and orangutan conservation, addressing their misconceptions, and promoting behaviour that support orangutan conservation;

3.   assess the impact of the belief-based approach to interpretation on the conservation learning outcomes of local and international visitors; and

4.   explore the implications of the research findings for the design of visitor interpretation to support orangutan conservation.

To achieve these aims, this study was conducted in two stages. Stage 1 involved an exploratory study designed to assess local and international visitors' beliefs and knowledge about orangutans and orangutan conservation. In Stage 2, using findings obtained from Stage 1, an intervention in the form of an interpretive booklet that incorporates principles of ELM was designed. Stage 2 used an experimental approach to test the impact of the intervention booklet on visitors' learning outcomes. The methodology will be discussed in greater detail in Chapter Three.

CHAPTER THREE: METHODOLOGY

3.0   Chapter overview

This chapter has seven sections detailing the method that was applied to achieve the four study aims. The first section discusses the quantitative research approach that was applied in this study (section 3.1). Secondly, the study paradigm is stated (section 3.2). This is followed by information relating to the study site (section 3.3). Section 3.4 lists the selected conservation behaviours chosen for this study. The fifth (section 3.5) and the sixth section (section 3.6) detail the methods involved (i.e., instrumentation, pilot testing, sample size and sampling process, location and procedures) for stage one and stage two of the study, respectively. The last section (section 3.7) states the ethical clearance and gatekeeper approval that was obtained in this study.

To reiterate, the main aim of this study is to explore the impact of an orangutan wildlife experience and interpretation on local and international visitors' conservation knowledge, attitudes, behavioural intentions, and on-site conservation behaviours. The specific aims of this study are to:

1.   ascertain local and international visitors' knowledge and beliefs about orangutans, existing threats to their habitat loss, and conservation behaviours linked to orangutan conservation;

2.   develop an interpretive intervention that builds on visitors' knowledge and beliefs about orangutans and orangutan conservation, addressing their misconceptions, and promoting behaviour that support orangutan conservation;

3.   assess the impact of the belief-based approach to interpretation on the conservation learning outcomes of local and international visitors'; and

4.   explore the implications of the research findings for the design of visitor interpretation to support orangutan conservation.

To answer the research aims, this study was carried out in two stages. Stage one was designed to answer aims one and two of this study and posed three research questions:

1.   Are there any differences between local and international visitors in their knowledge and beliefs about orangutans and orangutan conservation?

2.   What is the impact of the orangutan experience on visitors learning about orangutans and orangutan conservation?

3.   What are the beliefs that influence engagement in orangutan conservation behaviour such as donating time and money, or supporting sustainable palm oil products?

The findings obtained from stage one were used to develop a theory-based intervention booklet that was tested on-site in stage two. Stage two was designed to answer aims three and four of the study and posed four research questions:

1.   What is the potential impact of an interpretive booklet on visitors' conservation learning and conservation behaviour?

2.   Do local and international visitors differ in regards to the nature and extent of their learning from the visit?

3.   Is the impact of the intervention different for local and international visitors?

4.   What aspects of the booklet do visitors find most interesting?

The findings in this study were used to explore the implications of the research findings for the design of visitor interpretation to support orangutan conservation (Aim four).

3.1   Overview of the research approach

"Research approaches are plans and procedures for research that span the steps from broad assumptions to detailed methods of data collection, analysis and interpretation" (Creswell, 2013, p. 3) . There are five research approaches that can be used to collect data: quantitative, qualitative, mixed method, indigenous and cross-cultural methodologies (Jennings, 2010).

The two common approaches are quantitative and qualitative research methods. Quantitative research involves testing theory to answer questions while qualitative research may involve generating a theory through inquiry, or using a theory to shape the variables of the study (Creswell, 2009). Qualitative studies usually provide more in-depth and richer data that focuses on making meanings. This includes "…collecting quotes from people, verifying them, and contemplating what they mean" (Patton, 2014), meanwhile, both quantitative and qualitative approaches can be used in a mixed method approach.

This study's main aim is to explore the impact of an intervention on a treatment using a control group's knowledge, attitudes and behaviours. This is best explored using a quantitative approach, as this approach enables researchers to explore causal effects, relationships and the occurrence of different factors in a population (Newing, Eagle, Puri et al., 2011).

A self-administered survey questionnaire was applied in this study to collect data in both stages. A self-administered questionnaire was selected, based on a number of advantages. Firstly, self-administered questionnaires are relatively cheap and provide flexibility in sampling. They can be used to reach a large sample and researchers are flexible in terms of choosing the groups to be sampled (Bourque, Fink, & Fielder, 2003). Secondly, self-administered questionnaires enable researchers to pre-determine the questions and generally ensures a high rate of completion (Kolb, 2008). Thirdly, questionnaires can be used to collect a mix of quantitative and qualitative data (Johnson & Christensen, 2013). Due to the nature of this study which necessitates visitors to be sampled on-site after their wildlife experience, a self-administered questionnaire was deemed to be the most appropriate method to collect data.

Although this study mainly used a quantitative approach, it also integrated a qualitative component by measuring visitors' beliefs and knowledge using a series of open-ended questions in Stage one of the data collection. Open-ended questions are deemed qualitative in nature (Johnson & Christensen, 2013; Stake, 2010), hence, open-ended questions were used to explore local and international visitors beliefs surrounding orangutan conservation and knowledge about orangutan conservation behaviours. A number of open-ended questions were also included in Stage two to support the study findings and provide further in-depth information relating to the learning outcomes for local and international participants. As noted previously, few studies had examined the public's views of issues surrounding orangutan conservation. Hence, open-ended questions were considered appropriate as these types of questions "…are valuable when the researcher needs to know what people are thinking and the dimensions of the variables are not well defined" (Johnson & Christensen, 2013, p.199).

To provide a detailed methodology for this study, this chapter comprises five main sections: underpinning paradigm perspective, study site, selected conservation behaviours that support orangutan conservation, stage one research design, and stage two research design.

3.2   Paradigm Perspective

A research paradigm refers to the researcher's philosophical stance about where his/her research stands. This stance is important in determining or aligning the study to its ontology (the nature of reality), epistemology (the relationship between the researcher and the participants/subjects/objects), axiology (values, ethics and associated with ethical practice), and the method (tools for data collection) of the study (Jennings, 2011).

Jennings (2011) identified ten different paradigms or worldviews which have been commonly adopted in tourism research. They are positivism, post positivism, critical realism, pragmatism, chaos and complexity theory, interpretive social science, critical theory, feminist perspectives, post modernism and participatory worldview. In the social sciences involving both quantitative and qualitative studies, there are four major worldviews which have been frequently discussed. These four worldviews are post positivism, constructivism, advocacy/participatory, and pragmatism (Creswell, 2009). Positivist and post-positivist involves research that is guided by a scientific approach. Research design, data collection and data analysis is logical and systematic (Creswell, 2014). Interpretivist /Constructivist worldviews is research that is guided by the researcher's own interpretation of what others have said (Creswell, 2014). It involves interpreting and generating themes and theories from the findings (Creswell, 2014). A transformative worldviews takes into consideration social, political, cultural, economic, and racial/ethnic values (Mertens, 2007). It is often conducted to address research problems relating to various cultures and ethics. A pragmatic worldview uses all approaches to answer a problem. It is not fixed on one worldview, but applies multiple worldviews, different methods and assumptions to find the best solution to a problem (Creswell, 2014). Table 3.1 shows these four main world views and the terms associated with each world view.

Table 3.1: Four major worldviews used in research

Positivist/post positivist	Interpretivist/ Constructivist	Transformative	Pragmatic
Experimental Quasi-experimental Correlational Reductionism Theory verification Causal comparative Determination Normative	Naturalistic Phenomenological Hermeneutic Interpretivist Ethnographic Multiple participant meanings Social and historical construction Theory generation Symbolic interaction	Critical theory Neo-marxist Feminist Critical Race Theory Freirean Participatory Emancipatory Advocacy Grand Narrative Empowerment issue oriented Change-oriented Interventionist Queer theory Race specific Political	Consequences of actions Problem-centred Pluralistic Real-world practice oriented Mixed models

Source: Adapted from Mackenzie and Knipe (2006), Creswell (2009) and Mertens (1998).

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The current study adopts a post positivist philosophy, as it aims to test a theory or explanations of a causal nature (Mackenzie & Knipe, 2006; Mertens, 1998). It seeks to test the impact of an intervention on local and international visitors' conservation knowledge, attitudes and behaviour. Behavioural theories such as the Theory of Planned Behaviour (TPB) posit that an individuals' behavioural intentions and actual behaviour stem from underlying psychological traits such as attitudes and beliefs (Ajzen & Fishbein, 1980). Correspondingly, researchers studying persuasive communication techniques stipulate that when messages are designed with consideration of these traits, they enhance persuasiveness and increase the possibility of impacting on people's attitudes and behaviour (Petty & Cacioppo, 1986). These stances are concurrent with the post positivist worldview, as this view reflects, "a deterministic philosophy in which causes (probably) determine effects or outcomes" (Creswell, 2013, p. 7).

Studies framed within post positivism worldviews often use quantitative methods to collect and analyse data (Mackenzie & Knipe, 2006). As aligned with this view, this study mainly employs a quantitative approach to collect and analyse data.

3.3   Sepilok Orangutan Rehabilitation Centre (SORC)

The research site for this study is the Sepilok Orangutan Rehabilitation Centre (SORC) located in Sabah, Malaysia. There are a number of reasons why this site was chosen as the study site. Firstly, Sabah is located in Sundaland, one of the world's biodiversity hotspots (Myers et al., 2000) (Figure 3.1 and Figure 3.2). These hotspots have the highest concentration of endemic and specialized plant and animal species in each location, as well as undergoing extensive loss of habitat (Myers et al., 2000). As stated in Chapter One, Malaysia and Indonesia are among the countries with the highest numbers of threatened species (IUCN, 2014), including the critically endangered Bornean and Sumatran orangutans.

Figure 3.1: Location of the world biodiversity hotspots (in red)
(Source: Myers et al., 2000)

Figure 3.2: Location of the study site
(Source: Google Maps, 2014)

Secondly, the SORC is one of the first and oldest rehabilitation centres involved in the rescue and rehabilitation of orangutans (Kuze, Sipangkui, Malim et al., 2008). Thirdly, Sabah received about 3.3 million visitors in 2014 (Sabah Tourism, 2014), and SORC received 103,360 visitors in 2014 (Sabah Wildlife Department, 2014). Since 2004, the number of international visitors has surpassed the number of domestic (Malaysian) visitors. The top six countries with the most visitors were from Australia, UK, Germany, Sweden, France, Netherlands and USA (Sabah Wildlife Department, 2014).

In SORC, visitors view the orangutans from a viewing platform (Figure 3.3) during feeding times, as well as through a glass enclosure in the outdoor nursery (Figure 3.4). The centre is open daily with two feeding times for the orangutans, one at 10 am and another at 3 pm., while the outdoor nursery feeding times are at 10.30am and 3.30pm.

Figure 3.3: Viewing platform A
(Source: Orangutan Appeal UK, 2016)

Figure 3.4: Outdoor nursery

3.3.1   Current interpretation at SORC

Generally, visitors' experience in the Sepilok Rehabilitation Centre comprised an optional viewing of the video, then, visitors were able to take a walk through the forest on a boardwalk to view the orangutans from the designated viewing platform. From the viewing platform, visitors walked through the boardwalk to an outdoor nursery where they viewed orangutans in training through a glass enclosure. In the outdoor nursery, visitors can choose to sit in either the air-conditioned area, or the non-air-conditioned area.

The centre has an information/interpretive centre located close to the main administration building. There is an AV room where visitors can enjoy optional viewing of an educational DVD about orangutan relocation and translocation efforts. Interpretation and education at the centre includes published materials such as viewing panels and banners which educate tourists on do's and don'ts of viewing orangutans (no feeding, no touching, no camera flashes), the history of orangutans, and individual information on orangutans and their names. Based on this researcher's observation, there were limited materials that highlighted current issues surrounding orangutans, such as deforestation and support for sustainable products. Panels mostly showcased facts about orangutans (Figure 3.5) and their behaviour, as well as information about the objectives and process of rehabilitation.
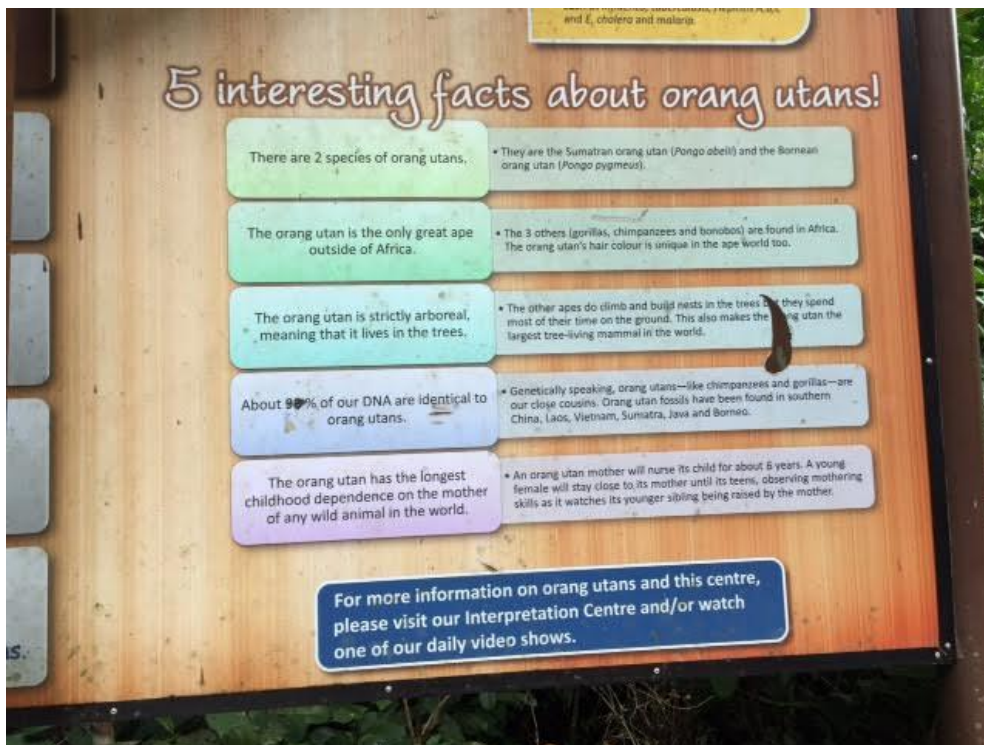
Figure 3.5: Example of an interpretive panel in SORC

There is limited information or messages that relate to conservation behaviours relating to sustainable behaviours that can be carried out by visitors on-site and post visits. For this reason, the selected conservation behaviours highlighted in this study combines conservation behaviours that can be carried out on-site or off-site (post-visits). This includes on-site conservation behaviours such as signing petitions and giving donations on-site, purchase related behaviour intentions (e.g., buying certified sustainable products), information seeking behaviours (e.g., seek more information

and talk/discuss about conservation), as well as organisational related behaviours such as joining fundraisers.   These are further detailed in the next section (Section 3.4).

3.4   Selected conservation behaviours

There has been a limited number of studies that have evaluated the impact of wildlife experiences and interpretation on actual on-site behaviour in non-captive wildlife sites.   As discussed previously, many studies have relied entirely on self-reports to evaluate changes in behaviours. This study includes participant observation of four on-site conservation behaviours to explore the actual impact of the intervention; as opposed to relying only on self-reports of behaviour change. There were twelve conservation behaviours selected for this study.   Four conservation behaviours were measured on-site; eight were measured as behavioural intentions (off-site). As the current on-site interpretive materials had limited information relating to various behaviours that can be carried out to support orang-utan conservation, the selection of conservation behaviours focused on behaviours that supported efforts to ensure long-term wildlife conservation such as sustainable purchase behaviours.

The conservation behaviours that were included in this study were derived from a review of published materials (e.g., academic publications, websites and pamphlets), and formal and informal interviews with various personnel that had expertise and previous experience in designing interpretive materials at nature based sites in Sabah, which included an email interview with Ms. Bernadette Joeman, Head of the Environmental Education Department in the Sabah Forestry Department. The Department designed a number of interpretive materials in the Rainforest Discovery Centre (RDC). The RDC is located next to the SORC, and has existing interpretation and educational programmes with a focus on the flora and fauna of Sabah (Rainforest Discovery Centre, 2010).

Conservation behaviours that were highlighted in the Orangutan Appeal UK website, which is a registered NGO authorised by Sabah Wildlife Department that works on behalf of Sepilok Orangutan Rehabilitation Centre were also included. The Orangutan Appeal UK is the first and only NGO authorised by the Malaysian Government to help with the conservation of orangutans in Sepilok. Apart from this, informal conversations were held with Ms. Hilary McLeod who had previous experience in designing interpretive materials in RDC Sabah. These conversations were used to help inform the selection of conservation behaviour resources for this study.

Twelve behaviours that were deemed to have the potential to enhance the short and long-term viability of orangutans in Borneo were chosen for the study. These behaviours included four on-site behaviours and eight off-site behavioural intentions. The rationale guiding these behaviours and categorisation of high/low effort behaviours is listed in Table 3.2. Behaviours are categorised as either on-site (observed) and off-site (behavioural intentions), and were listed based on low to high effort.

Table 3.2: The twelve conservation behaviours chosen for the study

	BEHAVIOURS	RATIONALE GUIDING THE CHOSEN BEHAVIOUR	CATEGORY OF HIGH/LOW EFFORT
On-site observed behaviour			
1.	Signing a petition "Support Sustainable Palm Oil"	This is a mock campaign designed by the researcher that asks manufacturers and companies to use sustainably-grown palm oil, as well as label products using sustainable palm oil. The campaign asks the public to buy products from manufacturers who are members of the Roundtable of Sustainable Palm Oil (RSPO) which uses only sustainably-sourced palm oil. The campaign claims that signatures will further drive the effort to produce sustainable palm oil, instead of halting palm oil. Petition signing behaviour demonstrates support for these causes.	**Low effort** Visitors are only required to state their country of origin (to distinguish from local or international) and their signature.
2.	*Taking a photocopied list containing manufacturers who are members of RSPO	This list contains information that further informs visitors about manufacturers who are members of RSPO and those who pledge to source sustainable palm oil.	**Low effort** Visitors only need to take a photocopied sheet and read for further information.
3.	*Taking photocopied information about downloading app to check for sustainable palm oil products	This is a leaflet informing visitors about downloading a "palm oil app" that allows them to check the palm-oil contents (certified to non-certified) in registered items in supermarkets.	
4.	On-site donations	Rehabilitation centres are set up to	**High effort**

	(adoption scheme by Orangutan Appeal UK and through donation box)	rehabilitate orangutans that are displaced from their habitats, as well as baby orangutans that have lost their mothers due to deforestation, poaching or hunting. A current adoption scheme that is carried out by the Orangutan Appeal UK based in Sepilok encourages visitors to adopt a specific baby orangutan. Donors contribute a six month fee to help cover the costs of rescuing and habituating young orangutans that have been victims of habitat loss. A donation box is also placed for visitors who would like to directly donate money to the centre.	Visitors need to pledge an amount of money over a period of time (for adoptions). Donation forms are also available where visitors can make donations through credit card deductions.
Off-site (self-report behavioural intentions)			
1.	*Seek more information about orangutan conservation.	Information seeking behaviours are an important part of wildlife conservation as they build current understanding about the status of a species, the threats to that species, and efforts towards conservation.	**Low effort** This is categorised as low effort as individuals only need to browse through websites. This can be done at any time. However they may need to weigh up what information is trustworthy or valid, which may be time-consuming.
2.	Spreading the word to others about the impact of unsustainable sourced palm oil products	Spreading the word to others is behaviour that requires understanding about an issue to be able to talk to others.	**Low to medium effort** Individuals need to spread the word/share through social media, and/or to talk to others about orangutan conservation. This takes relatively little time but requires some understanding about unsustainable palm oil and wildlife conservation. For these reasons, this behaviour has been classified as low to medium effort.
3.	Giving online donations to organisations	This behaviour gives flexibility in terms of time/resources to those who want to donate money to orangutan organisations. There	**Low-high effort** Individuals need to browse through orangutan websites and

		are a number of non-profit organisations that carry out projects to conserve and protect the orangutans including the World Wide Fund (WWF) and The Orangutan Project (TOP). Visitors are able to directly donate to organisations through websites to help contribute to the rehabilitation of the orangutans.	choose which organisations that they perceive are worthy to the cause. Additionally, individuals need to give credit card information that may be prone to security attacks. (depending on financial circumstances)
4.	Becoming a member of an orangutan organisation	There are various organisations that support orangutans and wildlife conservations. Among are Orangutan Appeal UK, WWF, The Orangutan Project and Ape Alliance. These organisations further educate and offer various opportunities such as internship and volunteering programmes.	**Medium to High Effort** There are some organisations that charge membership and associated fees for internship/volunteering programmes.
5.	Downloading an app to check for sustainable palm oil labelling	This app allows individuals to check registered items on the sustainable palm oil contents in supermarkets.	**Medium to High effort** Downloading an app requires low effort; however, it takes a substantial amount of time to check items individually in supermarkets. Some individuals with low technology/impaired vision might have difficulties using the app.
6.	Joining a fundraiser to raise funds for orangutans	Taking part in fundraising helps to build a donation that supports the rehabilitation of orangutans in the centre. The Orangutan Appeal UK has organised a fundraising pack that informs individuals how to fundraise for the conservation of orangutans (Orangutan-Appeal, 2014).	**High effort** Individuals need to spend a certain amount of time and money to join fundraisers, or to organise fundraisers.
7.	*Actively seeking information on sustainably sourced products	The use of products derived from unsustainable palm oil further contributes to the destruction of orangutan habitats as it increases and/or sustains the current demand for unsustainably grown oil palm plantations. These plantations contribute to major deforestation and displacements of orangutan habitats. Actively seeking	**High effort** Individuals need a substantial amount of time to research what are sustainably sourced products, what items are currently available and the certification processes relating to sustainably sourced products. This is

		information about sustainable products will increase understanding about the products and the processes involved.	considered high effort.
8.	Buy products that use sustainable palm oil	Products that use sustainable palm oil are products that are sourced from plantations that are managed sustainably and responsibly. Buying sustainable palm oil products ensures that orangutan and other wildlife species who share the same habitat are protected.	**High effort** Individuals need to identify certification labels, read labels to identify items in supermarket, or use an app to identify items. They also need to pay a higher price to buy certified sustainable products.

Note. *This type of conservation behaviours is related to "information-seeking behaviour" (Kiel & Layton, 1981).

3.5 Stage one: elicitation of visitors beliefs and knowledge to design an intervention booklet

3.5.1 Introduction

Conservation learning models stipulate that visitors who come to free-choice learning settings have different personal histories. These histories include different interests, motivations, prior experiences and prior knowledge that affects how and what they learn (Falk et al., 2012). Falk and Adelman (2003) stated, "These differences would directly affect how these visitors perceived the conservation messages presented, how they processed those messages, and ultimately, the degree to which those (aquarium) messages were integrated into visitors' cognitive structures" (p. 3).

Falk et al. (2012) stated that individuals develop their knowledge from a cumulative number of experiences that are collected over the years. Knowledge is one of the factors that contributes to a person's beliefs (Sommer, 2011). In turn, beliefs are the underlying basis for attitude and behavioural changes, as posited by the TPB and also its predecessor TRA (Ajzen & Fishbein, 1980). These variables contribute to the foundation of factors within an individual that facilitate learning for conservation, and affects how people learn in different wildlife settings.

Stage one, is therefore designed to develop an intervention booklet based on local and international visitors' knowledge and beliefs about orangutan conservation. Ascertaining local and international visitors' knowledge and beliefs extends the current literature to understand how different cultures or similar groups' learn in wildlife settings. In particular, this stage was designed to achieve Aim 1 and 2:

1. To ascertain local and international visitors' knowledge and beliefs about orangutans, existing threats to habitat loss, and conservation behaviours linked to orangutan conservation;
2. To develop an interpretive intervention that builds on visitors' knowledge and beliefs about orangutans and orangutan conservation, addresses their misconceptions, and promotes behaviour that supports orangutan conservation.

Therefore, this stage addresses three research questions:

1. Are there any differences between local and international visitors in their knowledge and beliefs about orangutans and orangutan conservation?
2. What is the impact of the orangutan experience on visitors learning about orangutans and orangutan conservation?
3. What are the beliefs that influence engagement in orangutan conservation behaviours such as donating time and money, or supporting sustainable palm oil products?

The exploratory study design was used to ascertain local and international visitors' knowledge and beliefs about orangutans, existing threats to their habitat loss, and conservation behaviours that are linked to orangutan conservation. Ascertaining visitors' knowledge about orangutans and the conservation behaviour associated with orangutans prior to designing the booklet provides a baseline to establish what visitors have currently learnt about orangutans and issues surrounding orangutan conservation. This stage of the study also elicited visitors' salient beliefs with regards to behaviour that supports the conservation of orangutans, such as supporting sustainable palm oil products and donating time and money. This was seen as important because in the TPB, beliefs are the underlying basis of attitudes, behavioural intentions and ultimately, behaviour (Ajzen, & Fishbein, 1980). A belief elicitation method based on the Theory of Planned Behaviour was employed to elicit these "salient beliefs".

3.5.2 Stage one instrument

Data were collected via a self-administered questionnaire that explored local and international visitors' which included,

- knowledge about orangutans and orangutan conservation;
- knowledge about conservation behaviour supporting orangutans;
- the impact of SORC experience on learning about orangutans and orangutan conservation;
- beliefs with regard to conservation behaviour supporting the protection and conservation of orangutan habitats.

The self-administered questionnaire was divided into four main sections (Appendix A). Section A was designed to measure visitors' knowledge about orangutans and orangutan conservation, Section B was designed to measure the impact of the SORC experience on visitors' learning about orangutans and orangutans' conservation, and Section C and D were designed to elicit beliefs with regards to conservation behaviour supporting the protection and conservation of orangutan habitats.

The first question in the questionnaire asked visitors whether they were local (from Malaysia or Indonesia) or from overseas. A definition[15] of sustainable products was included after this question to define sustainable products. The questionnaire included several sections as follows;

Section A: Knowledge about orangutans and orangutan conservation.

This section was designed to measure visitors' conservation knowledge with regards to general knowledge of orangutans, the main threats surrounding orangutans, and conservation behaviour related to orangutans. Previous studies have used various types of questions to assess knowledge, including multiple choice quizzes or yes/no format (Brooks, Warren, Nelms et al., 1999; Cheung, Chan, & Wong, 1999; Pearson et al., 2013; Reading, Clark, & Kellert, 1994), and open-ended questions (Falk & Adelman, 2003). Ten multiple choice questions and one open-ended question were included.

The multiple choice questions were used to measure:

- general knowledge about orangutans (5 items);
- knowledge about existing threats to orangutan habitat loss and the major causes of habitat loss (2 items); and
- knowledge about purchasing sustainable products (3 items)

The open-ended question was used to measure knowledge of conservation behaviour. This was included because using open-ended questions helps to elicit in-depth information when there is limited knowledge about an issue (Johnson & Christensen, 2013).

Section B. SORC's impact on learning about orangutans and orangutan conservation

This section measured what visitors had learned about orangutans and orangutan conservation as a result of their visit and what were they motivated to know more about orangutans. Open-ended questions were used to explore what visitors' learnings and were they motivated to know more.

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[15] In this study, sustainable products are defined as those that are sourced from or produced by companies that support long-term benefits to the economy, local communities and the environment.

Section C and D. Belief elicitation for orangutan conservation behaviours

This section ascertained local and international visitors' beliefs relating to conservation behaviour that supported orangutan conservation. Procedures to elicit beliefs were based on the 'belief elicitation phase' outlined by Theory of Planned Behaviour (TPB) (Ajzen, 2002; Francis et al., 2004; Middlestadt et al., 1996).

Participants were asked a series of open-ended questions that elicited salient beliefs with regard to donating their time and money, as well as supporting sustainable palm oil products to assist the conservation of orangutans. Although there were 12 identified conservation behaviours for this study, it was impossible to elicit three sets of behavioural, normative and control beliefs for each of the 12 behaviours. Doing so would have produced a total of 36 open-ended questions.

Therefore, this study elicited beliefs under two broad themes of behaviour reflecting the 12 selected conservation behaviours. The first was "**donating time and money**" and included adopting an orangutan, making on-site donations, online donations to orangutan organisations, joining fundraisers to help raise funds for orangutans, becoming an active member of orangutan organisations The second was "**supporting sustainable palm oil products**" and included signing a petition to support sustainable palm oil, actively seeking information about sustainable palm oil products, actively using sustainably sourced palm oil products, spreading the word about orangutan conservation and sustainable products through social media, or by talking to others. The belief elicitation for these two broad themes was conducted by asking participants to write down their answers based on their thoughts and feelings in regards to their commitments in supporting orangutan conservation.

Three sets of open-ended questions were designed to elicit behavioural beliefs (BB), normative beliefs (NB) and control beliefs (CB) for each of the two umbrella behaviours. To elicit salient beliefs, a set of TPB beliefs questions (i.e., BB, CB and NB) were asked to identify the most 'salient' or most frequently identified beliefs with regards to the behaviour. Following the implementation for TPB research, the TACT (Target, Action, Context and Time) elements (Ajzen, 2005), were implemented in this study to elicit beliefs relating to behaviours supporting orang-utan conservation.

The principle of compatibility requires that the measures of attitude and behaviour involve exactly at the same action, target, context and time elements, whether defined at a very specific or at a more general level. Principles of compatibility which originated from the reasoned-action approach (Ajzen & Fishbein, 1977), state that there must be a symmetry or compatibility for

assessing specific attitudes relating to the behaviour of interest (Ajzen, 2005). Early studies that investigated the relation between attitudes and behaviour tended to predict specific behaviours from general attitudes (see Ajzen, 2002 p.3 for further reading). For example, researchers attempted to predict specific behaviours such as donating for turtle conservation based on participants' general attitude scores. These studies found that attitudes are poor predictors of the specific behaviour of donating to turtle conservation.

Therefore, in this study, TACT was designed as visitors' (Target) thoughts and feelings about making a commitment to support orangutan conservation (Context) in the next six months (Time), such as donating your time and money in support of orangutan conservation (Action). The first theme of behaviour for "donating time and money" elicited a set of beliefs through the following questions:

1. What do you think are the benefits or the good consequences that could result if you donated your time and money through the above actions?

2. What do you think are the downside or bad consequences that could result if you donated your time and money through these actions?

3. Who (individuals/groups) would approve of you donating time/money?

4. Who (individuals/groups) would disapprove of you donating time/money?

5. What factors or circumstances would make it easy for you to donate time/money through the above actions?

6. What factors or circumstances would make it difficult or prevent you from donating your time/money through the above actions?

This set of procedures has been used in other studies to design intervention messages (e.g., Hughes et al., 2009; Brown et al., 2010). Frequently mentioned beliefs were regarded as 'salient beliefs' and were the ones most suitable to target in the design of an intervention (Ham, 2013). This follows the TPB assumption that targeting salient beliefs impacts positively on intentions and behaviour (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 2011).

Ideally, in studies that use the belief elicitation phase, a second step that measures the strength of the salient beliefs is conducted (Francis et al., 2004; Ham & Ham, 2011). This is usually done by designing questions that measure the strength of behavioural, normative or control beliefs pertaining to the target behaviour. This second step,

> *"...*quantitatively measures and compares the strengths of these beliefs among two different samples—in this case, a sample of those who pledged to act ("actors") and a sample of those who did not pledge to act ("non-actors"). Where differences in belief strengths are found,

communicators then target those beliefs for influence in a campaign*"* (Ham & Ham, 2011, p. 4).

However, these can only be done by adopting behaviour that can be differentiated between a group of compliers and non-compliers, such as keeping a dog on a leash as suggested by Hughes et al. (2009) and picking up litter in Brown et al. (2010). Therefore, these researchers were able to assess the strength of beliefs by handing out the questionnaire discreetly to a group of compliers and non-compliers. One or two messages were designed that were based on beliefs (either from BB, CB and NB) that had the biggest differences between compliers and non-compliers.

Even with the second step of measuring the strength of beliefs, researchers are still required to individually choose which beliefs that should be targeted to produce one or two persuasive messages (chosen from BB, NB or CB) that target this type of behaviour. Belief elicitation is indeed unique in that it is both an "empirically-driven and pragmatic selection process" (Sam Ham, personal email communication, 2 May 2015). On the other hand, there is no way of knowing which beliefs would have the most impact on people's attitudes and behaviour, even if all beliefs were included in the campaign, as undertaken by the *Voice of the Ocean Galapagos Campaign* (Ham & Ham, 2011) and *The Baja Forever! Campaign* (Ham & O'Brien, 2003).

Since this study is focussing on targeting a number of behaviours that were not available at the site (e.g., signing petitions, taking leaflets), and including long-term behaviours (e.g., joining fundraisers, becoming an active member of orangutan organisations), it was impossible to distinguish between compliers and non-compliers. Similar challenges were encountered in a previous study about developing a communication strategy for the Voice of the Ocean on the National Geographic Explorer (Ham & Ham, 2011). Here, the researchers assumed that all of the mentioned beliefs were salient beliefs, and because there were a number of interventions used, the researcher should be able to incorporate them all. However, this is not possible in the current study because there is only one intervention tool and it is impossible to include all of the beliefs obtained from Section C and D in the booklet. This is because it would significantly increase the number of pages, the time required to read the booklet, and would probably overwhelm the majority of participants. Instead, this study used a combination of the most frequently mentioned behavioural, normative and control beliefs.

Demography

Apart from nationality (local vs international), demographic questions probed aspects including age and gender to provide a general profile of the sample.

3.5.3 Pilot testing

Pilot testing was important for a variety of reasons. It enabled the researcher to ensure that the instruments were adequate, to anticipate any problems that might occur, and to test the participants' understanding of the content (Van Teijlingen & Hundley, 2002). The questionnaire was firstly pilot tested on 20 respondents (10 local bilingual Malaysians and 10 international respondents) who had been to the site (SORC). Respondents were obtained by using the researchers' personal connections and who were personally approached via face-to-face requests and through email.

A number of changes were made in response to feedback obtained in the pilot test. Several of the pilot participants made comments such as "*Sorry I don't know what sustainable is*!" while others said that there are unclear and had mixed perceptions about the definition of 'sustainable'. Consequently, a definition of the term "sustainable products" was added to page one of the questionnaire. Minor changes were also made in section C and D of the questionnaire to highlight the behaviours that were being measured.

3.5.4 English-Malay Translation

The revised final questionnaire was translated into Malay. Since this study involved locals (Malaysian and Indonesians) and English speaking international visitors, it was important to ensure translations were done correctly. The simplest translating procedure was through simple translations where a set of instruments were translated by a translator (Sperber, 2004). However, this approach does not ensure its validity unless it is further tested (Sperber, 2004). Generally, there are four techniques for translations involving cross-cultural research that are deemed most appropriate (Campbell, Brislin, Stewart et al., 1970). These four techniques included:

1. Back translations where instruments such as questionnaires were translated back and forth to the original source of language;
2. Bilingual techniques where a number of bilinguals took the test in both languages;
3. Committee approach which involved a number of bilinguals translating the instruments to the original language; and
4. Pretest procedures where the questionnaire was field tested to ensure the participants' comprehension of the content.

Translations in the current study used a combination of these techniques. The revised final questionnaire was firstly translated into the Malay language version by a certified professional

translator. This was then pre-tested with five bilingual Malaysians[16] from the researcher's personal connections to check for any misunderstood content. A copy of the English version was available to clarify any misunderstood questions. There were some minor alterations in terms of use of some wording in the local language (e.g., False was translated as *Palsu* in Malay) that were perceived to be inappropriate. This term was changed to another term "*Tidak Benar*" which was deemed to be more appropriate for use by the general population. Changes also include adding a measurement scale of 1 to 4 for question 11 for the Malay version as it was found from the pre-testing that there were confusion when the word "*Please order the factors below from 1 to 4.*" were translated into Malay. The final version of the questionnaire was printed in both the English and Malay language. Local (including Indonesians) and international visitors were given the option of answering in either English or Malay.

3.5.5   Participants

The target population for the belief elicitation phase were visitors to the Sepilok Orangutan Rehabilitation Centre over the age of 18 years. Local participants included both Malaysians and Indonesians. International participants only included those who spoke and understand English; however, since most international visitors[17] to SORC were from countries where English is one of the main languages spoken (EU, 2006), this was not regarded as a critical limitation of the study. Visitors who came as a family or in tour groups were welcomed to participate separately as individuals in the study. Those who agreed, were asked to answer individually without discussing their answers with their family or peers.

3.5.6   Sample size and sampling method

The belief elicitation phase based on Theory of Planned Behaviour (TPB) outlined by Francis et al. (2004) that recommends that researchers sample a minimum of 25 individuals from each group to identify their salient beliefs. However, there are currently no definitive guidelines on how large a sample must be for a TPB belief-elicitation phase. Researchers usually follow Francis et al.'s (2004) guidelines using 25 individuals from each group or to reach saturation point, as used by Brown et al.'s (2010) and Middlestadt et al.'s (1996) study. A review of 47 studies using the TPB by Downs and Hausenblas (2005) failed to determine the best method on conducting the elicitation phase due to insufficient information in the reviewed studies. The authors did, however, specify that the belief

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[16] Although this was not a field test, the pre-testing was done on Malaysians who had previously visited SORC, or visited a wildlife site.
[17] The top five countries were Australia, UK, Germany, Sweden and France. Excluding France, English were one of the main languages spoken in these countries.

elicitation phase must be conducted on the targeted population in the study (Downs & Hausenblas, 2005).

The current study used quota sampling, which is often used to reach a specific targeted sample. Quota sampling is non-probability sampling which does not use random selection of the participants into the study (Babbie, 2013). However, the selection of participants within the groups itself uses random sampling by applying the next-one approach. In the present study, a next-one approach to recruiting was used by sampling in two timeframes (morning session and afternoon session). To ensure the representativeness of samples, the data were collected over a two week period including weekdays and weekends.

A total of 200 visitors (100 local Malaysians and 100 non-Malaysians) were sampled. Out of the total of 200 questionnaires distributed, the researcher obtained a total of 123 usable questionnaires. Sixty respondents were international visitors and 63 were locals. No Indonesians were sampled during the period of stage one data collection. Earlier in this study, local visitors are defined as visitors who originate from countries where orangutans are native: Malaysia and Indonesia. Apart from these facts, local visitors were generalised as Malaysians and Indonesians based on the Malaysian and Indonesian similarities in relation to culture (Clark & Pietsch, 2014), religions and common occupations (Funston, 2001), multicultural and multi-religious ideologies (Funston, 2001). More importantly, these two countries share similar economic revenue from the palm oil industry as well as efforts to tackle surrounding issues relating to palm oil expansion (i.e., biodiversity loss) (Mukherjee & Sovacool, 2014; Wicke, Sikkema, Dornburg et al., 2011; Wilcove & Koh, 2010). Despite the similarities, since no Indonesians were sampled in Stage one, this may still affect the generalizability of this study (see Section 7.2.6).

