UNIVERSITI PUTRA MALAYSIA

STRUCTURAL MODEL FOR PREDICTING DISTURBANCE BEHAVIOUR INTENTION OF MALAYSIAN BIRDWATCHERS TOWARDS BIRDS

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By

MARJAN JAFARPOUR

Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in Fulfilment of the Requirements for the Degree of Doctor of Philosophy

May 2016

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DEDICATION

Dedicated to

My Father and Mother

For Overwhelming Support and enormous Scarifies

Abstract of Thesis presented to the Senate of Universiti Putra Malaysia, in Fulfilment of the requirements for degree of Doctor of Philosophy

STRUCTURAL MODEL FOR PREDICTING DISTURBANCE BEHAVIOUR INTENTION OF MALAYSIAN BIRDWATCHERS TOWARDS BIRDS

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MARJAN JAFARPOUR

May 2016

Chairman : Assoc. Prof. Manohar Mariapan, PhD
Faculty : Forestry

Bird-watching has a range of potentially negative and positive effects on birds. The premise of this research is to mitigate negative effects of Malaysian birdwatchers with identifying the key factors influencing human behaviour towards birds in the context of recreational disturbance to help in developing a sustainable tourism. This study also developed and tested a structural model to examine influencing factors on the intention of Malaysian birdwatchers toward disturbance behaviour on birds.

The main assumptions of Theory of Planned Behaviour (TPB), the theory of normative conduct and the cognitive hierarchy model were integrated into a comprehensive model. The main goal of the model was to identify key predictors that influence the intentions of Malaysian birdwatchers toward disturbance behaviour on birds.

The census technique was applied to collect data from 421 Malaysian birdwatchers using a field survey. The model was tested using Structural Equation Modelling (SEM), particularly Partial Least Squares (PLS) approach in the domain of disturbance behaviour on birds to examine the direct and mediating effects of the hypotheses. SEM-PLS, a more recent approach in analysing moderating effects, was applied as an alternative analysis to further extend the body of research. Outer weights in formatively measured constructs were the results of partial regression in this study using Smart-PLS. In addition, this research helped to produce a more inclusive picture of negative effects (disturbance behaviour) of Malaysian birdwatchers in the formative structure of a developed questionnaire.

Results support the hypothesised relationships (H1-H8): H1. Value orientation predicts attitude toward disturbance behaviour on birds among Malaysian birdwatchers.H2. Value orientation predicts intention toward disturbance behaviour on birds among Malaysian birdwatchers.H3. Attitude predicts intention toward disturbance behaviour on birds among Malaysian birdwatchers.H4. Subjective norm predicts intention toward disturbance behaviour on birds among Malaysian birdwatchers.H5. Descriptive norm predicts intention toward disturbance behaviour on birds among Malaysian birdwatchers. H6. Past behaviour predicts perceived behavioural control toward disturbance behaviour on birds among Malaysian birdwatchers. H7. Past behaviour predicts intention toward disturbance behaviour on birds among Malaysian birdwatchers. H8. Perceived behavioural control predicts intention toward disturbance behaviour on birds among Malaysian birdwatchers.

The results also show that disturbance behavioural intentions were influenced by descriptive norms, subjective norms, past behaviour, value orientations, perceived behavioural control and attitude. From the path coefficient view, the effect of predictors on intentions towards disturbance behaviour on birds was as follows in decreasing order: descriptive norms (β=0.222), subjective norms (β=0.219), past behaviour (β=0.202), value orientation (β=0.148), perceived behavioural control (β=0.128), and attitude (β=0.123). These findings showed that subjective norms had the strongest effect on intention and, on the other hand, attitude and perceived behavioural control have the weakest effects on intention. The findings also showed that subjective norms had the strongest f^2 effect size (variance) among other predictors of the model of study, but attitude and perceived behavioural control had the smallest f^2 effect size on intention in the model of study. The results also supported mediating hypothesised relationships (H9 and H10): H9. Attitude mediates the relationship between value orientation and intention. H10. Perceived behavioural control mediates the relationship between past behaviour and intention. However, from the six hypotheses, all were rejected except H11 and H15; H1. The frequency of participation moderates the relationship between value orientation and intention, and H15. The frequency of participation moderates the relationship between attitude and intention.

This research made several theoretical and practical contributions and provided further insight into the negative effects of Malaysian birdwatchers on birds. Theoretical, managerial and methodological implications were discussed, and several potential avenues for future research were identified.

In short, greater engagement with these theories advocates better integrating social science into wildlife studies and improving the understanding and management of the interaction between recreation needs and conservation.

Abstrak tesis yang telah dikemukakan kepada Senata Universiti Putra Malaysia sebagai memenuhi keperluan ijazah Doktor Falsafah

MODEL STRUKTUR UNTUK MERAMAL NIAT PERILAKU GANGGUAN OLEH PEMERHATI BURUNG MALAYSIA TERHADAP BURUNG

Oleh

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Aktiviti Pemerhatian Burung mempunyai pelbagai kesan yang mungkin negatif dan positif kepada burung.Premis kajian ini adalah untuk mengurangkan kesan negatif daripada pemerhati burung Malaysia dengan mengenal pasti faktor-faktor utama yang mempengaruhi tingkah laku manusia ke arah burung dalam konteks gangguan rekreasi untuk membantu dalam membangunkan pelancongan yang mampan.Kajian ini juga dibangunkan untuk menguji model struktur yang mengkaji faktor yang mempengaruhi niat pemerhati burung di Malaysia ke arah tingkah laku gangguan pada burung.

Andaian utama teori gelagat terancang (Theory of Planned Behaviour,TPB), teori kelakuan normatif dan model hierarki kognitif telah diintegrasikan ke dalam model menyeluruh. Matlamat utama model ini adalah untuk mengenal pasti peramal utama yang mempengaruhi niat pemerhati burung Malaysia ke arah tingkah laku gangguan pada burung.

Teknik banci telah digunakan untuk mengumpul data daripada 421 pemerhati burung Malaysia menggunakan kajian lapangan.Model ini telah diuji menggunakan "Structural Equation Modelling "(SEM), terutamanya "Partial Least Squares" (PLS) pendekatan dalam domain tingkah laku gangguan pada burung untuk mengkaji kesan langsung dan mediator pada hipotesis.SEM-PLS, pendekatan yang lebih baru-baru ini dalam menganalisis kesan moderation, telah digunakan sebagai analisis alternatif.Pemberat luar dalam pengukuran formatif adalah hasil daripada regresi separa dalam kajian ini menggunakan Smart-PLS. Di samping itu, kajian ini membantu untuk menghasilkan gambar yang lebih inklusif kesan negatif (tingkah laku gangguan) daripada pemerhati burung Malaysia dalam struktur formatif peghasilan soal selidik.

Keputusan menyokong hubungan hipotesis (H1-H8): H1. Orientasi nilai meramalkan sikap terhadap tingkah laku gangguan burung di kalangan pemerhati burung Malaysia. H2. Orientasi nilai meramalkan niat ke arah tingkah laku gangguan burung antara birdwatchers. H3. Sikap meramalkan niat ke arah tingkah laku gangguan burung di kalangan pemerhati burung Malaysia. H4. Norma subjektif meramalkan niat ke arah tingkah laku gangguan burung di kalangan pemerhati burung Malaysia. H5. Norma deskriptif meramalkan niat ke arah tingkah laku gangguan burung di kalangan pemerhati burung Malaysia. H6. Tingkah laku yang lepas meramalkan dilihat kawalan tingkah laku ke arah tingkah laku gangguan burung di kalangan pemerhati burung Malaysia. H7. Tingkah laku yang lepas meramalkan niat ke arah tingkah laku gangguan burung di kalangan pemerhati burung Malaysia. H8. Kawalan tingkahlaku yang dilihat meramalkan niat ke arah tingkah laku gangguan burung di kalangan pemerhati burung Malaysia.

Keputusan juga menunjukkan bahawa niat tingkah laku gangguan dipengaruhi oleh norma-norma deskriptif, norma subjektif, tingkah laku yang lepas, orientasi nilai, kawalan tingkah laku dilihat dan sikap. Keputusan juga menunjukan kesan peramal pada niat ke arah tingkah laku gangguan pada burung adalah seperti berikut (dalam tertib menurun): norma deskriptif (β = 0,222), norma subjektif (β = 0.219), tingkah laku yang lalu (β = 0.202), Orientasi nilai (β = 0.148), kawalan tingkah laku menyedari (β = 0.128), dan sikap (β = 0,123). Penemuan ini menunjukkan bahawa norma subjektif mempunyai kesan yang kuat ke atas niat dan, di sisi lain, sikap dan kawalan tingkahlaku yang dilihat mempunyai kesan yang paling lemah pada niat. Dapatan kajian juga menunjukkan bahawa norma subjektif mempunyai kesan terbesar saiz f^2 (varians) di kalangan peramal lain dalam model kajian, tetapi sikap dan kawalan tingkahlaku yang dilihat mempunyai paling kecil saiz kesan f^2 pada niat dalam model pengajian. Keputusan juga menyokong hubungan mediator hipotesis (H9a dan H9b): H9. Sikap menjadi mediator antara orientasi nilai dan niat. H10. Kawalan tingkahlaku yang dilihat menjadi mediator antara tingkah laku yang lepas dan niat. Walau bagaimanapun, dari enam hipotesis, semua ditolak kecuali H11 dan H15; H11: Kekerapan sederhana penyertaan menjadi moderasi antara orientasi nilai dan niat, dan H15: Kekerapan sederhana penyertaan menjadi moderasi antara sikap dan niat.