The sample size (200) was deemed sufficient, considering the minimum requirement of 25 individuals for each group (i.e., 25 locals and 25 internationals') had been surpassed, and that a range of frequently mentioned 'salient' beliefs was obtained.

3.5.7 Location and Procedures for data collection

The data collection was conducted in March, 2015 over a two week time period. It is noted here that the data collection was not conducted during the peak season for the centre. Initial observation revealed that visitors usually departed immediately after exiting the trail as they are already tired from the experience. Hence, recruiting participants in the main administration building would be problematic as it would significantly decrease the rate of participation. Consequently, the outdoor

nursery area was selected as there were two large comfortable seating areas (with and without air-conditioning).

The recruiting process began when the first visitor who entered the main entrance of the outdoor nursery was approached. This was done randomly by using the next-one approach. The next potential participants were continuously approached after the previous individual finished recruiting. This process ensured that enough respondents were obtained within the allocated time and budget.

Recruitment was done during two sessions (10.00-11.00 am, morning and 3.00-4.00 pm. afternoon). This timeframe allowed the researcher to sample visitors who had already been exposed to some information about orangutans within the site. This included interpretive panels along the boardwalk and viewing the orangutans from Platform A. The recruitment started with the researcher explaining the purpose of the study, and asking whether the prospective respondents were aged 18 years of age or older. International visitors were informed that only English questionnaires were available. Local and international (English speaking) visitors 18 years and older who agreed to participate were given the questionnaire and told to take as much time as they needed to complete the questions whilst they were in the outdoor nursery area. Visitors who came late (around 10.35-10.40 am) were not approached because there would not be enough time for them to both enjoy the nursery and complete the questionnaire. Fifteen minutes before closing time, the researcher reminded participants that the centre would be closed at 11.00 am and to hand in their questionnaires at the counter before leaving. The same procedure was followed in the afternoon session. A token of appreciation in the form of a locally handmade orangutan key chain was given to each participant upon submitting their completed questionnaire.

3.5.8 Overview of stage one data analysis

The aim of this phase was to ascertain local and international visitors' knowledge about orangutans and orangutan conservation, and elicit their beliefs with regards to conservation behaviours that is linked to orangutan conservation. Data collected was compiled in IBM SPSS Version 22.

Knowledge questions in section A was measured using multiple choice questions (i.e., true/false/I don't know) and were analysed using chi-square tests. One way chi-square tests of independence were conducted to test whether there were any differences in knowledge scores between local and international visitors.

A thematic analysis was used for open-ended responses measuring knowledge of conservation behaviour and responses that were obtained from sections B, C and D. Thematic

analysis is often used in qualitative research to identify the patterns or "emerging themes" in the data (Braun & Clarke, 2006). In this study, the open-ended question was coded and analysed in three steps. Firstly, the researcher recorded each response according to their datasets (local participant dataset or international participant dataset) in SPSS. Secondly, responses were re-read several times to find a list of common specific themes. Once a list of specific themes was obtained, each specific theme is given a code in SPSS. Thirdly, each response was then coded blindly according to the specific themes that it represents. Frequencies for each theme were assessed for both local and international groups. This is done to gather the most frequently mentioned responses, or "modal salient beliefs" that could later be used to develop messages for the intervention.

As mentioned earlier, not all beliefs that were elicited by the participants could be included in the intervention. It was decided that messages in the intervention would use a combination of the 'most frequently mentioned themes' reflecting salient behavioural beliefs (BB), normative beliefs (NB) and control beliefs (CB). To ensure consistency, the researcher selected the two highest belief themes from each BB, NB and CB. This ensured that the beliefs were mentioned by at least 60% of locals, and 60% of international visitors. The results of the open-ended questions are presented in Section 4.1.2, Section 4.1.3 and Section 4.1.4 respectively. Data for the open-ended questions were then analysed and used to produce the final messages for the booklet. These are further detailed in Section 4.3.

Stage one findings will be presented and discussed in Chapter four (Section 4.1 and Section 4.2), and the open-ended responses that were obtained were used to develop the final messages in the intervention booklet (Section 4.3).

3.6   Stage two: Testing the impact of the intervention booklet on the conservation learning outcomes of local and international visitors

3.6.1   Introduction

As postulated in Chapter two, learning in informal or free-choice settings refers to meaningful learning that involves not only acquiring knowledge about science or the environment, but also how this acquired knowledge is acted upon, and how the experiences change people attitudes (Dierking and Falk, 1994; Novak, 1977). Therefore, studies that measure conservation learning outcomes principally measures cognitive and behavioural changes in visitors after a wildlife experience. This study uses the learning outcome definition by (Ballantyne, Packer, & Falk, 2011) (in wildlife settings) which is defined as,

"…the deepening and expanding of personal knowledge and understanding of environmental sustainability issues; changes in awareness, appreciation and concern for wildlife; development of intentions to take or refrain from specific personal actions that have an impact on the environment; and enactment of lifestyle changes designed to support environmental sustainability" (Ballantyne, Packer, & Falk, 2011, p. 3).

Based on this definition, there are four main measures of learning outcomes which include:

1. measures of knowledge (deepening and expanding of personal knowledge and understanding of environmental sustainability issues relating to orangutans);
2. attitudes (changes in awareness, appreciation and concern for orangutans and wildlife);
3. behavioural intentions (development of intentions to take or refrain from specific personal actions that have an impact on orangutan habitats); and
4. actual behaviour that measures behaviours that were designed to support orangutan conservation and environmental sustainability were applied in stage two.

These measures have been used to assess learning outcomes when applied in Stage two, which was designed to explore the potential impact of the intervention booklet on visitors' conservation learning outcomes. As there has been a limited number of research studies that have evaluated the impact of wildlife experience and interpretation on actual on-site behaviour changes in non-captive wildlife sites, this study also measured the four on-site conservation behaviour to assess the potential impact of the booklet.

Specifically, Stage Two was designed to assess the impact of the belief-based approach on interpretation of local and international visitors' conservation learning outcomes (**Aim 3**). Findings were used to explore the implications of the research findings for the design of visitor interpretation to support orangutan conservation (**Aim 4**). There were four research questions that guided Stage two of this study:

1. What is the potential impact of an interpretive booklet on visitors' conservation learning and conservation behaviour?
2. Do local and international visitors differ in regards to the nature and extent of their learning from the visit?
3. Is the impact of the intervention different for local and international visitors?
4. What aspects of the booklet do visitors find most interesting?

To answer the first two aims and the related research questions, a randomised two-group post-test-only experiment, which is a type of classical experimental design (Fraenkel, Wallen, & Hyun, 2011; Trochim & Donnelly, 2006) was used. Experimental design was chosen as this design probes causal relationships by observing the effects of an intervention on subjects (Babbie, 2013). Using experimental research enables researchers to demonstrate how a condition (independent variable) will produce outcomes (dependent variable) (Fraenkel et al., 2011). Data was collected in the form of a self-administered survey questionnaire that was given to participants at the end of their visit to measure conservation learning outcomes.

Participants in the experiment were divided into a treatment condition (access to an interpretive booklet) and a control group (no booklet) (Table 3.3). The impact of the intervention was tested by measuring whether there were differences between treatment and control groups in:

- post-visit knowledge about orangutans and orangutan conservation
- post-visit attitudes on orangutan conservation;
- post-visit behavioural intentions for eight orangutan conservation intentions (listed in section 3.4, Table 3.2)
- participation in four on-site behaviours supporting orangutan conservation (listed in section 3.4, Table 3.2)

Table 3.3: An experimental two-group post-test-only randomised design employed in Stage Two

GROUP A (TREATMENT)	TREATMENT GROUP (LOCALS AND INTERNATIONALS)	INTERVENTION **GIVEN AN INTERPRETIVE BOOKLET**	POST-TEST ONLY: CONSERVATION KNOWLEDGE, ATTITUDES, INTENTIONS, AND ON-SITE BEHAVIOUR CHANGES
GROUP B (CONTROL)	CONTROL GROUP (LOCALS AND INTERNATIONALS)	NO INTERVENTION **NOT GIVEN THE INTERPRETIVE BOOKLET**	POST-TEST ONLY: CONSERVATION KNOWLEDGE, ATTITUDES, INTENTIONS, AND ON-SITE BEHAVIOUR CHANGES

Source: Adapted from Fraenkel et al. (2011) and Trochim and Donnelly (2006) and used in this study.

3.6.2 Stage two instruments

The main aim of stage two was to assess the impact of the intervention on conservation learning outcomes. This was achieved by using a self-administered questionnaire, and instruments designed for the sole purpose of the research to allow observation of visitors' participation at four on-site behaviours. This include observation of existing on-site donations, a mock petition to observe whether visitors signed the petition in support of sustainable palm oil movement, and leaflets designed by the researcher to observe whether visitors displayed information seeking behaviour in support of sustainable palm oil use. The instruments are further detailed below.

3.6.2.1 Self-administered questionnaire

A self-administered questionnaire (Appendix B) was used to measure post-visit knowledge, attitudes, and the eight behavioural intentions of participants in the treatment and control groups, as well as measures to explore aspects of the booklet perceived as most interesting. The questionnaire was available in two languages, English and Malay. It contained three main sections. Different types of questions (e.g., nominal, ordinal, open-ended) were used to measure participants' conservation learning outcomes (i.e., knowledge, attitudes, behavioural intentions, observed behaviour). However, the questionnaire mainly consisted of Likert scale items to measure participants' conservation learning outcomes. Likert scales are commonly used in behavioural studies (Kerlinger, 1986), as this type of scale provides the researcher with indications of a population's agreement or disagreement with an issue or topic (Breckler, Olson, & Wiggins, 2005).

Section A: Knowledge about orangutans and orangutan conservation

This section was designed to measure participants' conservation knowledge pertaining to:

- general knowledge about orangutans (4 multiple choice items);
- knowledge about existing threats to orangutan habitat loss and the major causes of habitat loss (2 multiple choice items);
- Perceived knowledge gain and perceived impact of sustainable products (2 Likert scale items); and
- knowledge of behaviours relating to orangutan conservation (open-ended).

The question used the same knowledge questions from Stage One. Differences in knowledge scores between treatment and control groups were used to measure whether the intervention was successful in impacting on participants' knowledge.

Section B. Attitudes

The measures for attitudes predominantly focused on views relating to orangutan conservation issues and the orangutans welfare. In this study, attitudes were measured using three main constructs;

    i.   General attitudes towards orangutan welfare (7 items)

    ii.   Attitudes towards orangutan conservation (5 items)

    iii.   Perceived learning outcomes (5 items)

This study measured attitudes using scales that have been used in a wide range of wildlife settings using various samples. General attitudes towards the welfare of orangutans were measured using seven (7) items adapted from the Animal Attitude Scale (AAS) developed by Herzog Jr, Betchart, and Pittman (1991). AAS was also used in Pearson et al.'s (2013) study. Attitudes towards orangutan conservation were measured using five (5) items adapted from Ballantyne, Packer, and Falk (2011) study. Five items measuring perceived learning outcomes were also included to ascertain visitors' perceived learning about orangutan conservation and general attitude change resulting from the visit. These items were adapted from Ballantyne, Packer, and Falk (2011) study. All three attitude scales in this study retained the original five (5) point Likert scales ranging from strongly disagree to strongly agree to maintain its comparability with other studies.

Section C. Behavioural intentions

The respondents' intentions to adopt eight conservation behaviours that support orangutan conservation were measured by using a seven-point Likert scale ranging from 1- extremely unlikely, to 7 –extremely likely. Based on the principles of compatibility (Ajzen, 2005), measures for the behavioural items in this study (i.e., behavioural intention and actual behaviours) were designed to be compatible with the previous beliefs relating to the two themes of behaviour that were elicited in Stage one (i.e., donating time and money, and supporting sustainable palm oil products behaviours). These behaviours included:

1.   Joining a fundraiser to raise funds for orangutans.

2.   Downloading an app to check for sustainable palm oil labelling.

3.   Seeking more information about orangutan conservation.

4.   Giving online donations to organisations.

5.   Becoming a member of an orangutan organisation.

6.   Actively seeking information on sustainably sourced products.

7.   Buying products that use sustainable palm oil.

8.   Spreading the word to others about the impact of unsustainable sourced palm oil products.

Although it has been generally suggested that the scales used in a questionnaire should adopt the same consistencies in terms of scaling (Goodwin, 2009), there is no stated guidelines whether the use of 5 or a 7 rating scale is better (Goodwin, 2009; Krosnick & Presser, 2010). Other studies reported that 5 and 7 point ratings revealed the same mean scores (Dawes, 2008). However, a 7 point Likert scale is deemed to better in terms of providing participants more choice at both positive and negative ends, particularly in measuring stated intentions. As stated by Edwards and Smith (2011), some participants are reluctant to respond to either of the extreme ends of scales when presented with Likert scales. If this occurs, it makes it harder to assess differences between groups. As one of the key aims of the present study was to assess whether there was a difference between local and international respondents in terms of the intervention's impact on behavioural intentions, a seven point scale was considered to be the most appropriate as this gives them more choice.

To further measure behavioural intentions towards supporting orangutan conservation, participants were asked to indicate three specific things they would be most likely do to support conservation of endangered species such as the orangutans. These were measured using an open-ended question.

Section D: Evaluation of the most interesting aspects of the booklet

Apart from the questions that directly measured learning outcomes, the treatment group questionnaire included three questions that was designed to assess aspects or elements in the booklet that facilitated learning outcomes for visitors, and support findings relating to the impact of the booklet on visitor's conservation learning outcomes. The word "interesting" is defined in this study as "to an individual's focused attention and/or engagement with particular events and objects"(p.169) (Renninger and Hidi, 2011). Hidi and Renninger (2006) describe interest as something that triggers a person attention. In this study, the most "interesting" aspect of the booklet refers to any messages, images, stories, or information in the booklet that captures the participants' attention.   There were two open-ended questions that asked what was the most interesting aspect of the booklet, and reasons why the booklet was interesting. This section also included eight (8) questions that measured perceived ratings indicating an understanding on eight related orangutan conservation issues. They were measured on a five point Likert scale ranging from 1=strongly disagree to 5=strongly agree. A tick box that indicated "I was already well aware of this before" for

each of the conservation issues was included as an option for visitors who were already knowledgeable about these issues.

Demographics

There were four demographic questions which asked the participants' country of origin, age, gender and travel party. Country of origin was chosen to differentiate between local and international visitors. Based on other studies, the samples used from wildlife sites tended to have an equal representation of males and females, although in some cases there was a higher female representation (Adetola, Adenuga, & Morenikeji, 2016; Carr, 2016; Mellish, Pearson, Sanders et al., 2016), with a mean age between 21-40 years (Lee, 2015; Mellish et al., 2016; Skibins & Powell, 2013). Based on these profiles, age and gender in this study was expected to corroborate these studies. The demographics results also provided a general profile of the sample of visitors to SORC.

3.6.2.1 Instruments for observation of four on-site conservation behaviour

The impact of the intervention on visitors' on-site behaviours was measured by observing whether visitors participated in the following conservation behaviours: on-site donations (Appendix C) (Orangutan Appeal UK has provided a donation box in the centre for those who wanted to adopt and donate/pledge for donations), sign a petition to support sustainably sourced palm oil through RSPO (Appendix D), taking a photocopied sheet of RSPOs members list (Appendix E), and taking photocopied information about downloading an app for sustainable palm oil products (Appendix F). The observation was recorded by two research assistants in separate locations. Participants from both control and treatment group were observed. This was possible as upon recruitment, all participants in this study were given a coloured sticker. Four different colours were given to differentiate locals and internationals in either control or treatment group. Data was recorded by noting participants using coloured stickers for each of the four observed behaviours. This enabled to researcher to gather data on the control and treatment participants who carried out the behaviours (see Section 5.2.4 for results). The procedure for the observation of the four on-site conservation behaviour is further detailed in Section 3.6.4.

3.6.3 Pilot testing

3.6.3.1 Control group pilot testing

The questionnaire[18] was pilot tested at the SORC. Pilot testing was conducted to: 1) assess participants' understanding of the contents of the questionnaire; 2) test the data collection procedures in Stage two; 3) check timing for the procedure; and 4) provide training for the research assistants. The pilot test was first done with the control group consisting of 15 Malaysians and 15 international visitors. These led to a number of revisions as outlined below.

1. There were no major problems found in the English questionnaire however there were a number of revisions needed for the Malaysian questionnaire. For example, the sentence "please rank" or "*sila susun kedudukan ranking*" was revised to "*sila susun mengikut urutan*" which is not a direct translation but was more widely understood by the respondents. The word such as "spesifik" which was translated from the English word "specific" was not understood by some local participants and was revised to a general Malay word.

2. During the pilot test, the researcher recruited participants at the main entrance of the administration building before they entered the orangutan viewing area and gave them a numbered colour sticker. The colour sticker was used to enable the researcher to identify those who would be completing the questionnaire after exiting the orangutan viewing area. However, a number of the pilot test participants had removed their stickers before exiting the orangutan viewing area. In addition, many of the participants were in a hurry to catch their buses and/or were too tired to spend time reading and answering questionnaires after the visit. It was therefore decided that the recruitment would be done in the outdoor nursery (as in Stage one) as the outdoor nursery has air-conditioning and provided comfortable seating.

Participants usually finished answering the questionnaire in 10 to 12 minutes. The pilot test also provided training for the research assistants to observe participants' on-site behaviour by noting the numbers on the participants' stickers[19]. The observation results were used to compare whether there are any differences between treatment and control group participants based on the four on-site behaviours[20].

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[18] The English questionnaire was translated by a certified translator before pilot testing.
[19] Local and international were given different coloured sticker to enable identification.
[20] Four on-site behaviours were observed: on-site donations, signing a petition, taking a photocopied list containing manufacturers who are members of RSPO, and taking photocopied information about downloading an app to check for sustainable palm oil products.

3.6.3.2 Treatment group pilot testing and the use of "cued testing" protocol

The pilot test for the treatment group was conducted a week after the control group pilot testing. Ten participants were given the printed booklet in the outdoor nursery after viewing orangutans from the viewing platform. The pilot participants were then asked to complete the questionnaire. This protocol mimics the maximum effectiveness study (Shettel, 1968) or "cued testing" approach done in several formative studies (Shettel, 2001), where participants know that they are to be tested after the intervention was given. As free-choice learning settings allow visitors to choose what they want to know and read, using the cued testing approach allows the researcher to anticipate how well the intervention will work in a real world setting. As Shettell (2001) stated, "…such data tells us that if visitors' choose to attend an exhibit in its entirety, they would be able to respond at a certain level on whatever measures would be appropriate for that exhibit" (p. 6). The intervention used a booklet as opposed to another form of interpretation such as panels because booklets are cost effective, flexible and portable (see Section 4.3.1 for further discussion on the selection of a booklet).

In this study, visitors were "cued", consequently, it was anticipated that they would be highly likely to carefully read the information in the booklet. Had visitors not been cued, there was a possibility that they would not read the booklet and thus responses to the questions posed would not be a reliable indicator of the booklet's effectiveness. Using cueing provides results that are "…predictive of how well that element could perform in its final setting if it is installed and used as intended" (Shettell, 2001, p. 6).

No further revision to the questionnaire was required; however, the cueing exercise revealed that treatment group participants required around 10 minutes to read the booklet in its entirety.

3.6.4   Procedures for stage two data collection

The data collection for Stage two (including pilot testing) took approximately five weeks to complete, starting in mid-July 2015. Sampling was conducted on both weekdays and weekends. The recruitment process was undertaken in two sessions (10.00-11.00 am in the morning and 3.00-4.00 pm in afternoon) at the entrance of the outdoor nursery. The procedure involved the researcher explaining the purpose of the study, and asking whether prospective participants were 18 years or older. Eligible participants who agreed to participate were given a coloured sticker to allow the research assistants to identify locals from internationals who wanted to carry out on-site conservation behaviour. Visitors who came late (15-20 minutes before nursery closing time) were

not approached because there was not be enough time for them to enjoy the outdoor nursery and to complete the post-visit questionnaire in the time available.

The treatment condition was applied for every second day. This was necessary as if both conditions were applied in one day, those in the control group might have seen the booklet. Additionally, as the entrance ticket was valid for only one day and because of this, a number of visitors might go to both morning and afternoon sessions. The separate days for treatment and control group were found to be appropriate to avoid the possibility that participants would be approached twice (either in the treatment or control group). Only participants in the study were given the booklet, relevant with the "cued testing" protocol used previously in a number of visitor studies.

Similar to Stage one, the outdoor nursery was found to be the best location for sampling as it allowed the researcher to sample visitors who had already been exposed to the information about orangutans within the site. This included viewing the DVD in the AV room, reading interpretive panels along the boardwalk and viewing the orangutans from Platform A. The outdoor nursery also provided an adequate amount of seating for the participants to enjoy viewing the orangutans through the glass enclosure while reading the booklet, and later, completing the questionnaire. Participants in the treatment group were given the intervention booklet, then handed the post-visit questionnaire approximately 10-15 minutes later. They were only informed that the booklet was part of orangutan conservation research, and were not informed that they would be asked questions directly related to the booklet. However, it was still presumed that the treatment participants were "cued" as they were given the booklet and informed that a questionnaire would be given later to be completed.

The participants in the control group were only given the questionnaire. A complimentary souvenir in the form of a locally handmade orangutan keychain was provided to all participants after they completed their questionnaire. Participants were also reminded that the stickers should only be taken off after they exited the main administration building. This allowed the research assistants to observe and record participants' on-site behaviour. Figure 3.6 depicts the procedure. Point A was the recruitment point by the researcher while observation of on-site behaviours was completed at Point B and C.
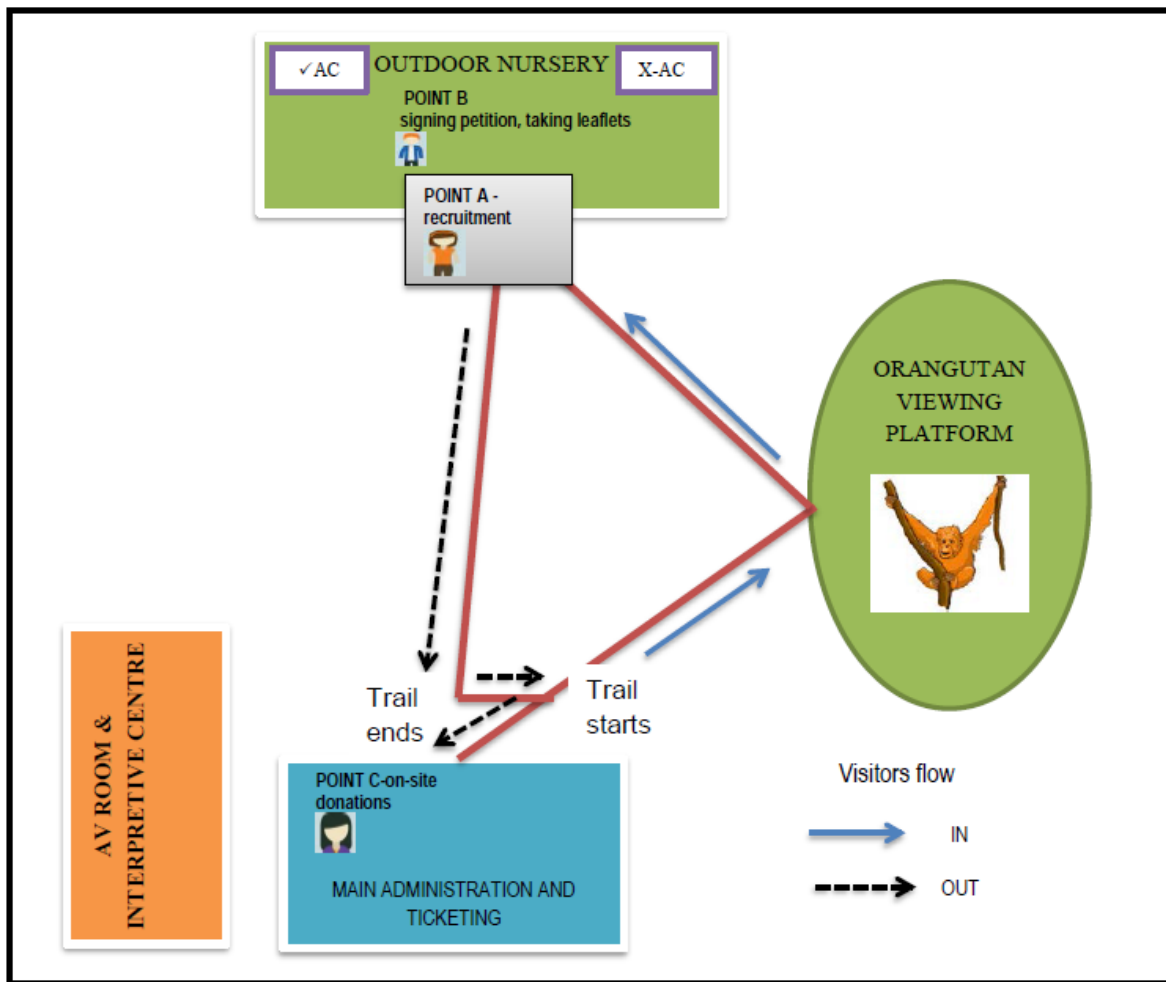
Figure 3.6: Diagram detailing the Stage two procedures

3.6.5 Sample size and sampling method

The determination of the sample size for stage two of this research is based on the general guidelines to conduct experimental studies. In experimental designs involving treatment and control groups, a general guideline stated that a minimum of 100 participants in each group was considered to be appropriate (Babbie, 2013). Fraenkel et al. (2011) stated that for experimental study designs, such as randomised post-test only control group, a minimum of 40 subjects is required in each group.

Quota sampling method was used to reach the intended sample size; however, the selection of participants used a systematic random sampling based on two allocated time frames. Participants were recruited continuously based on the next-one approach until the intended sample size was reached. The initial intended sample size for stage two was 400 (200 participants in control group

and 200 participants in treatment group). The researcher distributed a total of 480 questionnaires (240 for treatment and 240 for control) in case some respondents did not complete their questionnaires.

3.6.6 Overview of stage two data analysis

Data analysis for Stage two addresses aims three and four:

- To assess the impact of the belief-based approach to interpretation on the conservation learning outcomes of local and international visitors' (Aim 3); and
- To explore the implications of the research findings for the design of visitor interpretation to support orangutan conservation (Aim 4).

Data obtained in Stage two was compiled and analysed using IBM SPSS Version 22. The analysis in Stage two focused on assessing differences for each conservation learning outcome (i.e., knowledge, attitudes, behavioural intentions and on-site behaviours) between local and international visitors in both the treatment and control groups.

3.6.6.1 Quantitative data analysis

Before the data were analysed, responses were cleaned and transformed (for negatively worded items). This step is crucial in data analysis to control for missing data, assess outliers and address basic assumptions of the techniques involved (Hair, Black, & Babin, 2010). Out of the 480 questionnaires that were distributed, 49 of the questionnaires were either incomplete or consisted similar responses for questions measured in Likert scale (e.g., participant choose all 3-point scales), hence, these questionnaires were rejected. The final sample in Stage two consisted of 431 participants, 222 in the treatment group, and 209 in the control group. Chi-square analysis were performed on the demographic variables and trip characteristics (i.e., type of visitors, age, gender, type of travellers and travel groups) to assess differences between the two groups on these variables.

There were four measures of conservation learning outcome variables; 1) conservation knowledge; 2) conservation attitudes; 3) behavioural intentions; and 4) actual on-site behaviour. Analysis to assess the outcomes of learning is detailed below.

Conservation knowledge:

Similar to Stage one of this study, knowledge questions in section A were measured using multiple choice questions (i.e., true/false/I don't know) and were analysed using chi-square tests. One way

chi-square tests of independence were conducted to test whether there were any differences in knowledge scores between local and international visitors. For items measuring knowledge on impact of sustainable products for orangutan conservation and perceived knowledge gained, two-way ANOVA was conducted to assess differences in mean scores between local and international visitors' in the treatment and control group. All statistical analyses that were reported were based on two-tailed tests, with a set value of $p < 0.05$ unless stated otherwise.

Conservation attitudes and behavioural intentions

The 17 individual conservation attitude statements and eight individual behavioural intention statements were subjected to exploratory factor analysis. This was conducted to further refine the scales and explore underlying structures that may exist (Reise, Waller, & Comrey, 2000). It also allowed the researcher to develop composite items to measure conservation attitudes and behavioural intentions. As opposed to single item indicators, multiple item indicators are more presentable as a construct due to the internal correlations between items (Churchill, 1979; Peter, 1979). This enabled the researcher to assess the impact of the intervention on the treatment and control groups, as well as make inferences with regard to differences between local and international visitors.

The reliability of each factor as a construct was assessed using Cronbach alpha (α) measure of internal consistency. Values for internal consistency are considered acceptable if they are at least .65 (Nunnally, 1978; Nunnally & Bernstein, 1978; Vaske, 2008). A series of two-way ANOVAs was subsequently performed on each of the factors to examine the differences between the scores of local and international participants in both the treatment and control groups on their attitude and behavioural intentions.

Additionally, effect sizes were calculated using Cohen's d effect size (Cohen, 1992) . Effect sizes are comprised of the measure of the practical impact of the results. Results for the effect size can be interpreted using Cohen's d effect sizes based on the rule of thumb (Cohen, 1992):

$$d \sim 0.2 \text{ (small effect size)}$$
$$d \sim 0.5 \text{ (medium effect size)}$$
$$d \sim 0.8 \text{ (large effect size)}$$

Observed on-site behaviours: To assess the impact of the booklet on actual behaviours, chi-square tests of independence were conducted to ascertain whether there were differences between the

treatment and control group on total frequencies of recorded participation in the four observed on-site behaviours.

Evaluation of various aspects of the booklet: Three questions relating to measuring aspects of the booklet were included in the treatment group questionnaire and further analysed. These include two open-ended questions measured aspects of the booklet that were perceived to be the most interesting, and reasons why the booklet was interesting. Chi-square tests of independence were conducted to assess whether there were any differences between local and international visitors for each emerging theme. For the third question, independent sample t-tests were conducted to assess differences between local and international participants in regards to their understanding of a number of orangutan conservation issues.

3.6.6.2 Open-ended questions analysis

Open-ended questions in this study were analysed and coded using thematic content analysis, in which responses were coded based on emerging themes or categories (Burnard, Gill, Stewart et al., 2008). This type of method is the most commonly used in qualitative studies, particularly those involving interviews, where a researcher transcribes and codes responses based on the themes or categories that were most frequently mentioned. This method is descriptive and requires the researchers to make explanations (Burnard et al., 2008), particularly where a pattern emerges.

In this study, the participants' open-ended responses were recorded in SPSS. The content analysis for the open-ended responses was first completed by the researcher by reading all the responses to find common emerging themes. A set of common emerging themes were then established and a code for each theme given. As open-ended questions were a reflection of the visitors' own opinion or thinking, some responses contained different themes, and a number of responses may reflect more than one theme. For these responses, different codes were given to each sentence that represented different themes. The researcher then re-read each of the responses blindly and coded based on the theme that they represented. Since the open-ended responses consisted mainly of short and simple sentences, the coding process was conducted without any major difficulty.

Analyses for the open-ended questions relating to the knowledge of behaviours of orangutan conservation, such as, "After your visit, what do you think you could do to conserve and protect orangutans?" involved rating the depth of knowledge. Responses were given a score of zero (0 points), minimal knowledge (1 point), moderate knowledge (2 points) or extensive knowledge (3

points) using a method for calculating composite scores adapted from Adelman et al.'s (2003) study. This allowed the researcher to further assess whether local and international responses differed in terms of their depth of knowledge relating to orangutan conservation behaviour.

3.7   Ethical clearance and gatekeeper approval

Ethical clearance was obtained from the UQ Business School to ensure that the study adhered to the guidelines outlined by the University ethical review process. The ethical clearance process ensured that the study met strict ethical consideration for conducting research such as ensuring participants' anonymity and confidentiality of data, as well as obtaining participants consent to participate in the study. The ethical clearance was obtained for both stages of the study. Additionally, gatekeeper approval was obtained from the Economic Planning Unit (EPU), Prime Minister Department, Putrajaya, Malaysia, Economic Planning Unit Sabah, Sabah Tourism and Sabah Wildlife Department. Approval was also obtained for both stages of the study.

This chapter has presented the methodology used in this study and detailed the two-stage approach used to address the 4 study aims. The next chapter will present and discuss findings that relate to Stage one: the elicitation of visitor beliefs and knowledge to help develop the intervention booklet.

CHAPTER FOUR: STAGE ONE RESULTS AND DISCUSSION: ELICITATION OF VISITOR BELIEFS AND KNOWLEDGE TO DESIGN AN INTERVENTION BOOKLET

4.0   Chapter overview

To reiterate, the aims of stage one were to:

1. ascertain local and international visitors' knowledge and beliefs about orangutans, existing threats to their habitat loss, and conservation behaviours linked to orangutan conservation; and

2. develop an interpretive intervention that builds on visitors' knowledge and beliefs about orangutans and orangutan conservation, addressing their misconceptions, and promoting behaviour that support orangutan conservation.

This chapter has three main sections. Section 4.1 presents the results relating to local and international visitors' knowledge and beliefs about orangutans, and the existing threats to habitat loss, and conservation behaviours linked to orangutan conservation (Aim 1). The findings will be discussed in Section 4.2, and Section 4.3 describe how the findings were used to develop an interpretive intervention that builds on visitors' knowledge and beliefs about orangutans and orangutan conservation, addresses their misconceptions, and promotes behaviour that supports orangutan conservation (Aim 2).

4.1   Results: local and international visitors' knowledge and beliefs about orangutans, existing threats to habitat loss, and conservation behaviours linked to orangutan conservation

4.1.1   General profile of stage one sample

Table 4.1 presents the nationality and gender of participants. The sample consisted of 123 respondents with 63 locals (Malaysians) and 60 international English speaking respondents. The international tourists who were approached came from 17 different countries of origin. The top country of origin for the international participants was the UK (10%), Australia (9 %), USA (6%), Italy (2%), Germany and Netherland (2%). These demographics were found to be similar with previous visitation statistics to SORC where the highest number of international visitors were from

Australia, UK, Netherlands, Sweden, Denmark, USA, Finland, and China (Sabah Wildlife Department, 2015). There were no Indonesians sampled during the Stage one of data collection.

There were more females than males in the sample, though the proportion in each of the two groups (local and international) were similar. A slightly higher female representation may be due to the fact that visitors, who came in groups of families, and couples, usually opted for the wife or female partner to complete the questionnaire.

Table 4.1: Participants' nationality and gender

	Gender			
	Male	Female	No answer	Total
International	22	34	4	60
Local	20	34	9	63
Total	42	68	13	123

The respondents were mainly aged younger than 40 years of age (60%) (See Table 4.2). This result is similar to other studies that reported that the highest visitation rates in wildlife sanctuaries were adults aged between 18-49 years (74%) (Ballantyne, Packer, & Sutherland, 2011; Falk & Adelman, 2003; Kaffashi, Yacob, Clark et al., 2015).

Table 4.2: Age of study participants

Age	Total
18-29 years old	42 (34%)
30-39 years old	32 (26%)
40-49 years old	13 (11%)
50-59 years old	14 (11%)
60-69 years old	7 (6%)
70 and above	3 (2%)
No answer	12 (10%)
Total	123

4.1.2 Local and international visitors' knowledge about orangutans and orangutan conservation

In general, both local and international visitors scored highly in regard to their general knowledge about orangutans' status as a threatened species and its habitat (Table 4.3). However, in terms of more specific biological composition and reproduction rates, chi-square tests of independence (X^2 test) results showed that local visitors scored significantly lower compared to international visitors in the four constructs measuring general knowledge (Q3 and Q4), and knowledge of sustainable products (Q5 and Q8). Although the majority of members in both groups perceived that tropical forest clearance was the main threat to the orangutans survival (Q10), results showed that there was a highly significant difference in terms of perceptions of which factors contributed to orangutan habitat loss (Q11). International visitors were significantly more likely to perceive that palm oil plantations were the most important factor that contributed to orangutan habitat loss, while locals were more likely to perceive that a combination of factors (i.e., forest fires, palm oil developments and housing developments) contributed to orangutan habitat loss.

Table 4.3: Local and international visitors' general and specific knowledge about orangutans

		Responses (%) International	Responses (%) Local	Total (%)	Chi square test (X^2)
1. The Bornean orangutan is an endangered species (True)	*True*	90	94	92	$X^2(2. N=123) = 2.15$, p = .34
	False	3	5	4	
	I don't know	7	2	4	
2. Orangutans can only be found in the wild in Malaysia and Indonesia (True)	*True*	80	86	83	$X^2(2. N=123) = 1.10$, p = .58
	False	12	6	9	
	I don't know	8	8	8	
3. Orangutans share 50 percent of DNA with humans. (False)	*True*	23	46	37	$X^2(2. N=123) = 13.77$, p =.001*
	False	58	25	42	
	I don't know	15	27	22	
4. Compared to other mammals, orangutans are the fastest to reproduce and mature in the wild. (False)	*True*	3	32	18	$X^2(3. N=123) = 17.63$, p = .001*
	False	52	37	44	
	I dont know	43	32	38	
	No answer	2	0	1	

#	Question	Response				Statistics
5.	Using sustainable palm oil products will not make much difference to the conservation of orangutans. (False)	True	10	24	17	$X^2(4. \quad N=123) = 42.04$, p =.000*
		False	70	14	42	
		I dont know	18	60	40	
		No answer	1	0	1	
		Maybe	0	2	1	
6.	For the first 2 years, a baby orangutan will be completely dependent on the mother. (True)	True	78	78	78	$X^2(2. \quad N=123) = 8.974$, p = .01
		False	13	2	7	
		I dont know	8	21	15	
7.	Orangutans are likely to disappear in the wild in 50 years. (True)	True	67	59	63	$X^2(2. N=123) = 2.00$, p = .3.68
		False	7	14	11	
		I dont know	27	27	27	
8.	Certified sustainably-sourced products are usually much cheaper than non-certified products. (False)	True	17	24	20	$X^2(2. \quad N=123) = 17.28$, p < .001*
		False	62	25	43	
		I dont know	22	51	37	
9.	Products we use in our everyday lives can impact the orangutans. (True)	True	92	69	80	$X^2(2. \quad N=123) = 10.53$, p = .005
		False	2	10	6	
		I dont know	7	22	15	
10.	Which of the following is the main threat to orangutans? (Tropical forest clearance)	Water pollution	2	5	3	$X^2(2. \quad N=123) = 10.45$, p = .06
		Climate change	2	6	4	
		Tropical forest clearance	85	75	80	
		Tourism developments	5	11	8	
		No answer	0	3	2	
		More than one answer	7	0	3	
11.	Please order the factors	Forest fires	8	43	26	$X^2(4. \quad N=123) = 39.41$, p = .000*

below in terms of their impact on orangutans habitat loss, with 1 being the most important factor and 4 being the least important factor. (No exact answers can be ascertained although literature pointed out the palm oil plantations is main factor for habitat loss in orangutans)				
	Palm oil plantations	80	25	52
	Housing developments	12	22	17
	Rubber estates	0	8	4
	Incomplete answer	0	2	1

Note. *Statistically significant at p = < .001. Bolded responses are messages targeted in the booklet.