Kajian ini membuat beberapa sumbangan teori dan praktikal dan memberikan pandangan lebih jauh ke dalam kesan negatif daripada pemerhati burung Malaysia mengenai burung. Implikasi teori, pengurusan dan metodologi telah dibincangkan dan beberapa jalan yang berpotensi untuk kajian akan datang telah dikenal pasti.

Pendek kata, kita menyokong penglibatan yang lebih besar dengan teori-teori ini untuk lebih mengintegrasikan sains sosial ke dalam kajian hidupan liar dan meningkatkan pemahaman dan pengurusan interaksi antara keperluan rekreasi dan pemuliharaan.

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I certify that a Thesis Examination Committee has met on 13 May 2016 to conduct the final examination of Marjan Jafarpour on her thesis entitled "Structural Model for Predicting Disturbance Behaviour Intention of Malaysian Birdwatchers Towards Birds" in accordance with the Universities and University Colleges Act 1971 and the Constitution of the Universiti Putra Malaysia [P.U.(A) 106] 15 March 1998. The Committee recommends that the student be awarded the Doctor of Philosophy.

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LIST OF ABBREVIATIONS

AT	Attitude
CB-SEM	Covariance –based Structural Equation Modelling
DN	Descriptive Norm
FR	Frequency of participation
IN	Intention
IPMA	Importance-Performance-Matrix Analysis
NGO	Non-Governmental Organization
OLS	Ordinary Least Square
PB	Past Behaviour
PLS	Partial Least Square
SEM	Structural Equation Model
SN	Subjective Norms
SPSS	Statistical Package for social Science
TPB	Theory of Behaviour Planned
VO	Value Orientation
VAF	Variance Accounted For
VIF	Variance Inflammation Factor

CHAPTER I

INTRODUCTION

1.1 Background of Study

Less developed countries of the world display higher levels of biodiversity compared to developed countries, and that would make parts of less developed countries with a rich wildlife, the most suitable destinations for tourism concerned with wildlife. In recent times, a lot of tourists are eager to observe and interact with wildlife inside their natural habitats as near as possible, to experience the actual conditions in which they live. The human impact on various species initially modifies the behaviour and then their normal adaptations, causing the specimens to decline in many possible ways (Higginbottom, 2004; Ballantyne *et al.*, 2011).

There are many controversies regarding wildlife watching tourism more than enough to be considered a controversial issue. Certain conservationists believe that wildlife watching tourism is extremely likely to negatively disturb wildlife along with their habitats. Other conservationists believe that this sort of tourism, if properly managed, can assist biodiversity conservation. Shackley and Wynne (1996) state that wildlife tourism has shown its viability as a method of ensuring sustainable economic profits, without being at the expense of local communities and wildlife conservation.

There is a meaningful difference between wildlife tourism and other forms of tourism. While most forms of tourism are oriented towards human-made structures and human-oriented concerns, there is a form of tourism that is oriented towards a different aspect of the world involving animals that could be considered non-humanized. This is wildlife tourism, which is concerned with arranging for observations and interactions between tourists and wild or non-domestic animals, whether in the wild or in captive conditions. Wildlife tourism is dividable into two categories. The first category would be consumption, being concerned with wildlife hunting, recreational fishing, and other activities involving the capturing of wildlife. The second category would be non-consumption, being concerned with wildlife watching, the photographing of wildlife, and the feeding of wildlife. The degree and form of interaction with wild animals are dependent on the specific form of entertainment desired by the existing tourist market (Sinha, 2001).

The term wildlife is a broad and generic term, but a more official definition would consider it to include both fauna and flora that are generally considered to be wild species (Higginbottom, 2004). Wildlife-watching tourism is focused on viewing wildlife that is freely roaming in their natural habitat. It makes such tourism dissimilar from fishing, hunting and other forms of activities concerning wildlife. Wildlife viewing is fundamentally an observational activity that in certain circumstances could include interactions with wild species. Such interactions could

include touching, caressing or feeding the wild animals. Tourism of this type is not immensely difficult to set up, and consequently has flourished rapidly in recent years, increasing in popularity in many nations (Tapper, 2006).

A quick glance made through a search on the internet will yield many companies that either deals with wildlife-watching tours or offer voluntary participation during the tours, which is increasingly popular with their customer base. The tourism industry prefers to call it by the term of "wildlife tourism" rather than "wildlife-watching tourism". Both terms appear to be synonymous, but often the specific term "wildlife tourism" is used to advertise tourism which involves hunting and fishing. At times the term of wildlife tourism is also used to refer to tourism involving the observation of captive wild animals, where animals do not live in the wild but in a captive environment(Green and Higginbottom, 2001).

According to Green and Higginbottom (2001), this kind of tourism with wildlife-watching comes in many possible forms, such as:

1. Unintentional encounters with wild animals in areas that are protected, without any direct intervention on the part of tour operators.

2. Wildlife watching tours with a focus on specific varieties of animals likely to appeal to tourists. Examples of such main attractions could be bear-watching safaris or bird-watching.

3. Visiting local high-density wildlife areas, with an abundance of wild animals. Examples of these could be colonies of bats in caves, avian or mammalian migration corridors, areas where wild animals are prone to feed, or breeding zones such as the nesting places of eagles or where stags are prone to mate.

4. Tours that are based on nature walks. This could include wildlife watching taking place within tours of national parks, and nature walks through certain protected areas that have hiking trails with specific habitats (alpine, coniferous forest), possessing wildlife considered interesting to tourists.

5. Tours for purposes of research, conservation or education connected to wildlife, conducted by organisations that are not primarily interested in tourism. Examples of these would be educational facilities such as schools or universities, environmental NGO sand public institution, or private companies concerned with flora and fauna.

6. Sightseeing tours that only incidentally, without deliberate intent or arrangement, lead to wildlife encounters.

7. Dwelling in accommodations that are close to wildlife. Examples could be resorts, farms, shelters, huts intended for the shepherd or other herding purposes. This category would also include tourist activities not primarily concerned with wildlife, but likely to take place in areas inhabited by wildlife, such as climbing, trekking and any volunteer work occurring in the wilderness.

It should be noted that wildlife leisure activities in all its forms invariably has many possible expressions, both direct and indirect. Nevertheless, the scope of this research is concentrating on those expressions which are direct, such as the tourist's observation of birds in their natural habitats among bird-watching tours. Wildlife watching tourism (bird-watching) can result in many adverse effects. There are many possible adverse effects, ranging from short-term physiological alterations or behavioural changes of certain species that are more long-term that increased demise of some species, interfering with the chances of mating and causing the degradation of available habitat. These disturbances occur to not only the species in which tourists are interested in but also inadvertently harm other wildlife species, which might have considered uninteresting by tourists in the first place (Green and Higginbottom, 2001; Jones and Nealson, 2005; Green and Jones, 2010).

Species, once disturbed, will spend less of their available time resting or feeding, and these species will waste precious energy as they attempt to flee and hide from disturbances. Human disturbances are likely to cause animals to vacate their safe habitats abundant in food and nutrition. Once the animals are in new areas after fleeing the tourist presence, this is likely to lead to competition for space and food with other species, and the animals might also be more likely to be attacked by predators in the new area. Simultaneously, species that usually hibernate, when disturbed are likely to alter their typical hibernation behaviour. Close observation is likely to disrupt animal patterns of feeding and seeking out sources of food, meaning that the animals will not hibernate at all or will cut short their hibernation(Green and Higginbottom, 2001).

Once some species are used to be fed by tourists, these species will become habitual, and grow dependent on being fed by humans. As they reduce hunting or cease hunting altogether, this inevitably leads to disturbances in the ecosystem as their prey species proliferate unchecked. The wintering areas of species that hibernate can be adversely compromised, and this might result in undesirable changes in their physiology, and can also have lethal consequences. For example, hibernating bats, when prematurely awakened, will lead to rapid energy consumption that would have been crucial for a full 50 days of hibernation, causing the numerous individual bats to die (Green and Higginbottom, 2001; Jones and Nealson, 2005).

Breeding periods are an extremely crucial period for most species, and any disturbances to them or their mating rituals at these times can have extremely dire

consequences for successful species perpetuation. These dire consequences could lead to a notable population decrease in the short term and severely endanger the survival of the populations of entire species in the long-term. Unfortunately, tourists are extremely likely to disrupt birds during breeding seasons in one way or another; particularly with species like mountain cocks that tend to have mating rituals that provoke human curiosity. Recent studies have established that tourist activities can lead to physiological changes of various species, mostly relating to alterations in their blood chemistry, caused by high stress(Green and Higginbottom, 2001; Jones and Nealson, 2005; Green and Jones, 2010).

In addition, certain species are vulnerable to diseases passed by humans, these usually being diseases to which these species have never previously developed immunities or resistance to. Tourists who approach the animals run the risk of disease transmission to these animals in the process of observing them. Habitats will be disturbed and destroyed easily by any substantial tourist influx. Any large tourist presence is liable to lead to the creation of immense quantities of waste, light pollution, emissions and noise pollution. There is also a real possibility of tourists collecting rare plants or otherwise harming rare animals, even if this is legally prohibited(Green and Higginbottom, 2001; Jones and Nealson, 2005; Green and Jones, 2010).

Most people engaged in their outdoor recreations do not know that their activities can affect wildlife adversely. People tend not to feel responsible even after they know instructions. Even natural habitat managers themselves are not always alert to the possibility that they might be the ones who cause the disturbance. Almost all animal species are sensitive and vulnerable to leisure activities experienced in the habitats they inhabit, although the degree of vulnerability may differ. Among vertebrates, birds are the most studied group, followed by mammals. The consequences of disruption or destruction can be very dire among animals(Blanc *et al.*, 2006)

1.2 Problem Statement

Bird-watching is considered a sustainable leisure activity and is becoming more widespread in Malaysia. There is a need for psycho-socio ecological studies to identify the effective factors on behavioural intentions among Malaysian Birdwatchers. These factors may increase birdwatchers' potential impact on birds in terms of disturbance in the context of recreation and ecotourism for conservation planning.

Ecotourism is now widely accepted as an educational and lucrative brand of tourism that can conserve and preserve our environment and economy; it is unsurprising that it has become a hot topic concerning the economy in the tourism industry (Zhang and Lei, 2012). The definition of ecotourism can have many divergent meanings, but it is understood to be essentially a responsible travel in

which special attention is paid to minimising the negative impact of visitors, particularly in places without much human presence or disturbance(Zhang and Lei, 2012).

Sustainable tourism must be promoted to improve and protect the chances for wildlife to survive and thrive alongside humans' desire to encounter them in the world (Savu, 2012).In Asia, the challenge to conserve wildlife is one of the key issues; in Southeast Asia [including Malaysia], the unsustainable use of wildlife has been recognised. Malaysia has also been confronted with criticism and suggestions regarding the actual decline in biodiversity levels. If steps are not taken to conserve wildlife, careless managing of wildlife and ecosystems may cause the disappearance of some species of animals and plants, along with the ecosystems(Nijman, 2010).

Wildlife watching tourism is considered friendly to the environment. It is expected that those tourists who want to observe wildlife are also concerned with its conservation. Thus, it is possible for wildlife tourism to support conservation and create a positive influence. Nevertheless, it can also create several adverse impacts, resulting in a decrease in animal populations, causing stress and bizarre animal behaviour, and altering their habitats. Success in preventing this requires taking positive steps if conservation plans are to be successfully realised (Green and Higginbottom, 2001).

From 1978 to 2010, academic journals in English produced sixty-nine papers regarding the effects of wildlife watching tourism activities on avian life. Negative impacts were found in sixty-one of the papers (88%)(Steven *et al.*, 2011). Human effect on species firstly alters the behaviour and then their normal adaptations, leading to degenerate specimens(Bouros, 2012)which are no longer a sample of emblematic species in Malaysia.

Continents and regions, such as Asia, Australia, Africa and Central America, with high bird diversity, still have very limited research regarding wildlife tourism (Steven*, et al.*, 2011). Recently, there has been a greater emphasis on wildlife viewing in a broader range of environments, as well as being concerned with a wider range of species (Green and Higginbottom, 2001; Higginbottom *et al.*, 2001), which has been occurring in Malaysia as well.

Green and Jones (2010) expressed concerns regarding the conservation-related behaviour and morality of bird-watching tourists. Green and Higginbottom (2001)observed that birdwatchers would often approach nesting birds for purposes of identifying the precise species, ignoring the effect on the birds, or the tourists would deliberately flush out a rare species of bird. Burger et al. (1995) mentioned a reliable pattern of behaviour; after bird-watchers arrive at a new region, they usually wish to see bird species that are shy, rare or both. Unfortunately, these bird species have a highly vulnerable to disturbance.

Wearing and Neil (2009)asserted that there is a vital concern regarding ecotourism and wildlife tourism; it frequently and meaningfully threatens to destroy the environment that it wants to protect. The warning of Ream(1978)was that even bird-watchers and photographers were likely to frequently harass wildlife. Huxley and Fladmark(1994)also asserted that it was the people who knew what they were seeking or looking for, are the one who inflicted the greatest harm. Anderson and Keith (1980)stated that many well-meaning observers still held something Wilkes (1977)referred to as 'the myth of the non-consumptive user'. This myth or misconception would be the idea that even those usages of wildlife resources considered non-exploitative effect organisms. Regrettably, even good intentions can lead to damage.

There is growing concern regarding the human disturbance on wildlife owing to increasing human access to the countryside (Martínez-Abraín *et al.*, 2010). In environments that are regularly disturbed by humans, breeding performance is likely to decline sharply, leading to the reduction of the number of breeding locations, eventually diminishing the bird population(Steven*, et al.*, 2011).

The popularity and frequency of bird-watching are increasing on a global scale as means of recreation. Several problems can be recognised from a close reading of both local and international literature, especially the interviews with experienced personnel who work in the Australian government conservation agencies. These problems are both latent and manifest. The negative effects on wildlife caused by wildlife tourism, particularly for the current study's concerns about birds, can be classified into three groups: "(1) disruption of activity, (2) direct killing or injury, and (3) habitat alteration (including the provision of food)". There is the possibility of extreme variation regarding the quantity of negative effects on wildlife. This definition covers most of the potential negative effects on wildlife, especially birds (Green and Higginbottom, 2001).The negative effect of birdwatchers on birds in Malaysia is specified for the development of the instrument in the current research.

However, the science supporting conservation planning is undergoing a renaissance, with widespread and increasing acknowledgement of the importance of understanding the socio-ecological context of planning regions (Chan *et al.*, 2012).Social research provides tools and techniques for understanding the feasibility of conservation actions. Social research can also assist with the identification of the scope of conservation problems, such as the identification of key stakeholders who have an interest in or affect on the conservation problem and the characteristics of management and analytical contexts that may influence the problem. Most conservation planners are trained as biologists or ecologists and must, therefore, continually acquire new knowledge and skills in the social sciences. Conservation planners are encouraged to explicitly and comprehensively justify their rationale for integrating social theory, such as the theory of planned behaviour, into conservation planning theory. A study of existing social science theory relevant to the research problem may promote the development of new, integrated conservation planning theory. The review also revealed the absence of an existing theory or a set of variables to explain the relationships between

conservation science and social science constructs. Furthermore, a general absence of robust testing and validation of social measures included in conservation planning studies was noted(Taylor and Knight, 2003; Raymond and Knight, 2013).

In addition, social scientific analysis of the relationship between outdoor recreation and wildlife disturbance is still regrettably limited. There is a need for an integrated ecological and social approach to the analysis of recreational disturbance. The challenges of understanding tourist values, attitudes and behaviour, and identifying appropriate mechanisms and interventions to influence these are still mostly unsolved problems of social science. Findings from the current research which is relevant to outdoor recreation and theories and models of human behaviour could be extremely useful for guiding management responses to bird disturbance. There is a need for the synthesis of relevant information on recreational disturbances to debate whether recreational activities have significant negative impacts on birds (Marzano and Dandy, 2012b).

Furthermore, it is drawn from the consideration of both natural and social science studies that there is no direct measurement instrument for the assessment of disturbance behaviour on wildlife (birds) via leisure activity, specifically bird-watching. The available measures are all ecological/biological approaches. Considerably less work has been carried out on the social dimensions of recreational disturbance, particularly bird-watching. Thus, our research presents a new, valid and reliable conservation instrument that may assist conservation planners in integrating psychosocial research techniques into the model for conservation planning. In the current research, there is also an attempt to identify the key factors influencing birdwatcher intentions towards disturbance behaviour on birds among Malaysian birdwatchers. Consequently, these efforts lead to a valid and reliable model for further studies and implications to support conservation planning.

To sum up, This research focused on identifying the four substantial gaps in existing psychological studies: (1) The absence of an existing theory to explain the relationship between conservation science and social science constructs; (2) The lack of validation of social measures in conservation planning; (3) The considerable gap in the social scientific analysis of the relationship between outdoor recreation and wildlife disturbance; (4) The unsolved problem of social science in understanding behaviour of tourist in conservation planning. If we want to use tourism as a conservational tool, we need to study the behaviour and psychology of tourists as well as wildlife to be able to explain tourist behaviour. For a sustainable and long-term bird-watching activity, more research is necessary. This research would lead to an comprehensive management which is more capable of monitoring influential factors on intention towards disturbance behaviour of Malaysian birdwatchers in the conservation planning.

1.3 Objectives of the Research

1. To examine all relationships between independent variables and dependent variables toward defined disturbance behaviour on birds among Malaysian birdwatchers.

2. To examine the mediators role of attitude and Perceived Behavioural Control toward defined disturbance behaviour on birds among Malaysian birdwatchers.

3. To investigate the moderator role of frequency of participation in bird-watching on the relationships between the factors and intention toward disturbance behaviour on birds among Malaysian birdwatchers.