Table 4.4 presents participants' knowledge about behaviours supporting orangutan conservation. The majority of participants stated that giving donations was something they could do to contribute to orangutan conservation. There were a number of participants who stated the importance of responsible purchasing behaviours; however, this answer was more often stated by international participants. Few locals mentioned long-term behaviours such as responsible purchasing (e.g., sustainable palm oil purchases). Other behaviours included respecting wildlife, supporting projects, spreading the word and volunteering.

Table 4.4 : Participants' knowledge about behaviours that support orangutan conservation

Emerging themes about behaviours that can be done to protect and conserve orangutans	Response Frequency[1]		Percentage[2]
	International	Locals	
1. Donations	22	18	33
2. Responsible purchasing behaviour	21	0	17
3. Respecting/realising personal role to protect nature/wildlife	2	9	9
4. Supporting GOVT/ NGO forest conservation and wildlife projects	3	7	8
5. Spreading the word	6	4	8
6. Volunteering or involving self to OU conservation groups	2	6	7
7. Debate, argue or talk to people on issues about wildlife and conservation	2	4	5

8. Learn more/become more aware	3	2	4
9. Visiting wildlife park	2	1	2
10. Others	6	8	11
11. No answer	14	17	25

Note.
[1] Frequencies do not total 123 as respondents may give more than one answer
[2] Percentages do not total 100 since respondents could give more than one answer

4.1.3 Local and international visitors' experiences on learning about orangutans and orangutan conservation from Sepilok Orangutan Rehabilitation Centre (SORC)

Two open-ended questions were used to measure visitor experiences in regard to learning about orangutans and orangutan conservation at the centre. These questions enabled the researcher to explore the current impact of orangutan experience on learning about orangutans and orangutan conservation in Sepilok. Local and international responses were combined into one Table as these responses were only used to ascertain whether there were any other elements that needed to be included in the intervention booklet.

Table 4.5 showed the results about what visitors learnt about orangutans from their visit to Sepilok. A range of responses reflected general knowledge about orangutans in terms of their behaviours, threatened status, personality (e.g., cheeky), and similarities to humans were obtained.

Table 4.5: Impact of SORC experience on learning about orangutans

Emerging themes on learning about orangutans	Response Frequency[1]	Percentage[2]
1. Behaviour	23	19
2. Endangered/threatened status	22	18
3. Personality	18	15
4. Similarity to humans	17	14
5. Mother/baby relationship and care	13	11
6. Rehabilitation process and care	12	10
7. Conservation and protection concerns	11	9
8. Diet and feeding habits	9	7
9. Not much/not much information	8	7
10. Habitat	7	6

11. A lot (not specific)	7	6
12. Reproduction/mating	6	5
13. Movements	5	4
14. Nesting habits	2	2
15. Life expectancy & longevity	1	1
16. No answer	15	12

Note.
[1] Frequencies do not total 123 since respondents could give more than one answers
[2] Percentages do not total 100 since respondents could give more than one answers

Responses to the question "*What did you learn about orangutan conservation today*?" are presented in Table 4.6. The experience mainly informed visitors about the rehabilitation centre (i.e., importance, process and costs) and the general importance of orangutan conservation. There were fewer responses about threats surrounding orangutans and how to decrease these threats, signifying that the current experience did not successfully inform visitors about *how* to act, and *why* they should prevent current threats to orangutans. One of the visitors commented, "*After the feeding, my children felt very bored. They do have lots of questions, but in the end they learnt nothing*".

Additionally, a number of respondents stated that there was no information/not much information to help visitors understand about orangutan conservation. This implies that the current information was insufficient, and additional interpretive content needed to be added to maximise learning outcomes.

Table 4.6: Impact of SORC experience on learning about orangutan conservation

Emerging themes on learning about orangutans experiences	Response Frequency[1]	Percentage[2]
1. Role of rehabilitation centre	25	20
2. Importance of orangutan conservation	20	16
3. Process of rehabilitation (including training, rescue & release)	17	14
4. No information and less understanding about conservation (did not understand, have not seen info, not much, received less knowledge about this, nothing, not much)	15	12
5. Struggles for conservation (long process, takes a long time)	9	7
6. Protecting wildlife habitat	9	7

(expression about the importance to protect, respect and care for wildlife and habitat)		
7. Threats/causes of habitat loss in orangutans	7	6
8. Donations for conservation (including adoption)	5	4
9. Decreasing threats (expression about what can they do to avoid deforestation and pollution)	4	3
10. Supporting sustainable products (expression that includes use of sustainable palm oil etc.)	4	3
11. History of orangutan conservation	3	2
12. Cost of rehabilitation	3	2
13. A lot-not specific	2	2

Note.
[1] Frequencies do not total 123 since respondents could give more than one answers
[2] Percentages do not total 100 since respondents could give more than one answers

4.1.4 Belief elicitation results

Belief elicitation provides an assessment or understanding about the group of "salient" or most frequently mentioned beliefs about particular behaviours (Ajzen, 2002). Research shows that interventions based on these beliefs are more likely to succeed in influencing behaviours (Von Haeften, Fishbein, Kasprzyk et al., 2001). In the current study the most frequently mentioned themes for Behavioural Beliefs (**BB**), Normative beliefs (**NB**) and Control beliefs (**CB**) were combined to inform the design of the intervention.

This section firstly presented belief elicitation results for the behaviour theme of "donating time and money for orangutan conservation". Table 4.7 showed that the most frequently mentioned beliefs about the good consequences or advantages were donating time and money (**BB**-behavioural beliefs). The two most common beliefs about the advantages of donating were preventing orangutan extinction, and the centre having more funds for take care of orangutans. In terms of beliefs about the disadvantages of donating, only 30% stated that donations would had no disadvantages. Both local and international respondents expressed concerns about trustworthiness. Trustworthiness can be defined as "the willingness of an individual/or party to be vulnerable to the actions of another party based on the expectation that the other party will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party" (Mayer et al., 1995, p.712). This term (i.e., trustworthiness) is used in this study to represent the extent of an individual's perceived trust of orangutan organisations to manage monetary donations.

However, these concerns relating to trustworthiness were more evident amongst international respondents' comments (see Section 4.2 for further discussion). For example, "*I think many people are sceptical about donations in general. I would need to educate myself so others can have clear answers from me when they ask. How do you know that the money will be used properly?*" Another respondent stated, "*Losing the key problem (deforestation on unsustainable palm oil production, rubber production) from sight, thus focusing on symptoms of a problem (orangutans needing help) but not on root cause?* Finally, the last respondent stated, "*I have no result! I can't see what's happened with my money (Germany is too far away)*"

Table 4.7: Respondents' behavioural beliefs about donating time and money

Advantages of donating (BB)	Frequency		Response Frequency	Percentages
	International	Local		
1. Help to conserve and protect the orangutans to avoid extinction	21	25	46	37
2. Maintenance/cost for taking care of orangutans	19	18	37	30
3. Awareness and education programmes can be organised to spread awareness	12	2	13	11
4. Provide more funds for conservation agencies	4	4	8	7
5. Future generations will know orangutans	2	5	6	5
No answer	11	14	25	20
Disadvantages of donating (BB)				
1. No bad consequences/impact	14	23	37	30
2. Trustworthiness (misuse of donations/use for bad purpose/profit making/not knowing)	20	12	32	26
3. Less time/resources for other activities	6	2	7	6
4. Orangutans become too dependent on humans	1	5	6	5
No answer	14	47	31	25

Note. Beliefs mentioned by other category (1-2 respondents) are excluded.

Table 4.8 showed the respondents' beliefs about who would approve if they donated time and money. Two key normative beliefs emerged – family and friends, and conservation groups.

Table 4.8: Respondents' normative beliefs about donating time and money

People who approve (NB)	Frequency		Response Frequency	Percentages
	International	Local		
1. Family & friends	27	10	37	30
2. Conservation groups/WWF/Orangutan Appeal UK	5	11	16	13
3. Myself	5	6	11	9
4. Zoos and sanctuaries	4	6	10	8
5. No one	3	7	10	8
6. The government	1	4	5	4
7. Non-govt companies/other companies	0	4	4	3
8. No answer	17	16	33	27

People who disapproves (NB)				
1. No one	21	30	51	42
2. I don't know/not sure	6	4	10	8
3. People who don't care	4	4	8	7
4. Certain governments	4	2	6	5
5. Myself (if financially unstable)	3	3	6	5
6. No answer	17	18	35	29

Note. Beliefs mentioned by other category (1-2 respondents) are excluded.

Table 4.9 shows the results of the control beliefs, in which participants mentioned the most important factors that made it easier to donate time or money. Both groups believed that having resources (time and money) and the availability of information would make it easier for them to donate. For international respondents, transparency/trustworthiness over the donation was the main factor that made it easier. Consequently, both groups stated that a lack of resources was the main barrier, while trustworthiness emerged as the second most important barrier according to the international respondents.

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Table 4.9: Respondents' control beliefs about donating time and money

Factors that makes it easier to donate time/money (CB)	Frequency		Response Frequency	Percentages
	International	Local		
1. Resource (time and money) to do so	10	18	28	23
2. Availability of information (Online method/direct debit/online information)	8	11	27	22
3. Transparency/trustworthiness	12	3	15	12
4. If there is more educational and awareness programme/being more aware	4	5	9	7
5. Donation box at viewing	6	2	8	7
6. If I think the actions are easy	5	3	5	7
7. Location(being near)	2	3	3	2
No answer	14	18	32	26
Factors that makes it difficult to donate time/money (CB)				
1. No resources of money/time	24	27	51	42
2. No information (details about donating, volunteering, etc.)	5	7	12	9
3. Trustworthiness (not knowing where the fund goes)	9	2	11	8
4. Nothing/no difficulties	4	5	9	7
5. Require travelling and scheduling	6	2	8	7
No answer/Not sure	16	19	35	29

Note. Beliefs mentioned by other category (1-2 respondents) are excluded.

Belief elicitation in section D focused on respondents' beliefs about supporting sustainable palm oil production. The most frequently mentioned belief about the benefits of supporting sustainable palm oil was that it helped to preserve orangutans and other animals (see Table 4.10). The second most frequently mentioned benefit was that Malaysia will improve as a country due to palm oil production. These beliefs were predominantly expressed by locals.

On closer inspection, it seems that there were some misconceptions about the meanings associated with sustainable palm oil products. This was mainly found in the local visitors'

responses, where their understanding of the term "sustainable palm oil" was that palm oil is produced relentlessly, without long term consideration of the environment. These respondents felt that sustainable palm oil production would destroy habitats, convert forests into plantations and ultimately lead to the extinction of orangutans.

Table 4.10: Respondents' behavioural beliefs about supporting sustainable palm oil products

| Benefits/good consequences of supporting sustainable palm oil products (BB) | Frequency | | Response Frequency | % |
	International	Local		
1. Help preserve forest/conserve habitat for orangutans/animals	30	16	29	24
2. Malaysia as biggest palm oil producer/supporting country's economy	1	10	11	9
3. Support sustainability and sustainable products	7	3	10	9
4. Spread awareness about sustainable palm oil	6	2	8	7
5. Clean environment	2	4	6	5
6. Don't know/not sure	1	4	5	4
7. Destroys orangutans habitat	2	5	7	3
8. Palm oil production is scheduled/controlled	0	4	4	3
9. The palm oil will be cheaper	0	3	3	2
10. Business opportunity for sustainable companies/Unsustainable palm oil producers/companies will go out of business	3	0	3	2
No answer	10	17	27	22
Downside/bad consequences of supporting sustainable palm oil (BB)				
1. There is no bad consequences	17	17	34	28
2. Orangutan extinction/habitat & forest destroyed	3	14	17	14

	International	Local		
3. I don't know/I am not sure/unaware	7	5	12	10
4. Costly/more expensive	6	1	7	7
5. Local people upset/companies go out of business	4	1	5	4
6. Palm oil companies will find other alternative to keep producing/it falls on deaf ears	4	1	5	4
7. Sustainable products may not be true/lies/corrupt	3	0	3	2
No answer	14	19	33	27

Note. Beliefs mentioned in other category were excluded.

Table 4.11 shows the results of the questions about the participants' normative beliefs. The majority of international participants indicated that everyone or most people, including people close to them, would approve of them supporting sustainable products. The highest responses from local visitors were "no one". This supports the observation outlined earlier that local respondents had misconceptions about the term sustainable palm oil.

Table 4.11: Respondents' normative beliefs about supporting sustainable palm oil products

People who approves supporting sustainable products (NB)	Frequency		Response Frequency	%
	International	Local		
1. Everyone or most people	10	5	15	12
2. People close to me (family, friends)	9	5	14	11
3. No one	5	9	14	11
4. I'm not sure/don't know of any	8	4	12	10
5. Conservation groups (WWF)/Wildlife groups	5	5	10	8
6. People who accept/understood about sustainability	2	6	8	7
7. Myself	5	2	7	6
8. Govt & non-govt companies	1	5	6	5
9. Manufacturers & developers of palm oil	0	4	4	3
No answer	17	20	37	30

People who disapproves supporting sustainable products (NB)				
1. *No one	19	21	40	33
2. Unsustainable palm oil producers/companies	10	3	13	11
3. I don't know/not sure	6	6	12	10
No answer	18	22	40	33

Note. Beliefs mentioned by other category (1-2 respondents) are excluded.

When asked what made it easy or difficult to make a commitment to supporting sustainable palm oil (Control Beliefs), most of the international participants stated that they needed more information, such as viewing an app and labels to show that the products were sourced sustainably (see Table 4.12). Locals wanted the addresses of websites and more information about sustainable palm oil. Both groups indicated that the main factor that made it difficult, was having no knowledge and understanding about sustainable palm oil. This was particularly evident in the local group. Additionally, there were also concerns about the cost of sustainable palm oil but these were considered to be outside the scope of the intervention.

Table 4.12: Respondents' control beliefs about supporting sustainable palm oil products

Factors that makes it easy to support sustainable palm oil products (CB)	Frequency		Response	
	International	Local	Frequency	Percentages
1. Websites/app/information for awareness on sustainable palm oil	15	13	28	23
2. Labelling/clear marking to show it's sourced from sustainable palm oil companies	17	5	22	18
3. I don't know/not sure	3	12	15	12
4. If its affordable	7	3	10	8
5. Availability of sustainable palm oil products in supermarket	6	1	7	6
6. If the product is trustworthy	1	6	7	6
7. I am currently supportive/it's easy for me	6	0	6	5
8. Others(not related to palm oil)	1	4	5	4

9. Fully supportive of palm oil	0	3	3	2
No answer	18	21	39	32

Factors that makes it difficult or prevent from supporting sustainable palm oil products (CB)				
1. If I have less knowledge/no understanding/no information of palm oil and its consequences	16	19	35	28
2. Expensive/costly	12	6	18	15
3. I don't know/not sure	6	11	17	14
4. Unknown/no labelling/no trustworthiness of the products or companies	11	1	12	10
5. If it is easy/not difficult to make commitments (e.g., spreading the word)	5	4	9	7
6. Limited options in the shop/availability	7	2	9	7
7. Being far	1	0	1	1
No answer	15	22	37	30

Note. Beliefs mentioned by other category (1-2 respondents) are excluded.

4.2   Discussion of stage one results

This study found that there were a number of key differences between local and international visitors in terms of their conservation knowledge and beliefs that have important implications for the design of the intervention booklet. International visitors demonstrated a deeper understanding of conservation behaviour and the linkages between human behaviour and wildlife habitat loss compared with local visitors. As there was very little information about sustainable products/palm oil links to orangutans at SORC, this finding suggested that international visitors may be more exposed to information regarding threatened species, and the connections of human impacts and existing threats with wildlife habitat loss.

These findings were not surprising as awareness campaigns and efforts to educate the public have come mainly from international non-governmental agencies, such as Save the Orangutan-UK, The Orangutan Project-Australia, Orangutan Foundation International-USA and WWF International-Switzerland. Almost all of their websites have highlighted the destruction of orangutan habitats due to palm oil plantations, with some campaigning for consumers to completely avoid palm oil products.

None of the local participants mentioned the importance of responsible purchasing behaviours when responding to questions that assessed their knowledge of conservation behaviours that helped to protect and conserve orangutans. Furthermore, while local visitors were more apt to state general conservation behaviours such as donating, protecting the environment and wildlife, international visitors exhibited more refined answers that indicated greater knowledge depth in terms of how responsible purchasing affects long-term protection and conservation of wildlife. This supports Haron et. al.'s (2005) study that indicated that the majority of Malaysians do not know about complex environmental terms such as Greenhouse effects, Chlorofluorocarbons (CFCs), Biodegradable, Organic/non-organic, and environmentally friendly products.

The concept of environmental sustainability is complicated, particularly for people living in developing countries (see p. 73 for definition and discussion of developing or emerging economies countries). Concerns about environmental problems may not be 'high on the list' for locals particularly in rural areas, because social and economic development are a priority. There is also a lack of local non-governmental conservation organisations in Malaysia and Indonesia (Koh & Wilcove, 2010) which may limit their exposure to information about wildlife conservation and their connections to sustainable consumption.

There were also differences in how trusting visitors are, in terms of donating their time and money. International visitors exhibited high levels of concern about trustworthiness issues compared with local visitors, and were more concerned that the funds could be used for corrupt purposes and profit-making. This supports Webb and Mohr's (1998) study which revealed that some consumers have a level of scepticism about the organisations themselves, and the people who manage the donations. Another possible explanation regarding international visitors' concerns about trustworthiness, particularly those related to making on-site monetary donations, is the unfamiliarity of being in another country. This presents the risk of uncertainty; international visitors may be more willing to donate in their home country. This notion is supported by Hvenegaard and Dearden's (1998) study where they found that general eco-tourists and birding tourists were more involved in conservation initiatives when they were in their home countries, as opposed to when visiting another country.

The belief elicitation phase also found that international visitors had a deeper understanding of the term 'sustainable palm oil'. This was reflected in findings that showed that the majority of international visitors requested information about labelling and markings of certified sustainable products, while local visitors had a limited understanding of the term. Essentially, it appears that

international visitors are more ecologically literate[21], due to having prior knowledge and experience with this term.

International visitors who reside in Western countries may have a more advanced understanding of sustainability partly due to the historical roots of the term. It is known that the term originated as early as 1713 in Germany (Du Pisani, 2006). As the environmental movement commenced in developed countries, people in these countries may have been exposed to other generic environmental-friendly terms such as responsible purchasing, fair-trade, green purchases, etc. (Raynolds, 2000). As a result, public awareness programmes and environmental education were available much earlier to people residing in developed, high-income countries. Additionally, international media coverage and campaigns in Western zoos, such as the *Don't Palm Us Off* campaign (Zoos Victoria, Australia) and *Palm Oil Crisis Awareness* (Cheyenne Mountain Zoo, USA) impacted on people's knowledge and beliefs. Therefore, it is likely that international visitors had been exposed to some of these messages and that they have strong beliefs about being advocates of sustainable palm oil consumption due to the accumulated exposure to these environmental terms.

The concept of sustainability was introduced much later in Malaysia between 1971 and 1976, in response to environmental policy changes spearheaded by developed countries such as the USA (Hezri & Nordin Hasan, 2006). Furthermore, the average education levels was still low and consequently, public understanding of complex environmental issues was not widespread (Haron et al., 2005). This may explain why local visitors had misconceptions about the term 'sustainability' as this requires a complex understanding of the connections between human consumption and the processes involved in producing sustainable products. This may also be a result of the confusion in the use of the term in Malay, where sustainable is termed '*mampan*', which is associated with another Malay term '*berkekalan*', that means 'continuous or sustainable' (DBP, 2016). This suggests that the term 'sustainable' may be taken to mean that a product will be made available endlessly, without consideration for wildlife habitats. Therefore, locals may perceive that *sustainable* palm oil means a continuous supply of palm oil and believe that sustainable palm oil had negative consequences for the orangutans. However, it is more likely that there was a lack of understanding in relation to the complex issues surrounding sustainable production of goods, as the definition of "sustainable" was provided to the participants earlier in the questionnaire.

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[21] Ecological literacy relates to how well people understand about the complexities and relationships involved to solve environmental problems (Orr, 1992) .

Additionally, findings from stage one also indicated that the current experience was only able to increase the visitors' understanding about the rehabilitation of orangutans and general information about orangutans and orangutan conservation. There was less mention of the outcomes associated with the specific content relating to orangutan conservation behaviours. This supports Russon and Susilo's (2014) previous belief that interpretive messages in orangutan rehabilitation sites are often inadequate.

4.2.1 Key findings in relation to local and international knowledge and beliefs with regards to issues surrounding orangutan conservation

In sum, there were a number of similarities and differences in the knowledge and beliefs of local and international visitors. In terms of knowledge, international visitors indicated more in-depth understanding of the behaviours that can be done to protect orangutans. This includes relating to specific behaviour that is based around responsible purchasing; whereas locals tended to provide examples of general behaviour such as providing donations and protecting nature and wildlife.

In terms of their donating beliefs, both groups believed that donating will help to conserve orangutans and that they will be better taken care of in the future. Both groups stated that a lack of resources was the main disadvantage. However, findings showed that international visitors exhibited higher levels of concern about trustworthiness issues.

In regards to supporting sustainable palm oil beliefs, both groups believed that more information and awareness programmes was necessary for them to commit to behaviours that supported sustainable palm oil. However, international visitors seemed to have stronger beliefs about being advocates and in supporting sustainable palm oil. Their responses about wanting more information about labelling and marking of certified sustainable products suggested that they had a more profound understanding and knowledge surrounding the term 'sustainable palm oil'.

Since the beliefs between local and international visitors had greater similarities than differences, it was decided that the intervention booklet should be designed by combining messages that targeted knowledge and beliefs of both local and international visitors. However, since a misunderstanding occurred with local visitors about the term 'sustainable palm oil'. This was because the term "sustainable palm oil" was viewed as long-lasting product of sustainable palm oil without any consideration of orangutan habitat; an added message that corrects the local visitors' misconceptions about the term "sustainable" was added in the local participants' booklet.

Since both local and international participants in the treatment group received similar booklets that contained relevant messages that targeted their knowledge and beliefs, this enabled the

researcher to assess the overall impact of the intervention and to compare learning outcome scores between local and international participants. In essence, this allowed the researcher to answer the following four research questions that guided Stage two:

1. What is the potential impact of an interpretive booklet on visitors' conservation learning and conservation behaviour?
2. Do local and international visitors differ in regards to the nature and extent of their learning based on their visit?
3. Is the impact of the intervention different for local and international visitors?
4. What aspects of the booklet do visitors find most interesting?

The findings relating to these research questions are presented in the next chapter (Chapter 5: Stage two results). The next section of this chapter will present the findings based on the development of the intervention booklet (based on Stage one findings) (Section 4.3).

4.3   Development of the intervention booklet based on visitors' knowledge and beliefs

4.3.1   Introduction

The main aim of this study is to design an interpretive intervention then assesses the impact of visitors' understanding of, and commitment to, the conservation of orangutans. An interpretive booklet[22] was chosen as the intervention in the present study for the following reasons:

1. Booklets are relatively cheap to produce and are easily distributed to visitors. They can be produced in multiple languages, enabling the researcher to translate messages into the local language.
2. Using a booklet enables the researcher to ensure that only the treatment group receives the intervention. This would be difficult (if not impossible) if the interpretation was delivered via panels, signage or talks.
3. Using a booklet enables the researcher to design interpretive material that visitors found to be personally relevant as it combines key conservation messages and actions relating to orangutan conservation in one document.

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[22] This study uses the term booklet as the intervention was in the form of a smaller booklet, instead of the usual three fold, double sided brochure.

4.3.2 Incorporating principles of ELM to design an interpretive booklet

The Elaboration Likelihood Model of Persuasion (ELM) is a persuasive communication model that assumes individuals will process messages through central and peripheral routes (Petty & Cacioppo, 1986). In this regard, central route processing tends to produce strong, enduring attitude changes as individuals focus on the central theme of the message (Petty & Cacioppo, 1986). Central route processing leads individuals to process the message arguments, considering the implications of the ideas, and connecting the messages to their own knowledge and personal values (Perloff, 2010; Petty & Cacioppo, 1986). Peripheral route processing on the other hand, occurs when individuals focus on other less-important aspects of the message, such as the source, the colours, or even the attractiveness of the person communicating the message. Attitude change resulting from peripheral route processing is often weak and reversible.

In this study, both central and peripheral cues were incorporated in the booklet. This method of mixing both central and peripheral cues has been successfully used in previous studies examining the impact of interventions on environmental behaviour such as picking up litter (Brown et al., 2010). Central cues were based on local and international visitors' knowledge about orangutans and salient beliefs (obtained using TPB beliefs elicitation method) about the two main types of behaviour that supports orangutan conservation (i.e., donating time and money and supporting sustainable palm oil products). For example, to target the control beliefs relating to concerns about 'trustworthiness', the booklet explained to visitors how the donations will be used. Based on the ELM, designing messages based on individual beliefs will most likely result in strong elaboration of the messages (central path). Consequently, additional peripheral cues such as using the logos of relevant authorities (e.g., RSPO, WWF), colours and images, and providing celebrity appeals were included to strengthen the persuasiveness of the messages. This approach ensured that visitors will process messages using both central and peripheral cues. It was noted in this study that the ELM was only used as a guide to design the booklet, hence this study did not measure variables in the ELM such as the strength of message processed (through central or peripheral routes) as done in other ELM studies.

4.3.2.1 Incorporation of central cues based on visitors' knowledge and salient beliefs

Table 4.13 presented the final messages that were included in the intervention booklet together with the salient beliefs that each message was targeting. These final messages were obtained from the results shown in Section 4.1.2 (Local and international visitors' knowledge about orangutans and

orangutans conservation), Section 4.1.3 (Local and international visitors' knowledge about orangutans and orangutans conservation) and Section 4.1.4 (Beliefs elicitation results).

There were six knowledge items that were included as information in the intervention. These were chosen based on the fact that knowledge responses for these questions had high percentages of incorrect answers for either of the local and international groups. Additionally, information pertaining to these facts were also chosen to facilitate an understanding of the connections between orangutan threats and conservation behaviour.

Based on the pre-intervention impact of the SORC experience (section 4.1.3), results showed that the experience mainly impacted on learning about rehabilitation of orangutans. There were fewer responses about current threats, and the connections relating to conservation behaviour to support orangutan conservation. These aspects were targeted in the booklet to better assist visitors to understand the connection between current threats, and how visitors as individuals can carry out behaviour that supports orangutan conservation.

A combination of Behavioural Beliefs (BB), Normative Beliefs (NB) and Control Beliefs (CB) were used to design messages based on the two umbrellas of behaviour. For example, control beliefs relating to donating, targeted "resources of money" (highlighting the fact that people can donate any amount online or on-site) and "availability of information". Since it was not feasible to target availability of time, the researcher also considered the third highest frequently mentioned beliefs (i.e., trustworthiness).

There were two salient behavioural beliefs to support sustainable products that were targeted in the intervention. These were, supporting sustainable palm oil products will help preserve forest/conserve habitat for orangutans/animals, and supporting sustainable palm oil products will further support the sustainable industries and sustainable products (e.g., companies). The findings in this study found that international visitors were already aware of certified sustainable labelling of products while locals had limited understanding about sustainable palm oil. Therefore information about RSPO logos, and examples of sustainable products were included to target international visitors' control beliefs, as well as providing messages that explained the importance of supporting sustainable products target locals limited understanding. Additionally, a specific message targeting the misconception was specifically designed to target local visitors' misconception which was previously found. These messages were based on beliefs incorporating various guidelines/suggestions in interpretive designs, and included asking thought provoking questions based on their relevant beliefs (Ham, 1992, 2013; Moscardo et al., 2007). Table 4.13 lists the final messages that were incorporated in the booklet.

Table 4.13: Targeted messages incorporated into the booklet

Section obtained from the Stage one questionnaire	Respondents' knowledge and salient beliefs	Messages in the booklet
Knowledge	1. Orangutans share 50 percent of DNA with humans	Can baby orangutans show emotions to their mother? Yes baby orangutans can cry, smile and even whimper to their mother. They're our closest relative. How many percent of our DNA do we share with orangutans? They share around 96.4 percent of our DNA!
	2. Compared to other mammals, orangutans are the fastest to reproduce and mature in the wild	In 5-7 years, how many times does a female orangutan give birth? Only once! They are very slow to reproduce and mature in the wild. This makes it harder to replace the population that is already threatened – extinction is likely unless we do something fast.
	3. Using sustainable palm oil products will not make much difference to the conservation of orangutans	Buying sustainable palm oil products ensures that orangutan habitats are protected.
	4. Orangutans are likely to disappear in the wild in 50 years	How many are left in the wild? Decades ago, there were hundred thousands of orangutans living in the wild. Now due to deforestation, less than 69000 are living in the wild.
	5. Products we use in our everyday lives can impact the orangutans	Buying sustainable palm oil products ensures that orangutan habitats are protected. Products you buy may cost orangutans their home. Choose responsibly.
	6. One of the most important factors contributing to orangutan habitat loss is palm oil production.	Unsustainable production of palm oil is the biggest threat to orangutan habitat
Beliefs about Donating time and money	BB- Donating will help to conserve and protect the orangutans to avoid extinction	They're just like human babies! Success of our rehabilitation programme means a better chance of avoiding extinction in the wild!
	BB- Donating will ensure that the centre can support the maintenance/cost for taking care of orangutans.	
	BB- Donations will be used for the wrong purposes such as make a profit	Donating – where does your money go? Some orangutans depend on the centre for years. Funds are always limited. All your donations will help buy: • Milk supplies • Foods (Bananas, watermelons) • Medicines & medical equipment • Cost of veterinary staff & so much more!
	NB- People or organisations such as Conservation groups/WWF/Orangutan Appeal UK will approve of donations.	Orangutan Appeal UK, the rehabilitation centre (SORC).
	CB- The main barrier for donating time and money is that there is less resources (time and money to do so).	Donate any amount you can. Do it online : http:/www.orangutan-appeal.org.uk/donate * Resource of time could not be manipulated.
	CB- Availability of information such as online method about donating will make it less difficult to donate.	Donate any amount you can. Do it online : http:/www.orangutan-appeal.org.uk/donate * Resource of time could not be manipulated.

		CB- There is no details about donating money or volunteering that makes it difficult to donate.	How you can donate your money or time : - Adopt an orangutan - Make an on-site donation - Donate any amount you can. Do it online : http:/www.orangutan-appeal.org.uk/donate - Join fundraisers to help raise funds for orangutans - Become an active member of orangutan organisations. Flip to find out more. *organisations listed include RSPO GreenPalm WWF Global Orangutan Appeal Uk, Orangutan Outreach
Beliefs about supporting sustainable palm oil products	BB- Supporting sustainable palm oil products will help preserve forest/conserve habitat for orangutans.	What's the fuss about palm oil and orangutans? Production of unsustainable palm oil is the biggest threat to orangutan habitat. Buying sustainable palm oil products ensures that orangutan habitats are protected. Products you buy may cost orangutans their home. Choose responsibly.	
	BB-Supporting sustainable palm oil products will help support the sustainable industries or current sustainable companies.	. Choose responsibly. 100% sustainable palm oil - The Body Shop - L'Occitane - Nestle - Nutella-Ferrero	
	Misconceptions in local- sustainable palm oil will lead to orangutan extinction and habitat destroyed	*Included only in the Malay booklet *Have you got it wrong? (for local booklet only)* *If you think that sustainable palm oil means an endless production of oil palm and destruction of orangutan habitat, think again!* *Sustainably managed palm oil production conserves natural resources. Sustainable palm oil plantations are not planted on land that supports endangered species such as orangutans.*	
	NB- People close to me (family, friends) will approve of me to support sustainable palm oil products.	Tell your friends and family! Be the one in your community to spread awareness.	
	NB-Unsustainable palm oil producers/companies will disapprove of supporting sustainable palm oil products.	Contains unsustainable palm oil - Colgate-Palmolive - Doritos - Pantene - Ruchi Gold Oil *for more info : WWF palm oil buyer scorecard	
	CB-It would make it easier for me to support sustainable palm oil products if there are websites/app/information for awareness on sustainable palm oil.	What can you do? Supporting sustainable palm oil products What can you do? - Use sustainable palm oil products. Look for the RSPO trademark - Be Palm oil aware. Seek further info about sustainable products - Sign a petition. Urge everyone to choose sustainability too. - Tell your friends and family! Be the one in your community to spread awareness. - Download the palm oil shopping app	
	CB-It would make it easier for me if there were labelling/clear marking to	Use sustainable palm oil products Look for the RSPO trademark	

	show it's sourced from sustainable palm oil companies	
	CB-It would make it difficult for me to support sustainable palm oil if I have less knowledge/no understanding/no information of palm oil and its consequences	Unsustainable production of palm oil is the biggest threat to orangutan habitat Buying sustainable palm oil products ensures that orangutan habitats are protected. Products you buy may cost orangutans their home. Choose responsibly.
	CB- It would make it difficult for me if I do not know current sustainable palm oil labelling's nor have no trustworthiness of the products or companies.	RSPO trademark signifying certified sustainable palm oil. Included listing of WWF palm oil buyer scorecard
Note. BB-Salient Behavioural beliefs NB-Salient Normative Beliefs CB-Salient Control Beliefs		

4.3.2.2 Incorporation of peripheral cues and a main theme

As detailed in Chapter Two, images play an important role in persuading individuals to think more deeply about a message. The ELM stipulates that source attractiveness is a type of peripheral cue, where people focus on different aspects such as the images, symbols or celebrity appeals (Petty & Cacioppo, 1984). Consequently, the booklet included persuasive images sourced from websites that used appeals presented about guilt, celebrity, or evidence-based images. Images were also selected to complement the messages that were designed, following the principles of visual persuasion (Andrews, 2008). Thus, images of mother and baby orang-utans were featured to increase the emotional appeal to the visitor (Ballantyne, Packer, Hughes, et al., 2007). Approval to use these images was sought from the original source.

Additionally, a main theme was incorporated in the booklet. Ham (1992) argued that people are more likely to remember themes than facts because thematic communication is more interesting and easier to comprehend. Incorporating themes into interpretive design is one of the factors that has been found to increase the effectiveness or the persuasiveness of conservation messages (Ham, 2013; Ham & Weiler, 2003). The main theme in the booklet designed for this study was "*You can make a difference*". This was used throughout the booklet to highlight that individuals can make a difference by adopting particular behaviour that assists in the conservation of orangutans. The theme was personalised by incorporating the word 'you' as personalisation had been found to make a theme more effective (Ham, 1992).

Booklet drafting

The drafts of the booklet were evaluated by a panel which consisted of two tourism interpretation experts. The two tourism interpretation experts on the panel were related to this study and were experienced in designing various interpretative materials in free-choice wildlife settings. Prior to designing the booklet draft, the researcher has also sought the suggestions and opinions from two tourism and psychology experts in relation to the use of theory (TPB) and principles in designing persuasive messages. Feedback in relation to content of the booklet draft was also sought from SORC staff and NGOs through informal interviews during stage one.

The first draft of the booklet was made in two sizes, one was a traditional three-fold brochure type, and the second version was in the form of a small booklet. The content for the booklet messages that was obtained from stage one findings was similar for both versions. This draft was disseminated to 10 personnel who come from the researcher's personal connections and who consisted of academic researchers, friends and family from Malaysia, Indonesia, Japan, and Thailand. Personnel were selected based on their knowledge of the theoretical aspects in designing interpretation particularly in regards to the suitability of message content (understanding) for the target audience. Feedback was obtained in relation to the quality of interpretive message, quality of images, font size, font colour, font types, and word spacing. Some comments were used to improve the booklet. These include:

1) increasing font size to increase readability for the adult market segment
2) Using a mix of bright colours in the background and font colours as the cover was deemed too depressing
3) Removing sentences to avoid message crowding.

Suggestions were then incorporated into the digital version that was then sent to the manager of the SORC to ensure that the messages aligned with the conservation education goals of the sanctuary. The digital draft was sent to SORC and the UK Orangutan Appeal for approval however no further feedback on the draft was obtained. The digital draft was also sent to the organisations (i.e., orangutan appeal UK, red apes) and individuals that contributed their images for final approval. Since this study main objective was to test the booklet on visitors' conservation learning, feedback in relation to the design aspects of the booklet was only obtained from the questionnaire (see Section 5.3).

Once final approval was obtained, the booklet was professionally translated from English to Malay to produce two language versions of the booklet. At this stage, a professional graphic designer was engaged to design the final booklet for both English and Malay versions. The Malay

version was then disseminated to five Malaysians that had previously been to Sepilok. There were a number of minor revisions, such as changing two Malay sentences that were deemed too long-winded and complicated, and the re-positioning of messages to minimise cluttering.

The final version was distributed to the panel for approval. The final interpretive booklet was an A6 size, double-sided full colour print and UV laminated cover booklet. The final intervention booklet has 13 pages, divided into five main sections including the back cover. Though the booklet has 13 pages, there were only five main sections and only short simple sentences was used, as aligned with the principles of designing interpretation. A shorter booklet was not used as the researcher needed to incorporate various elements such as provoking images and specific information that necessary to increase meaning-making in the booklet. This assisted participants to make connections to the current problems surrounding orangutans and increase their understanding on specific actions that they can carry out individually.

The booklet was printed both in English and Malay (Appendix G).

4.3.3   Layout of the booklet

The first section (Cover to Page 5) was designed to provoke readers and increase their understanding of the threats facing orangutans. The cover featured a single image portraying the threats faced by orangutans with an overlaid question "Will you continue to let this happen?" It portrays a sad story of the current scenario facing the orangutans (i.e., the loss of their habitat). This choice was based on Jacobson's (2009) suggestion that a single photograph on a cover is more effective than the use of multiple images. The use of a provoking question follows that is based on Tilden's (2009) recommendation to use questions that provoke readers. The first section incorporated the true story about Ceria, a rehabilitated orangutan in SORC. It also included facts about deforestation (e.g., 36 football fields lost per minute) and images designed to increase its persuasive appeal.

The second section (Pages 6 and 7) targeted beliefs surrounding sustainable palm oil behaviour. This included messages that highlighted the advantages of supporting sustainable palm oil and labels of sustainable palm oil organisation (i.e., RSPO). Since the belief elicitation phase revealed locals often misunderstood the term "sustainable palm oil", the Malay version of the brochure also included the following statement: "Have you got it wrong? If you think that sustainable palm oil means the endless production of oil palm and destruction of orangutan habitat, think again!"

The third section (Pages 8-9) focused on targeting beliefs about donating behaviour. It highlights the trustworthiness of the SORC and that funds are to be used to buy food and medical supplies.

The fourth section (Pages 10-11) used celebrity appeal and a fun quiz to target general knowledge about orangutans. The celebrity featured was Harrison Ford, an actor who starred in the documentary "*Years of Living Dangerously*", a documentary about deforestation and orangutans.

The last section: The last section (Page 12-13) reasserted the main theme of "you can make a difference" to remind visitors of their individual role in the conservation of orangutans. It also included five websites of organisations who were linked to orangutan conservation. Then a quote "lend a hand, together we can make a difference" was used to affirm to visitors that individual efforts accumulate to impact on orangutan conservation, as Knudson, Cable, and Beck (2003) recommended to use a final quote to summarise written publication in a powerful way.