1.4 Hypothesis

Objective 1

H1. Value orientation has a positive contribution to attitude toward disturbance behaviour on birds among Malaysian birdwatchers.

H2. Value orientation has a positive contribution to intention toward disturbance behaviour on birds among Malaysian birdwatchers.

H3. Attitude has a positive contribution to intention toward disturbance behaviour on birds among Malaysian birdwatchers.

H4. Subjective norm has a positive contribution to intention toward disturbance behaviour on birds among Malaysian birdwatchers.

H5. Descriptive norm has a positive contribution to intention toward disturbance behaviour on birds among Malaysian birdwatchers.

H6. Past behaviour has a positive contribution to perceived behavioural control toward disturbance behaviour on birds among Malaysian birdwatchers.

H7. Past behaviour has a positive contribution to intention toward disturbance behaviour on birds among Malaysian birdwatchers.

H8. Perceived behavioural control has a positive contribution to intention toward disturbance behaviour on birds among Malaysian birdwatchers.

Objective 2

H9. Attitude mediates the relationship between value orientation and intention toward disturbance behaviour on birds among Malaysian birdwatchers.

H10. Perceived behavioural control mediates the relationship between past behaviour and intention toward disturbance behaviour on birds among Malaysian birdwatchers.

Objective 3

H11. The frequency of participation moderates the relationship between value orientation and intention toward disturbance behaviour on birds among Malaysian birdwatchers.
H12. The frequency of participation moderates the relationship between subjective norms and intention toward disturbance behaviour on birds among Malaysian birdwatchers.

H13. The frequency of participation moderates the relationship between descriptive norms and intention toward disturbance behaviour on birds among Malaysian birdwatchers.

H14. The frequency of participation moderates the relationship between past behaviour and intention toward disturbance behaviour on birds among Malaysian birdwatchers.

H15. The frequency of participation moderates the relationship between attitude and intention toward disturbance behaviour on birds among Malaysian birdwatchers.

H16. The frequency of participation moderates the relationship between perceived behavioural control and intention toward disturbance behaviour on birds among Malaysian birdwatchers.

1.5 Operational definition of terms used in the study

Attitude

Attitude is a psychological tendency that is expressed by evaluating a particular behaviour with some degree of favour or disfavour (Jillian J *et al.*, 2004).

Birdwatchers

An individual who closely observes or tries to identify birds (Kuehn *et al.*, 2010).

Bird-watching

The act of observing and identifying birds in their native habitats (Kuehn*, et al.*, 2010).

Past behaviour

Past behaviour in general could be understood as actions or reactions of a person in response to external or internal stimuli in past (Sommer, 2011)

Intention:

A central variable in the theory of planned behaviour is the individual's intention to perform behaviour.Behavioural intentions are regarded as a summary of the motivation required to perform a particular behaviour, reflecting an individual's decision to follow a course of action, as well as an index of how hard people are willing to try and perform the behaviour(Fishbein and Ajzen, 1975; Ajzen, 1985; Ajzen, 1991).

Perceived Behavioural Control

When social psychologists measure perceived behaviour control they are quantifying to what extent people feel that they have the ability to perform the behaviour being investigated. It measures the perceived presence (or absence) of required skills, resources and other prerequisites required, and how much power people perceive each of these factors to have in making the behaviour easy or hard to do (Ajzen, 1991).

Descriptive Norms: Perceptions about what important people do (Forward, 2009)

Injunctive Norms/Subjective Norms: Perceptions about what important people think a person should do (Forward, 2009)

Value Orientation

An individual's value orientations are an expression of basic beliefs providing a foundation for higher-order cognitions, such as attitudes and norms (Tanakanjana and Saranet, 2007; Vaske, J. *et al.*, 2011).

Wildlife tourism

The literature demonstrates that wildlife tourism, which can incorporate anything from insects, flowers, mammals and birds, has become a potentially lucrative activity which is attracting attention from tourists and destinations. There are both positive and negative impacts associated with wildlife tourism(Curtin, 2008).

1.6 Organisation of the dissertation

This dissertation includes four more chapters beyond this introductory chapter.Chapter two includes the literature review where the theoretical framework of the study and the relationships between key theoretical variables are discussed. The proposed model is also presented. Chapter three presents the methodological approach used in this study as well as the steps taken toward the development of a scale that measures the elements (construct and items). Chapter four presents the analysis of the data and results for the scale development and the testing of the model's proposed hypotheses. Chapter fouralso discusses the results derived from the data analyses and compares and contrasts these results with previous research on this topic. Chapter five presents conclusion, implications and recommendations for future researches in this field

CHAPTER II

LITERATURE REVIEW

2.1 Introduction

This study examines factors leading to intentions towards disturbance behaviour on birds among Malaysian birdwatchers in ecotourism management. It also proposes a structural relationship between intentions towards disturbance behaviour on birds and attitude, value orientation, past behaviour, subjective norms, perceived behavioural control.

Firstly, the disturbance behaviour on wildlife and the impacts of wildlife tourism on birds and are reviewed. Then it seems imperative to define disturbance behaviour. This chapter also encompasses a review of theories which are used. The next part involves the definitions and the review of all central concepts in Planned Behaviour Theory (TPB), the theory of focus normative conduct and the cognitive hierarchy model. The main concepts in these theories are attitude, perceived behavioural control, subjective norms, descriptive norms, value orientation and past behaviour. In addition, there is a review of all relationships between constructs in the theoretical framework of the study. After that, a theoretical framework is introduced. Finally, a conceptual framework is derived from the reviews on the disturbance behaviour on birds among Malaysian birdwatchers.

2.2 A short review on human behaviour and the disturbance of wildlife

There is a very little research involving the social operator of wildlife disturbance such as norms. While some of these human dimensions have been analysed in closely related areas, such as the effect of norms on wilderness recreation experiences and behaviour (Shelby and Vaske, 1991; Marzano and Dandy, 2012a), the only aspect to have undertaken any persistent research in the recreational disturbance literature is on perceptions that recreationists have of their (and others') influences on the wildlife. Some studies have explored whether there is a positive relation between participation in the outdoor recreation and concerns for the environment with research into this relationship beginning in the 1970s (Geisler, 1977).There have been difficulties in collecting evidence to prove a strong, direct link, but some studies have found that participation in recreation can increase pro-environmental behaviour such as belonging to an environmental organisation, campaigning for environmental issues or joining in an environmentally friendly activity such as green consumerism (Larson *et al.*, 2011). Nonetheless, there are studies which recommend that in spite of holding high conservation values, people can disengage worries about the environment from how they separately behave outdoors (Lemelin and Wiersma, 2007). The form of recreational pursuit and favourite places to perform that activity as well as place attachment are also said to have a bearing on environmental attitudes(Dorwart *et al.*, 2009; Lee, T. H., 2011).

A few studies have shown social research with recreationists themselves, focused mainly on wildlife, rather than habitats. For example, in a study on recreational disturbance of mammals in a US State, Taylor and Knight (2003) surveyed trail users, including hikers, mountain bikers and horse riders, on issues such as whether recreational activities affect negatively on wildlife and which user group was held most responsible. Another survey (Sterl *et al.*, 2008) accomplished in an Austrian urban national park during winter explored visitors alertness of the potential impacts of their activities on wildlife. These studies found that recreational users can be mainly unconscious of the results of their activities for wildlife, and are probable to hold other user groups responsible for negative effects (Manning *et al.*, 2004; Marzano and Dandy, 2012b). Taylor and Knight (2003) reported that fifty percent of those surveyed did not believe that recreational activities had any effects on wildlife. Sixty per cent of visitors in Sterl *et al*. (2008) study believed the same view. Explanations for this, commonly related to considerations of 'suitable' behaviour (such as sticking to trails, following prescribed rules and being quiet), though some recreationists simply felt they were not disturbing wildlife if they did not see any (Sterl*, et al.*, 2008). Taylor and Knight (2003) also showed that recreational users understimated the distance over which wildlife are disturbed (Symmonds *et al.*, 2000).

There is obviously a substantial gap in our understanding of the social facets of recreational disturbance. Integrating ecological impact studies with social data on recreationists' values, attitudes and behaviour may well suggest to more useful and socially acceptable management actions (Taylor and Knight, 2003). On the other hand, there are few studies of recreational disturbance which draw directly on established behaviour theory to offer analytical directions or framing and none of them related directly to, or present principal data from research on the bird-watching in Malaysia.

There are numerous approaches in which human behaviour is conceptualised and studied. The most common viewpoint, established upon social psychological research, focuses on the individual who selects about how they behave (a cognitive perspective). They can be influenced to a greater or lesser degree by external factors such as social burdens or economic capability. Some cognitive models have been applied to forecast recreationists' behaviour in the outdoors (Martin and Mccurdy, 2009). The theory of planned behaviour (TPB) (Ajzen, 1991) is one of the most broadly cited and applied theories adopting the cognitive views, and statements that intention is the best predictor of actual behaviour. It suggests attitudes towards a behaviour (and its outcomes), subjective norms (that is perceived social pressures), and perceived behavioural control as three principle causes of intention(Marzano and Dandy, 2012b).