4.4   Chapter summary

This chapter presented and discussed the main findings that led to the design of an intervention in the form of an interpretive booklet. Based on the belief-based approach using TPB to design the intervention messages, that was based on the "salient beliefs" (Ajzen & Fishbein, 1980) and visitor knowledge, incorporating various persuasive content such as the use of themes (Ham & Krumpe, 1980; Ham & Weiler, 2003) and persuasive visuals, the interpretive intervention was designed to increase persuasiveness that positively impacted on learning outcomes.

Therefore, in Stage two, the interpretive booklet was tested on-site by comparing learning outcomes between a treatment (orangutan experience with a booklet) and a control (orangutan experience without a booklet). The next chapter details the results of Stage Two of the study: testing the impact of the intervention booklet on visitors' conservation learning.

CHAPTER FIVE: STAGE TWO RESULTS: TESTING THE IMPACT OF THE INTERVENTION BOOKLET ON THE CONSERVATION LEARNING OUTCOMES OF LOCAL AND INTERNATIONAL VISITORS

5.0   Introduction

This chapter discusses the results of Stage Two of the Research Design which was designed to address the final two study aims:

Aim 3:   To assess the impact of the belief-based approach to interpretation on the conservation learning outcomes of local and international visitors; and

Aim 4:   To explore the implications of the research findings for the design of visitor interpretation to support orangutan conservation.

The results presented in this chapter examine the impact of the booklet on the conservation learning outcomes of visitors. The main focus is to assess the potential impact of the booklet on visitors' learning outcomes, and to explore whether the booklet has a different impact on the learning outcomes of local and international visitors.

This chapter firstly presents a general overview of the profile of Stage Two participants (Section 5.1), followed by a section that provides the findings of the impact of the booklet on the conservation learning outcomes of local and international visitors (Section 5.2). Section 5.3 presents an evaluation of the participants opinions of the most interesting aspects the booklet. A summary of the findings is presented at the end of Chapter Five.

5.1 General profile of Stage Two participants

As planned, the quota sampling produced a sample with a balanced proportion of local (Malaysians and Indonesians) and international visitors (see Table 5.1).

Table 5.1: Survey response for the 2x2 groups in Stage Two

	Treatment (with booklet)	Control (no booklet)
International	116	104
Local	106	105
Total	222	209
	431	

Table 5.2 presents the demographic profile of the sample collected in Stage Two. The international participants were mainly born in the UK, followed by Germany, Spain, and Australia. The large proportion of international participants from the UK aligns with SORC's visitor demographic profile, which shows that a high number of visitors were from the UK (7.1 percent for the year 2014) (SORC, 2015). The Chi-square test of independence showed no significant differences between the number of lo cal (Malaysians and Indonesian) and international visitors in the treatment and control groups, X^2 (1, N = 431) = .27, p= .63.

Approximately half of the sample were under 30 years of age. A further 29% were aged between 30 and 40 years, while the reminder of the sample was those who were 40 years and older. There were a slightly higher number of females in the sample, with more females included in the treatment group. This is similar to previous studies that found higher female representation (Adetola et al., 2016; Carr, 2016), however, the Chi-square test of independence showed no significant differences in gender between the treatment and control group, (X^2 (2, N=432) = .57, p=0.58). As found to be the case in Stage One, female representation may be higher because of the observation that visitors who came in groups (e.g., couples and families with children) usually opted for the female member to complete the questionnaire.

Table 5.2: General profile of Stage Two sample

Variables	Treatment (n=222)	Control (n=209)	%
Country of origin			
1. Malaysia (Local)	103	105	48
2. UK	40	28	16
3. Germany	17	15	7
4. Other Europe	6	16	5
5. Spain	8	10	4
6. Australia	10	5	3.5
7. Netherlands	6	9	3.5
8. USA/Canada	8	6	3
9. Other (Internationals)	6	6	3
10. Ireland and France	9	2	2
11. Italy	2	5	2
12. Indonesia (Local)	3	0	2
13. Not specific	4	2	1
Age			
18-29	105	119	52
30-39	63	62	29
40-49	27	16	10
50-59	10	5	3
60-69	6	2	2
Above 70	2	0	1
No answer	9	5	3
Gender			
Male	76	92	40
Female	114	84	47
No answer	32	33	33
Total (N=431)	222	209	100

Almost all participants were independent travellers, with only nine percent visiting as part of a guided tour. Participants mainly visited as a couple (34%) or as families with children (14 %). There were almost equal number of participants who visited alone (10%) or part of a tour group (9%). Others stated that they travelled to the centre with friends or colleagues, or for business

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purposes. A Chi-square test of independence showed no significant differences in travel parties between the treatment and control group (X^2 (5, N = 425) = 8.11, p=.15).

5.2 Impact of the intervention booklet on the conservation learning outcomes of visitors

The findings in Section 5.2 are presented according to the potential impact of the booklet on the conservation learning outcomes of visitors in regard to their conservation knowledge (section 5.2.1), attitudes (section 5.2.2), behavioural intentions (section 5.2.3), and observed on-site behaviours (section 5.2.4). The results are presented so as to assess the potential impact of the booklet on both the treatment and control groups. This allowed the researcher to evaluate the potential impact of an interpretive booklet on the conservation learning and conservation behaviour of visitors (research question 4). Additionally, results were presented to determine the differences between the conservation learning outcomes of local and international visitors (RQs 5 and 6).

5.2.1 Impact of the intervention booklet on local and international visitors conservation knowledge

5.2.1.1 General knowledge about orangutans and knowledge about existing threats to orangutan habitat loss and the major causes of habitat loss

Responses to questions about general knowledge about orangutans and knowledge of existing threats to orangutans are presented in Table 5.3. A Chi-square test of independence was completed to test differences in general knowledge scores between treatment and control groups. As expected, X^2 showed that visitors in the treatment group were significantly more likely than those in the control group to answer these questions correctly.

Table 5.3: Knowledge scores of the treatment and control groups

Knowledge items		Frequency / Responses (%)		Chi-square test (X²)
		Treatment (n=222)	Control (n=209)	
1. Orangutans share 50 percent of DNA with humans. (Answer: False) (General knowledge 1)	*True*	40	64	X^2 (3, N=431)=
		18%	31%	43.88 p
	False	161	91	=.000***
		73%	21%	
	I don't know	15	50	
		7%	24%	
2. Compared to other mammals, orangutans are the fastest to reproduce and mature in the wild. (Answer: False) (General knowledge 2)	*True*	12	53	X^2 (3, N=431)=
		5 %	25%	55.13 p =
	False	175	99	.000***
		79%	47%	
		28	53	
	I don't know	13%	25%	
3. Orangutans are likely to disappear in the wild in 50 years. (Answer: True) (General knowledge 3)	*True*	180	118	X^2 (3, N=431)=
		81%	57%	36.66 p =
	False	8	36	.000***
		4%	17%	
	I don't know	28	50	
		13%	24%	
4. Products we use in our everyday lives can negatively impact the orangutans. (Answer: True) (Impact on sustainable products 1)	*True*	186	159	X^2 (3, N=431)= 12.85 p = .005**
		84%	76%	
	False	19	18	
		9%	9%	
	I don't know	9	28	
		4%	13%	
5. Which of the following is the main threat to orangutans? (Answer: Tropical forest clearance)	*Water pollution*	1	4	X2 (3, N=431)= 12.85 p = .03*
		1%	2%	

(Existing threats 1)	Climate change	2	14	
		1%	7%	
	Tropical forest clearance	193	170	
		87%	81%	
	Tourism developments	17	13	
		8%	6%	
	Multiple answers	3	3	
		1%	1%	
6. Please order the factors below in terms of their impact on orangutans' habitat loss, with 1 being the most important factor and 4 being the least important factor. (Answer: Palm oil plantations. Forest clearance for palm oil plantations is debated as the major contributing factor in the literature) (Existing threats 2)	Forest fires	42	57	X^2(3, N=431)= 12.85 p = .000**
		19%	27%	
	Palm oil plantations	151	94	
		68%	45%	
	Housing developments	21	37	
		10%	18%	
	Rubber estates	1	7	
		1%	3%	
	Multiple selected answers	1	8	
		1%	4%	

Note: * Significant at p < .05 , **significant at p < .01 *** significant at p < .001

Having established that those in the treatment group scored a higher percentage of correct answers for the multiple choice items that measured general knowledge and knowledge of threats to orangutans, a Chi-square test of independence was conducted to determine whether local and international participants in the treatment group (N=222), differed in their scores for items on general knowledge and knowledge of existing threats. Table 5.4 presents the responses for the items of general knowledge about orangutans, and knowledge of existing threats.

For items related to general knowledge (Q1, Q2, Q3), only one significant difference was found in relation to general knowledge of the similarity of orangutans' DNA to humans (Question 1). International participants had significantly higher correct responses with regards to orangutan's similarities to humans compared to the local participants, and international participants were also

more likely to perceive that products used in their daily lives can negatively impact on orangutan habitat loss.

The majority of the participants from both groups answered that tropical forest clearance was the main threat surrounding orangutans; however, a small percentage of the local participants answered that tourism development was the main threat to orangutans. When knowledge about threats was questioned specifically (*Please order the factors below in terms of their impact on orangutans' habitat loss, with 1 being the most important factor and 4 being the least important factor),* the results of the X^2 test showed that international participants were significantly more likely to perceive that palm oil plantations were the most important factors, as opposed to most of the local participants who provided mixed responses (e.g., forest fires and housing development).

Table 5.4: Knowledge scores between local and international participants'

Knowledge statements		Frequency		Total N=222	X^2 test
		International n (116)	Local n(106)		
1. Orangutans share 50 percent of DNA with humans. (False)	*True*	18	22	40 18%	X^2 (3, N=222)= 9.92, p = .02*
	False	93	68	161 72.5%	
	I don't know	3	12	15 6.8%	
	No answer	2	4	6 2.7%	
2. Compared to other mammals, orangutans are the fastest to reproduce and mature in the wild. (False)	*True*	2	10	12 5.4%	X^2 (3, N=222)= 7.10, p = .07
	False	97	78	175 78.8%	
	I don't know	14	14	28 12.6%	
	No answer	3	4	7 3.2%	
3. Orangutans are likely to disappear in the wild in 50 years.(True)	*True*	97	83	180 81.1%	X^2 (3, N=222)= 2.43, p = .49
	False	5	3	8 3.6%	
	I don't know	11	17	28 12.6%	
	No answer	3	3	6 2.7%	
4. Products we use in our everyday lives can negatively impact the	*True*	108	78	186 83.8%	X^2 (3, N=222)= 16.59, p =.001**

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orangutans. (True)	*False*	3	16	19 8.6%	
	I don't know	2	7	9 4.1%	
	No answer	3	5	8 3.6%	
5. Which of the following is the main threat to orangutans? (Tropical forest clearance)	*Water pollution*	0	1	1 0.5%	X^2 (3, N=222)= 16.64, *p* =.005**
	Climate change	0	2	2 0.9%	
	Tropical forest clearance	110	83	193 86.9%	
	Tourism developments	2	15	17 7.7%	
	Multiple answers	1	2	3 1.4%	
	No answer	3	3	6 2.7%	
6. Please order the factors below in terms of their impact on orangutans' habitat loss, with 1 being the most important factor and 4 being the least important factor. (Forest clearance for palm oil plantations are viewed as the major contributing factor in the literature)	*Forest fires*	6	36	42 18.9%	X^2 (3, N=222)= 53.07, *p* =.000***
	Palm oil plantations	102	49	151 68%	
	Housing developments	3	18	21 9.5%	
	Rubber estates	1	0	1 0.5%	
	Multiple selected answers	0	1	1 0.5%	
	No answer	4	2	6 2.7%	

Note. Significant at   * *p < .05*   **p <.01   ** *p< .001*

5.2.1.2 Perceived impact of sustainable products to the conservation of orangutans

Respondents were also asked whether they thought that using sustainable products would make a positive difference to the conservation of orangutans. Their responses were measured on a five-point Likert scale which ranged from strongly disagree to strongly agree, as shown in Table 5.5. A two-way ANOVA was conducted to assess the differences between the experimental condition (treatment or control) and type of visitors (local and international) on the perception of whether "*using sustainable products will make a difference to the conservation of orangutans*". Table 5.5 presents the results of the two-way ANOVA and the profile plot.

Table 5.5: Two-way ANOVA for impact of using sustainable products for orangutan conservation

Item	Group	Mean and SD		ANOVA output	
		International	**Local**		
Using sustainable products will make a difference to the conservation of orangutans	Treatment	Mean = 4.54 SD = .58	Mean = 4.00 SD =1.14	Treatment vs Control	$F(1, 418) = 10.30$, p=.001 (Cohen's $d = .0.33$)
	Control	Mean = 4.24 SD =.76	Mean = 3.75 SD =.87	International vs Local	$F(1, 418) = 37.46$, p=.000 (Cohen's $d = .0.60$)

Results from the two-way ANOVA showed that there was a main effect of experimental conditions (treatment or control group), and a significant main effect between type of visitors (local or international). There were no interaction effects, $F(1, 418) = .057$, p =.81. This shows that the booklet increased the understanding of the treatment group to support the positive use of sustainable products for the conservation of orangutans. Interestingly, there were statistically significant differences between means scores of local and international participants. The profile plot (Figure 5.1) displays these effects where the differences between international and local participants in both groups were obvious. The average mean had increased when the intervention was given for both groups. But as shown on the plot, even without an intervention, international participants identified strongly with these statements compared to local participants in the treatment group.
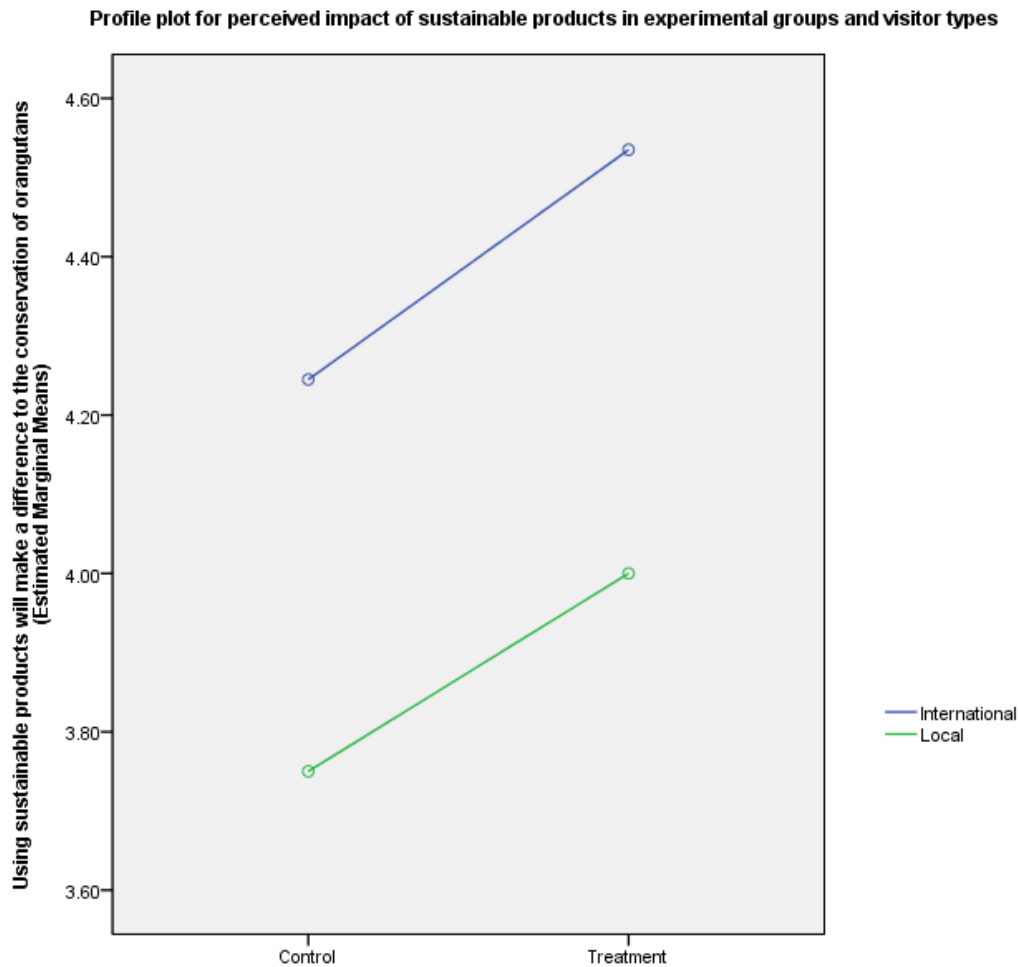
Figure 5.1: Profile plot in response to the question "using sustainable products will make a difference to the conservation of orangutans"

5.2.1.3 Perceived knowledge gain

The perceived knowledge gain was measured on a five-point Likert scale by asking participants to rate their agreement with the question "*My knowledge of orangutan conservation has changed as a result of this visit*". Two-way ANOVA was conducted to assess if there were any differences between local and international participants in both the treatment and control groups. The results are presented in Table 5.6.

Table 5.6: Differences between experimental groups and visitor types on perceived knowledge gain

Item	Group	Mean and SD		ANOVA output	
		International	Local		
My knowledge of orangutan conservation has changed as a result of this visit.	Treatment	Mean = 4.15 SD = .69	Mean = 4.16 SD =.72	Treatment vs Control	F (1, 419) = 12.61, p=.000 (Cohen's d = .33)
	Control	Mean = 3.81 SD =.83	Mean = 3.98 SD =.76	International vs Local	F (1,419) = 1.63, p = .203

The results from the two-way ANOVA showed that there were no significant differences found between local and international visitors in terms of any perceived knowledge gain. However those in the treatment group who were given the booklet rated significantly higher for perceived knowledge gain compared to those in the control group. There were no interaction effects F (1, 419) = 1.22, p = .27. Both local and international visitors had the same level of perceived increase in knowledge about orangutan conservation as a result of the visit. Figure 5.2 shows the profile plot for the two-way ANOVA on the 2 x 2 groups. Although the local participants rated that their perceived knowledge gain was higher than international participants in the control group, however, in the treatment group, the levels of perceived knowledge gain were almost similar between local and international visitors (difference of 0.01).
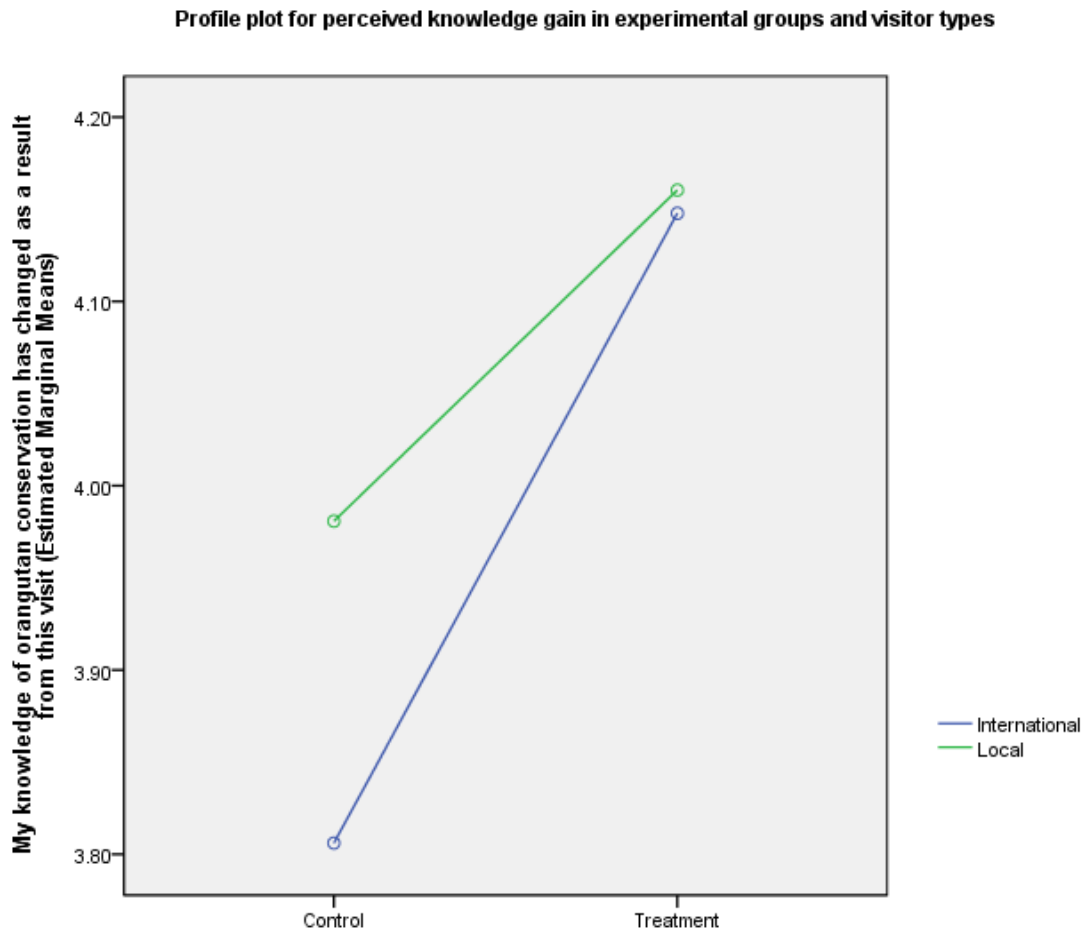
Figure 5.2: **Profile plot for perceived knowledge gain**

5.2.1.4 Open-ended responses in knowledge of behaviours relating to orangutan conservation

Next, participants were asked "*After your visit, what do you think you could do to conserve and protect orangutans*?" to assess their understanding and knowledge of behaviour that could support orangutan conservation. These opinions were asked in an open-ended format. These responses for knowledge of conservation behaviours that could support orangutan conservation were further categorised into six major themes (Table 5.7). The most commonly mentioned behaviour was related to supporting sustainable products and those in the treatment group were significantly more likely to mention this behaviour than those in the control group. The responses from the treatment group were also more specific about sustainable palm oil products while some indicated knowledge about specific brands containing unsustainable palm oils:

- *Ensure products I buy use sustainable ingredients (Treatment)*

- *Download palm oil app, share with friends, stop buying doritos and colgate, sign and share petition (Treatment)*
- *If buying products containing palm oil then only use sustainable ones (Treatment)*

The second theme, donating time and money was related to behaviours that were associated to donating money (either online or onsite), as well as investing time to support orangutan conservation causes (e.g., through campaigns, fundraisers). Examples of the responses included:

- *Become an active member of orangutan organisation (Treatment)*
- *Being a volunteer if needed - help the team and learn about how to preserve the animals without endangerment (Treatment)*
- *Support more conservation projects(Control)*
- *Promotion with regards to orangutans and the threats surrounding its habitat loss through social media (Control)*

The third theme included more general responses, such as protecting forest and orangutan habitats. The fourth theme related to education and included responses such as taking the time to learn, reflecting about their choices or educating themselves on issues surrounding orangutan conservation and environment:

- *Find more info about orangutans and share information about orangutans (Treatment)*
- *Inform myself about what in my lifestyle to contribute to rainforest clearance and based on that make changes to my lifestyle. Donate money to this place (Control)*

The fifth theme that emerged was the importance of policy making and research. These are more isolated for specific answers, such as supporting policy changes that included implementing fines, implementing safety zones, preventing illegal pet trading and supporting local economies.

Table 5.7: **Treatment and control group knowledge of conservation behaviours**

Main theme	Emerging themes	Frequency Treatment (n=222)	Frequency Control (n=209)	Chi-square test
1. Support sustainable palm oil products	Use buy sustainable products/palm oil products/make changes	73	20	
	Make others aware about palm oil/sustainable products	56	28	
	Avoiding palm oil products/minimise consumption of palm oil	18	17	
	Total responses	**147 (66%)**	**65 (31%)**	X^2(1, N=431)=27.27, p=.000*
2. Donate time/money	Money donation	56	34	
	Supporting causes/campaigns/fundraisers	22	21	
	Orangutan welfare-giving food/treatments	0	1	
	Total responses	**78 (35%)**	**55 (26%)**	X^2(1, N=431)=2.44, p=.10
3. General	No clearing of forest	9	6	
	Protecting habitats	5	15	
	Total responses	**14 (6.3%)**	**21 (10%)**	X^2(1, N=431)=1.83, p=.17
4. Educate self	Get more information/educate self	**9 (4.1%)**	**4 (1.9%)**	X^2(1, N=431)=1.23, p=.20
5. Implementation of policies /research	Imposing fines/policies implementation	2	2	
	Protection from poaching	1	1	
	Orangutan conservation research	1	2	
	Total responses	**4 (1.8%)**	**5 (2.4%)**	-

6. Others/specific	Supporting local economy	5	2	-
	Not buying tropical wood	0	1	-
	Yes I can make a difference	1	0	-
	Total responses	**6 (2.7%)**	**3 (1.4%)**	**-**
No given answer		**35 (15.7%)**	**62 (29.7%)**	**-**

Note:

 Percentages may not total 100% as some respondents may have provided more than one answer.

*Statistically significant at p < .001

 To assess whether there were differences between local and international participants in terms of their thoughts about what they could do to conserve and protect orangutans, a comparison was completed between local and international participants in regards to the question "*After your visit, what do you think you could do to conserve and protect orangutans*?" Responses are listed in Table 5.8 in order of the frequency in which they were mentioned.

Chi-square tests of independence revealed significant differences between local and international participants on five of the six themes. It was found that international visitors were significantly more likely to mention using or buying sustainable products, making others aware about palm oil and deforestation effects; and avoiding minimising consumption of palm oil products. Local participants were significantly more likely than international visitors to mention supporting the cause and protecting the environment, orangutan habitats and the forest. Generally, responses from international participants focussed on consumption behaviour whereas local participants were more focused on campaigns and forest protection.

Table 5.8: Local and international visitors' thoughts about what they could do to conserve and protect orangutans

Conservation behaviour	International (n= 116)	Local n=106	Total (N=222)	Chi-square test
1. Use or buy sustainable palm oil products	52	21	73 (32.9%)	X^2(1, N=222)= 10.61 ,p= .001 **
2. Make others aware about effects of palm oil	37	19	56 (25.2%)	X^2(1, N=222)= 4.24, p=.04 *
3. Money donation	27	29	56 (25.2%)	X^2(1, N=222)= 0.38, p=0.54
4. Protect the environment/habitat	9	20	29 (13.1%)	X^2(1, N=222)= 5.31, p=0.02 *
5. Support the cause	5	17	22 (9.9%)	X^2(1, N=222)= 7.70 ,p=0.01*
6. Avoid/minimise consumption palm oil products	17	1	18 (8.1%)	X^2(1, N=222)= 12.86 ,p=.000 **
7. Educating self	4	5	9 (4.1%)	-
8. Support local economy	1	4	5 (2.3%)	-
9. Policies/fines for poaching	2	1	3 (1.4%)	-
10. Orangutan research	2	2	4 (1.8%)	-
11. Others	1	3	4 (1.8%)	-
No answer	14	21	35 (15.7%)	-

Note: Percentages may not add to 100 as some participants gave more than one response. Chi-square tests were not conducted on cells that had expected count less than 5. * p < .05   ** p < .01

5.2.1.5 Rated knowledge scores

To further explore the depth of understanding of local and international participants' knowledge of conservation behaviour, open-ended responses were shown in Table 5.9 that used the scale between zero (0 points) and extensive (3 points). This method was adapted from Adelman et al.'s (2003) study as follows:

- **No given point (0)** - No answers or answered "I don't know "

  Minimal (1 pts) - General references to basic knowledge e.g., donating, protecting forest & habitat (without any references to orangutan conservation). Examples included:

  > *Protect the rainforest*
  >
  > *Tidak membuang sampah sesuka hati* (no throwing rubbish anywhere you please)
  >
  > *Protect the forest*

- **Moderate (2 pts)** - Specific references to behaviours surrounding orangutan conservation (e.g., supporting sustainable palm oil products). Minimal or no elaboration was provided. Examples included:

  > *Donate money, avoid buying palm oil products (e.g. doritos colgate).*
  >
  > *Not using products containing non-sustainable palm oil.*

- **Extensive (3 pts)** - Specific references to behaviour (with examples) that indicated a deep concern and understanding of issues surrounding orangutan conservation (e.g., supporting sustainable palm oil, talking/discussing/debating with others about issues). Often accompanied with elaboration. Examples include:

  > *Donate money, tell my friends and family about the orangutans habitat loss, raise awareness, buy sustainable palm oil products, check the companies, and urge other people to do the same!*
  >
  > *Buy certified products (e.g., with sustainable palm oil-nestle). Reduce consumption of products with palm oil at all. Discuss the problem with friends and family to spread the knowledge learnt here.*

Table 5.9 showed that 73% of local participants scored minimally (scores of zero and 1pt.) in their depth of knowledge about orangutan conservation behaviour. This was contrasted with international participants' responses which tended to be either minimal or moderate (scores of 1 and 2 pt.) which totalled 79%.

Table 5.9: Rated knowledge scores for local and international responses

Given score	Treatment (N=222)	
	International (n=106)	**Local (n=116)**
0 point No answer or I don't know	15 (13%)	23 (22%)
Minimal **1 point**- **General references** to donating, protecting the environment. **No elaboration was given**.	24 (21%)	54 (51%)
Moderate **2 point**- **Specific references to orangutan conservation issues** (e.g., sustainable products, spread awareness). **Minimal or no elaboration**.	67 (58%)	25 (23%)
Extensive **3 points** - **Specific references to behaviours that indicate an understanding of issues** (e.g., purchase behaviours, sustainable products, human activities) in orangutan habitat loss and conservation. **Further elaboration was given** to indicate further understanding.	10 (9%)	4 (4%)

5.2.2 Impact of the intervention booklet on the conservation attitudes of local and international visitors

Factor analysis can be used to explain whether items could be better represented in smaller sets of factors, and/or to explore which items belong to each dimension (Kim & Mueller, 1978). An exploratory factor analysis (EFA) was conducted on the 17 attitudes items to refine the scales and explore underlying structures that may exist (Reise, Waller, & Comrey, 2000). Factor analysis was also conducted on eight behavioural intentions items (presented in section 5.2.3).

At the most level, factor analysis seeks to simplify and order (Child, 1990, p. 1). It explores "…the possible underlying structure in a set of interrelated variables without imposing any preconceived structure on the outcome" (Child, 1990, p6). There are two ways to use factor analysis; firstly, to explore the structure of a set of variables, or secondly, to confirm the structure of a set of variables. A set of interrelated variables is confirmed by the correlations that exist between the variables.

There are a number of assumptions that need to be made when using factor analysis. In general, a sample size of above 300 is acceptable (Field, 2013), depending on the number of items. Nunnally (1978) stated that the minimum requirement for exploratory factor analysis is at least 10 observations for each item. There were 17 items used in this study hence the minimum sample size would be at least 170 cases. In this study, the sample size was 431 which is deemed satisfactory.

Factor analysis using varimax rotation was conducted separately on the 17 conservation attitude items for both international and local groups. The factor analysis results suggested that the items were loaded onto similar factors for both groups, however with three exceptions. Two items, "I am part of the solution" and "I want to do everything I can to protect and conserve orangutans" were loaded onto different factors for both groups. One item, "I feel helpless when it comes to helping orangutans" had a low level of communalities for the international group but high communalities with the local group dataset. It was therefore decided that these three items should be removed from the factor analysis to ensure comparability. Factor analysis was re-conducted on both the local and international datasets with the exclusion of these three items. The analysis produced the same underlying factors. Results of the final factor analysis produced a four-factor solution which explained 53% of the variance.

Two tests were used to assess the suitability of factor analysis: the Kaiser-Meyer-Olkin statistics (KMO) for sampling adequacy (Kaiser, 1974), and the Bartlett's test of sphericity (Bartlett, 1954). The KMO ranges from 0-1 and should be greater than 0.5 (Field, 2013), or at least 0.60 (Kaiser, 1974). The Bartlett's test is used to assess whether the variables in the correlation matrix are correlated and thus are suited to be factored. In this study, the KMO test produced a value of .847 while the Bartlett test of sphericity was significant ($p < 0.001$) which met the assumptions of factor analysis. Table 5.10 presents the results of the factor analysis that produced a four-factor solution.

The first factor represents the items that measure the perceived changes in understanding and attitude changes in relation to orangutans and orangutan conservation. This factor comprises the original five items based on Ballantyne, Packer, and Falk (2011) study. Therefore, this factor was labelled as **perceived learning outcomes**. The second factor has four items that represented the views that humans were more important and central, representing an anthropocentric position. However since the scores in this factor were based on reverse-coded scores, this factor was labelled **anti-anthropocentric**[23] **attitude**s. The third factor was labelled **protective nature** as these items

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[23] Anthropocentric attitudes are views or beliefs that humans are central and more important than other species (Boddice, 2011).

reflected a general attitude of being protective and caring for orangutans and their habitats. The fourth factor was labelled **environmental activism** as items in this factor reflected strong support to halt activities that used orangutan habitats for palm oil plantations and loggings. Three items were excluded from the factor analysis. However one item, "I am part of the solution to orangutans problems" was analysed as a single item attitude indicator as this particular item was important in determining whether the intervention prompted individuals to feel that they personally could contribute to orangutan conservation. This single item was labelled as **individual responsibility**.

Table 5.10: Factor analysis of items measuring conservation attitudes

Factor name	Factor loading	Eigenvalue	% variance explained	*a*
Factor 1: Perceived learning outcomes		4.16	29.71	.840
1. I have a better understanding of orangutan conservation issues because of my visit.	.836			
2. My visit has made me more concerned about the conservation of orangutans.	.808			
3. I learnt some new facts of information about orangutans.	.794			
4. My visit has made me more concerned about the wellbeing of wildlife in general	.753			
5. Some of my beliefs about orangutans have changed as a result of my visit.	.681			
Factor 2: Anti-anthropocentric attitude		2.24	16.01	.716
1. *Too much fuss is made over the welfare of orangutans these days when there are too many human problems that need to be solved*	.758			
2. *The production of inexpensive palm oil products justifies maintaining the loss of orangutan habitats*	.734			
3. *Humans have the right to use orangutans as we see fit*	.690			
4. *I think human economic gain is more important than setting aside more land for orangutans*	.667			
Factor 3: Protective nature attitude		1.29	7.88	.718
1. We have the responsibility to leave healthy ecosystems for our families and future generations	.766			

2. We need to help protect orangutan habitats.	.722			
3. Wild animals, such as orangutans, should not be held captive and sold as pets.	.746			
Factor 4: Environmental activism		1.10	4.2	.560
1. Forest clearance for palm oil plantations should be immediately stopped even if it means some people lose their livelihood.	.837			
2. The use of orangutan habitats to produce palm oil and paper products is unnecessary and should be stopped.	.785			

Excluded from the original items :

I want to do everything I can to protect and conserve
orangutans.

I feel helpless when it comes to helping orangutans.

I am part of the solution to orangutan's problems.

Note. *Items in italics are reverse-coded items*

The reliability of measures was assessed using Cronbach alpha's (a) measure of internal consistency. In this study, all factors yielded alpha values above the acceptable cut-off point of .65 except for one factor, environmental activism with a reported α of 0.560. However, low values do not necessarily mean that the scale lacks reliability, as a number of different factors affect reliability, such as participants' characteristics and the instrument itself (John & Benet-Martínez, 2000). One of the reasons may be due to the low number of items (Tavakol & Dennick, 2011), which is a high possibility given that there were only two items loaded under this factor. Participant's cultural differences may also affect the reliability, as found by studies that tried to assess environmental values between different cultures (Erdoğan, 2009). Nevertheless, the factor for environmental activism was retained, based on the view that multiple item indicators are more reliable as a construct than single item indicators.

A series of Two-way ANOVAs using these four factors were subsequently calculated to investigate whether there were any differences between the conservation attitudes of local and international participants. The independent variables were visitor type (international and local) and the experimental group (treatment and control). The dependent variables were the mean scores for each composite factor.

There are two basic assumptions when two-way ANOVA is used. Firstly, the data are normally distributed. Secondly, there is equal variance in the population cells (Pagano, 2012).

However, two-way ANOVAs are quite robust to the violations of these assumptions, provided that the sample size is sufficient. Violations of these assumptions are acceptable as long as there are equal sizes in both samples (Cochran, 1947; Pagano, 2012). Keppel (1993) stated that there is no exact rule of thumb that determined up to what point unequal sample sizes are acceptable. However, a number of statisticians have stated that violations of the homogeneity of variance are serious threats when the sample sizes are extremely unequal (Grace-Martin, 2017). In this study, the sample size in each of the four 2 x 2 cells was more or less equal, therefore, violation of the assumptions was not deemed a serious threat to the validity of the results. Data were normally distributed on all four factors except for 'protective nature'. However, the reported median (5.0), mode (5.0) and mean (4.6) were approximately equal, hence the analysis using two-way ANOVA continued. The assumption of homogeneity of variance was violated in two out of the four factors (i.e., perceived learning outcomes and protective nature). However, since the sample was more or less equal, it was decided to continue with the analysis for two-way ANOVA. As with previous results, when significant values were reported as (p < .05, p<.01. p<.001), effect sizes were calculated using Cohen's *d*.

5.2.2.1 Perceived learning outcomes

A two-way ANOVA was conducted to evaluate the impact of the booklet on perceived learning outcomes of the experimental groups (treatment or control) and visitor types (local or international groups). The results are presented in Table 5.11.

Table 5.11: Two-way ANOVA for perceived learning outcomes

Variable	Group	Mean and SD		ANOVA output	
		International	**Local**		
Perceived learning outcomes	Treatment	Mean = 4.14 SD = .58	Mean = 4.22 SD =.66	Treatment vs control	F (1, 421) = 7.49, p =.01 (Cohen's *d*= .26)
	Control	Mean = 3.92 SD =.57	Mean = 4.10 SD =.74	International vs local	F (1, 421) = 3.99, p = .05 (Cohen's *d*= .17)

Results for the two-way ANOVA indicated there were significant main effects for the experimental condition (treatment and control group) and visitor types (local and international). These however had a small effect size. There were no interaction effects, F (1, 421) = .67, p = .42. The perceived learning outcomes were significantly higher for both the local and international visitors in the treatment group, indicating that the booklet increased perceptions of understanding

and attitude change about orangutan conservation for both cultural groups. The results are plotted in Figure 5.3. Levels of perceived learning about orangutans' conservation were higher amongst local participants that in international participants.
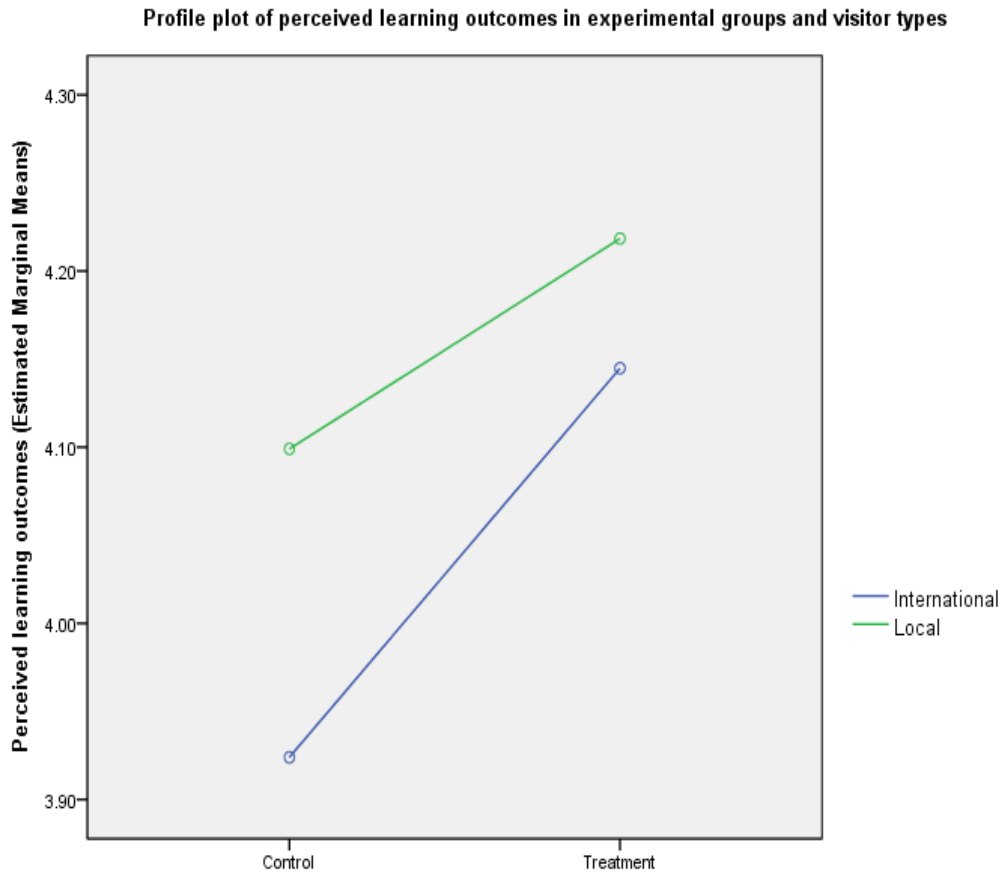
Figure 5.3: **Profile plot for two-way ANOVA on scores for perceived learning outcomes**

5.2.2.2 Anti-anthropocentric attitude

Table 5.12 shows the results of a two-way ANOVA that was conducted to assess the effects of the experimental group and visitor types, on anti-anthropocentric attitudes. As expected, participants in the treatment group had significantly higher anti-anthropocentric attitudes compared with those who did not receive the intervention. Results also showed that international participants had significantly higher anti-anthropocentric attitudes than locals. There were no interaction effects, $F (1, 421) = .06$, $p = .81$.

Table 5.12: Two-way ANOVA for anti- anthropocentric attitude

Variable	Group	Mean and SD		ANOVA output	
		International	**Local**		
Anthropocentric attitude	Treatment	Mean = 4.42 SD = .69	Mean = 3.84 SD =.84	Treatment vs control	F (1, 421) = 10.22, p = .001 (Cohen's *d*= .34)
	Control	Mean = 4.17 SD =.77	Mean = 3.62 SD =.72	International vs local	F (1,421) = 58.87, p =.000 (Cohen's *d*=.74)

Note. Mean score is based on scores of recorded items.

Figure 5.4 further illustrates these differences. Both the local and international participants were significantly more likely to have increased anti-anthropocentric attitudes when an intervention occurred. In addition, there were significant differences between local and international, with international participants significantly more likely than local participants to report an anti-anthropocentric attitude. Even without the intervention, international participants displayed significantly higher anti-anthropocentric attitudes than locals in the treatment condition.
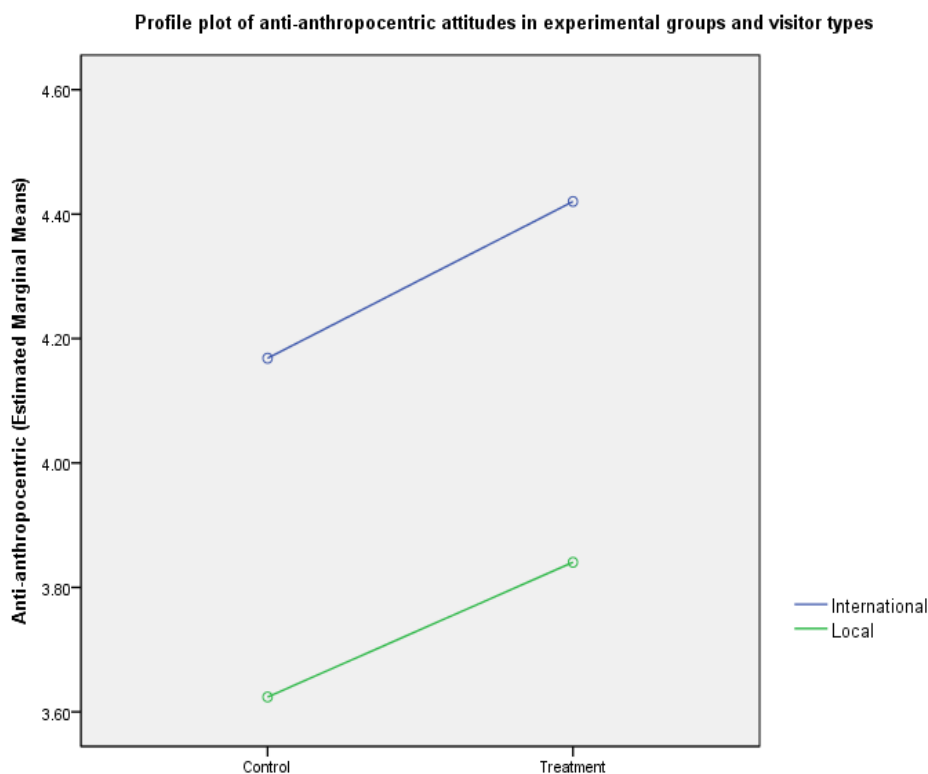
Figure 5.4: Profile plot for two-way ANOVA on scores for anti-anthropocentric attitude

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5.2.2.3 Protective nature attitudes

Protective nature refers to the responsibility that visitors felt to protect orangutans and orangutans' habitat for future generations. A two-way ANOVA was conducted to evaluate the impact of the booklet on protective nature attitudes of experimental groups (treatment or control) and visitor types (local or international groups) (see Table 5.13).

Table 5.13: Two-way ANOVA for protective nature attitudes

| Variable | Group | Mean and SD | | ANOVA output | |
		International	Local		
Protective nature	Treatment	Mean = 4.70 SD = .57	Mean = 4.51 SD =.80	Treatment vs control	F (1, 421) = 1.68, p =.20
	Control	Mean = 4.57 SD =.60	Mean = 4.47 SD =.72	International vs local	F (1, 421) = 4.68, p =.03 (Cohen's d = 0.23)

The two-way ANOVA showed that the average of both treatment and control groups was high in their protective nature attitudes. Significant differences were found between local and international participants in regard to their attitude scores for protective nature, with a small effect size, however, there were no interaction effects, F (1, 421) = .42, p = .52. The booklet had a greater impact on international participants than for locals. International participants were significantly more likely to have higher protective nature attitudes than local participants (see Figure 5.5). Even without an intervention, international participants had higher protective nature attitudes compared to locals who received an intervention.
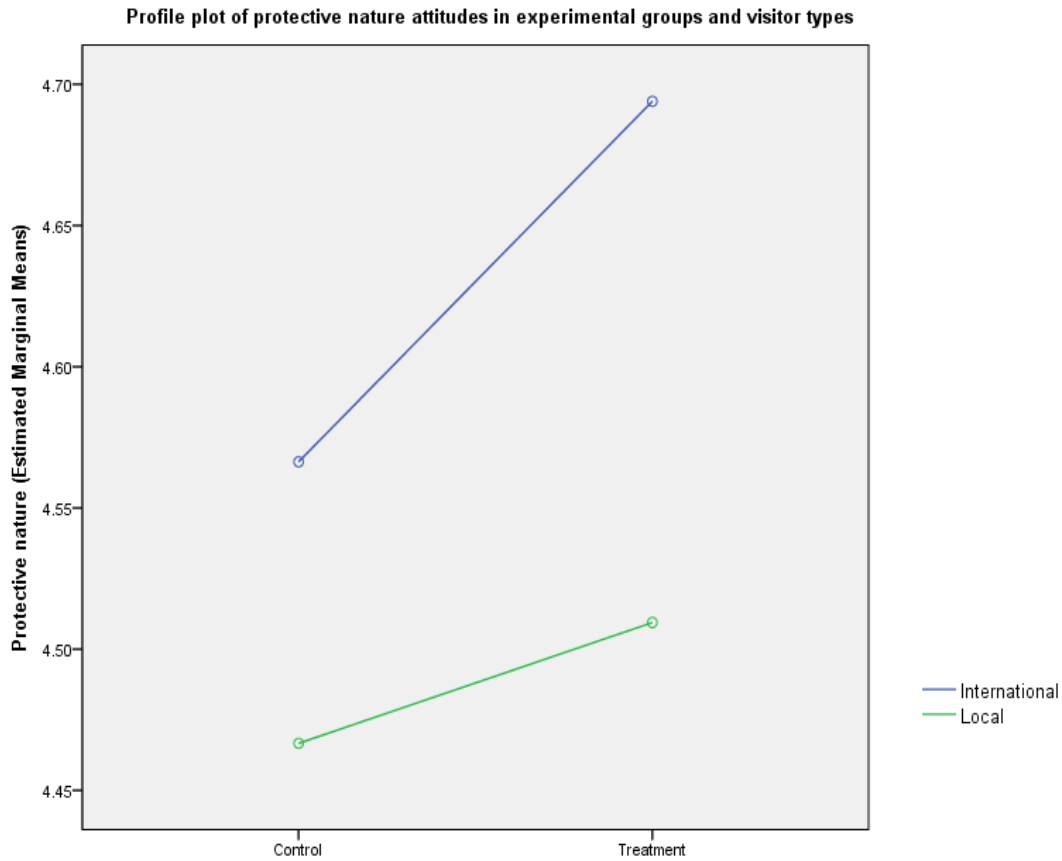
Figure 5.5: Profile plot for two-way ANOVA for mean scores of protective nature

5.2.2.4 Environmental activism

Environmental activism refers to participant's attitudes that reflected strong support for halting forest clearance activities to save orangutan habitats. A two-way ANOVA was conducted to evaluate the impact of the booklet on environmental activism for the experimental groups (treatment or control) and visitor types (local or international groups). These are presented in Table 5.14.

Table 5.14: Two-way ANOVA for environmental activism

Variable	Group	Mean and SD		ANOVA output	
		International	**Local**		
Environmental activism	Treatment	Mean = 4.03 SD = .91	Mean = 3.45 SD =.99	Treatment vs control	$F(1, 421) = 4.59$, p=.03 (Cohen's d = 0.23),
	Control	Mean = 3.79 SD =.91	Mean = 3.31 SD =.92	International vs local	$F(1, 421) = 35.25$, p= .000 (Cohen's d = 0.58)

Results for the two-way ANOVA report a significant difference in the mean scores for environmental activism between the experimental group (treatment or control group) and visitor types (local or international). No interaction effect was reported, $F (1, 421) = .31$, $p = .58$. However, there was a highly statistically significant difference between local and international groups. International visitors were more likely to have higher positive attitudes for environmental activism, which reflected strong support to halt activities related to palm oil plantations and logging in orangutan habitats. Similar to the previous two attitude measures (anti-anthropocentric and protective nature), even without an intervention, international participants were significantly more likely to have higher positive attitudes on this measure compared with local participants. These were illustrated in Figure 5.6.
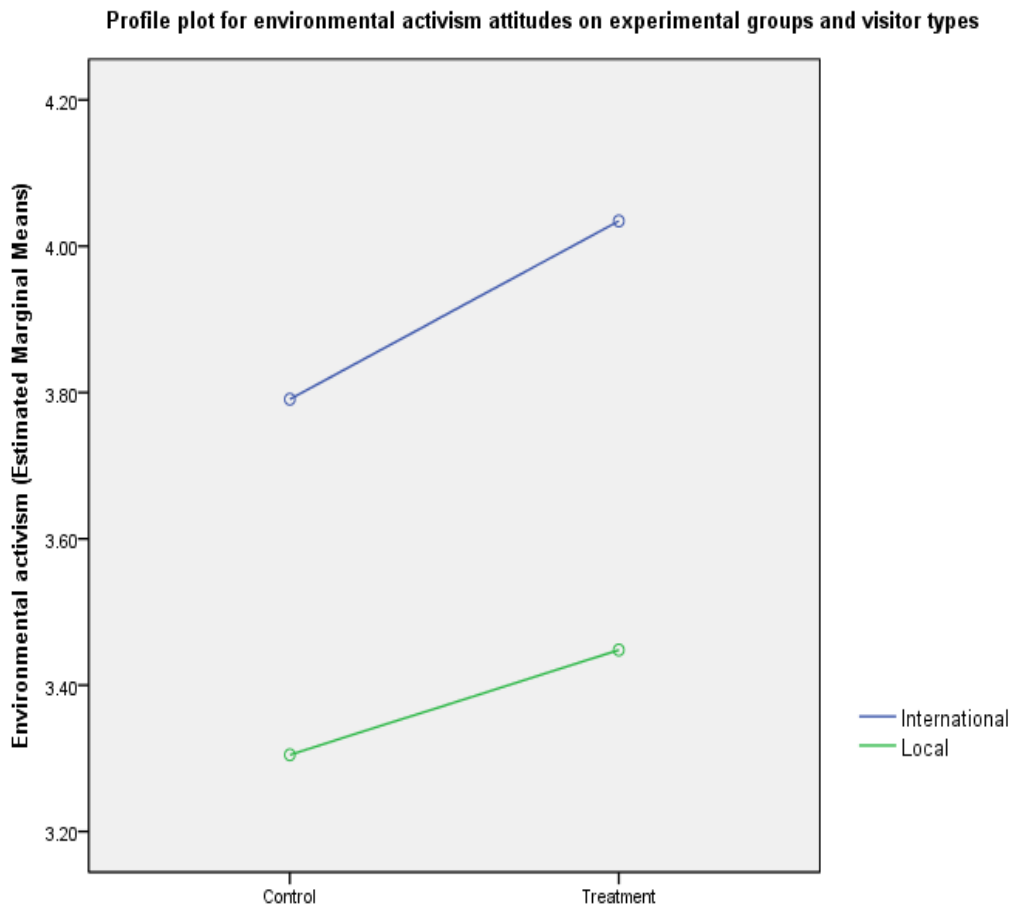
Figure 5.6: Profile plot for two-way ANOVA for environmental activism

5.2.2.5 Individual responsibility

To assess whether the intervention prompted personal accountability or individual responsibility when solving orangutan problems, the item, "I am part of the solution to orangutan's problems" were included as a single item indicator to attitudes in viewing that an individual can play a role in orangutan conservation. Two-way ANOVA was conducted to assess differences between experimental group (treatment or control) and visitor types (local or international). Results are presented in Table 5.15.

Table 5.15: Two-way ANOVA for individual responsibility

| Variable | Group | Mean and SD | | ANOVA output | |
		International	Local		
I am part of the solution to orangutan problems.	Treatment	Mean = 4.05 SD = .75	Mean = 3.92 SD =.99	Treatment vs control	F (1, 423) = 11.26, p=.001 (Cohen's d = 0.33)
	Control	Mean = 3.69 SD =.92	Mean = 3.67 SD =.92	International vs local	F (1, 423) = .69, p= .41

Results for the two-way ANOVA reported a significant difference in the mean scores for the statement "I am part of the solution to orangutan problems" between the treatment and control group. No significant differences were found between local and international groups on their agreement to this statement. There were also no interaction effect reported, F (1, 423) = .55, p = .46. This suggests that the booklet increased participants (regardless of being local or international) knowledge about their responsibilities as individuals to be a part of collective effort to solve orangutan problems. These results are illustrated in Figure 5.7.
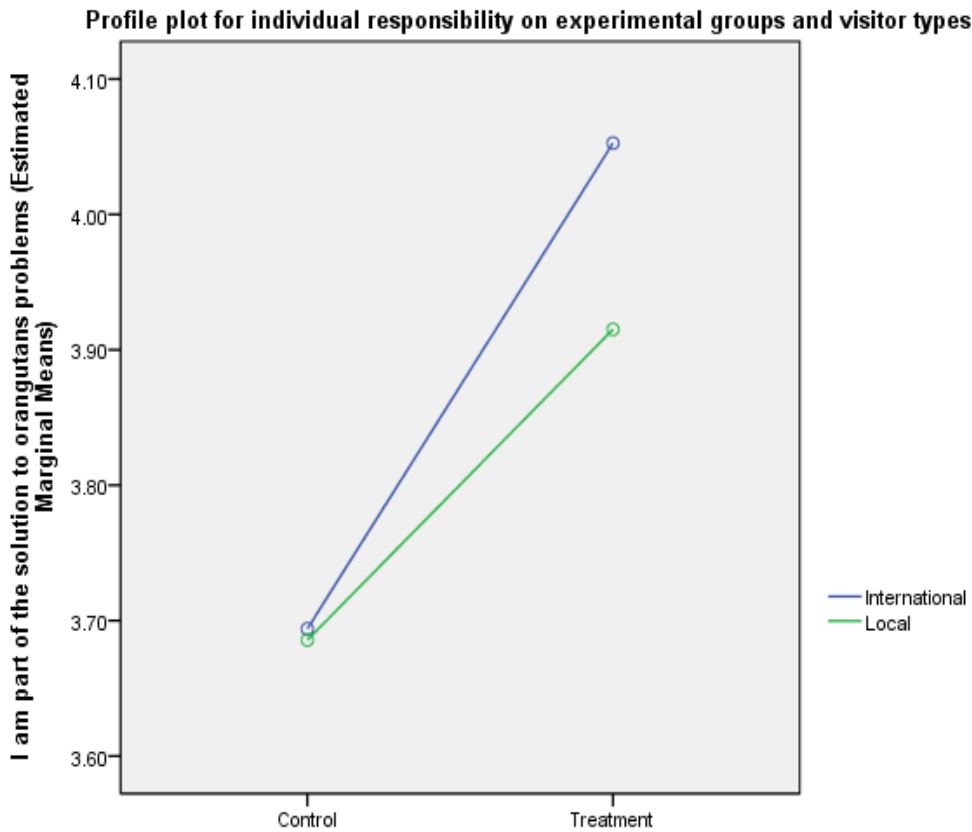
Figure 5.7: Profile plot for two-way ANOVA for "I am part of the solution to orangutan problems"

5.2.3   Impact of the intervention booklet on local and international visitors behavioural intentions

Similar to items on attitude factors, analyses were firstly conducted on the eight behavioural intentions items for the local and international datasets. This was conducted to explore the underlying structure of the variables, and to ascertain whether the structure was similar across both visitor types. The factor loadings reported similar underlying structure for both groups[24], therefore factor analyses were conducted based on combining responses from both local and international group visitors. The KMO produced a value of .841, and the Bartlett test of sphericity was significant ($p < 0.001$), meeting the assumptions necessary for conducting factor analysis. Results of the factor analysis that loaded two of the factors were reported in Table 5.16. The first factor was labelled **donating time and money** as the items represented an intention to carry out behaviour such as donating time and/or money to orangutan organisations. The second factor was labelled as

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[24] The data meets the assumptions for factor analysis.

supporting sustainable palm oil use as items in this factor reflected the behavioural intentions to support the use of sustainable palm oil products.

Table 5.16: Factor loadings for eight behavioural intentions items

Factor name	Factor loading	Eigenvalue	% variance explained	a
Factor 1: Donating time and money		3.90	48.74	.866
1. Joining a fundraiser to raise funds for orangutans.	.894			
2. Giving online donations to organisations.	.848			
3. Becoming a member of an orangutan organisation.	.808			
4. Seek more information about orangutan conservation.	.686			
Factor 2: Supporting sustainable palm oil use		1.90	23.72	.834
5. Spreading the word to others about the impact of unsustainable sourced palm oil products.	.843			
6. Buy products that use sustainable palm oil.	.839			
7. Actively seeking information on sustainably sourced products.	.826			
8. Downloading an app to check for sustainable palm oil labellings.	.700			

Two-way ANOVA was conducted on the two factors that measured the two themes of behavioural intentions. Data were normally distributed for both factors. The assumption of homogeneity of variance was violated in donating time and money intentions. However since there were more or less equal sample sizes in the four 2 x 2 cells, the analysis for two-way ANOVA for donating time and money was allowed to continue.

5.2.3.1 Donating time and money

A two-way ANOVA was conducted to explore the impact of the intervention booklet on the experimental groups (treatment or control) and visitor types (local or international participants) in regards to behavioural intentions that related to donating time and money to orangutan organisations. Table 5.17 shows the results of the two-way ANOVA. It was observed that average scores for their intentions in commit their time and money to organisations for local participants'

were higher than for international participants. This was observed in both the treatment and control groups.

Table 5.17: Two-way ANOVA for behavioural intentions to donate time and money

| Variable | Group | Mean and SD | | ANOVA output | |
		International	Local		
Donating time and money intentions	Treatment	Mean = 4.02 SD = 1.52	Mean = 4.97 SD =1.19	Treatment vs control	F (1, 419) = .32, p = .57
	Control	Mean = 4.16 SD =1.55	Mean = 4.99 SD =1.47	International vs local	F (1, 419) = .40.01, p =.000 (Cohen's d effect size=.65)

The results of the two-way ANOVA with regards to participants' intentions to donate their time and money for orangutan conservation showed that there was no significant difference on the composite scores between treatment and control groups. There was also no interaction effect, F (1, 419) = .19, p= .67. However, there is was a highly significant difference between the average intention scores in regard to donating time and money to the organisation for local and international participants. International participants' intentions to donate time and money were low for both treatment and control groups (see Figure 5.8). Local participants were significantly more likely than international participants to state they intended to donate their time and money. This pattern applied, with or without an intervention.

Figure 5.8: Profile plot for two-way ANOVA on mean scores for donating time and money intentions

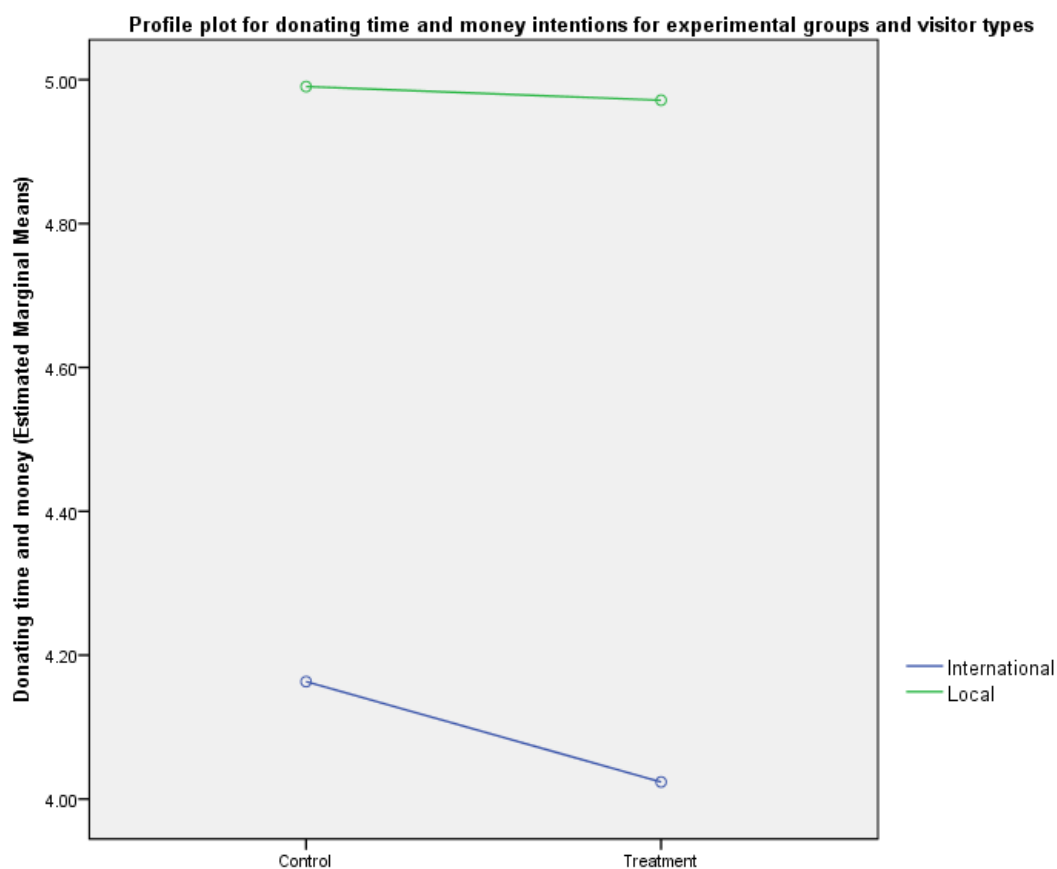### 5.2.3.2 Supporting sustainable palm oil use

A two-way ANOVA was conducted to explore the impact of the intervention booklet on the experimental groups (treatment or control) and visitor types (local or international participants) in regard to supporting sustainable palm oil use intentions. Table 5.18 presents these results.

Table 5.18: Two-way ANOVA for intention scores for supporting sustainable palm oil use

| Item | Group | Mean and SD | | ANOVA output | |
		International	Local		
Supporting sustainable palm oil use	Treatment	Mean = 5.73 SD = 1.34	Mean = 5.02 SD =1.24	Treatment vs control	$F(1,419) = 8.33$, p = .004 (Cohen's d= 0.32)
	Control	Mean = 5.21 SD =1.29	Mean = 4.80 SD =1.38	International vs local	$F(1,419) = 18.76$, p = .000 (Cohen's d= 0.75)

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Results of the two-way ANOVA showed that international participants were significantly more likely to have greater intentions toward behaviour that supported sustainable palm oil use. There were no reported interaction effect, $F_{(1,419)} = 1.44$, $p = .23$. These results suggested that the booklet had a significant impact on increasing the behavioural intentions in the treatment groups for both locals and international participants. However, it is interesting to note that with or without an intervention, international participants were significantly more likely than local participants to state their intention to support sustainable palm oil use. Figure 5.9 illustrates these differences.

Profile plot for intentions to support sustainable palm oil use in experimental group and visitor types
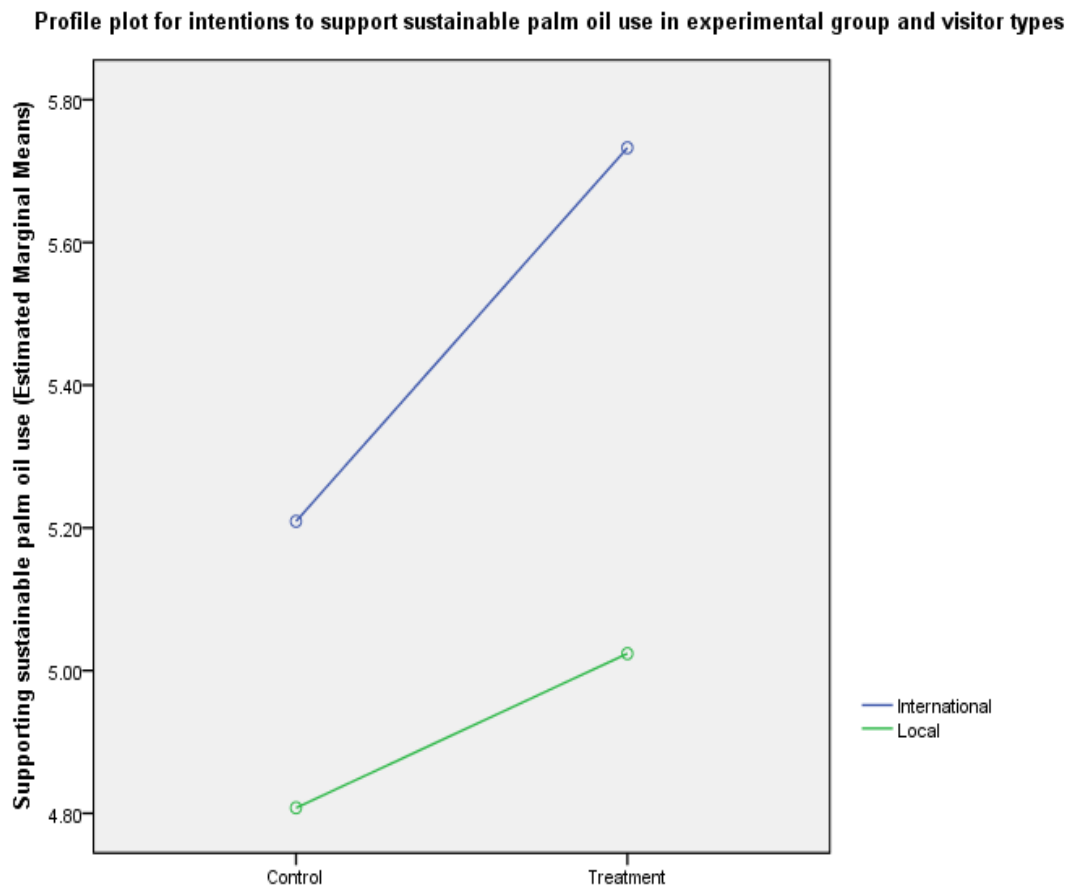
Figure 5.9: Profile plot for two-way ANOVA for intentions to support sustainable palm oil use

5.2.3.3 Open-ended responses in relation to behavioural intentions

The respondents were also asked to list three behaviours pertaining to orangutan conservation that they might carry out after their visit. Responses were divided between local and international participants in the treatment group. The responses were coded based on emerging themes. To further investigate whether local and international participants differed in their responses to future behavioural intentions, chi-square tests for independence were conducted to assess differences in frequency of response between local and international participants. Table 5.19 showed the responses that were categorised into six major themes. Significant differences were found between local and international participants in three major themes. These were, 1. donating time and/or money; 2. supporting sustainable palm oil; and 3. Spread awareness or telling others about orangutan conservation. Local participants was significantly more likely to list behaviours relating to money donations and philanthropic causes such as donate their time/money and volunteer; while international participants was significantly more likely to list behaviours relating to the support for sustainable palm oil such as using palm oil and using other alternatives to palm oil. International participants were also more likely to indicate they would educate others about the conservation of orangutans compared with locals.

Table 5.19: Local and international response on "Please list three specific things you would most likely do as an effort to support the protection and conservation of orangutans"

Main themes	Emerging themes	Response frequency[1] (N=222)		Chi-square test
		Local (n=106)	International (n=116)	
1. Donating- time and/or money	• Donate money	55	44	
	• Support the cause through campaign, programs/petitions	27	23	
	• Volunteer	14	6	
	• Fundraiser	1	2	
		97	**75**	X^2(1, N=222) = 5.15, p=0.02*
2. Supporting sustainable palm oil	• Use sustainable palm oil or use other alternatives/make changes	34	60	
	• Stop /boycott/reduce buying palm oil consumption	1	26	
		35	**86**	X^2(1, N=222) = 17.17, p=0.000**
3. Spread awareness/ telling others	• Spreading awareness and education of orangutan conservation issues (including palm oil)	29	61	
	• Tell others about this place/visit orangutan places	5	5	
		34	**66**	X^2(1, N=222) = 7.58, p=0.01*
4. General behaviours on protecting the environment	• Protect the environment	11	5	
	• No forest clearance /No burning forest or polluting/ Maintain cleanliness	7	7	

	of forest/recycle/save energy			
		18	**12**	X^2(1, N=222) = 1.8, p=0.17
5. Educating self	• Find information to understand more	**9**	**10**	X^2(1, N=222) = 0.71, p=0.97
6. Others	• No cruelty to animal/love animals	1	0	
	• Stop illegal pet trade	1	0	
	• Impose fines • Orangutan research	1	1	
	• Do not support captive sites where can touch these animals	0	1	
		3	**2**	-
No answer		**25**	**18**	-

Note.
[1] Percentages may not total 100 as participants may give more than one answer
Chi-square tests were not conducted on cells that had expected count less than 5.
Statistically significant at *p < .05   ** p < .01

5.2.4   Impact of the intervention on observed on-site behaviour

Frequencies for the four on-site conservation behaviours relating to local and international visitors' within the treatment and control groups were also reported. Table 5.20 shows the observed behaviours of those who participated in the study. Although participation in the four on-site behaviours was extremely low for both control and treatment groups, the results showed that those in the treatment group were more likely to participate in the behaviour than those in the control group, particularly in relation to the theme of behaviour that supported the use of sustainable palm oil (signing petitions, taking leaflets about products containing palm oil, and taking instructions about how to download the palm oil app). The Chi-square test of independence conducted on this theme of behaviour showed a significant difference between recorded frequencies for the on-site participation between treatment and control groups, X^2 (1, N=431) = 4.41, p=.04.   The highest participation in the treatment group was related to signing petitions, followed by taking leaflets. Donation behaviour recorded the lowest participation. Though these observations were small in number, in terms of their actual impact, this signified that the booklet can potentially impact on

visitors' positive behaviour, particularly when supporting sustainable palm oil causes (through a petition), and interest in seeking further information relating to sustainable palm oil (through taking leaflets).

Table 5.20: **Participants' observed on-site behaviour**

Behaviour theme	Observed behaviour	Control (n=209)		Total (Control)	Treatment (n=222)		Total (Treatment)
		I	L		I	L	
Donation	1. On-site donations	6	0	6 (2.9%)	3	1	4 (1.9%)
Supporting sustainable palm oil	2. Signing petitions	6	6	12 (5.8%)	10	12	22 (9.9%)
	3. Taking a small leaflet to download palm oil apps	3	2	5 (2.4%)	2	8	10 (4.5%)
	4. Taking leaflets containing information about sustainable palm oil	2	1	3 (1.5%)	8	10	18 (8.1%)

Note: I = International, L = Local

5.3   Evaluation of the most interesting aspect of the booklet

As part of the evaluation of the booklet, participants in the treatment group were asked to indicate what aspects of the booklet they perceived as being the most interesting, the reasons why the booklet was interesting and their perceived ratings on their understanding of eight orangutan conservation issues. These results are presented to support previous findings in relation to differences between international and local participants, to support results that showed the positive impact of the booklet on visitors' conservation learning outcomes, and to assess aspects of the booklet that facilitated the learning outcomes amongst visitors.

5.3.1   Aspects of the booklet perceived as the most interesting

There were four main aspects that were perceived to be most interesting. Out of the four aspects, the highest cited aspect concerned information on sustainable palm oil products and companies (31%). This theme was found to be significantly different in terms of the number of responses between local and international. The Chi-square tests for independence conducted found that

international participants were significantly more likely to perceive that aspects relating to sustainable palm oil were the most interesting (41%) compared with locals (20%), X^2 (1, N=222)= 8.42 p = .003. This supported previous results that showed that international participants were more likely to mention sustainable products and labelling in response to knowledge about behaviour that supported orangutan conservation.   Many of these responses supported the findings about knowledge relating to brands and sustainable labelling, indicating that visitors added to their knowledge about brands or companies using sustainable palm oil.   Examples of the responses (aspects that were perceived most interesting) were:

> *Information on palm oil sources (International)*
>
> *Brands which use palm oil (International)*
>
> *Learnt about companies that used sustainable palm oil (International)*

The second highest cited aspect of the booklet was the information about orangutan threats (15%), which includes an astounding statistic obtained from WWF which indicated that for every minute, 56 football fields are being wiped out to make way for human activities (e.g., palm oil plantations). Some of the responses included astonishment, indicating that the first section of the booklet was successful in provoking participants. Examples of the responses were:

> *The amount of rainforest destroyed every minute*
>
> *Part about the football fields*
>
> *How much rainforest is eliminated in every minute*
>
> *Speed at which forest are disappearing*

The third aspect involved the responses based on general information about orangutans (11%). Local responses were more frequent in this category than international participants responses, where 12 local participants rated this aspect as most interesting, compared to only 5 international participants.   Interestingly, participants made comments that associated the orangutans with humans. Some of the responses included:

> *They are just like humans*
>
> *That female orangutans give birth once every 5-7 years*
>
> *That babies cry and smile*
>
> *They have feelings just like humans*

The fourth aspect was related to the design and illustrations of the booklet (5%). The responses mentioned that the reason that the booklet was interesting was due to the design aspects, such as the colours and/or presentation of the booklet. This was in direct reference to the peripheral cues that were used in this study. Examples of these responses are:

> *The layout and how the information is presented*
>
> *The pictures of orangutan, particularly the baby orangutans*
>
> *Graphics, illustrations and short facts*

5.3.2 Reasons why the booklet was interesting

Participants were also asked in an open-ended question about why they thought the booklet was interesting. A number of themes appeared and the most frequent response (31%) was that it provided new information about sustainable palm oil and products. A number of the participants were surprised when they found this new information about companies that used unsustainable palm oil, and indicated their support for choosing the right products. This was mostly expressed by international participants (41%). Examples of the responses included:

> *Because I did not know that there actually were companies (even big ones) that supported sustainable palm oil production*
>
> *Sheds light on household products and their ethics*
>
> *I found a product that I've been using but will stop using*

Some Malaysians also expressed their newfound awareness and/or understanding about sustainable palm oil, indicating that the booklet had a profound impact on the locals' knowledge and awareness relating to sustainable palm oil. Some indicated that they had no previous knowledge of sustainable palm oil products and were now aware of the impact of sustainable products on orangutan conservation. Examples of the responses from local Malaysians were:

> *Never been exposed to unsustainable and sustainable palm oil*
>
> *It is a new info for me. I never knew that products sold in everyday market or pasar[25] affects the natural habitat of wild orangutans before this.*
>
> *Sustainable palm oil is not a bad thing*

Participants also indicated that one of the reasons the booklet was interesting was due to the facts that were presented. The responses reflected emerging themes about the astonishment about the

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[25] "Pasar" is a local term referring to local markets.

facts presented, as well as its association with the football fields and the palm oil plantation image shown in the booklet. Examples of the responses included:

> *Clear visual to understand huge amount being lost*
>
> *A fact that is very clear and shows the reality of what is happening*
>
> *Statistics around their sustainability to survive in the wild if nothing is done to prevent further developments of unsustainable palm oil plantations*
>
> *Didn't expect that it is so much (Germany) (*assuming talking about the rate of extinction and habitat loss)
>
> *36 football pitches is such a shocking amount of land. Did not know it was so much.*

There were also responses that were indicative of the emotional impact the brochure had on participants. These were more likely the result of thinking that orangutans have "humanlike feelings", as well as feelings of sadness about the stories of baby orangutans and their loss of habitat. Some of the responses included:

> *Heart-warming and sad to know very few of the baby orangutans are around*
>
> *Understand more, increase emotion towards them*
>
> *It is an emotional story*
>
> *It gave me a better understanding about orangutans' plight*

Only one participant mentioned information about donations as a reason why the brochure was interesting. This is consistent with results that the booklet had no significant impact on the treatment group's donation behaviour.