It can be enormously challenging to detach or draw boundaries around these different factors and recognise which ones may be most important in how people feel about, and involve in recreational activities. Behaviour theories offer many concepts and notions which nature managers can utilise when looking for understanding and addressing the disturbance of wildlife by recreationists.

Nevertheless, some of the notions provide more practical and instant ways to understanding and affecting behaviour than others (Marzano and Dandy, 2012b).

2.3 A review of the effects of wildlife tourism on birds

Recreational activity involving wildlife viewing can adversely affect the environment. Reviewing the literature relevant to recreation ecology that has been published in academic journals in the English language identified 69 articles, from 1978 to 2010, were concerned with the effects of this type of activities on birds. Negative impacts were found in sixty-one of these articles (88%). This included alterations in avian physiology (11 papers). Thirty-one out of thirty-seven papers found changes in the immediate behaviour of birds. Still, other papers found changes regarding avian abundance (28 out of 33 papers), and 28 out of 33 papers established changes in avian reproductive success. Most of these past studies have been concentrated in a small number of countries, specifically Argentina, the United Kingdom, the United States and New Zealand. These studies are also narrow in that they have focused mostly on cool temperate or temperate climatic zones. Frequently they have been restricted to wetland habitats or shoreline habitats. The examined foraging guilds were usually crustaceovore/molluscivore, carnivores or insectivores. Certain vast regions – indeed, entire continents - of the world that have both high bird diversity and nature-based recreation like mainland Australia, Central America, Asia, and Africa can only be considered partly studied, or have hardly been studied at all (Steven*, et al.*, 2011).

Human disturbances regimes vary in duration, intensity and periodicity which will change the significance of their impacts on wildlife (Steidl and Powell, 2006). Birds are likely to react to human approach by changing their behaviour, however briefly, or displaying flight reactions or an increased heart rate. Even though these responses can be brief, they nevertheless can lead to worrying changes in the long run, such as when flushed-out on breeding birds is making them leaving their eggs or chicks and easily attackable by predators (Guillemain *et al.*, 2007). Areas frequently disturbed by humans are likely to suffer decrease in both their breeding performance and the quantity of the available breeding sites, leading to severe population reduction in the long-term (Pearce-Higgins *et al.*, 2007). Although it is not easy to establish a direct connection between disturbances of human origin and population level effects, a hierarchical model can be used to demonstrate the relative importance of a negative effect. The significance of an effect will vary in ways dependent on the scale of the disturbance itself (Steven*, et al.*, 2011).

As it has already been noted, research relevant to these issues from many parts of the world is grossly insufficient. Entire continents and vast nations have been studied extensively, such as Europe and most of the American continents. In contrast, research of Australian, Asian, Africa and Central American origin is close to non-existent. Despite the fact that three Ecozones – Afrotropical, Indomalayan and Australasian – have high bird species richness, there was only one paper investigating the effects on the avian life in the Afro-tropical eco-zone. This paper

was concerned with South African shorebird breeding performance; Obviously, there is still much work to be done (Baudains and Loyd, 2007).

Many areas with high bird diversity make nature-based tourism or bird tourism important parts of their economies, such as various southern and eastern African countries (Lindsey *et al.*, 2007). The ecozone of Indo-Malaya had only a single paper examining developments of the tourism affecting the habitats of Malaysian plovers in the nation of Thailand (Yasué and Dearden, 2006). The region of Australasia produced only five papers of New Zealander origin, and a single paper of mainland Australian origin (Steven*, et al.*, 2011).

This single Australian study was about Sydney, the largest city, and how there had once abundant birds have reduced their activities and presence in the forest trails most used by human walkers and their dogs on the outskirts (Banks and Bryant, 2007).This is surprisingly restricted considering that Australia is a hotspot for bird biodiversity that has been recorded to have over 800 avian species, such as honeyeaters and endemic parrots. It is also a country where nature-based recreation can be considered popular (Jones and Nealson, 2005).Research about the impacts of non-motorised recreation on foraging guilds of birds like frugivores and nectarivores is also extremely lacking, with only a paper concerned with the impacts on these guilds. Considering the sheer importance of nectarivores and frugivores and their roles in the ecology of numerous communities, for both the dispersal of seeds and pollination, this seems to be a significant oversight. (Moran *et al.*, 2009; Steven*, et al.*, 2011).

According to Green and Jones (2010) both local and international literature, and furthermore interviews with Australian governmental conservation agencies, show many problems with wildlife tourism both actual and potential problems. These problems are already afflicting the welfare and the behaviour of wildlife, along with reducing their populations. It is possible to categorise these negative effects into three distinct groups: the disruption of wildlife activity, the direct harm or killing of wildlife, and the alteration of habitat, which would include providing the animals with food. Depending on the species, the stages of the life-cycle, the habitats and numerous other variables, the severity and the magnitude of negative effects can vary widely in many ways(Green and Higginbottom, 2001). Bird watching studies are necessary to assess adequately both positive and negative effects of bird watching on the birds and wildlife in the areas where bird watching takes place (Darryl N *et al.*, 2001; Jones and Nealson, 2005)

Management processes that identify potential and actual negative effects and implement actions to correct them are critical. Monitoring of wildlife that could be affected by wildlife tourism activities should incorporate well established statistical principles where possible. There are also many gaps in knowledge that we would ideally possess if we are to manage wildlife tourism in such a way as to minimise negative effects on wildlife (Green and Higginbottom, 2001). According to Buckley (2012), if our intention is to use tourism as a conservation tool, we must

study the behaviour and psychology of tourists as well as wildlife. Gaining knowledge of both tourists and wildlife is a prerequisite to successfully altering tourist behaviour in a positive way that leads to the satisfaction of concerns. The study of intentions of tourist, specifically Malaysian birdwatchers towards disturbance behaviour on birds is the general objective of this thesis.

2.4 Behaviour

A key objective of psychology is to recognise what determines people's behaviour, including understanding, explaining, and changing human behaviour. One important objective of environmental psychology is to recognise what determines people's actions on environmentally related domains. Several different ways to determine behaviour have been recommended through the field's review. Many of them could be classified under the general term "action models" or "action determination models". The theory of planned behaviour (TPB) , [see, e.g., Ajzen, 1991] was confirmed to be mainly beneficial in the dominion of environmental actions (Klöckner and Blöbaum, 2010).

The target behaviour should be defined carefully regarding its target, action, context and time(Jillian J*, et al.*, 2004). In this research, birds that have the most interaction with birdwatchers were selected as the target of disturbance behaviour. The focused behaviour (action) is disturbance behaviour on birds in the context of wildlife in Malaysia. The model can be used to predict factors of the model of the study that are influential on intentions towards disturbance behaviour on birds.

2.4.1 Definition of disturbance behaviour:

In the social sciences, a concept is an idea that is expressed in words or as a symbol (Blaikie, 2009). Concepts are also the foundations of social theories (Babbie, 2015). The process of selecting and defining concepts is referred to as conceptualisation. Conceptualisation is often missing from social assessments in conservation planning literature. A variety of concepts are often selected without sound justification for their inclusion in a study; in other instances, these concepts have been ill-defined (Raymond and Knight, 2013). For example, the concept of disturbance behaviour might be unclear because disturbance is commonly related, and frequently confounded, with a more general concept of perturbation. In ecology, perturbation is a very general term, describing distinct events in time that affect populations, ecosystems or landscapes by influencing their structure and function, and the physical environment(Dajoz, 1975).Consequently, this includes unpredictable natural perturbations, like climatic events, fire, flooding, drought, etc., but also human-induced perturbation. Most definitions present here are from authors working with birds, but they can often be generalised to all wildlife (Blanc*, et al.*, 2006).

Boere and Zegers'(1975) definition of disturbance is "any situation in which an animal behaves in a different way from its favoured behaviour". Some authors only reflect on the human-produced part of disturbance, which is then defined as any condition in which human activities lead animals to behave differently than they would have in the absence of these activities. This definition consequently excludes natural disturbances, linked, for examples, to the appearance of predators, even if natural perturbation by predators is frequent, remarkably its disturbance part. Following Cayford (1993)"Disturbance is a rather vague concept which loosely describes unplanned relationships between a wide range of (usually) anthropogenic stimulus and the reactions that have been shown in animal. " Besides, disturbance can be termed operationally any quite separate event in time that disrupts ecosystems, communities or populations, where disruption refers to a change in behaviour, physiology, numbers and survival. Disturbance differs in its magnitude, frequency predictability, spatial distribution and duration.

The other general definition of disturbance appears to be the one of the European Commission, cited by Harradine(1998): a disturbance is "any phenomenon that may cause a substantial change in the dynamics of a population or the ecological characteristics of populations". Significance in this case can be refereed after numerous criteria, but a disturbance will be considered "significant" if the event "contributes to the long-term decline of the population of the species on the site", "contributes to the decrease or to the risk of decrease of the variety of the species within the site" or "contributes to the reduction of the size of the habitat of the species within the site" (Blanc*, et al.*, 2006).

Of course, the above definition often remains theoretical, for it is difficult to assess if an individual's reaction to a disturbance event meaningfully affects population dynamic.(Blanc*, et al.*, 2006). In practice, is considered as a disturbance "any deviation from normal behaviour in response to unexpected incidences in the neighbourhood of a bird [an animal]" (Blanc*, et al.*, 2006).