5.3.3 Perceived ratings of understanding on orangutan conservation issues

Participants in the treatment group were asked to rate their understanding of behaviour related to protecting orangutans and their general understanding about orangutans. They rated eight statements on a five point Likert scale which ranged from 1=strongly disagree to 5=strongly agree. A tick-box stating "I am already well aware of this before" was also included for each statement. An independent sample t-test was conducted to assess the differences between local and international participants' responses. Those who responded "was already well aware before" were excluded from the t-test. Results are presented in Table 5.21.

Table 5.21: Perceived ratings of understanding on orangutan conservation issues

The brochure improved my understanding about:	Group	Mean and SD	% who was already well aware before	t-test output
1. the main threats of habitat loss in orangutans	International	Mean = 4.23 SD =.68	35	t (152) = -.90, p = .37
	Local	Mean = 4.33 SD =.75	15	
2. the many ways you can do to protect the orangutans	International	Mean = 4.12 SD =.72	9	t (192) = -2.221, p = .03* (Cohen's *d* = .33)
	Local	Mean = 4.34 SD =.63	4	
3. orangutans in general	International	Mean = 4.00 SD =.75	17	t (179) = -1.16, p = .25
	Local	Mean = 4.13 SD =.80	8	
4. the objectives of orangutan rehabilitation	International	Mean = 4.14 SD =.72	16	t (181) = -1.63, p = .11
	Local	Mean = 4.31 SD =.66	8	
5. supporting sustainable palm oil products	International	Mean = 4.43 SD =.77	8	t (193) = 2.619, p= .02 * (Cohen's *d* =.45)
	Local	Mean = 4.05 SD =.92	1	
6. sustainable palm oil labelling	International	Mean = 4.38 SD =.82	8	t (194)=2.619, p= .01 * (Cohen's *d* = .38)
	Local	Mean = 4.05 SD =.92	1	
7. what the donations will be used for (P-value for equal variances not assumed is reported)	International	Mean = 3.84 SD =1.00	8	t (192)= - 3.306, p = .001* * (Cohen's *d* = .47)
	Local	Mean = 4.24 SD =.66	3	
8. different ways of	International	Mean = 3.84 SD =.90	5	t (196) = -3.715, p= .000 ***

donating for orangutan conservation	Local	Mean = 4.27 SD =.75	2	(Cohen's d = .52)

International participants gave significantly higher ratings for their understanding of issues concerning sustainable palm oil products and sustainable labelling. Local participants rated significantly higher than international participants in terms of understanding what the donations will be used for, and whether they understood that they could donate in different ways. These results supported previous findings that suggested that international participants were more likely to support sustainable palm oil use, while locals were more likely to support donation behaviour.

5.4   Result summary

A summary of the impact of the intervention booklet on visitor's conservation learning outcomes is presented in Table 5.22.

Table 5.22 : Summary of the impact of the intervention on conservation learning outcomes in treatment vs control groups and local vs international participants

Learning outcomes	Differences between treatment and control [1]	Differences between local and international (in treatment group)
Knowledge		
General knowledge about orang-utans and existing threats	✓ (6/6)	4/6
Knowledge on impact of sustainable products on orangutan conservation	✓	✓
Open-ended responses in knowledge of behaviours relating to orangutan conservation	✓	✓
Rated knowledge scores (minimal to extensive knowledge)	n/a	✓
Perceived knowledge gain	✓	X
[2]**Attitudes (reported as composite)**		
Perceived learning outcomes (composite)	✓	✓
Anti-anthropocentric attitude (composite)	✓	✓
Protective nature (composite)	X	✓
Environmental activism (composite)	✓	✓
Individual responsibility (single item)	✓	X
[2]**Behavioural intentions**		
Donating time and money (composite)	X	✓
Supporting sustainable palm oil use (composite)	✓	✓
***Observed on-site behaviour**		n/a (as only less than 10 percent differences were found)
On-site donations	X (decrease of 1% in treatment)	
Signing petition	✓ (Increase of 4.1% in treatment)	

Taking a small leaflet to download palm oil apps	✓ (Increase of 2.1% in treatment)	
Taking leaflets containing information about sustainable palm oil * slight increase of participation of less than 10 percent	✓ (Increase of 6.6% in treatment)	

Note. Yes ✓ No X

[1] Differences denotes that participants in the treatment group scored higher than those in the control group.

[2] Composite scores were obtained based on factored items.

The findings from this study found that the intervention impacted positively on all learning outcomes, providing evidence that a theory based approach to the design of the booklet could potentially increase visitors' learning outcomes. The intervention led to significant increases in the treatment groups' knowledge across all nine measures, significantly higher positive attitudes for four composite attitudes and one single item measure, and significantly higher intentions to adopt conservation behaviour and to support sustainable palm oil use. Those in the treatment group were also significantly more likely to participate in on-site behaviour reflecting sustainable palm oil use, except for on-site donations.

This study also found differences in regard to the nature and extent of learning outcomes between local and international visitors. All measures of learning outcomes showed significantly different scores for local and international participants, excluding perceived knowledge gained and individual responsibility. Both local and international visitors that received the booklet perceived that their levels of knowledge had changed at a similar rate, and agreed that they had greater personal responsibility as individuals to be a part of the movement to save orangutans and their habitats. These results supported the reviewed literature about the differences between people from different countries, which was particularly noted on various measures that related to support for sustainable palm oil use.

Further findings from this study will be discussed in the next chapter.

CHAPTER SIX: THE IMPACT OF THE INTERVENTION ON VISITORS' CONSERVATION LEARNING OUTCOMES

6.0   Overview and structure of the chapter

This study aimed to explore the impact of an orangutan wildlife experience and interpretation on local and international visitors' knowledge, attitudes, conservation intentions and on-site conservation behaviour. The specific study aims were to:

1. ascertain local and international visitors' knowledge and beliefs about orangutans, existing threats to their habitat loss, and conservation behaviours linked to orangutan conservation;

2. develop an interpretive intervention that builds on visitors' knowledge and beliefs about orangutans and orangutan conservation, addressing their misconceptions, and promoting behaviour that support orangutan conservation;

3. assess the impact of the belief-based approach to interpretation on the conservation learning outcomes of local and international visitors; and

4. explore the implications of the research findings for the design of visitor interpretation to support orangutan conservation.

As discussion relating to Aim 1 and 2 has been presented in Chapter Four, this chapter focusses on the impact of the intervention on the conservation learning outcomes for visitors (Aim 3 and Aim 4). The discussion is guided by four research questions:

1. What is the potential impact of an interpretive booklet on visitor's conservation learning and conservation behaviour? (RQ4)

2. Do local and international visitors differ in regards to the nature and extent of their learning based on their visit? (RQ5)

3. Is the impact of the intervention different for local and international visitors? (RQ6)

4. What aspects of the booklet do visitors find most interesting? (RQ7)

Section 6.1 discusses the potential impact of the interpretive booklet on visitor's conservation learning and behaviour (RQ 4).   Section 6.2 discusses the differences between local and international visitors in regards to the extent of their learning from their visit (RQ 5) as well as whether the intervention impacted differently for local and international visitors (RQ 6). Section

6.3 discusses the aspects of the booklet that were perceived to be most interesting (RQ 7). The chapter concludes by presenting recommendations and guidelines for the design of visitor interpretation to support orangutan conservation (Aim 4).

6.1 The potential impact of the booklet on visitors' conservation learning and conservation behaviour

Many studies have assessed visitor learning outcomes after a wildlife experience (including aspects of interpretation), but there have been few attempts to systematically design and test an intervention aimed at enhancing visitors' learning outcomes at wildlife sites. This has limited our understanding of *how* to design interpretation that encourages visitors to support wildlife conservation.

This study shows that using a belief-based approach to design interpretation is clearly effective. The procedures in Stage Two used the "cued testing" approach (Shettel, 2001) and found that the booklet has the potentially to increase the learning outcomes of visitors. That is, the booklet can increase visitors' knowledge about orangutans and orangutan conservation, as well as enhance their attitudes and intentions to support orangutan conservation. The booklet was also able to address misconceptions of local visitors. More importantly, the intervention booklet shows the potential to impact on actual behaviour relating supporting sustainable palm oil use.

This discussion will begin by outlining the impact of the booklet on visitors' knowledge.

6.1.1 Impact of the intervention on knowledge

Previous studies have shown that wildlife experiences, particularly those that give visitors opportunities to engage emotionally with wildlife can raise the visitors' awareness of wildlife issues (Myers, Saunders, & Birjulin, 2004). Researchers have argued that with or without interpretation, knowledge changes are likely to occur because visitors reflect on new ideas (Ballantyne, Packer, & Falk, 2011), and combine these with previous experiences. However, the findings in this study suggest that the inclusion of an interpretive booklet as part of the experience has considerable potential to impact on visitors' general and specific knowledge about orangutans and orangutan conservation. This impact is greater than simply participating in the orangutan experience without a booklet.

This study found that those who received the intervention booklet perceived that their knowledge had changed significantly compared to those who did not receive the booklet. This is supported by findings that show that those who received the intervention scored higher on the items designed to measure general knowledge about orangutans, despite the fact that some of this

information was also presented on the on-site interpretive panels. This suggests that although all visitors were exposed to the on-site interpretive panels, the booklet reminds visitors about the specific facts about orangutans and reinforces their knowledge about orangutans. This corroborates with other wildlife studies that have found an increase in visitors' knowledge following exposure to an interpretation (Adelman et al., 2000; Orams, 1997; Pearson et al., 2013; Tisdell & Wilson, 2005).

The important key finding of this study is that the intervention booklet had significantly increased the treatment group's specific knowledge about sustainable palm oil production and orangutans in general. The group's responses demonstrated that they gained specific knowledge and understanding of the positive impacts of sustainable products on orangutan conservation. This suggests that the booklet was able to generate a greater depth of understanding of the term 'sustainable' and the role of sustainable products in orangutan conservation. The fact that those in the control group scored lower in the general facts section, and provided fewer suggestions about how to support the use of sustainable products suggested that the information currently provided did not enhance visitors' knowledge about orangutans and orangutan conservation. These findings showed that the booklet was able to add to knowledge about the role of sustainability in orangutan conservation. In Stage One, the results showed that the current experience was not able to help visitors understand more about orangutan conservation, therefore although exposure to the booklet was only brief, the visitors understanding about the role of sustainable products for orangutan conservation provided new evidence that the booklet added to the experience of assisting visitors to understand about orangutan conservation.

An increase in specific knowledge for the treatment group members was further supported by results from responses to the open-ended question that tested participant's knowledge about conservation behaviour. Participants who were given the intervention provided specific references to behaviour that related to orangutan conservation. These responses often indicated deep concerns and referred to specific examples of products, brands and companies that were featured in the booklet. Although nearly one third of those in the control group also stated examples of specific behaviour relating to responsible purchasing, their responses rarely mentioned products or brands. This is an important finding as this shows that the booklet was able to add to the visitors' knowledge about the list of products or brands that supported or used sustainable palm oil and to link this obtained knowledge (about examples of products) with their individual knowledge about sustainable purchase behaviour. Based on their model of Responsible Environmental Behaviour, Hines, Hungerford and Tomera (1987, p. 3) stated that, "those individuals with greater knowledge of environmental issues and/or knowledge of how to take actions on those issues were more likely

to have reported engaging in responsible environmental behaviours than those who did not possess this knowledge". The findings in this study corroborate this by showing that visitors who were given the booklet possessed greater knowledge about specific brands or products to enable them to act accordingly (i.e., purchase those specific products). Without possessing the knowledge of specific brands, visitors would be unlikely to be informed about which products that they needed to avoid.

There is a reticence in research that seeks to evaluate people's knowledge about orangutans and understanding of sustainable palm oil (Pearson et al., 2013). Findings in this study have shown that an increased knowledge about orangutans and orangutans conservation as a result of the use of the booklet indicated that people's current knowledge about orangutans and issues surrounding the conservation of orangutans can still be improved. Therefore, it is necessary to include additional information, such as the important role of sustainable purchasing in orangutan sites as this can potentially assist visitors to understand more about the conservation of orangutans.

6.1.2 Impact of the intervention on attitudes

Findings from this study have shown that the booklet has the potential to impart greater (or deeper) conservation attitudes for visitors. This is shown through the findings that have shown significant differences between the treatment and control groups for four composite attitudes (i.e., perceived learning outcomes, anti-anthropocentric attitudes, environmental activism and individual responsibility). Only one measure reported no significant difference between the treatment and control groups, which related to protective nature attitudes. These findings are further discussed below.

In terms of protective nature attitudes, both groups showed high support for items that reflected a general desire to protect and conserve orangutans (i.e., we have the responsibility to leave healthy ecosystems for our families and future generations; we need to help protect orangutan habitats; wild animals, such as orangutans, should not be held captive and sold as pets). This is not surprising as the fact that the current site (Sepilok Orangutan Rehabilitation Centre) is a wildlife rehabilitation site most likely attracted a segment of visitors who were already predisposed with positive attitudes toward protecting and conserving wildlife, as found in other studies (Lukas & Ross, 2005). The tendency to be caring towards nature (Leiserowitz, Kates, & Parris, 2005) and wildlife may explain why no significant differences were found between the treatment and control group for 'protective nature'. Both groups indicated high composite scores for protective nature attitudes (mean difference of 0.13 between treatment and control group); which signifies that their

conservation attitudes were already high before the visit. Consequently, only a minimal additional increase was likely as a result of exposure to the booklet. This 'ceiling effect' was reported by Hughes (2009), who found no difference in pre- and post-visit conservation attitudes of visitors to a wildlife site and concluded that such sites might attract visitors who already have high tendencies toward conservation. Additionally, positive attitudes are more likely to be observed with mammals and other attractive animals (Kellert, 1980; Kellert, 1993), and that despite differences between cultures or geography, people generally have positive attitudes towards wildlife conservation (Gunnthorsdottir, 2001; Harcourt, Pennington, & Weber, 1986; Udaya Sekhar, 2003). This was corroborated in findings from this study as conservation attitudes towards orangutans are likely to have at "ceiling effect", and that a further increase in positive attitudes as a result of the booklet were unlikely.

Although visitors in both groups were found to have high conservation attitudes toward protecting orangutans, findings in this study showed that visitors who were given the booklet were more likely to have higher anti-anthropocentric attitudes and support for environmental activism. Both these variables prioritised the importance of orangutan habitats over developments, signifying increased views for anti-anthropocentric, and indicating non- support for forest clearance and using orangutan habitat for illegal logging and palm oil development. Thus, providing information on the effects of human activities seems to increase positive attitudes towards protecting orangutan habitats. This shows the importance of designing interpretation that makes a connection between the audience and the site or animals that are viewed. As Tilden (2009) stated, "Any interpretation that does not somehow relate to what is being displayed or being described to something within the personality or experience of the visitor will be sterile.' (p. 14).

The higher level of anti-anthropocentric attitudes and support for environmental activism mainly reflected attitudes that prioritise the importance of orangutan habitats over economic developments also shows that the booklet was able to potentially prioritise the conservation of orangutans due to their threatened status. This supports Ballantyne et al.' s (2007b) claim that certain species or animals have greater influence on the public's general concerns about protecting a particular animal species. Clayton et al.'s (2009) and Myers et al.'s (2004) research also found that there were heightened concerns for primate species (i.e., gorilla and baboons). As discussed in the literature, orangutans are highly charismatic species due to their humanlike features and behaviours (Schwartz, 1987). It has also garnered much attention over the years due to issues relating to the use of palm oil. Consequently, orangutans are one of animals that are often associated with anthropomorphism (Weiss et al., 2012), particularly because of their physical similarities to

humans. The term 'anthropomorphism', defined as, "…attribution of human characteristics to nonhuman things or events" (Mitchell, Thompson, & Miles, 1997, p. 51).   Anthropomorphism is often discussed as seeing animals from their point of view or to give voices to animals (Bekoff, 2002). Therefore this term is often used in the fight for animal rights, on the basis that animals are also able to feel pain and sadness, therefore deserving of moral care and concerns from humans (Waytz, Cacioppo, & Epley, 2010). Empathetic comments extracted from the treatment group using open-ended questions in response to the question: Why was the booklet interesting? indicated that participants related to orangutans with attributes such as relating them to infancy and having humanlike feelings. These included comments such as;

> "heart-warming and sad to know that few of the baby orangutans are around"
> "feelings like humans"
> "provide more insight on information about orangutans, and I never knew about them, 5-7 years for 1 baby ☹ (symbol for sad was drawn by participant)"

This suggests that that the booklet, which also noted the story of Ceria—the orphaned baby orangutan found barely alive in an oil palm plantation—was able to increase sympathetic feelings and positive attitudes toward protecting the habitat of the orangutans as well as saving orangutans from extinction. This finding also related to other studies, where visitors' identified with the struggles faced by sea-turtles and whales. In their study, Ballantyne, Packer, and Sutherland (2011) visitor responses such as, "The determination of the turtle to get up the beach and to lay her eggs. I didn't like the torch lights being shined on her. I thought she must be very scared" (p. 5) and "I feel as they [whales] do not have a voice, it's up to us to speak for them and defend their right to live in peace (p. 6)", suggested that visitors' identified with animal struggles and strongly sympathised with them. The current study findings showed higher anti-anthropocentric attitudes and environmental activism attitudes for those who received the intervention. This shows that it is likely that visitors viewed themselves in the same place as orangutans and were able to sympathise with the threats faced by them.

However, higher levels of anti-anthropocentric attitudes and support for environmental activism was not surprising as the questions posed were specific to orangutans, and visitors' had just observed them and the efforts that are being made to rehabilitate orangutans into the wild. It is possible that if the questions were directed towards a different flagship species that were not observable in the study site (e.g., Borneo Hornbills), visitors might demonstrate lower anti-anthropocentric attitudes or environmental activism attitudes.

Another key finding that provided evidence on the potential impact of the booklet on visitor attitudes was the fact that those who were given the intervention were more likely to perceive they have acquired higher learning outcomes from the visit, compared to those in the control group. This included perceiving that they have a better understanding of orangutan conservation issues, to have learnt new facts about orangutans, to have become more concerned about orangutans and wildlife in general, and also perceived that some of their beliefs have changed as a result of the visit. Results that show the booklet was perceived to improve understanding in participants on various orangutan conservation issues (mean scores ranging from 4.3-4.8 on a 5 point Likert scale) and positive comments on the booklet that it helped to increase their understanding;

"understand more, increased emotions towards them"

"tells me more about the main factors of habitat loss in Malaysia",

"gives me more input about orangutans"

These statements supported that there were higher levels of perceived learning outcomes among participants. This corroborated with the current literature that found visitors in various wildlife settings (captive, non-captive and controlled settings) have reported positive learning outcomes from their visit, which was attributed to exposure to interpretive content during the experience (Moscardo, 2007). However, there are still limited information about which specific interpretive content was likely to influence these learning outcomes. This study provided further evidence that indicated that there were higher levels of perceived learning outcomes for the treatment group participants that was due to exposure to the booklet content.

An interesting finding was that those who received the booklet also expressed significantly higher agreement with the statement '*I am part of the solution to orangutan's problems*'. This was important, because unless respondents feel responsible and empowered, they are unlikely to act. It is likely that the booklet theme of '*You can make a difference*' that was emphasised in the content would have assisted in this regard. Some of the open-ended responses obtained in the study supported participant's acknowledgement of individual responsibility to be a part in the conservation of orangutans. This included responses such as:

"Because I can do something about it in the long run"

"It makes me aware to conserve and contribute to taking care of orangutan to avoid extinction"

The discussion so far has discussed the potential impact of the booklet to increase knowledge and to develop positive attitudes to protect and conserve orangutans. The discussion will now discuss the

potential impact of the booklet to impact on behavioural intentions for behaviour that supported orangutan conservation.

6.1.3   Impact of the intervention on behavioural intentions

Most of the studies in interpretive wildlife experiences have found that conservation-focused interpretation increases visitors' intentions to adopt environmentally-friendly behaviours (e.g., Hughes, 2013; Jacob & Harms, 2014) and to protect wildlife (e.g., Orams, 1997; Adelman et al., 2000). This was also found in this study, where findings showed that an intervention designed using beliefs, particularly beliefs about supporting sustainable palm oil was successful in increasing specific behavioural intentions. Visitors who received the intervention were significantly more likely than those in the control group to list intentions that specifically reflected their support for sustainable palm oil. These included: 1. downloading an app to check for sustainable palm oil labelling'; 2. actively seeking information on sustainably sourced products; 3. buying products that use sustainable palm oil; and 4. spreading the word to others about the impact of unsustainably sourced palm oil products.

These intentions were aligned with messages in the booklet that highlighted the connection between the major threats (i.e., production of unsustainable palm oil is the biggest threat to orangutan habitat), and individuals' responsibilty and their beliefs (e.g., buying sustainable palm oil products ensures that orangutan habitats are protected). This suggests that the treatment group's intentions were aligned with an increased understanding of the impact of sustainable products, an increase in their product knowledge and an increase in their anti-anthropocentric and biocentric attitudes. This supports previous studies in wildlife tourism that have found the positive impacts of interpretive wildlife experiences on visitors' conservation knowledge, attitudes and behavioral intentions (e.g., Powell and Ham, 2008; Falk et al., 2007). Similarly, the intervention in this study has prompted an increased depth of knowledge, and increased positive attitudes towards protecting orangutan habitats from developments, further prompting increased intentions to support sustainable palm oil production.

Though the booklet helped to increase the intentions for supporting sustainable palm oil use, these intentions were not evident in the behavioural intentions to donate time and money for orangutan conservation. Findings showed that the intervention did not impact on behavioural intentions relating to donating time and money for orangutan conservation. There were no significant differences between the treatment and control group on the four specific behaviours reflecting the donation of time and money (i.e., joining fundraisers, seeking more information

about orangutan conservation, giving online donations, and becoming a member of an orangutan organisation).

Some scholars have suggested that stated intentions might relate to whether the behaviour was considered to be 'high' or 'low' effort. Generally, visitors seemed to be more likely to make a commitment to carry out behaviour that required low effort and required fewer resources (time and money) (Ardoin et al., 2015; Schultz & Oskamp, 1996). This was supported by the results from this study that showed that both treatment and control group participants gave a mid-point score ranging from 3.50-4.50 on the 7 point scale to behavioural intentions that reflected future online donations, joining fundraisers to raise funds for orangutans, or becoming members of orangutan organisations that supported orangutan conservation. These behaviour requires high effort, and visitors may be required to donate additional money to orangutan organisations, and spend a significant amount of time and money to participate in volunteering programmes through orangutan organisations, or organising/joining fundraising events.

Results from the question relating to the behavioural intention of supporting sustainable palm oil use, also included the statements, 'buying products that use sustainable palm oil' and 'actively seeking information about palm oil' and this contradicted the notion of 'high and low effort' behaviour. Buying sustainable palm oil is considered high effort behaviour as certified sustainable palm oil is more expensive. Therefore, companies who used certified sustainable palm oil were more likely to be international brands that were more expensive, as exemplified in the booklet "examples of products and brands". High effort was also needed to actively seek information about companies and brands that used certified sustainable palm oil as this took substantial amount of time to research and compare brands.   However, those who received the intervention were significantly more likely to agree to act on this theme of behavioural intention. It could be that some of those participants were already actively buying products that were sustainable, which is a habitual behaviour (Heimlich & Ardoin, 2008), and that the additional knowledge about new products that were indicated in the booklet increased their intention to buy sustainable products. This was supported in Hughes' (2013) study, where she found that some families had increased intention to increase behaviour that was regarded as high effort behaviour, such as using minimal packaging, reusing containers and composting, as families were already performing these types of behaviour out of habit.   This suggests that the booklet may act as reinforcement and a reminder to continue behaviour that were supportive of sustainable products.

The findings from this study that are related to behavioural intentions, may also suggest that there is a need to explore the nature of conservation behaviour itself, specifically whether the

behaviour explored was indicative of short or long term effort. For instance, in this study, donating time and money was indicative of one-off, short term effort as donations were portrayed to buy daily food for the orangutans; while supporting sustainable palm oil behaviours are more indicative of more long-term positive effects toward protecting orangutan habitats. Results from this study showed that the intervention had no impact on composite scores for donating time and money behaviour. This was supported by the findings that showed that only one participant indicated that "giving donations" was the main reason that the booklet was interesting. Rather, findings across a range of measures in this study, such as increased knowledge about conservation behaviour, increased anti-anthropocentric and environmental activism attitudes suggested that the booklet may have impacted more on behavioural intentions that are more indicative of long-term effort such as purchasing sustainable products, downloading apps and actively seeking information about sustainable palm oil. As stated previously, further research is needed to further explore these two main types of conservation behaviour.

It is also possible that the design of the intervention itself created bias in the treatment group, specifically relating to issues surrounding orangutans – such as palm oil expansion. In the beginning, the booklet highlighted issues relating to deforestation and associated deforestation with a picture of a palm oil plantation and a story about an orphaned orangutan named Ceria being found in an oil palm plantation. This was designed to arouse the readers' emotions. The treatment group members emotions may have been impacted more strongly as the intervention portrays the negative impacts of unsustainable palm oil products and its impact on orangutan habitats. This was supported in this study as the findings showed that the highest response (in response to the aspect of the booklet that was interesting and reasons why) was due to information about sustainable palm oil. The responses showed the participant's surprise and newfound awareness about the effects of unsustainable palm oil (e.g., I was not aware of the damage caused through palm oil production, didn't realise the severity) suggested that the booklet may have aroused strong emotions relating to issues surrounding sustainable palm oil. This suggests that the use of persuasive elements is important to help visitors associate with what they can do. Meanwhile, donation behaviour were highlighted in the latter section of the booklet and featured less shocking or confronting images and facts.

The intervention's lack of impact on donation intentions could possibly be linked to beliefs about trustworthiness and whether the visitor's time and money were being well spent. Individuals have no control over their donations once they are processed and hence, may feel dis-empowered over their choices. Such beliefs may be hard to change, particularly when people are exposed to

media stories about environmental organisations abusing donations, making profits out of donations, or fundraising only for a 'greener' image (MacDonald (2008). Thus, with donation behaviour, it might be worthwhile for wildlife sites in non-Western countries to invest in programmes or campaigns that highlight their credibility and trustworthiness, as international visitors may have uncertainty about supporting organisations outside of their home country.

The discussion to this point highlights the positive impact of the intervention booklet on visitors' knowledge, attitudes and behavioural intentions relating to orangutan conservation. Many scholars have argued, however, that positive intentions are not necessarily translated into actual behaviour. The following section will discuss whether the increased intentions from treatment group members is expressed as actual on-site conservation behaviour.

6.1.4   Impact of the intervention on observed on-site behaviour

Most studies concerned with wildlife or environmental conservation behaviour have relied on self-reports of actual behaviour (Gagnon Thompson & Barton, 1994; Hughes, 2013; Smith et al., 2008). There is a longstanding argument about the 'intention-behaviour gap', with researchers reporting that there may not be changes to actual behaviour despite individual's stated intentions. Self-reports of behaviour may also be affected by social desirability bias, where participants falsely report that they engage in responsible conservation behaviour as a way of being viewed as good individuals.

Although this study found that there was an increase in knowledge, attitudes and behavioural intentions for participants who received the intervention, there was little evidence to indicate that the intervention had impacted on actual on-site behaviours, particularly on-site donations. This was observed for both local and international respondents. Therefore, the discussion pertaining to the impact of the intervention on observed on-site behaviours will be discussed generally, which includes both the local and international visitor's responses.

Findings from this study relating to the impact of interpretive wildlife experiences corroborates with other studies that reported that fewer than 10% of visitors carry out actual behaviour post-visit (Ballantyne, Packer, & Falk, 2011; Hughes, 2013). This is especially true in regard to donation behaviour, where less than 3% from each group (treatment and control) were observed to make on-site donations, despite participants from both groups stating that they intended to donate money. Surprisingly, there were more participants in the control group, rather than in the treatment group who donated. Only one local participant in the entire sample made a donation during the entire data collection period.

This study finding corroborates with Sgalitzer, Brownlee, Zajchowski et al. (2016) study that found that only 8.8% of tourists made on-site donations. They attributed this gap between intentions and donation behaviour to the tourist constraints. In the current study, fewer than 5% of participants donated, this low level may be attributed to the fact that the current on-site donation and adoption costs are very expensive, even for international visitors. Adoption costs for one orangutan are about RM200-300 (approximately AUD $60-90) per month. Such donation schemes that require visitors to pledge a certain amount over a certain period of time (such as for adoption) may be too daunting. For some local visitors, even donating RM10 (approximately USD $4.5 or AUD $3.5) may be considered too costly as they have already purchased tickets which they consider as a contribution to the centre.

The findings in regards to on-site donations was further investigated by sending an email to the liaison officer from the Orangutan Appeal UK who ran the donation booth during the data collection period. The liaison officer stated that they did not receive donations daily (personal communication, September 17, 2015). As communicated in the email:

'I don't get donations every day. Sometimes I get 50 RM, sometimes people give less than 5RM, or 10 RM. I think in the average week I might get 40 RM. I don't get many donations from Malaysians, and not many adoptions either-I have had maybe 8 Malaysian adoptions in the three months that I have been here. Maybe the price of 200 RM or 250 RM is too expensive for locals. The centre also has a donation box in reception. I just asked them for you. They said they usually get 30 - 40 RM per week and it's mostly from orang putih[26], same as ours! (Personal communication, September 17, 2015)

The low levels of donations might not be due to the lack of awareness, as the donation centre booth is open daily with attractive banners featuring appeals from Orangutan Appeal UK Representatives at the Centre. These leads to several recommendations for an on-site donation programme that will be discussed further in section 6.4.

The theme associated with support for sustainable palm oil usage showed a much more positive impact. Those in the treatment group were significantly more likely to sign petitions and take additional information in the form of leaflets about palm oil, as well as the list of relevant products/companies. However, the number of actual participants in the treatment group who were observed signing petitions and taking leaflets were less than 10 percent in each behaviour category.

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[26] 'Orang putih' or 'mat salleh' is a name frequently used by local people to refer to foreign visitors or Westerners.

There are a number of possible reasons why this uptake of these behaviours was low. Two reasons that could help explain this findings in this study are the difficulties in carrying out the behaviour (Ballantyne, Packer, & Falk, 2011) and situational factors, constraints or contextual factors (Ajzen & Fishbein, 1980; Hines et al., 1987; McKenzie-Mohr, 2003). The observed on-site behaviour reported in this study was more likely explained by the latter. Excluding donations, other on-site behaviour was viewed as low effort behaviour. Signing petitions only required participants to jot down their signature and country of origin, while the other two types of behaviour only needed visitors to take a leaflet. Hence the explanation that the behaviour was 'difficult' or 'high-effort' was unlikely. This particular finding raises a further question. If the visitors indicated relatively high support for the intention to support the use of sustainable palm oil, why were they so reluctant to sign petitions, even if this was relatively easy to do?

It is not possible to answer this question as the current study did not assess initial beliefs specific to the behaviour relating to signing petitions. However, these findings support previous studies on petition signing. For example, Oegema and Klandermans (1994) found that despite previous willingness to support campaigns or petitions, as well as the nature of the 'low effort' behaviour of signing a petition, there was still low actual participation. The researchers believed that one of the reasons for this may be the individual's social environment, where if the social environment is unconcerned about certain issues it leads to a low level of preparedness to act. They further stated that even a poorly executed campaign can be well-received if individuals have a high level of preparedness due to an encouraging social environment (Oegema & Klandermans, 1994). This suggested that visitors who travelled together in a social or tour group may be more likely to sign petitions if their friends/family do so. During the observation, there were some participants who were observed urging their friends to sign the petitions; however, there was not enough evidence to support this assumption, since this would require observation data that identified participant numbers and with whom they are travelling. Perhaps orangutan sites might create an encouraging social environment by highlighting the increasing number of visitors who have signed a petition to support sustainable palm oil industry.

Although the treatment group was significantly more likely than the control group to take a leaflet, this was still less than 10% of the group. The actual behaviour of taking additional a leaflet can be linked to the behavioural intention results relating to, "actively seeking information on sustainably sourced products", with participants in the treatment group showing significantly higher intentions than the control group. This showed that although intentions were high, actual participation that reflected these intentions was low, corroborating the long-standing argument of

the 'intentions-behaviour gap' (Darker et al., 2010; Mohiyeddini et al., 2009; Sheeran, 2002; Sniehotta et al., 2005). However, there is reason to believe that the findings in regards to low participation of on-site behaviour should not be viewed negatively.

This was because, firstly, the behavioural intentions measured were more likely to be carried out at home, and it is possible that individuals will still perform the behaviour after the visit. Secondly, the booklet contained several websites; hence visitors who received the intervention may not have felt the need to take additional leaflets on-site. In addition, current technology such as smartphones, iPads and social networking makes it easier for visitors to find out information about issues such as sustainable palm oil in their own time, rather than in the form of a hardcopy (Castells, 2002). Additionally, visitors were also travelling and may not want to carry around different paper handouts, in addition to the booklet that they had already received.

Although this study found promising results relating to higher levels of knowledge, attitudes and behavioural intentions, the impact at actual on-site behaviours were minimal. While it is tempting to state that the results in this study supported the widely held belief that increased attitudes and intentions do not always lead to actual behaviour (Kollmuss & Agyeman, 2002; Sheeran, 2002), there may be other factors at play.

Firstly, there is a need to assess post-visit behaviour associated with supporting sustainable palm oil, such as the actual purchase of sustainable palm oil products. If individuals with no economic constraints did not change their purchase behaviour over time, then it may lead to the support for the widely held notion that people, despite their knowledge and positive attitudes will not change their actual purchase behaviour to protect orangutan habitats.

Secondly, other factors or conditions may be added or combined with the booklet to increase the actual uptake of conservation behaviour. This study was only able to explore the impact of one intervention on a limited number of actual behaviours. Jacobs and Harms (2014) argued that combining different conditions in the interpretation might lead to different behavioural outcomes. These included conditions/factors that have received positive results in previous studies, such as access to post-visit resource kits (Hughes, 2013), environmental education (Farmer, Knapp, & Benton, 2007), providing opportunities to interact with wildlife (Orams, 1997; Russel, 1995), and providing incentives and compensation for wildlife conservation (Goffredo, Piccinetti, & Zaccanti, 2004; Stern, 2006).

The findings from this study have suggested that interpretation in wildlife settings leads to positive learning outcomes. This includes reinforcement and enhancement of visitor's environmental knowledge, attitudes, behavioural intentions, as well as on-site behaviours -although

engagement in the latter was extremely small. Nevertheless, these findings supported positive outcomes of interpretation found in previous wildlife studies (e.g., Ballantyne, Packer, & Falk, 2011; Hughes et al., 2011; Powell & Ham, 2008; Tisdell & Wilson, 2005). Those exposed to belief-based interventions exited the orangutan site with greater knowledge about orangutan conservation, demonstrated greater knowledge about products and brands that were sustainably sourced, increased positive attitudes about their role as individuals to conserve orangutans, and had greater intention to support sustainable palm oil behaviours.

6.2   Local and international visitors' differences in conservation learning outcomes

In Stage One, a number of key differences and similarities were found in local and international visitors in terms of their depth of knowledge about sustainable palm oil and conservation of orangutans, and their beliefs around two behaviour themes; supporting sustainable palm oil and the donation of time and money. These findings were then used to develop an intervention booklet that was tailored to address the knowledge and salient beliefs of each group. The previous section ascertained that the booklet potentially impacted on the positive learning outcomes, however it was interesting to note that the intervention booklet impacted differently on the two groups. Significant differences were found between the two groups in their post-visit knowledge, attitudes and behavioural intentions. In fact, the only similarity that both groups possessed was in regard to the general knowledge that both groups had due to relatively high scores. This supported the previous results obtained in Stage One, where international respondents were found to have deeper understanding of orangutan conservation, and displayed strong beliefs about being advocates for the support of sustainable palm oil. On the other hand, while locals were found to be as supportive as international visitors in regard to supporting behaviour such as sustainable palm oil and making a donation, they had less knowledge about orangutan conservation behaviour and less profound understanding and knowledge surrounding the term 'sustainable palm oil', compared to international visitors. These differences are likely to result in significant findings that there are different levels of post-visit knowledge, attitudes and behavioural intentions. This will be discussed further below.

6.2.1   Local and international differences in knowledge

The intervention increased knowledge about orangutans and their conservation in both groups, however, post-visit levels of knowledge were at different levels. In regard to general knowledge about orangutans, both groups had the same understanding; however they had different perceptions about threats to orangutans' habitats and behaviour that supported sustainable palm oil use.

In regard to general knowledge, more than 70% from each group correctly answered the questions that assessed information which was included in the booklet. This showed that the intervention was able to positively result in an increase in general knowledge about orangutans for both groups; however, there was one exception. Locals still scored significantly lower than internationals in regard to general facts about the orangutans' DNA; although, these differences were small. It is possible that some may have missed reading this information due to time constraints as this information was located at the back of the booklet. It is also possible that locals have limited understanding of the term DNA, as found by Haron et al.'s (2005) study in relation to the low understanding of Malaysians about environmental terms (e.g., CFC); however this was unlikely as current on-site panels and the booklet provide explanations by indicating that orangutans were the most similar species to humans.

In terms of local and international visitor's knowledge about threats to orangutan habitats, this study found that differences in respondent perceptions for factors that can lead to habitat loss for orangutans. Although more than 85% from both groups thought that tropical forest clearance was the main threat to orangutan habitats, there seemed to be a difference of opinion between local and international visitors in terms of factors that were perceived most important when contributing to orangutan habitat loss. International participants showed more agreement in their views about habitat loss, with almost the entire sample stating that palm oil plantations were the main reason for orangutan habitat loss. They (international participants) were also more inclined than local participants to strongly identify with using sustainable palm oil products for the conservation of orangutans.

It is also interesting to note that international participants in the control group rated the importance of using sustainable palm oil products higher than the local participants who received the intervention. This suggests that international visitors had existing knowledge about responsible purchasing and therefore, strong beliefs about supporting sustainable products. This explains why in Stage One, the international participants suggested that they strongly advocated for the use of sustainable palm oil. Locals, despite being given the intervention, had differing opinions, stating that a combination of factors such as forest fires and housing development were the main factors

leading to orangutan habitat loss. This suggests that despite the booklet's messages, locals did not see a strong link between palm oil plantations and habitat loss.

These differing opinions about causes for habitat loss may be due to exposure from the media, particularly for international visitors. As previously discussed, international media coverage and campaigns by orangutan conservation organisations that are based offshore are likely to have contributed to these views. Therefore they may be more likely to be exposed to information relating to the negative impact of deforestation. This corroborates with Reynolds' and Braithwaite's (2001) study, that the popularity of species conservation is linked to how widely it is covered in various media. Orangutans comprise a highly popular species that, due to their charisma, are frequently showcased in international English television documentaries (e.g., BBC Orangutans television series) alongside famous celebrity support (e.g., National Geographic featuring celebrity Michelle Yeoh) (BBC, 2009, 2016; NatGeoTV, 2014) and in the social media (e.g., Facebook page, Instagram and Twitter). While this certainly has raised the profile of orangutan popularity internationally, it has also sparked an ongoing debate about whether the relationship between orangutan survival and palm oil has been over-sensationalised throughout the years (Koh & Wilcove, 2007; Stone, 2007). International visitors who have been often exposed to negative and misleading media portrayal about orangutans that were found killed in palm oil plantations may lead them to have strong views about the negative effects of palm oil.