As underlined by Patonnier (2000), the effect of disturbance can be short-term direct effects (stopping of the current activity, vigilance, escape, death), from long-term direct effects (alteration of behaviour, of daily activity rhythm, of animal distribution, of demographic parameters) and from indirect effects (increase of predation rate, penetration of habitats by communication paths, hunting of sympatric species) (Blanc*, et al.*, 2006).

It also seems less ambiguous for the present purposes to group information according to the kind of disturbance which has on birds. In this study, disturbance behaviour on birds was defined as the categories of various negative effects, which were mentioned in a review by Green and Higginbottom (2001) in Australia, that is now being adopted in Malaysia.

2.4.2 Categories of disturbance behaviour

The negative effects on wildlife can be grouped into many possible ways. Those ways that take the response of the animal into account (habituation, avoidance, etc.) pose certain problems. These reactions, though undeniably vital to a thorough evaluation, are often unclear or unpredictable, and animals are capable of responding in several different or unknown ways. Grouping information according to the variety of disturbance can be, for the current purposes of this study, a less ambiguous method. The three categories used in this study for disturbance behaviours on birds are (Green and Higginbottom, 2001):

1. Disruption of the activity of animals, including using spotlights for birding at night, making noise by participating in a large group, keeping wild birds in cages and approaching birds for photography.

2. Intentional or accidental killing or injuring of animals, including killing wild birds (even for research), hunting, collecting or catching birds or trampling the nests of birds.

3. Habitat alteration, including feeding birds.

These definitions would cover most of the negative effects which could possibly afflict wildlife. These are connected to three disturbance levels that are broadly quoted from Liddle (1997): 'interruption of tranquillity' (animals smelling, hearing or seeing humans but not making direct contact with them), 'interference with rights or property' (the clearance of habitat and similar disruptions) and 'molestation' (fishing, hunting, vehicular collision, etc.). This study, however, changes to a small degree by considering that the intentional or accidental feeding of animals falls under habitat alteration, and by not attempting to judge the levels of severity of the three levels of disturbance. For example, habitat clearance, when compared to hunting which is well managed, has a higher likelihood of killing many more animals. Furthermore, disrupting the activity of parent animals often leads to the death of their abandoned progeny (Green and Higginbottom, 2001).

Any noisy activities, spotlighting and tourists coming close to animals which are looking after their young or foraging can be considered other examples of disrupting activity. In response to the human disruption of wildlife activities, the animals may show some possible behavioural reactions. The animals could react and display avoidance behaviour where the wildlife would flee or hide, or they could be already habituated to humans, having acquired a significant and regular lack of response to the human presence to the point of apparently disregarding their presence. Even worse, the animals could be attracted to humans and move towards them expecting to be fed. Some factors can influence the degree to which an animal will probably be affected by the activities of humans. Examples of such factors are the nature of the activity of the animal, whether or not it has dependent offspring, the quantity and type of past human contact, the openness of the habitat, the degree

of which human activity can be predicted, and the methods of transport used by the visitors.

Human intentions towards a particular behaviour may lead to wildlife destruction, such as collecting, fishing, or hunting; unintentional forms of death or injury to animals can also take place due to road accidents. The human presence is also often responsible for the destruction of wildlife in other ways, such as crushing wildlife underfoot through unintentional trampling (e.g., the eggs belonging to birds that are ground nesting), the intentional killing of animals for perceived security reasons, (e.g., snakes), intentional insecticide use for human comfort, and intentionally setting fire to the forest understory to make firebreaks (particularly when it is breeding season). Obviously, the clearing or serious modification of land to create the infrastructure required for tourism activities is an extremely serious form of habitat alteration, given that, at the very least, it will displace wildlife populations inclined to dwell or pass through those areas.

Additional habitat alterations can be caused by humans trampling on vegetation, or from off-road vehicle damage. Another form of habitat alteration that has to be kept in mind is the possibility of both intentional and accidental provision of food to wildlife. Such changes can lead to significant fluctuations in population numbers, reduced protection from weather or the elements, increased vulnerability to predation, or the dwindling of available prey species. The marked increase in numbers of any single species might potentially lead to negative impacts on the other species that can be found in the ecosystem. There is a real possibility of animals that are used to being fed by hand becoming aggressive towards humans or otherwise posing a threat to tourists. It is not remotely easy to determine the magnitude of impacts or designate them as positive, negative or neutral. There are many complex variables to bear in mind, as what can be considered positive for the welfare of one species may be considered only neutral or negative for another species (or for the well-being of the ecosystem). Something considered positive in an ecological sense could be negative in concerning the effects on species' behaviour. The goals of human activity also shape the assessment of impacts, such as, which is considered more important: the possibility of approaching animals or the display of their natural behaviour. The method used to approach animals and any other activities transpiring at the exact site are additional, important factors to take into consideration. Even species that are only indirectly involved in wildlife tourism can be affected or changed by human activities. It is possible for management actions regarding wildlife tourism to lessen or diminish the negative impacts of tourism on the wildlife itself. These activities can be focused on either the tourists or the wildlife, using many possible methods to alleviate the harm. In the majority of cases, it is considered appropriate to focus on the management of the visitors, as well as the tourist operators, regarding their distribution both spatially and temporally, numbers, behaviour, attitudes and their expectations(Green and Higginbottom, 2001).

This research focuses on birdwatchers' disturbance behaviour on birds in the scope of the categorisation by Green and Higginbottom (2001)regarding negative human impacts (human disturbance behaviour) on wildlife.

2.5 Theory of Reasoned Action

Fishbein and Ajzen (1967) introduced Theory of Reasoned Action (TRA) aiming to explain the relationships between attitudes, beliefs, intentions and behaviour. (Madden *et al.*, 1992; Fishbein and Ajzen, 2011), see figure 2.1. The theory has been widely applied by researchers in social psychology studies to predict and understand the effects of motivation on behaviour. Also, TRAmodel has been extensively used to predict behavioural intentions and behaviour. In their theory, Fishbein and Azjen (1967) classified the beliefs which precede behavioural intentions into two distinct categories, namely behaviour and normative. It is assumed that behavioural beliefs have the main influence on one's attitude towards the performance of the behaviour, while the individual's subjective norm related to behaviour performance is affected by the normative type beliefs. Thus, the intentions and subsequent behaviour are affected by information and salient beliefs either by attitude or by subjective norms. Later, Azjen extended the theory and added perceptions of behavioural control as a predictor of intentions and behaviour to the original theory(Madden*, et al.*, 1992; Fishbein and Ajzen, 2011).

According to the TRA, the individual's attitude toward particular behaviour as well as his/her subjective norms affect the likelihood of performing that behaviour by the individual (Fishbein and Ajzen, 2011). In social psychology research, the two most commonly used models to understand human behaviour are reasoned action theory (Fishbein and Ajzen, 2011) and the extended theory of planned behaviour(Ajzen, 2014). These theories have been employed in numerous studies aimed at understanding and influencing individuals' behaviour. The underlying assumption in all these studies is that understanding the behaviour predictors makes it possible to design better interventions intended to change individuals' behaviour (Elliott and Armitage, 2009; Fishbein and Ajzen, 2011). A review of the studies which used interventions designed based on findings from planned-behaviour-theory research revealed that the intervention produced some desired behavioural change in two-thirds of the cases (Hardeman *et al.*, 2002; Elliott and Armitage, 2009). There are two main assumptions underlie TRA and TPB: 1) individuals make an evaluation of (weight) the possible implications and consequences of performing a behaviour prior to making a decision whether or not to engage in that behaviour, and 2) an individual makes sensible decisions according to a systematic evaluation of the available information, regardless of the correctness or reliability of the information (Fishbein and Ajzen, 2011)

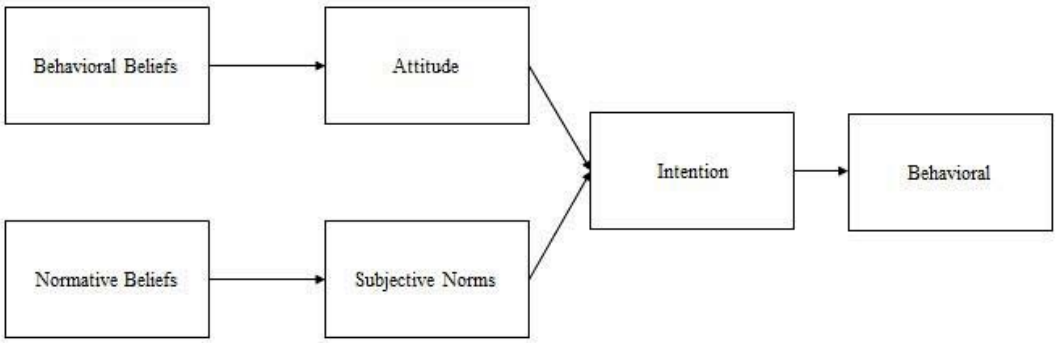


Figure 2.1. Reasoned Action Theory (Fishbein and Ajzen, 1967)

2.6 Theory of Planned Behaviour

The previous argument implies that the dependence of TRA upon intention as the mere factor predicting behaviour is not sufficient in cases where there is incomplete control over the behavioural goal. Many internal factors such as knowledge, skills, and abilities, along with external factors such as time, money, and opportunity can interfere with control over the individual's intended behaviour(Ajzen and Madden, 1986; Ajzen, 2011b; Yzer, 2012). According to Ajzen and Madden (1986), to ensure the accuracy of behaviour prediction in cases where people have little control over their behaviour, not only the intention must be assessed but also the extent to which an individual can have control over a given behaviour must be estimated(Ajzen, 2011b; Yzer, 2012).