Whilst almost all international visitors perceived that palm oil plantations were responsible for orangutan habitat loss, just over half of the locals thought that forest fires and housing development were the most important factors impacting on orangutan habitats. This result was consistent with those found in Stage One, suggesting that this is a common view among Malaysian and Indonesian citizens, and that their opinions were not affected by the intervention.

Although it is tempting to label these views as misconceptions, Fitzherbert et al. (2008) stated that there has been limited data about palm oil expansion contributing to orangutan habitat loss, and that other factors such as illegal logging and forest fires also caused habitat loss (Nellemann, 2007; Suzuki, 1988; Swarna Nantha & Tisdell, 2009). Hence, we cannot state conclusively that palm oil was the main contributor to orangutan habitat loss, as current data are still vague. For the past few years, Malaysia and Singapore have suffered critical smoke haze due to forest fires in Indonesia (The Star, 2015). The haze has been dubbed as a 'yearly event' and there has been huge local and international media coverage as well as social media posts on forest fires and haze, particularly in 2015 (AlJazeera, 2015; BeritaHarian, 2015). This could be the reason why

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local citizens have attributed orangutan habitat loss to forest fires and other factors, rather than palm oil developments.

The local visitors differing views about the most important factor relating to orangutan habitat loss may also explain their beliefs reflecting "Malaysia as biggest palm oil producer/supporting country's economy" that was found earlier in the beliefs elicitation (Stage One). Locals may be hesitant to hold negative views about palm oil development, as they perceive that this was the main factor that contributed positively to Malaysian economic development. Cognitive dissonance theory suggests that people usually will hold onto attitudes or beliefs that are consistent with their current beliefs to avoid negative feelings such as uneasiness over not being honest with their beliefs (Festinger, 1962). Therefore, locals may be hesitant to reflect negatively views about the palm oil industry as they may be inconsistent with their current beliefs.

In terms of knowledge about conservation behaviour, international participants who received the intervention were found to list more specific conservation behaviour with regards to using or buying sustainable palm oil products, and avoiding or minimising consumption of palm oil products. They also provided more specific, in-depth information regarding conservation behaviour, and these were indicative of examples of sustainable products. Responses from locals on the other hand, were minimal. This is an important finding as this indicates that when visitors come with already high baseline knowledge about supporting sustainable products, the intervention prompts responses that reflect these types of behaviour. Therefore the booklet which contained strong messages promoting the use of sustainable palm oil products may have reinforced international visitors' knowledge, and gave them confidence about talking about carrying out specific conservation behaviour.

Open-ended responses that related to knowledge about conservation behaviour indicated that international participants who were in the intervention group expressed a strong desire to be advocates for supporting certified sustainable palm oil through statements as, *Buy sustainable palm oil products, adopt an orangutan, put pressure on big companies and government for sustainable palm oil products* (England), *Do not buy non-certified palm oil* (Denmark). This supported Grunert, Hieke, and Wills (2014) study, which found that people from different countries have different levels of understanding about sustainable food labels. Those from UK and Germany were found to have a higher level of understanding, concern and familiarity with sustainable food labels. The sample of international participants in the current study had a substantial proportion of British and German respondents, which would account for their support, and confidence for their future use of sustainable palm oil products.

On the other hand, local visitor responses that related to knowledge of conservation behaviour also tended to be more general. They indicated that higher responses for general conservation behaviours such as protecting habitats and supporting causes than international participants. Conversely, they had significantly lower responses than the international participants relating to themes reflecting palm oil purchase behaviour, including using and buying sustainable products, making others more aware of palm oil's involvement and avoiding or minimising the consumption of palm oil. As postulated by learning theories such as the Contextual Model of Learning (Falk & Dierking, 2004) and Brody's (2005) Theory of Learning in Nature, learning for conservation is a continuous process in which individuals will build upon their knowledge through experience and reflection. Therefore, for locals, the concept of sustainable purchases may be completely new, therefore their beliefs about using sustainable products may not yet be crystallised; however, this does not necessarily mean that they are learning less from the intervention. Locals are still learning the basics about *what* sustainable palm oil is, and *why* it is important; hence conveying a certainty about the behaviours of using and buying certified sustainable palm oil may need further diffusing of the concept. Indeed, there has been limited exposure about the term 'sustainability' in developing countries and this has led to low levels of knowledge from people residing in these countries (Scott & Vigar-Ellis, 2014). When added to the fact that the concept of sustainability is a difficult concept to understand (Grunert et al., 2014), this suggests that that locals need more exposure and time to relate to this term with confidence.

6.2.2   Local and international differences in attitudes

Although the intervention increased positive conservation attitudes for both local and international visitors, these increases were at different levels. International participants were significantly more likely to report positive attitude changes after reading the booklet than locals. These attitude differences were particularly strong for two measures, anti-anthropocentric attitudes and environmental activism.

Initially, it was presumed that the presence of an intervention would increase positive attitudes for both groups at a similar level because the intervention was designed based on beliefs of both groups. Theoretically, the ELM stipulated that if an intervention was designed based on messages that addressed knowledge and beliefs about a particular issue or topic, it will increase the relevance of the message. As a result, the intervention would more likely lead to strong attitudes and behaviour (Petty & Cacioppo, 1986). This was confirmed in this study for 'protective nature' attitude measures (i.e., being generally concerned about orangutans). Both local and international

visitors who were given the intervention showed high positive attitudes towards protecting orangutans.

For anti-anthropocentric attitudes (e.g., humans are non-central, humans' problems and rights ought not to prevail over orangutan welfare) and environmental activism attitudes (i.e., forest clearance for palm oil plantations should be immediately stopped even if it means some people lose their livelihood; the use of orangutan habitats to produce palm oil and paper products is unnecessary and should be stopped), the results are less clear. International participants were significantly more likely to support orangutan needs above human needs and held positive attitudes towards supporting the protection of orangutan habitats over human economic development. As many of the international visitors already had an in-depth understanding of issues surrounding the use of sustainable products and their impact on wildlife habitats, it is possible that the intervention reinforced their beliefs about sustainable palm oil production. In doing so, this supported and reinforced their attitudes towards conserving wildlife habitat and supporting environmental activism activities that protected orangutan habitat. In other words, by targeting their knowledge and beliefs, the custom-designed intervention has led to strong anti-anthropocentrism and environmental activism attitudes.

However, this was not evident in the local sample. Specific issues such as those investigated in this study may have caused the local participants to reflect pro-environmental concerns differently, particularly when they were associated with economic barriers or situational factors (Hines et al., 1987; Kollmuss & Agyeman, 2002). Therefore, compared to the international sample, locals may have lower anti-anthropocentric attitudes and lower environmental activism attitudes than the international sample due to the fact that they needed to share the same environment with the orangutans to ensure their livelihood. Meijaard and Sheil's (2008) views supported this argument. They described the local Indonesians' perceptions of orangutan conservation,

> "…recent figures indicated that 52.4% of the people live on less than US$2 per day.
> Here in Indonesia, iconic images show the noble fight against poverty. Again, wild
> animals are largely irrelevant. Local community members of one of our orangutan
> conservation programmes was puzzled as to why we didn't help them first - 'for we
> are the orangutan' ('forest people')" (Meijaard & Sheil, 2008, p. 159).

This view was also supported by Campbell-Smith, Simanjorang, Leader-Williams et al. (2010) study that found that locals tended to have negative perceptions toward orangutans as their daily income will be affected if their crops are destroyed by these animals. This might explain why

local participants in this study, who had less economic and social stability than international visitors (Haron et al., 2005; Mohamed & Yusof, 2009), may have lower anti-anthropocentric and environmental activism views. They may have consciously weighed up the fact that their lives are dependent on the palm oil industry, and are also central and important to their survival. This is understandable as it is estimated that 2.26 million people are dependent on the palm oil industry in Malaysia (Malaysian Palm Oil Board, 2011). For this reason, statements that reflect 'sacrificing people's livelihood' may not resonate with locals because they understood that the positive impact of the palm oil industry in lessening poverty and increasing socio-economic benefits.

Nevertheless, this does not mean that local visitors do not have strong conservation attitudes towards orangutans. Findings from this study have shown that the intervention increased positive attitude levels for local visitors. This was apparent through the composite scores measuring protective nature attitudes. Even without an intervention, the results showed that locals were very supportive of orangutan conservation. Similar results in terms of positive local resident attitudes towards wildlife have also been found across the literature (Alexander, 2000; Campbell-Smith et al., 2010; Gillingham & Lee, 1999; Rauwald & Moore, 2002; Sekhar, 2003; Weladji, Moe, & Vedeld, 2003). However despite having positive attitudes towards orangutan conservation, locals did not have the choice of placing orangutan conservation as a lower priority (Meijaard & Sheil, 2008). Locals may simply perceive that they needed to have a certain economic stability first, that was most important. This suggests a prioritisation of basic human needs (Maslow, 1943), where the need for environmental conservation or importance of environmental conservation are not as highly regarded, if the basic physiological or security needs (e.g., food and safety) of individuals were not yet achieved.

Additionally, the lack of awareness and insufficient knowledge about the implementation of sustainable practices may also explain the lower scores for environmental activism and anti-anthropocentric tendencies of local visitors compared to international visitors. In this study, items measuring environmental activism and anthropocentrism were mostly reflected by the views that palm oil developments and plantations should be sacrificed in saving orangutan habitats. The results suggested that locals had lower positive attitudes to these items compared with international visitors. However, this may be due to the fact that they did not have existing knowledge leading to beliefs and attitudes that palm oil and orangutan habitats can co-exist through the implementation of sustainable practices. A recent study by Martin et al. (2015) assessed the knowledge and interests of local oil palm cultivators in implementing sustainable practices in their plantations, found that the majority of the respondents were, "…universally not interested, or much aware of, the sorts of

concerns that matter to some Western consumers of palm oil or outreach officers from NGOs and the Malaysian government" (p.56).

Their study showed that the respondents had almost non-existent knowledge or interest in an understanding of "sustainability" in relation to fertilizers, seeds and planting technology methods. The planter's choices in regard to types of fertilisers were made purely on the basis of which ones were the most economical and effective.

This points to the fact that the level of knowledge and/or awareness of local visitors surrounding the complexities of sustainability and its rationale for wildlife habitat conservation need to be further researched. This is because knowledge contributes to the foundation of beliefs (Sommer, 2011), and beliefs are precursors to attitudes, as posited by the TPB (Ajzen, 1991). The intervention in this study was only able to impact positively on local visitors positive attitudes to a level that was slightly lower than the attitudes of international visitors. This is understandable as short-term exposure to messages relating to sustainable palm oil and orangutan habitats may not foster strong positive attitudes immediately. Therefore, if the locals were more exposed to information that led to their awareness and knowledge about sustainable production of palm oil, and the rationale for wildlife conservation, their attitudes on environmental activism and anti-anthropocentrism would more likely be greater in the future.

6.2.2 Local and international differences in behavioural intentions

Local participants were significantly more likely than international participants to be interested in donating their time and money to organisations. This contradicted previous studies that found increased intention for international visitors' to donate, that was found in Powell and Ham (2008) study, where 92% of the sample were from the US. This study finding, in regard to the donating intention of international visitors, also contradicted Jacobs and Harms's (2014) study that explored donating intentions for whale conservation with the majority of the European sample had increased intentions to donate for whale conservation. This may have been attributed to strong beliefs about trustworthiness.

Philanthropic behaviour that included donating behaviours, typically rely on trustworthiness (Bekkers, 2003; Burt, 2014). Trust in an organisation is one of the major determinants for engaging in philanthropic behaviour (Bekkers, 2003; Bryce, 2007; Uslaner, 2000). In recent years, Bekkers (2003) pointed out that general social trust in countries such as the UK and US had declined. Other studies also corroborated this that confidence in charitable organisations had declined in developed countries (Light, 2004; Terwel, Harinck, Ellemers et al., 2009). The current study supported this, as

many international respondents expressed their scepticism about where their money would be channelled to, and whether it would be used appropriately. This could be more so when it involved trusting countries that were unfamiliar to them, such as Sabah, Malaysia. Conversely, locals may not be as much affected in terms of trustworthiness as they were already familiar with their own country's main conservation organisations. Hence, they may have had fewer concerns in this regard.

It is likely that local visitors may be more willing to state their intention in behaviour that they think they are able to commit to, such as joining fundraisers or making online donations[27] that were more flexible in terms of resources that were donated (i.e., time and money). It seems the intervention can positively increase their intention to donate for local visitors, but not for international participants. Perhaps, for behaviour that involves having a certain belief about inherent trustworthiness, or by the standing of an organisation, there were other factors at play. It is possible that intentions related to donations not only involved behavioural or control beliefs about the organisation, but also beliefs and trust of the countries concerned. This related to the concerns about trustworthiness voiced by international participants in relation to donating behaviours found in Stage one.

In terms of sustainability-seeking intentions, international participants were reported to have significantly stronger intentions to engage than local visitors. This finding suggests that it may be easier to influence intentions when the existing beliefs, prior knowledge and attitudes are already high. International participants who demonstrated existing beliefs, in-depth knowledge and higher positive attitudes in regards to issues surrounding sustainable palm oil were also significantly more likely than locals to state their intention to use sustainable palm oil products. This supports the findings by Fielding et al. (2008) who found that intentions related to environmental activism were predicted by strong normative beliefs and positive attitudes. In this study, messages in the booklet about sustainable palm oil and orangutans were highly relevant to the existing knowledge and attitudes of the international visitors. It is likely that they were processed via the central route and therefore, made an impact on their attitudes and behaviour (Petty & Caccioppo, 1986). However, perhaps the messages were less relevant or were totally new for the local visitors.   Support for this argument can be found in the locals feedback about why the booklet was interesting: *Never been exposed to unsustainable and sustainable palm oil; I never knew about this before*; *new concept about conservation of orangutans; that sustainable palm oil is not a bad thing*. In other words, the

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[27] Some organisations such as The Orangutan Project offer a minimum of $2 online donations, while many other organisations (e.g., Orangutan Outreach, Orangutan Foundation International-OFI) suggest any amount to donate online.

messages listed in the intervention may have failed to adequately build on local's pre-existing knowledge and beliefs.

It is also possible that the intentions of international visitors' to support sustainable products was stronger than local visitors due to their higher level of economic stability. In this light, as the certification of sustainable products is an expensive process as each supply chain must be certified, sustainable products are generally more expensive (Ozanne & Vlosky, 1997), and consumers need to pay a premium for the associated costs in eco-labelling and certification (Roheim, Asche, & Santos, 2011). In this study, international participants mainly originated from European countries and Australia, which are classified as high-income or developed countries (World Bank, 2016). International visitors may perceive that they were able to purchase and to buy the more expensive certified sustainable products as they possessed higher incomes. This assumption relates to the concept of the contextual domain or contextual factors, as discussed in behavioural theories (Ajzen, 1985; Hines et al., 1987; Stern, 1999). Basically, individuals are more likely to commit to behaviours when they have strong personal beliefs or attitudes towards the behaviour, which coincides with weak contextual factors (e.g., no economic constraints). Thus, the participants may be more agreeable to changing their products to more expensive brands of sustainable palm oil products as it did not impact on them financially. Moreover, some international participants may already have an existing preference to purchase sustainable food labels, as exemplified by the findings from Grunert et al. (2014).

Thus, local visitors may find it harder to commit to long-term conservation goals such as buying sustainable palm oil, which may be more expensive and requires them to compromise their livelihood or economic standing on a long-term basis. Based on the International Labour Organisation (ILO) average monthly income statistics for the year 2009, Malaysians earned an average of $961 monthly, which is extremely low compared to countries which had the highest number of international participants, UK ($3065) , Germany ($ 2720 monthly), Spain ($2352), Australia ($2610), Netherlands ($ 3922) (International Labour Organisation, 2016). Despite this, locals were found to increase their intentions to support sustainable products, which suggested that the messages in the booklet such as, '*Products you buy may cost orangutans their home. Choose responsibly.*' had a positive impact on the intentions of local visitors. However, the brands indicated to support sustainable palm oil in the booklet were the more expensive and high-end international brands (e.g., *L'occcitane*, *The Body Shop*). Hence, locals may be less willing to demonstrate positive intentions to support sustainability-seeking behaviour, as opposed to the international visitors.

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This section has discussed the differences in knowledge, attitudes and behavioural intentions of local and international visitor participants. These findings form the basis for recommendations for best practice for visitor interpretation relating to orangutan conservation. However, prior to presenting these, there are a number of factors that need to be taken into consideration.

Studies that looked specifically into the way different cultures respond to interpretation have suggested that the design of nature interpretation needs to consider a cultural understanding (Ballantyne et al., 2014; Packer et al., 2014). For example, Xu et al. (2013) explained that aesthetics such as story-telling were important to Chinese visitors (Xu et al., 2013), while Al-muhrzi (2015) highlighted the importance of instilling a sense of pride and belonging to Arab visitors at an Arab heritage site. These studies add to the body of knowledge on the '*what*' and '*how*' of designing interpretation for different cultures. However, there are a number of factors that need to be considered before designing interpretations for different cultural or visitor groups.

Firstly, the time and context need to be considered. Based on the Contextual Model of Learning, Falk and Dierking (2000) posited that learning was a continuous process that evolves over time. That is, a person's knowledge and what they learn evolves over time, with new knowledge and experiences adding to existing ones. Based on this model, we need to consider the fact that, over time, the concept of sustainability will be more widely understood by Malaysians and Indonesians. Findings in this study found that locals possessed less knowledge compared to international visitors in relation to sustainable palm oil and their products. Over time, interpretation messages may need to become more targeted for locals, based on changes to community knowledge and understanding.

Secondly, there may be an issue in the design process based on the concept of who is the 'average visitor'. If we design separate conservation messages for locals and internationals based on the findings, it might eventually lead to 'one size fits the locals, one size fits the international'. For example, in this situation, locals may only be given a "booklet for Malaysian visitors", while international visitors may only be given "a booklet for international visitors". However, it is likely that a certain percentage of locals may have different knowledge levels (e.g., on par with international visitors) and may not find the strategies and content designed for a local visitor relevant to them, and vice-versa for international visitors. Therefore, creates the possibility of the message content being viewed as inadequate.

Thirdly, an effect called Too Much Information (TMI) (Bawden, Holtham, & Courtney, 1999; Bawden & Robinson, 2009) may arise if there are major differences in designing interpretive messages targeted for two different groups or cultures. Moscardo et al. (2007) stated that one of

the important elements in the design of interpretive signs is keeping the text simple. Visitors are reluctant to engage in reading messages that are complicated and take too much time (Moscardo et al., 2007). Thus, if there are two different messages in two different languages that target two groups (i.e., international visitors and local visitors) in one brochure or panel, there is a risk of crowding the messages with too much information.

Therefore, based on these discussions, there may be a need to combine all the information targeted for both local and international visitors. The content may change overtime, based on changes in knowledge and attitudes. However, to reduce the risk of TMI, messages can be broken down and delivered using different mediums in different areas of the site.

This section has discussed the main differences in learning outcomes found between local and international participants, despite both being provided with an intervention. This chapter addresses the current gap in the literature that is noted as limited in exploring whether there are any differences between local and international groups and *how* these differences affect the design for conservation related content for orangutan sites. The findings from this study suggest that there are marked differences between both groups, and this leads to a number of recommendations about how to improve the interpretive content in orangutan sites (discussed in Section 6.4). This further addresses Russon and Susilo's (2014) previous statement that there has been the lack of educational content in naturally occurring orangutan sites. There are also certain aspects of the interpretive booklet that appears to attract participants interest and are likely to facilitate learning about orangutans and their conservation. This will be discussed in the next section.

6.3   Aspects of the booklet perceived most interesting

There are four main aspects of the booklet that were perceived as being particularly interesting. These aspects were more likely to facilitate learning about orangutans and orangutan conservation and are discussed below.

Information about brands or companies using sustainable palm oil

The most interesting aspect of the booklet was that it included relevant information about brands and companies that used sustainable palm oil. Participants indicated that the booklet provided new information about companies that used sustainable palm oil, and these added to their current knowledge. For Malaysians, the booklet assisted them to gain a deeper understanding about sustainable palm oil, and there were indications that the booklet was able to correct a number of previous misconceptions surrounding the term 'sustainable palm oil' and the relentless production

of oil palm. These findings suggested that visitors were more likely to read information on conservation content that was relevant to what they wanted to know, and what they already knew. The inclusion of relevant information aligns with one of Moscardo et al.'s (2007) principles of interpretation, namely: "Interpretation must make a personal connection with, or be relevant to the intended audience" (p.5). This affirms the importance of conducting formative evaluation in relation to the level of knowledge and beliefs of visitors.

Provoking written message content and visuals

Participants who read the booklet demonstrated surprise and were quite shocked when they read the facts presented in the booklet. In particular, they associated these feelings (surprise and astonishment) to the thought provoking statistics included in the booklet about the rate of deforestation. A picture of the football field was also included as a provoking image for readers to imagine the vastness of the rate of deforestation. These findings supported the current literature in regards to the inclusion of persuasive content in interpretation. In particular, the use of evidence-based messages (Perloff, 2010), such as the WWF facts and persuasive visuals used in this study (Andrews, 2008) was effective in persuading participants to think more deeply and to make connections.

Anthromorphophism and emotional content

The literature illustrates that animals categorised as charismatic species tend to evoke positive emotions from visitors (Ballantyne et al., 2007). This is supported in the current study as orangutans are charismatic species. The participants noted that one of the most interesting aspects of the booklet was the emotional impact on them. Most of the comments indicated that orangutans had human-like feelings, and expressions of empathy to the plight of the mother-baby orangutans suggested that it was important to include these aspects in the design of interpretive materials at wildlife sites.

Short, simple and easy to read layout

The fourth aspect mentioned as being the most interesting was the layout and the overall design of the booklet. In particular, participants mentioned the booklet was interesting due to its colour, presentation of information, graphics, illustrations and short facts. This suggests that the booklet's overall design was easy and enjoyable to read. This is important because the overall presentation of interpretive materials, particularly in free-choice settings need to be simple, concise and

entertaining enough to attract the visitor's attention in a short span of time. As defined by Ward and Wilkinson (2006, p. 2),

"Interpretation assumes a short, usually one-time exposure to a message. It addresses the modern reality of an audience that is easily distracted, time-constrained, and free to pay as much or as little attention to a message as the communicator inspires".

Findings from this study have been used to develop recommended guidelines for the design of best practice visitor interpretation at sites supporting orangutan conservation.

6.4 Recommended guidelines for the design of 'best practice' visitor interpretation designed to support orangutan conservation

Based on the findings, this study proposed a number of key recommendations for best practice visitor interpretation of environmental learning in an orangutan site. Suggestions to enhance positive learning outcomes for local and international visitors are also included.

Guideline one: Orangutan sites need to provide additional and relevant information about orangutans and orangutan conservation to maximise visitors' learning about orangutan and orangutan conservation. Additional information should be designed based on knowledge and understanding of visitors.

The findings from this study have shown that the booklet increased participant's knowledge about issues relating to palm oil production and orangutan conservation. The interpretive booklet also had the potential to increase positive attitudes and behavioural intentions in relation to behaviour related to supporting sustainable palm oil use. This is likely because the booklet was given in an outdoor nursery and the participants had the time to sit and read the booklet while viewing the orangutans through the glass. Orangutan sites should therefore provide further information and additional materials for visitors to read in order to maximise their learning about orangutans and their conservation. Furthermore, these additional materials and information needed to be strategically located. One possible location was after the orangutan viewing activity, as additional materials can enrich and reinforce the visitor experience at orangutan sites. Additionally, this information can be presented in a brochure format that visitors can take home and share with their friends and family.

Additional interpretive materials and relevant information also needs to be designed based on the knowledge and understanding of visitors. Knowledge and understanding of the audience is

one of the main principles of effective interpretation (Ballantyne et al., 2009; Ham, 1992, 2013; Hughes & Ballantyne, 2013; Moscardo et al., 2007; Tilden, 1957). As found in this study, the booklet's key messages were developed based on the findings obtained from Stage One of this study. The findings showed that participants were interested in the booklet as it contained new information about sustainable palm oil, as well as a new understanding of the term "sustainable palm oil" that assisted them to correct misconceptions about the term. These findings are unlikely to be obtained should 'formative evaluations' or prior assessment of visitors' beliefs and current knowledge about orangutan and their conservation were not carried out. This study affirms the importance of knowing your audience before developing conservation messages in a wildlife sanctuary.

Guideline two: Interpretation in orangutan sites should be designed based on beliefs that are specific to issues relating to orangutan conservation.

The design of interpretive messages should be specific enough to increase meaning-making and increase an audience's understanding of a subject (Ham, 1992). Meaningful interpretation helps audiences to connect and think about why should they care (Bacher, Balthrus, Barrie et al., 2007). Findings from this study showed that the intervention increased positive anti-anthropocentric and environmental activism attitudes for those who received this intervention. They also demonstrated a higher sense of individual responsibility through increased positive attitudes by being 'part of the solution to orangutans' problems'. This is likely because the design of the intervention booklet was based on beliefs specific to supporting sustainable palm oil production for the conservation of orangutans. The threats surrounding deforestation and unsustainable palm oil were central to the booklet, and these were relevant to the beliefs elicited relating to behaviour theme, "supporting sustainable palm oil use" that was assessed in Stage One. As stipulated by the TPB, beliefs are precursors to attitudes (Ajzen, 1991). This can possibly increase positive attitudes relating to anti-anthropocentric and environmental activism.

It is also argued that the intervention prompted more positive attitudes for the treatment group toward protecting orangutan habitats, because the booklet had specified *what* the threats were, *why* they were important, and *how* specifically individuals can help. Responses on why the booklet was interesting supported this argument, as participants made comments indicating that they have obtained new information about orangutan conservation and behaviour such as the purchase of sustainable palm oil that is integral to assist in the conservation of orangutans. Additionally, the slogan '*you can make a difference*' which was constantly emphasised in the

booklet may also have assisted visitors to personally relate to the issue. This may have amplified these positive attitudes about protecting orangutan habitats, and activated their individual responsibilities for protecting orangutan habitats.

Therefore, the messages about conservation behaviour which are communicated through various interpretive tools (e.g., signs and brochures) in orangutan sites must outline information or messages needed to be more specific about issues related to orangutan conservation. In particular, specific issues that are highly associated with orangutans such as the negative impact of unsustainable palm oil, must be communicated to increase meaning making. Sites need to provide interpretation that showcases the negative impact of human activities and their relationship to habitat loss. This also includes specific cause-effect messages that promote sustainable products (e.g., *when you buy sustainable, you help save a piece of the orangutan's home*), rather than communicating generic messages such as *humans destroy orangutan habitats*, or *save the orangutans habitats* that does not promote meaning-making or reflection. Similar to the slogan in this booklet, "You can make a difference", it is also important to incorporate the word 'YOU' to demonstrate personal responsibility as posited by Ham's (2007) TORE Model of Thematic Interpretation.

Guideline three: Orangutan sites should address the differences in the level of knowledge about orangutan conservation and sustainable palm oil between local and international visitors.

This study found that international participants were already knowledgeable and had relatively strong beliefs, attitudes and behavioural intentions to adopt a range of conservation behaviour. The intervention was able to increase international visitors' conservation learning by including messages that built on their current knowledge, such as relating to product samples and labelling. It is argued that interpretive messages which target environmental behaviour needs to include information and examples of manufacturing companies that support sustainable developments and products that are 100% sustainably certified.

This study also suggested that for locals, it is important to design messages that correct the misconceptions that were found earlier about the term sustainable palm oil. Locals misinterpreted the definition of sustainable palm oil, viewing it as the relentless production of palm oil without consideration for orangutan habitats. There is evidence that the intervention booklet that targeted this misconception among locals, had overcome this misunderstanding. Therefore, it is relevant to include messages that target this specific misconception. This will help locals to develop their

knowledge and beliefs over time and help them to crystalize their understanding of the links between human behaviour and wildlife conservation.

Guideline four: The design of interpretation in orangutan sites need to include persuasive written content and visuals.

This study found that providing written message content and visuals that were included in this study provided evidence-based messages (i.e., WWF statistics about deforestation) and the use of an image of a football field had induced feeling of shock and disbelief for participants. Additionally, participants also provided reasons why the booklet impacted on them emotionally, while some of these comments related to orangutans having human-like feelings. They also mentioned the importance to them of the mother-baby orangutan relationship, low reproduction rate, and statistics of orangutans in the wild. These findings indicated that these were important in inducing feeling of sadness and empathy, and also facilitated an understanding of the importance of conserving orangutans. Increased empathy toward animals is important as these feelings will eventually increase feelings of support for the animal's conservation (Ballantyne, Packer, & Sutherland, 2011; Clayton et al., 2009). It is possible that a combination of provoking images (e.g., football field, oil palm plantation), emotional appeals (e.g., true story of Ceria and mother-baby pictures), and persuasive written content (e.g., statistics about deforestation and numbers of orangutan left in the wild) facilitated participants learning more about orangutans their conservation. Therefore, the fourth guideline outlines the need to combine various persuasive written and visuals to help design interpretation for visitors at orangutan sites. It is also important to note that any design of interpretive materials should also be evaluated by a team of panel to gain feedbacks on the design aspects prior to on-site dissemination.

Guideline five: Interpretive messages in orangutan sites that promote donating behaviours should reflect trustworthiness and perceptions of affordability to increase local and international visitors' on-site donation behaviours.

The percentage of participants in this study who donated money to orangutan conservation was found to be low. As discussed previously, intentions to donate have much to do with people's underlying beliefs. Visitors may not be familiar with the organisations that manage the funds, or have had enough information to convince them to make decisions about whether these organisations can be trusted.

In Stage One, a number of respondents (particularly international respondents) stated that trustworthiness was the main reason for their reluctance to donate. This was corroborated in Sgalitzer et al.'s (2016) study that found 46% of tourists stated that they did not donate on-site because of a lack of information about the donation process. Therefore, orangutan sites should convey messages that help to build trust in orangutan organisations that are currently managing the site. Though this may take time, it would be worthwhile in the long term as international visitors will be reassured that the resources that they donate to will be managed judiciously. Therefore, the centre may need to design interpretations that highlight the organisation's history, its success stories, previous contributions that have been made, and how the funds are managed.

Additionally, the centre can also increase initiatives to design less expensive donation programmes. Current on-site adoptions are expensive, especially for the locals, who showed that they were keen to donate, and campaigns that targeted increased on-site donation behaviour should convey a sense of simplicity or sincerity so that all visitors can feel that they can contribute in small ways to help orangutans. For example, less expensive on-site donations such as '*One for the Orangs?*' (e.g., donate one dollar or one Ringgit Malaysia) to be placed in a donation box that can be clearly seen by the visitors. This may work particularly well for local visitors who have a high intention to donate but may not be able to due to monetary constraints.

Guideline six: Orangutan sites need to provide interpretation that promotes the positive impact of sustainable palm oil production on orangutan survival.

Findings from this study showed that the intervention was able to enhance visitor attitudes toward issues surrounding orangutan habitats and sustainable palm oil production. Interpretation that promotes an understanding of the positive impact of sustainable palm oil production is therefore important, particularly for local visitors. As discussed previously, local visitors may have a limited understanding about this issue and how it relates to the long-term viability of orangutans. They also have lower anti-anthropocentric attitudes and fear that their livelihood may be affected. The Malaysian government has also enforced policies and practices that are designed to ensure current orangutan habitats are protected. For example, there are existing policies and initiatives in place such as *Kinabatangan[28]-Corridor of Life* which is a collaboration of oil palm companies, WWF, land owners and the government working together to promote sustainability for wildlife, people and the environment (WWF, 2007). Orangutan sites should use this information to promote and

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[28] The Kinabatangan River is located in Sandakan, the location of the current study site, where there are existing wild Bornean orangutans and other Bornean endemic species, such as the proboscis monkey and Asian elephants.

increase the locals' understanding about how people can work together to make sustainable palm oil production a success. Efforts by palm oil companies, such as what done by Sime Darby that produces about 97 per cent of Certified Sustainable Palm Oil (CSPO) (Sime Darby, 2015) should also be communicated to provide information to both local and international visitors on the current efforts that are being made towards sustainable palm oil.

Guideline seven: Orangutan sites need to design interpretive messages relating to sustainable palm oil and orangutan conservation that reflect a 'balanced view'.

Orangutan sites should be cautious not to convey messages that are deemed too extreme or too prejudiced (e.g., don't consume palm oil!). This because such messages may send the wrong message and lead to feelings of extreme biocentrism, particularly for international visitors. Findings from this study indicated that around 22% of international participants (refer to Table 5.19 on behavioural intentions) indicated that they would stop consuming and were prepared to boycott palm oil consumption. International visitors may form the view that it is better not to consume palm oil at all, while local people may feel offended by working in the palm oil plantations, or thinking that their livelihood or survival is less important. This needs to be stressed that messages about palm oil within orangutan sites should aim to reflect a balanced perspective and stress the importance of producing sustainable palm oil that provides long-term economic, social and environmental benefits, as envisioned by RSPO (2014).

Guideline eight: Orangutan sites should consider rewording the term "sustainable palm oil" to "responsible palm oil" or including additional explanations to address current misconceptions in local visitors.

This study found that the locals did not fully understand the use of the term "sustainable palm oil". The intervention addressed this misconception through an additional message in the booklet that found that the inclusion helped to increase local's knowledge and understanding of "sustainable palm oil". Therefore, it is important to consider rewording the term 'sustainable palm oil' to a more generic term such as 'responsible' palm oil when designing messages that target sustainable products at orangutan sites. 'Responsible' is directly translated to Malay as '*bertanggungjawab*', while 'sustainable' is translated as '*berlanjutan*' (Kamus, 2012), meaning '*berpanjangan, berterusan, or berkekalan*' mirroring continuity (Dewan Bahasa Pustaka, 2013). Rewording this term may assist local visitors to view palm oil from a different perspective and prompt visitors to consider behaviour that supports responsible purchases. Ideally, visitors should exit orangutan sites

with no confusion about the term; instead, it is hoped that they leave with an increased awareness of the importance of supporting sustainable products.

It is further noted that should the findings of the study is to be further used for the development and design of the on-site interpretive materials (including those in the visitor center), an in-depth group of panels consisting all stakeholders (e.g., Sabah Wildlife Department, Sabah Tourism, relevant NGOs) must be established to contribute in feedbacks and suggestions to ensure that the final design of interpretive materials and messages is aligned with current objective, mission and policies of all stakeholders involved in the conservation of orangutans.

This chapter has discussed the impact of the intervention and the differences in various learning outcomes between local and international visitors. These findings add to the current literature by demonstrating that interpretive wildlife experiences impact on the conservation learning of visitors and this can be augmented by designing interventions based on a combination of behavioural and persuasive communication theories. A number of recommendations for 'best practice' for visitor interpretation of environmental learning and orangutan conservation were also presented.

CHAPTER SEVEN: CONCLUSION

Fostering positive conservation knowledge, attitudes and behaviour among humans is an important way to halt or reduce the current loss of biodiversity. In terms of wildlife tourism, any effort that is made to foster pro-conservation behaviours in visitors is part of a larger and long-standing effort to ensure the survival of wildlife. Despite the claim that interpretation in wildlife sites positively impacts on visitors' learning outcomes, limited research has explored *how* interpretation can be designed to enhance visitor's conservation learning for wildlife conservation. More importantly, there has been little understanding about *how* environmental interpretation impacts on different visitor segments that are visiting different wildlife sites. This study had specifically addressed this issue and provides insights into the much lesser-researched topic of designing wildlife interpretation to positively impact on learning outcomes aimed at the conservation of orangutans.

This study addressed these issues by testing whether an interpretive intervention, the design of which is based on beliefs and knowledge of local and international visitors, impacted on visitors' learning outcomes (i.e., knowledge, attitudes, intentions and behaviour). In this study, the researcher explored issues surrounding a threatened wildlife species, 'the orangutans', who live in habitats threatened by deforestation. By designing an intervention booklet that took into account the different variations that exist in visitors' beliefs and knowledge, and incorporating persuasive content in the design of the booklet, this study showed that the intervention successfully impacted on the learning outcomes of in relation to issues surrounding orangutan conservation. More importantly, this study also found the intervention impacted differently on the conservation learning outcomes of local and international visitors.

This has resulted in a number of theoretical and practical implications that adds to our understanding of visitor conservation learning at wildlife sites. These will be discussed below, together with limitations of this study and suggestions for future research.

7.1 Contributions of the study

This study highlights the importance of ascertaining previous knowledge and beliefs of local and international visitors' prior to designing an interpretative intervention. This shows that the approach used in this study to design an intervention booklet results in a positive impact on visitors learning about orangutan and orangutan conservation. The main theoretical and practical contributions are discussed below.

7.1.1 Theoretical Contribution

- **Understanding current knowledge and beliefs about orangutans and orangutan conservation for local and international visitors.**

    This study makes a specific contribution by advancing our understanding about visitor's current knowledge and beliefs about orangutans and their conservation. There is a dearth of studies that have investigated how and what people understand about the links between orangutan survival in the wild and sustainable palm oil production, particularly in Malaysia and Indonesia. These countries house orangutans and it is highly conceivable that these countries can make a difference by using orangutan sites as platforms to gain visitor support for sustainable palm oil production. The present study highlights the differences between local and international visitors in terms of their knowledge, beliefs and conservation learning outcomes after visiting an orangutan site.

- **Use of the belief-based approach and assessment of knowledge in designing effective intervention.**

    This study is one of a few that provides empirical evidence to support the relevance of a systematic method to assess variations in terms of the beliefs and knowledge of visitors and to use this information to design an intervention that was subsequently tested on-site. The fact that both local and international visitors showed increased conservation learning outcomes[29] was important because of the belief-based approach of the Theory of Planned Behaviour as well as providing prior assessment of knowledge. However, wildlife sites need to firstly identify who are the major groups of visitors, and assess any variations based on their knowledge and beliefs so as to design an effective interpretation.

    This study's systematic approach to designing and testing a targeted interpretation further contributes to theoretical knowledge about how to design interpretation materials using persuasive

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[29] This excludes behavioural intentions results for donating time and money.

communication techniques (i.e., Elaboration Likelihood Model) and to apply them to a real-life setting. This helps to further our knowledge when answering the question of *how* to incorporate behavioural and persuasive communication theories (such as the TPB and ELM) to the design of interpretation; and whether this approach positively impacts on conservation learning for visitors. Although this study is specific to only the Bornean orangutans, it is nevertheless crucial as it has furthered our knowledge of how to apply established theories to the design of conservation messages.

The findings from this study were also promising as the intervention prompted a significantly higher level of positive post-visit knowledge, attitudes, intentions and behaviour, despite the fact that it was only a short-term exposure (estimated reading time ranged from 5-15 minutes). This study therefore contributes to current knowledge that despite short-term exposure, additional interpretation designed to be relevant to the visitors has the ability to positively impact on visitor's learning outcomes. This provides empirical evidence to support other studies that found similar results despite short-term exposure to additional and targeted on-site interpretation in a real-life setting (e.g., Jacobs & Harms, 2014; Knapp & Poff, 2001).