The theory of planned behaviour was proposed by Ajzen (1985, 1991), with the aim of moving beyond solely volitional action. TPB is an extended version of the theory of reasoned action by adding the concept of behavioural control. Nowadays, the role of control over intended behaviour is increasingly attracting interested psychologists' attention (Yzer, 2012). The fact that the probability of behavioural achievement must be to some extent dictated by the available opportunities and resources makes the significance of actual control self-evident. Therefore, researchers have proposed examining the opportunity context, the presence of facilitating factors, resources and action control to be able to make accurate behaviour predictions when individuals have little control over their behaviour. The adequate assessment of actual control before behaviour observation is often difficult, if not impossible. There are many accidental factors which can prevent the performance of an action and, by definition, cannot be anticipated. Moreover, we have a quite limited ability to identify required skills or other internal factors and make a valid assessment of these factors. In a nutshell, we cannot be certain that people have the required resources and those suitable opportunities will not be available unless one attempts to perform a specific behaviour (Ajzen and Madden, 1986).

However, it is possible to assess perceived behavioural control or the person's belief about the extent of probable easiness or difficulty of performing a certain behaviour. According to the theory of planned behaviour, a group of beliefs that are concerned with the presence or absence of required opportunities and resources is among the ultimate determinants of intention and action. The perceived behaviour control should increase with increasing opportunities and resources people think they have and decreasing barriers they anticipate. It is possible, as it regards to behavioural and normative beliefs, to treat these control beliefs separately as to some extent independent behaviour determinants. Since beliefs about behaviour consequences, are considered as determinants of attitudes, and normative beliefs are regarded as subjective norms. Thus we may view beliefs concerning resources and opportunities as the main perceived control over behaviour. (Yzer, 2012).

Furthermore, the impact of perceived behaviour control on human behaviour and judgment has been of interest to many researchers; such as wildlife tourism (Ham and Weiler, 2012) , environmental behavioural intentions (Chao, 2012; Greaves *et al.*, 2013),nature conservation (De Snoo *et al.*, 2013), Recreational behaviour and wildlife disturbance (Marzano and Dandy, 2012b), conservational planning (Raymond and Knight, 2013). It has been received considerable empirical support from meta analyses of studies across the different behavioural domains (Armitage and Conner, 2001; Yzer, 2012).

There are two versions of TPB, which illustrates schematically. The first version of TPB holds that intention completely mediates the impact of perceived behavioural control on behaviour and that intention immediately precedes goal-oriented actions. Perceived control over behaviour can have an indirect effect on behaviour through intentions. However, the second model assumes that there is possibly a direct connection between perceived control over behaviour and behaviour. Empirical support for direct perceived behavioural control effects on behaviour is not strong(Armitage and Conner, 2001; Yzer, 2012). A direct perceived behavioural control-behaviour relationship is shown in Figure 2.2 by a broken arrow.

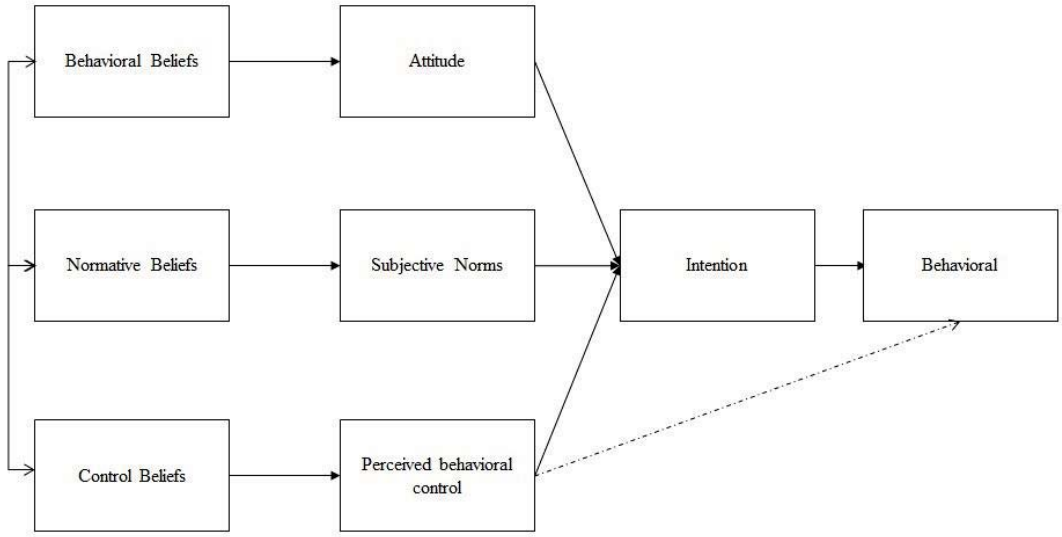


Figure 2.2. Planned behavioural theory (1985, 1991)

Attitude towards Behaviour

Albarracin *et al*.(2001) have defined attitude as "the psychological tendency of an individual to evaluate an entity (person, place, behaviour or thing) with a degree of favour or disfavour." So, it is an individual's general evaluation of a particular behaviour. Attitude about behaviour consists of two components working together, i.e. beliefs about behaviour consequences and related judgments, either positive or negative, about these behaviour features.

Concerning wildlife conservation, the general perception has been that positive attitudes about a preserved area or positive attitudes towards conservation may be related to pro-conservation behaviours; thus, attitudes toward conservation among people have been investigated by many researchers (Holmes, 2003). Nevertheless, having knowledge about the distribution pattern of general attitudes will not be necessarily helpful in designing interventions with the aim of changing a certain behaviour since an individual may hold a positive attitude toward conservation, but perform different behaviours such as poaching protected species (Ajzen, 1985)

Studies exploring attitudes about protected species discovered that people have positive conservation attitudes; however, they either do not perform conversation behaviours or engage in behaviours with negative conservational consequences. Such findings are mainly due to the mismatch that exists between gathered data and individuals' behaviour(St John *et al.*, 2011).The usefulness of the information in designing conservation interventions to change behaviour can be limited by this kind of mismatch, e.g. assessing conservation attitudes, yet linking them to contradictory behaviours. For instance, if we know that crop-raiding animals cause negative attitudes about conservation, this knowledge can lead to the initiation of

projects aimed at deterring that group of animals (De Boer and Baquete, 1998). Such interventions, however, may not be useful if negative attitudes never lead to negative behaviours toward the protected species or areas. Similarly, positive attitude about a protected areas resulted from perceived profits and good relationship with staff does not necessarily mean that people follow all the rules of that area(St John*, et al.*, 2011).

Findings of a study by Infield and Namara (2001) showed that despite their more positive attitudes about wildlife and Lake Mburo National Park, the behaviour of local people who were involved in a long conservation programme of the park in Uganda did not change and they continued illegal grazing and poaching. These researchers concluded that attitude alone cannot be a sufficient predictor of behaviour. Several wildlife and conservation studies have investigated attitudes towards the species (Kaczensky *et al.*, 2004; Lindsey *et al.*, 2005; Bruskotter *et al.*, 2007; Marchini and Macdonald, 2012). In another study on attitudes about endangered species, Waylen et al.(2009)also showed that conservation attitudes were not necessarily predictors of behaviour. According to this study, even the respondents who held positive attitudes about conservation and believed that hunting was a threat to conservation, continued to do hunting as a pastime.

However, a setback with these two studies is the studied attitude-behaviour mismatch. Ajzen (1991) argues that studying general attitudes about a subject might have little use in the identification of particular behaviour predictors. Thus, if the purpose is to affect a certain behaviour like poaching in a protected area, the focus of the attitude studies should be on people's attitudes about poaching, rather than what people think of conservation or other issues. As suggested by Conner and Sparks(1996), the target, action, context, and time of specific behaviour need to be taken into account (Ajzen, 2005). Marchini and MacDonald (2012) argued that based on the theory of planned behaviour, attitudes will predict behaviours, only if they are assessed specifically related to the behaviours under investigation. Examples of the mentioned four attitude objects are: killing (action), killing a Jaguar (action + target), killing a jaguar on own property (action + target + context), and killing the next jaguar that appears on own property (action + target + context + time) (Prokop *et al.*, 2008).

Perceived Behavioural Control

Peoples' perception of the degree of which they are capable of, or have control over, performing given behaviour (Fishbein and Ajzen, 2011). Perceived behavioural control is conceptually the same as self-efficacy, which is a judgment of one's ability to organise and execute given types of performance (Yzer, 2012).