- **Ascertaining differences in learning outcomes in local and international visitors.**

Additionally, this study found that even with an intervention that specifically targeted each of the group's previous knowledge and beliefs, different outcomes were produced. In this study it was found that local and international visitors did not have the same increase in post-visit knowledge, attitudes, and conservation intentions, although there were little differences in participation in on-site conservation behaviour between both groups. This has advanced our understanding about how to target both groups' knowledge and beliefs in the design of an intervention that will not necessarily lead to the same increase in knowledge, attitudes and behaviours between both groups, especially when there were differences found when conducting prior elicitation of visitor beliefs and knowledge. Therefore, while there was merit in using the TPB-ELM framework to positively impact on the conservation learning of visitors, it might produce different levels of post-visit learning outcomes between the different types of visitor groups.

In this study, findings have shown that international visitors came with already strong beliefs and advanced knowledge about the connection between sustainable palm oil and the conservation of orangutan habitat, suggesting that they might have built upon knowledge and beliefs due to long-term exposure. Therefore, this intervention seems to reinforce knowledge, attitudes and behavioural intentions relating to the issue surrounding sustainable palm oil. Local

visitors were found to have limited understanding of sustainable palm oil and orangutan conservation, therefore the increased levels of post-visit knowledge, attitudes and behavioural intentions scores were lower than for international visitors. These suggested that short-term exposure to the booklet is unlikely to instantaneously produce a "ceiling effect" in regard to learning outcomes, particularly for locals when the understanding about these concepts relating to sustainable palm oil is new knowledge. Learning is a continuous process, as posited by The Contextual Model of Learning (Falk & Dierking, 2004) and Kolb theory of experiential learning (Kolb, 1984), therefore individuals need to build new knowledge based on their existing knowledge and experiences. Hence, this research found that despite having an interpretive booklet that targeted beliefs and knowledge of local and international visitors, we cannot assume that the levels of conservation learning outcomes for the post-visit will be similar.

7.1.2 Practical contribution

This study has addressed Russon and Susilo's (2014) concerns and criticisms about the poor quality and outdated information that is provided in interpretive materials that are currently used in orangutan sites in Malaysia and Indonesia. Based on the current lack of research into design of interpretation, this study's results can be used to contribute to existing knowledge for developing 'best practice' interpretive conservation messages at different orangutan sites. The current study site (SORC) should implement the eight recommendations outlined in the previous chapter (Section 6.4) to develop these interpretations.

Other wildlife sites, particularly orangutan sites could also adopt the method used in this study to assess beliefs and knowledge, but firstly these sites need to identify who are the major groups of visitors. It is likely that other wildlife and orangutan sites have a different composition of visitor types, not necessarily being a mixture of local and international visitors, and this may impact on different salient beliefs and knowledge about specific wildlife. For example, a number of orangutan sites located in Malaysia and Indonesia (e.g., Kinabatangan River, Sabah; Gunung Palung National Park, Kalimantan) reflect the characteristics of the "hard core element "of the ecotourism spectrum because these areas are more remote and are more physically challenging to view orangutans, compared to rehabilitation sites that reflect a more minimalist or "soft element" of ecotourism (Weaver, 2005). The areas that fall under the hard ecotourism spectrum are likely to attract segments of 'hard ecotourists' or visitors that are likely to be ecotourists that are already knowledgeable about wildlife conservation issues, have strong bio-centric attitudes and display a higher level of environmental commitment (Weaver, 2002; Weaver & Lawton, 2002). If this is the

case, then interpretative intervention should be designed based on these segments of 'hard ecotourists'.

Additionally, based on an assessment of the current beliefs and learning outcomes (i.e., knowledge, attitudes and behavioural intentions) obtained from this study, other orangutan sites can use these findings to target the current beliefs and conservation learning outcomes of local and international visitors to make interpretation more relevant. This was not necessarily achieved through the use of interpretation of booklets. Through oral interpretation, nature guides can tailor interpretive talks based on their audience that further differentiate between local and international visitors. Considering that international participants are already knowledgeable and have relatively strong beliefs, attitudes and behavioural intentions to support conservation issues such as sustainable palm oil, the tour guides may need to tailor their interpretive talks to include subjects such as examples of current manufacturing companies that support sustainable developments and products that are 100% sustainably certified. For the local visitors, however, it is more important to tailor talks to correct the misconceptions or increase an understanding of "making the connection" with regards to sustainable issues surrounding orangutan conservation. It is noted however that because tour guides are mostly locals, tour companies need to provide additional training to ensure that these tour guides have a correct understanding of sustainable products and wildlife conservation. Additionally, as noted in Section 6.4, any design of interpretive materials must also be evaluated by a panel to gain feedbacks on the design aspects (e.g., images, messages, colours, size) before it can be disseminated on site to the visitors.

This study provides further empirical evidence to support the use of learning theories that posit that variations of knowledge and beliefs that are found among groups or people (Falk & Dierking, 2000; Kolb, 1984); and due to these variations, the visitor's knowledge and beliefs may also differ about (wildlife) species to other types of species. Therefore, there is a need to consider variations or differences in not only visitor groups, but also based on the specific type of wildlife. Careful consideration is needed to assess the beliefs and knowledge of visitors specific to a particular animal species. Of particular importance is how these variations in group beliefs and knowledge will affect the design of interpretation for species that are labelled as 'critically endangered' or 'threatened wildlife' species. It is likely that different groups have different beliefs and knowledge in regard to different wildlife species, as was found in this study in relation to differences between local and international visitor's knowledge and beliefs about orangutans and their conservation. Further research needs to substantiate this. This is an important piece of information for sites such as zoos that exhibit various threatened wildlife species. It may help to

tailor the design of a range of threatened wildlife species more effectively based on different visitor groups.

No doubt, variations in visitor groups may be more notable in years to come as more and more tourists travel internationally. Tourists bring with them individual variations in their personal history related to their own beliefs and knowledge about different wildlife species. Depending on the surrounding issues associated with wildlife (e.g., orangutans–palm oil, whales–whale hunting, and rhinoceros–poaching horns), there are unique variations in how different cultures or demographic groups view conservation of certain wildlife species. This study has supported the notion that it is time to forego the thinking of 'one size fits all' or rather, 'one size fits all wildlife', if we are to improve interpretive design in wildlife settings (Higham & Lück, 2008; Hughes et al., 2011).

7.2 Limitations of the study

7.2.1 Exploring central and peripheral path message processing

This study used the Elaboration Likelihood Model (ELM) as the basis for the design of an intervention booklet based on the assumption that visitors will process messages using central and peripheral cues. The ELM stipulates that individuals will process messages through a dual process; central and peripheral path. This study did not investigate which path leads to a greater increase in knowledge, attitudes and behavioural intentions, or whether both paths were equally important. This was not the main objective of this study; however, this may be an avenue for future research.

7.2.2 Focusing on one specific conservation behaviour

The main objective of this study was to explore how the design of an intervention impacted on the visitor's knowledge, attitudes, and behavioural intentions related to orangutan conservation. As the main objective was to test the impact of the intervention on learning outcomes related to orangutans and their conservation, this study did not focus on testing specific conservation behaviours such as focusing on signing a petition, or adopting an orangutan. Although this might have provided an in-depth understanding of this type of behaviour, the study objective was to bridge the gap in understanding about *how* to design interpretive materials that positively impact on the theme of conservation behaviour that supports orangutan conservation.

Additionally, learning outcome assessment related to other types of behaviour that relates more to on-site behaviours such as 'do's and don'ts', and correcting erroneous misconceptions about the rehabilitation centre's objectives was not included as part of this study. In stage one, several

participants made suggestions such as 'train orangutans to do shows', 'photography session with the orangutans' which reflected a misconception about the objectives of SORC. These misconceptions about the objectives of the centre are seen as much more appropriate to be addressed directly by current management.

7.2.3 Use of stickers for observation

The researcher used stickers to identify and record participant's on-site behaviour. Some participants may have removed their stickers before exiting through the orangutan viewing site, therefore the number of observations may have been inaccurate. Participants who questioned the use of stickers were told that the sticker's purpose was to mark those who participated in the orangutan conservation study as well as for identification to receive free souvenirs after completing the questionnaire. By directly informing participants about the purpose of the numbered sticker for behavioural observation, this may have prompted participants to sign the petition, donate or take leaflets, due to its social desirability bias.

7.2.4 Using self-reports to measure intentions

Measures of behavioural intentions may be subject to social desirability bias (SDB) (Grimm, 2010). Participants may have responded to the statements based on what they thought society would approve of, rather than based on their own 'true intentions'. Although this study did not explore whether intentions actually led to long-term behaviour, it measured four actual on-site behaviours so that it was not totally reliant on measures of behavioural intentions. The choice of behaviour that was related to supporting sustainable products, such as 'buying and using sustainable products', made it impossible to observe the behaviour as this required the researcher to observe the individual purchasing behaviour of participants.

7.2.5 Sampling and participants

This study only sampled participants in a semi-captive orangutan wildlife site. Due to lack of time, logistical and budget limitations, it was not possible to conduct this study in more than one wildlife site. This may affect the generalizability of this study to other wildlife settings. Secondly, this study sought to explore differences between Malaysians and international visitors. The intervention was only available in Bahasa or in English. Thus, international visitors with a limited understanding of English were excluded from the study. Due to this limitation, the generalisability to other non-English speaking populations may have been compromised.

7.2.6 Generalisability

This study conducted sampling at only one orangutan site in Malaysia. Therefore, the results obtained in this study cannot be generalised as they may differ depending on the wildlife species being studied and the specific wildlife site. Since this study was conducted in a relatively semi-captive orangutan site, results may differ when it was conducted in other wildlife settings, as the segments of local and international visitors may be different. Additionally, this study has defined local visitors as Malaysians and Indonesians based on the many similarities that they share, particularly in relation to the two countries being native countries for the orangutans, its development of palm oil, and similarities in terms of culture, religions, literature, and occupations. However, further research may need to authenticate the similarities between Malaysians and Indonesians in terms of their beliefs and conservation learning.

The results from this study also cannot be generalised to other wildlife sites, as the design of any intervention using this method necessitates researchers to assess beliefs and knowledge pertaining to different wildlife species that may have different issues.

7.2.7 Cued testing

However, since the approach in this study used "cued testing" procedures, one limitation of this study were that there was no guarantee that a typical visitor would actually accept a booklet and read it. Therefore, it is important for orangutan sites to address this limitation by encouraging visitors to read the booklet anytime during or after the experience, or communicating messages that were included in the booklet using a variety of tools (e.g., panels, nature talks, touch-screen monitors and video presentations).

7.3   Suggestions for future research

The findings and limitations of this study create a number of possibilities for future research. These are discussed below:

In future, the design of donation messages may need further assessment relating to the specific beliefs toward trust in the on-site management, or the NGO that runs the orangutan site. This will inherently indicate whether international participants had lower intentions to donate due to their perceived level of trust of the organisation. The importance of establishing an organisation's

trustworthiness and the impact of this on visitors' donation behaviour also needs to be further explored.

This study only used a booklet as the main intervention. Future research should consider the design of different types of interventions and assess their impact on the conservation learning outcomes of visitors. Combining different interventions in an experimental study would help to discover what interpretive intervention was the most effective. It may also be possible to determine whether different interventions will work better for different conservation behaviours. This needs further exploring.

Further studies need to investigate what are the factors that contribute to the forming of pre-visit beliefs, knowledge and attitudes for different cultural groups. This might provide more clues as to how to structure early educational experiences about nature and wildlife conservation. It could also help to inform the design of campaigns outside of wildlife sites, so as to promote the concept of sustainable products and their effect on wildlife conservation.

This study observed differences with regards to specific issues that relate to the debate about palm oil expansion and orangutan conservation. This was a unique issue as there has been a lot of media coverage on highlighting the negative impact of palm oil expansion on orangutan habitat. Future research should seek to assess how strong media exposure is surrounding sensationalised issues relating to charismatic species such as orangutans, and their contribution to the foundation of visitor's knowledge, beliefs and attitudes. In particular, future research should explore whether exposure to negative and positive media about orangutans impacts directly, rather than indirectly on visitor beliefs, attitudes and behaviour.

In terms of increased learning outcomes, it would be appropriate to test whether the approach used in this study would produce similar results with other species. As Jacobs and Harms (2014) noted, positive results increased in their study with conservation intentions with whales however, this may not extend to other non-charismatic species. Similarly, this study also found that there was an increase in learning outcomes for orangutans - also a highly charismatic species. In future, it would be interesting to test other charismatic species that were tied to sensationalised issues in different cultures/countries. Issues such as 'great white sharks - the culture of eating shark fins' and 'elephants/rhino–locals hunting for the tusks' could be investigated. These could extend our understanding on how to design interpretations that were specifically linked to highly charismatic species.

Future research that seeks to assess changes in specific beliefs needs to consider the re-wording belief statements more specifically, particularly when the wildlife are associated with

cultural or mythical beliefs. In this study, the statement 'some of my beliefs about orangutans have changed as a result of my visit' that was adapted from other wildlife studies, may not be appropriate because this study focussed on orangutans, which is associated with mythical and cultural beliefs. Therefore, when the statement "'some of my beliefs about orangutans have changed as a result of my visit' is translated, it may yield a different meaning or understanding to locals.

One of the major limitations was that this study was not able to observe the purchase behaviour of sustainable palm oil products. Future studies may seek to design controlled experiments that ask participants to make responsible purchases based on different conditions (e.g., no economic constraints, medium or tight economic constraints) or to observe actual purchases in supermarkets. Alternatively, future studies could design intervention programs that allow the researcher to observe responsible purchase behaviours after a wildlife visit.

Final comments

As orangutans are faced with threats of extinction, now more than ever it is vital to increase our efforts to design effective and relevant interpretation targeting orangutan conservation in wildlife sites such as in Malaysia and Indonesia. This needs to be a collective effort. As discussed by Meijaard and Sheil (2007), "solving the biodiversity crisis in Borneo requires marked changes in the behaviour of governments, private enterprises and others to address legal, political and economic aspects" (p. 11). However, many researchers are still reluctant to carry out research that seeks a deeper understanding of issues that are 'sensitive' and prone to conflict. This may extend to the orangutan–palm oil issues as well, as the matters surrounding palm oil expansion–orangutans have sparked a lot of debate about accusations of 'who is to blame' for the effects of the loss of biodiversity.

There is a simple truth in that, all of us are responsible and that it is everybody who need to make the changes in solving global biodiversity loss. In order to make changes, we need to understand 'people'; what we know, what we don't know, and how can we understand more. This study is one of the first studies to understand the beliefs and knowledge of local and international visitors relating to orangutans and their conservation. This research had demonstrated that the presence of an intervention that was designed using behavioural and communication theories had a positive impact on the conservation learning of local and international visitors. This study is one of only a few conducted in non-Western settings that explores and compares the impact of interpretation on local and international visitors. In doing so, this study found that differences existed in the outcomes of the learning outcomes between local and international visitors and this has led to a number of key recommendations to help improve the design of interpretation at orangutan sites.

All of us need to acknowledge that we all play a role in contributing to biodiversity loss, and as a result we need to acknowledge that 'we can make a difference'. This was the ultimate objective of this study - making a small contribution in the hope that people, regardless of whether they are local or international visitors, will take accountability for their actions, and understand and realise their role as ambassadors in helping to conserve threatened orangutan specie. We need to utilise every avenue available, not only through wildlife tourism, but also through other platforms such as education, politics and the local media that are able to reach the general population. As stated previously, conservation of threatened species needs to be a collective effort. Only then, will we avoid the total extinction of orangutans.

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Appendices

Appendix A: Stage one questionnaire

ORANGUTAN CONSERVATION: DESIGNING AND EVALUATING THE IMPACT OF AN INTERPRETIVE BROCHURE ON VISITORS' CONSERVATION LEARNING

Dear participants,

This questionnaire is a part of a PhD. It is designed to gain a better understanding of visitors' knowledge and beliefs after visiting an orangutan sanctuary. The information gathered will be used to design an interpretive brochure that aims to educate visitors about orangutan conservation.

Participation in this research is voluntary - you may withdraw at any time. You are also free not to answer any of the questions if you choose to do so. The survey should take around 15 minutes to complete.

Please be advised that the information obtained from this survey will be kept strictly confidential. You will **not** be identified in the project. All responses will be coded and will contribute to the pooled data, so no individual responses will be made available. Potential identifying information will be used ONLY for the purpose of providing you with a summary of results.

This study adheres to the Guidelines of the ethical review process of The University of Queensland. Whilst you are free to discuss your participation in this study with the researcher, if you would like to speak to an officer of the University not involved in the study, you may contact the University's Ethics Officer on +61 4336 53924.

If you would like to discuss this project further, you may contact Sheena Bidin at contact number +61 43171 3026 or +60 172009208, email: s.bidin@business.uq.edu.au.

Thank you for your support.

Participant number:	I have read the information sheet relating to this study and give my written consent to be involved. Signature: _____

Your country of origin/residence:

_____

*In this study, sustainable products are defined as those that are sourced from or produced by companies that support long-term benefits to the economy, local communities and the environment.

Section A. Your current knowledge.

Please circle your answers.

1.	The Bornean orangutan is an endangered species.	True	False	I don't know
2.	Orangutans can only be found in the wild in Malaysia and Indonesia.	True	False	I don't know
3.	Orangutans share 50 percent of DNA with humans.	True	False	I don't know
4.	Compared to other mammals, orangutans are the fastest to reproduce and mature in the wild.	True	False	I don't know
5.	Using sustainable palm oil products will not make much difference to the conservation of orangutans.	True	False	I don't know
6.	For the first 2 years, a baby orangutan will be completely dependent on the mother.	True	False	I don't know
7.	Orangutans are likely to disappear in the wild in 50 years.	True	False	I don't know
8.	Certified sustainably-sourced products are usually much cheaper than non-certified products.	True	False	I don't know
9.	Products we use in our everyday lives can impact the orangutans.	True	False	I don't know

10. Which of the following is the main threat to orangutans?

    a) Water pollution
    b) Climate change
    c) Tropical forest clearance
    d) Tourism developments

11. Please order the factors below in terms of their impact on orangutans' habitat loss, with **1 being the most important factor and 4 being the least important factor.**

Factors	Rank (1-4)
Forest fires	
Palm oil plantations	
Housing developments	
Rubber estates	

12. After your visit, how do think you could personally contribute to conserve and protect the orangutans?

_____
_____
_____

Section B. Your experience at Sepilok Orangutan Rehabilitation Centre.

1. What did you learn about orangutans today?

_____
_____
_____

2. What did you learn about orangutan conservation today?

_____
_____
_____

*Your honest opinions are really important. To improve communication for the conservation of orangutans, we urge you to avoid altering your answers after reading the next section.

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Section C. Your thoughts and feelings about making commitments in support of orangutan conservation.

Think about doing things in the next 6 months such as **donating your time and money** in support of orangutan conservation. This includes actions such as:

> - **Adopting an orangutan**
> - **Making on-site donations**
> - **Online donations to orangutan organisations**
> - **Joining fundraisers to help raise funds for orangutans**
> - **Becoming an active member of orangutan organisations**

1. What do you think are the **benefits or the good consequences** that could result if you donate your time and money through the above actions?

   _____
   _____
   _____

2. What do you think are the **downside or bad consequences** that could result if you donate your time and money through these actions?

   _____
   _____
   _____

3. Who (individuals/groups) would **approve** of you donating time/money?
   _____

4. Who (individuals/groups) would **disapprove** of you donating time/money?
   _____

5. What **factors or circumstances would make it easy** for you to donate time/money through the above actions?

   _____
   _____
   _____

6. What **factors or circumstances would make it difficult or prevent you** from donating your time/money through the above actions?

   _____
   _____
   _____

Section D. Now think about doing things in the next 6 months such as **supporting sustainable palm oil** products. This includes actions such as:

> - **Signing petitions to support sustainable palm oil**
> - **Actively seeking information about sustainable palm oil products**
> - **Actively using sustainably sourced palm oil products**
> - **Spreading the word about orangutan conservation and sustainable products through social media (e.g.,** **), or by talking to others**

1. What do you think are the **benefits or the good consequences** that could result if you support sustainable palm oil products through the above actions?
   _____
   _____
   _____

2. What do you think are the **downside or bad consequences** that could result if you support sustainable palm oil through these actions?
   _____
   _____
   _____

3. Who (individuals/groups) would **approve** of you supporting sustainable products?
   _____

4. Who (individuals/groups) would **disapprove** of you supporting sustainable products?
   _____

5. What **factors or circumstances would make it easy** for you to support sustainable palm oil products through the above actions?
   _____
   _____
   _____

6. What **factors or circumstances would make it difficult or prevent you** from supporting sustainable palm oil products through the above actions?
   _____
   _____
   _____

Age: ☐ 18-29   ☐ 30-39   ☐ 40-49   ☐ 50-59   ☐ 60-69   ☐ 70+

Gender: Male / Female

THANK YOU. PLEASE RETURN COMPLETED QUESTIONNAIRE TO THE RESEARCHER AND COLLECT YOUR FREE SOUVENIR AS A TOKEN OF OUR APPRECIATION!

Appendix B: Stage two questionnaire

CONSERVATION LEARNING

IN SEPILOK ORANGUTAN REHABILITATION CENTRE, SABAH

Dear participants,

This survey is part of a PhD. It is designed to gain a better understanding of visitors' knowledge, attitudes and behaviours after visiting an orangutan sanctuary.

Participation in this survey is voluntary- you may withdraw at any time. You are also free not to answer any of the questions if you choose to do so. The survey should take around 10 minutes to complete.

Please be advised that the information obtained from this survey will be kept strictly confidential. You will not be identified in the project. All responses will be coded and will contribute to the pooled data, so no individual responses will be made available. Potential identifying information will be used only for the purpose of providing you with a summary of the results.

This study adheres to the ethical guidelines of the review process outlined by The University of Queensland, Australia. If you would like to discuss this project further, you may contact Sheena Bidin at +61 43171 3026 or +60 172009208. If you would like to speak to a University officer which is not involved in the study, you may contact the Univeristy Ethics Officer on +61433653924.

Thank you for your support.

I have read the information pertaining to this research and give my written consent to participate.

Signature:_____

Participant Sticker number: _____

Country of origin: _____

Please answer based on your recent experience in Sepilok.

*In this study, sustainable products are defined as those that are sourced from or produced by companies that support long term benefits to the economy, local communities and the environment.

Section A. Please circle your answers.

1.	Orangutans share 50 percent of DNA with humans.	True	False	I don't know
2.	Compared to other mammals, orangutans are the fastest to reproduce and mature in the wild.	True	False	I don't know
3.	Orangutans are likely to disappear in the wild in 50 years.	True	False	I don't know
4.	Products we use in our everyday lives can negatively impact the orangutans.	True	False	I don't know

5. Which of the following is the main threat to orangutans? Please circle your answers.

        a) Water pollution
        b) Climate change
        c) Tropical forest clearance
        d) Tourism developments

6. Please order the factors below in terms of their impact on orangutans' habitat loss, with **1 being the most important factor and 4 being the least important factor.**

Factors	Rank (1-4)
Forest fires	
Palm oil plantations	
Housing developments	
Rubber estates	

7. After your visit, what do you think you could do to conserve and protect orangutans?

_____

_____

_____

Section B. Please rate your agreement on these statements.

SD : Strongly disagree   **D** : Disagree   **N** : Neutral   **A** : Agree   **SA** : Strongly Agree

STATEMENTS	SD	D	N	A	SA
1. My knowledge of orangutan conservation has changed as a result from this visit.	1	2	3	4	5
2. Using sustainable products will make a difference to the conservation of orangutans.	1	2	3	4	5
3. Wild animals, such as orangutans, should not be held captive and sold as pets.	1	2	3	4	5
4. Humans have the right to use orangutans as we see fit.	1	2	3	4	5
5. Forest clearance for palm oil plantations should be immediately stopped even if it means some people lose their livelihood.	1	2	3	4	5
6. I think human economic gain is more important than setting aside more land for orangutans.	1	2	3	4	5
7. Too much fuss is made over the welfare of orangutans these days when there are too many human problems that need to be solved.	1	2	3	4	5
8. The production of inexpensive palm oil products justifies maintaining the loss of orangutan habitats.	1	2	3	4	5
9. The use of orangutan habitats to produce palm oil and paper products is unnecessary and should be stopped.	1	2	3	4	5
10. I want to do everything I can to protect and conserve orangutans.	1	2	3	4	5
11. I feel helpless when it comes to helping orangutans.	1	2	3	4	5
12. We need to help protect orangutan habitats.	1	2	3	4	5
13. We have the responsibility to leave healthy ecosystems for our families and future generations.	1	2	3	4	5
14. I am part of the solution to orangutan's problems.	1	2	3	4	5

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15. My visit has made me more concerned about the well-being of wildlife in general.	1	2	3	4	5	
16. I learnt some new facts or information about orangutans.	1	2	3	4	5	
17. My visit has made me more concerned about the conservation of orangutans.	1	2	3	4	5	
18. I have a better understanding of orangutan conservation issues because of my visit.	1	2	3	4	5	
19. Some of my beliefs about orangutans have changed as a result of my visit	1	2	3	4	5	

Section C.

Please list three specific things you would most likely do as an effort to support the protection and conservation of orangutans.

1. _____
2. _____
3. _____

How likely are you to carry out these behaviours within 6 months after your visit?

STATEMENTS	Extremely unlikely						Extremely likely
1. Joining a fundraiser to raise funds for orangutans	1	2	3	4	5	6	7
2. Downloading an app to check for sustainable palm oil labelling's.	1	2	3	4	5	6	7
3. Seek more information about orangutan conservation.	1	2	3	4	5	6	7
4. Giving online donations to organisations	1	2	3	4	5	6	7
5. Becoming a member of an orangutan organisation.	1	2	3	4	5	6	7
6. Actively seeking information on sustainably sourced products.	1	2	3	4	5	6	7
7. Buy products that use sustainable palm oil.	1	2	3	4	5	6	7
8. Spreading the word to others about the impact of unsustainably sourced palm oil products.	1	2	3	4	5	6	7

Section D. Aspects of the booklet (for treatment group only)

Which part of the brochure that was most interesting and why?

Most interesting:

_____

Reason:

_____

Please rate the brochure on the following aspects. If you were already aware of these before, please tick the box in the right

The brochure improved my understanding about:	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	I was already well aware of this before.
1. the main threats of habitat loss in orangutans.	1	2	3	4	5	☐
2. the many ways you can do to protect the orangutans.	1	2	3	4	5	☐
3. orang-utans in general.	1	2	3	4	5	☐
4. the objectives of orangutan rehabilitation.	1	2	3	4	5	☐
5. supporting sustainable palm oil products.	1	2	3	4	5	☐
6. sustainable palm oil labelling.	1	2	3	4	5	☐
7. what the donations will be used for.	1	2	3	4	5	☐
8. different ways of donating for orangutan conservation.	1	2	3	4	5	☐

Demographics. (Please tick √ or circle where appropriate)

Age: 18-29 ☐   30-39 ☐   40-49 ☐   50-59 ☐   60-69 ☐
       70+ ☐

Gender: Male ☐   Female ☐

You are travelling:

   a) Alone
   b) As a couple
   c) As a family with __ children (Please indicate number of children)
   d) In Tour Package Groups; ____ (Please indicate the number of person in the group)
   e) Others; Please specify_____

THANK YOU FOR YOUR PARTICIPATION.
PLEASE RETURN COMPLETED QUESTIONNAIRE TO THE RESEARCHER AND
COLLECT YOUR FREE SOUVENIR AS A TOKEN OF OUR APPRECIATION!

Appendix C: On-site donation observation

(picture showing research assistant in headscarf observing donation behaviour)

Appendix D : Mock Petition

Support the battle against unsustainable palm oil.

SIGN THIS PETITION to encourage all those involved to switch to sustainable palm oil.

Photo credit: Beddy Tiun

Make a difference. It starts with you.

Yes! I am signing this petition to support sustainable palm oil.

Country of Origin	Date	Signature
GERMANY	19/8/15	F Heidbüchel
ITALY	19/8/15	
ITALY	19/8/15	GATATO F.
MALAYSIA	20/8/15	
MALAYSIA	2/8/15	
Canada	20.08.2015	Melanie Pla...
CANADA	20.08.2015	
UK	20/08/2015	Willey
Aus	20/08/2015	ryli
Australia	20/08/2015	JP
Australia	20/8/2015	DB
UK	20/8/15	
England	20/8/15	
UK	20/8/15	T. Hill
IRELAND	20/08/15	
England.	20/8/15.	
UK	21/8/15	raw
Brazil	21/8/15	
Australia	21/8/16	Radzak
Australia	22/8/15	
MALAYSIA	22/8/15	
Australian	22/8/15	
British	22/8/15	

Appendix E: Photocopied list of products and manufacturers and downloading app

Sustainable Palm Oil Products.

Take one to see some of the products that use sustainable palm oil.

Be informed.
Make a Difference.

Cosmetics & Others

Clean & Clear	80g Handpicked Hotels Soap – Gilchrist & Soames (UK)
Dove	Aveeno
Earth	AXE
L'occitane	BAND-AID
Listerine	Benadryl
Pond's	Happy Elephant Dish Washer Gel, Refill & Laundry Powder – Saraya (China, Japan, Russia)
Simple	Marks & Spencer (UK)
St.Ives	Silk
Suave	Swedish Spa Refrehing Shower Gel – Oriflame
The Body Shop	Vaseline
TRESemme	Visine
Tylenol	Waitrose Pure Soap – Waitrose (UK)

*All example products are from companies that are members of The Roundtable of Sustainable Palm Oil (RSPO).

Food brands

Activia	Nutella
Danone	Buitoni
Ferrero Rocher	Butterfinger
Friskies	Carnation
Gerber	Ben & Jerry's
Gold Bullion Grand – Gold Bullion	Beneful
Haagen-Dazs	Bertolli
KitKat	Cadbury
Knorr	Chips Ahoy
Lindt	Purina
M&M's	Ritz
Magnum	Skittles
Milky Way	Slim Jim
Motrin	Snickers
Nabisco	Starburst
Nescafe	Toblerone
Nesquik	Toll House
Nestea	Twix
Neutrogena	Uncle Ben's
New Britain 'Finest' Frying Oil	Wheat Thins
Nutro Olive Oil– Nutro Palm	Whiskas
Oreo	Wonka
Pedigree	Wrigley

Want to know more?

Roundtable of Sustainable Palm Oil (RSPO):
   http://www.rspo.org/

WWF and sustainable palm oil:
   http://www.wwf.org.au/ our_work/ saving_the_natural_world/forests/ palm_oil/what_wwf_is_doing/c certified_sustainable_palm_oil/
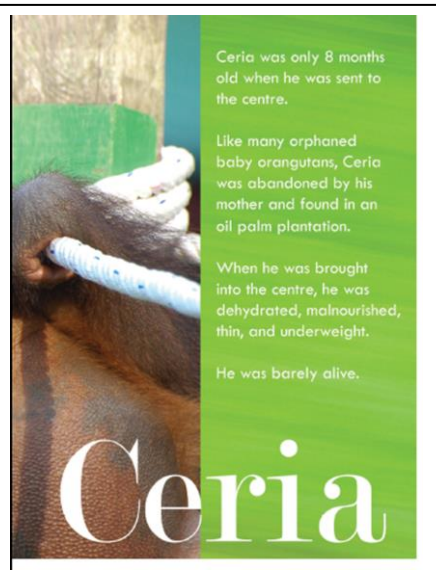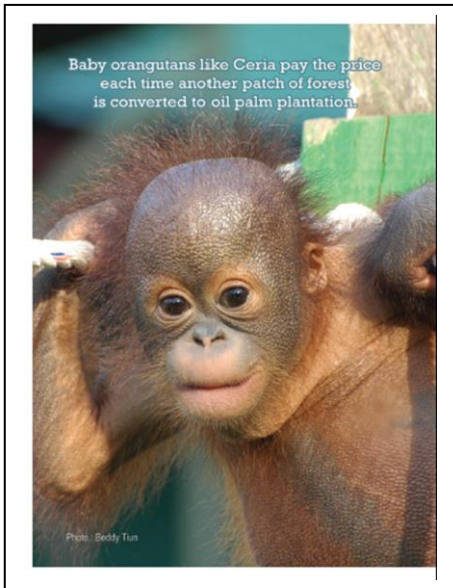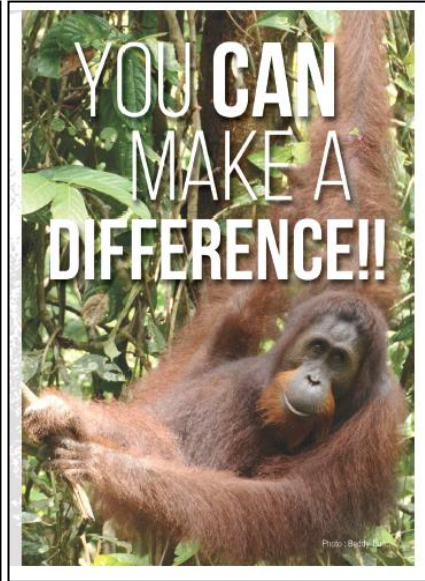
HUTAN-Kinabatangan project :
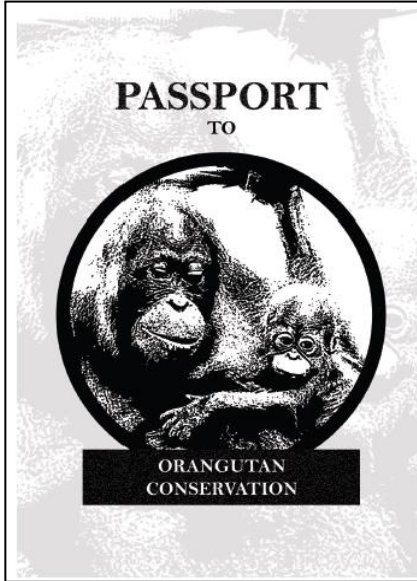   http://www.hutan.org.my/

WWF-endangered species :
   http://wwf.panda.org/ what_we_do/ endangered_species/great_apes/ orangutans/? uProjectID=MY0243

IUCN List of threatened species- Bornean orang-utan:
   http://www.iucnredlist.org/ details/17975/0

Appendix F: Downloading app

Don't Boycott. Choose sustainable products.

Download these apps to make responsible choices :

http://www.cmzoo.org/index.php/ conservation-matters/palm-oil-crisis/

http://www.palmoilinvestigations.org/

Appendix G: The intervention booklet

WILL YOU CONTINUE TO LET THIS HAPPEN?

PASSPORT TO ORANGUTAN CONSERVATION

YOU **CAN** MAKE A DIFFERENCE!!

Baby orangutans like Ceria pay the price each time another patch of forest is converted to oil palm plantation.

Ceria was only 8 months old when he was sent to the centre.

Like many orphaned baby orangutans, Ceria was abandoned by his mother and found in an oil palm plantation.

When he was brought into the centre, he was dehydrated, malnourished, thin, and underweight.

He was barely alive.

Ceria

WHY SHOULD YOU CARE?

EVERY SINGLE MINUTE, THIS WORLD LOSES AN EQUIVALENT OF

36 FOOTBALL FIELDS OF FOREST

60 SECONDS, 36 FOOTBALL FIELDS, AND COUNTING...

AT THIS RATE, IT IS LIKELY THAT IN 50 YEARS, ORANGUTANS WILL BE EXTINCT IN THE WILD.

What can you do to protect orangutans like Ceria?

WHAT'S THE FUSS ABOUT PALM OIL AND ORANGUTANS?

Photo : Beddy Tiun

PRODUCTION OF **UNSUSTAINABLE PALM OIL** IS THE BIGGEST THREAT TO ORANGUTAN HABITAT. BUYING SUSTAINABLE PALM OIL PRODUCTS ENSURES THAT ORANGUTAN HABITATS ARE PROTECTED.

USE SUSTAINABLE PALM OIL PRODUCTS
Look for the RSPO trademark.

CERTIFIED SUSTAINABLE PALM OIL — RSPO

Download the PALM OIL SHOPPING APP

WHAT CAN YOU DO?

BE PALM OIL AWARE
Seek further info about sustainable products.

TELL YOUR FRIENDS AND FAMILY!
Be the one in your community to spread awareness.

SIGN A PETITION
Urge everyone to choose sustainability too.

PRODUCTS YOU BUY MAY COST ORANGUTANS THEIR HOME
CHOOSE RESPONSIBLY.

100% SUSTAINABLE PALM OIL*	CONTAINS UNSUSTAINABLE PALM OIL*
The Body Shop soaps	Colgate-Palmolive
L'Occitane	Doritos
Nestle	Pantene
Nutella-Ferrero	Ruchi Gold-Oil

*for more info: WWF palm oil buyer scorecard

They're just like human babies!

Photo : Beddy Tiun

Success of our rehabilitation program means a better chance of avoiding extinction in the wild!

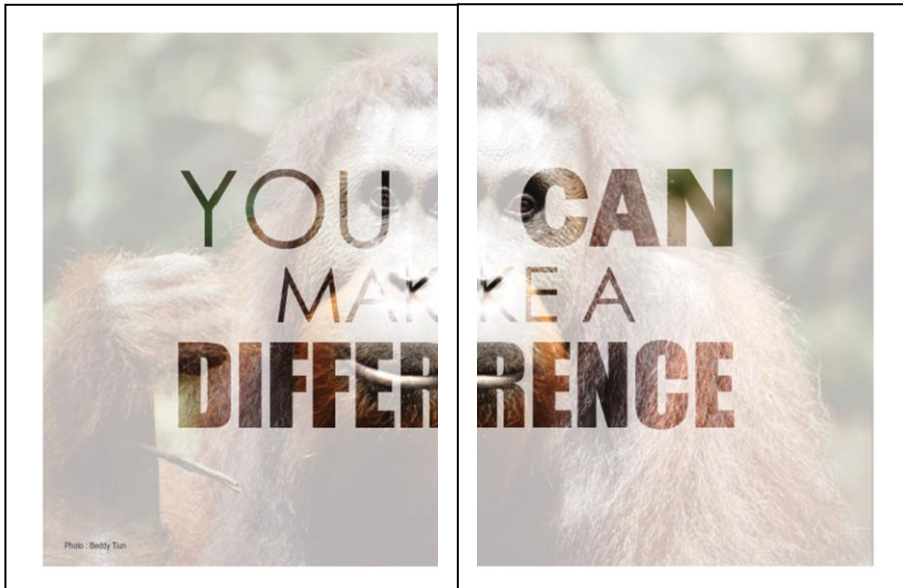---

DONATING
WHERE DOES YOUR MONEY GO?

Photo : Beddy Tiun

All donations will help buy:

Milk supplies

Food (Bananas, watermelons)

Medicines & medical equipment

Cost of veterinary staff

and so much more

HOW YOU CAN DONATE YOUR MONEY OR TIME:

ADOPT AN ORANGUTAN

MAKE AN ON-SITE **DONATION**

JOIN FUNDRAISERS TO HELP RAISE FUNDS FOR ORANGUTANS

DONATE **ANY AMOUNT** YOU CAN. DO IT ONLINE : http://www.orangutan-appeal.org.uk/donate

BECOME AN ACTIVE MEMBER OF ORANGUTAN ORGANIZATIONS