The inclusion of perceived control over behavioural performance as an additional determinant of intention and behaviour marks one of the most significant developments in Reasoned Action Theory. In essence, perceived behavioural

control is a person's answering to the question "can I do it?" when she or he considers performing a particular behaviour. Individual with high perceived behavioural control are expected to be motivated to perform the behaviour under consideration and to be perseverant in their attempts to do so. In contrast, individuals with low perceived behavioural control should be less motivated to perform the behaviour, and their attempts to do so are short-lived. The perceived behavioural control construct has advanced our understanding of the foundation of behaviour formation and change. It has important implications for interventions that seek to improve socially relevant behaviours (Yzer, 2012). Perceived behavioural control has the strongest influence on individual behaviour (Marzano and Dandy, 2012b).

In measuring perceived behaviour control, psychologists quantify the extent to which individuals think that they can perform a given behaviour. They measure the perceived presence of requisite resources, skills and other requirements, as well as the amount of power that individuals understand these requirements have in making behaviour performance easier or harder (Ajzen, 1991). These factors influence decision making since, as argued by Conner and Sparks (1996), individuals who feel that they possess the required resources and believe that there is an opportunity for behaviour performance (with little barriers), will more probably perform the behaviour.

Social Norms

Norms have a substantial impact on human action; however, the impact can only properly know when researchers separate two types of norms that at times act antagonistically in a situation- Injunctive norms and Descriptive norms (Cialdini *et al.*, 1990).

Despite a history of long and extensive use within the discipline, there is no current consensus within social psychology about the explanatory and predictive value of social norms. On the one hand are those who view the concept as vague and overly general, often contradictory, and inappropriate to empirical test (Weir, 2012).

Social norms are the common and accepted behaviours for specific situations(Göckeritz *et al.*, 2010). In Theory of Normative Conduct, Cialdini *et. al*(1990) differentiated between two categories of normative beliefs. Descriptive normative beliefs, which refer to what an individual thinks others do in particular situations, and injunctive normative beliefs, which describe what an individual thinks others approve or disapprove of. Put more simply; descriptive normative beliefs can be understood as norms of is and injunctive normative/subjective norms beliefs as norms of ought (Cialdini*, et al.*, 1990).To date, the little research that does exist suggests that there is a discrepancy between what people approve of and what people do (Smith *et al.*, 2012; Weir, 2012).

Subjective Norms/Injunctive norms

An individual's personal estimation of the social pressure on performing or not performing a particular behaviour is referred to as subjective norms. Two interacting components are supposed for subjective norms: normative beliefs which relate to beliefs about how the important others would like the individual to behave, and outcome evaluations which are the positive and negative judgements on the beliefs (Jillian J*, et al.*, 2004). It has been argued that the concepts of subjective norms proposed within TPB might refer more to the perspective aspects of social influence, and might not completely catch the processes of norm sharing within the group (Fornara *et al.*, 2011).

According to social psychology, the individual's behaviour is affected by the subjective norms, i.e. the expectations of other people who are important (Fishbein and Ajzen, 1975). The common understanding of acceptable, obligatory, or forbidden actions is termed as social norms (Ostrom *et al.*, 1999) These norms include general behavioural expectations of the society and standards developed from the observation of others' behaviour (Cialdini et al., 1990).

The enforcement of social norms is done by informal institutions, which are independent of judicial laws of the government (North, 1994; North, 2012). People who break social norms will face shame and rejection from the society (Posner and Rasmusen, 1999). According to Fortes (1966), some particularly unacceptable behaviours which may cause community and religious entities' displeasure can be classified as taboo(St John*, et al.*, 2011).

Traditional natural resource management systems existing in non-industrial countries can be governed with the help of social norms and taboos (Berkes *et al.*, 2000). Managing natural resources traditionally has been of importance for centuries around the world. For instance, since the 16th century, Indonesians have used a set of traditional rules known as sasi to control fishing and forest product harvesting patterns in Maluku (Harkes and Novaczek, 2002). Similarly, Norwegian Sami reindeer herders have managed stocking density on communal lands through traditional institutions (St John*, et al.*, 2011).

It has recently shown that social norms are significant in the prediction of re-enrolment to an ecosystem services payment scheme. In a study of investigating the significance of social norms and payment for conservation using stated-choice methods and it is found that social norms were the most important with average conservation payment, while they were the least important with the lowest and highest conservation payment levels, i.e. none or all participants would re-enrol. respondents made decisions based on what other farmers did when they were offered average conservation payment(Chen *et al.*, 2009).

Colding and Folke (2001) have identified six types of taboo (resource and habitat taboos) held by traditional societies which impact on conservation. According to these authors, taboos developed for reasons other than managing natural resources can greatly influence conservation. This type of taboos have played a role in the conservation of endangered species in Madagascar, such as Lemurs , which were believed to represent the ancestors, and the carnivorous fosa, thought to feed on the ancestors' bodies buried in the forest (Jones, J. P. *et al.*, 2008). The taboos mentioned above originate from respect for ancestors and are not related to natural resources management, yet they contribute greatly to the conservation of certain species. However, some taboos may negatively influence conservation, such as spotted eagle owls (Kideghesho, 2008) which are thought of negatively in Madagascar and Tanzania. These negative beliefs can lead to the persecution of these species.

Conservation interventions can result in the erosion of the taboos or social norms and their enforcing institutions(Anoliefo *et al.*, 2003; Jones, J. P.*, et al.*, 2008). For instance, Jones, J. P., et al. (2008) showed that the traditional management of Pandans (a plant used for weaving) broke down as a result of designating Ranomafana National Park in Madagascar. The reason for this breakdown was that as the resource became park property, the prevailing norm to keep the tip safe while harvesting was greatly ignored. Modernization and religions introduce recently are the other contributing factors that erode local social norms which protected sacred groves and streams in Nigeria and Tanzania (Anoliefo*, et al.*, 2003; Kideghesho, 2008). In the case of weak enforcement capacity, there is a need for conservationists to take care in introducing new rules which might adversely lead to the collapse of social norms which contribute to a level of practical management (Jones, J. P.*, et al.*, 2008).

Descriptive Norms

Descriptive norms measure a person's beliefs about other individuals' behaviour These norms are the things that are done, rather than the things that should be done which are the case with subjective norms (Forward, 2009; Agardh *et al.*, 2011).

Rivis and Sheeran (2003) conducted a meta-analytic study to examine the effect of descriptive norms in TPB. They argue that subjective norms are responsible for the influences of injunctive norms, rather than the descriptive norms on people. They found that the inclusion of descriptive norms may be useful inTPB(Armitage and Christian, 2003). Other studies have shown how descriptive norms represent an additional predictor of behavioural intentions withinTPB, independently of original TPB components (Fornara*, et al.*, 2011).

According to Fishbein and Ajzen (2005), the theory of planned behaviour confirms the impact of descriptive norms as the recent versions of this model has combined subjective norms with descriptive norms. Nevertheless, some studies have not

supported the combination and showed a distinction between these two variables and that, sometimes, descriptive norms can predict intention better than subjective norms (Rivis et al., 2009). Rivis et al. (2009) showed in a meta-analytic study of 14 studies that descriptive norms were overall efficient and raised the variance by 5% over the other variables included in the model. However, they reported some contradictory findings in their study as well. For example, descriptive norms successfully predicted intention of behaviours such as diet, while they could not predict intentions to perform behaviours such as using a condom. Different reasons have been provided for the conflicting results. One reason is related to the behaviour itself and that it becomes more important in examining the behaviours which are somehow risky. It is argued that risky behaviours are more salient and individuals are more affected by others in these situations (Forward, 2009).

Intention

Behavioural intentions refer to as a summary of motivations needed for behaviour performance, which reflect a person's decision to perform an action, and also an index of the extent to which individuals try hard to perform a particular behaviour(Fishbein and Ajzen, 1975). According to Jillian J et al. (2004), despite the imperfect intention-actual behaviour relationship, intention can be used to measure the behaviour approximately. Many studies have shown that behavioural intention accounts for a considerable proportion of variance in behaviour (Ajzen, 2012). Intention to engage in behaviour has been a key variable of study among tourism and social psychology scholars (Cunningham and Kwon, 2003; Petrick, 2004).

Attitudes, perceived behavioural control and personal and social norms are considered to be a reference used to cause intentions in a decision- making situation. While attitudes reflect cognitive and affective beliefs about the behaviour in question and perceived behavioural control reflects beliefs about the degree of determination, norms provide the moral "colouring" of the decision-making process. The integrating stage, nevertheless, is the intention, which is generated proximately before a behavioural decision is made (Klockner and Blobaum, 2010).TPB(Ajzen, 1991) assumes that intentions are assumed to capture the motivational factors that influence behaviour; they are indications of how hard people are willing to try, of how much of an effort they are planning to exert, to perform the behaviour.

Attitude-Intention

There are a few examples where social behaviour models have been used within conservation science (St John*, et al.*, 2011). The few examples (Aipanjiguly *et al.*, 2003; Zubair and Garforth, 2006) that exist have highlighted how information about attitude alone reveals a limited picture concerning the predictors of the target behaviour (St John*, et al.*, 2011). For example, farmers who had already planted

trees on their land, and those who had not, both have a positive attitude towards farm forestry, suggesting that other factors must influence farmer's decisions to engage in farm forestry (Zubair and Garforth, 2006).

The relationship between attitude and behavioural intentions has been studied and tested in TPB as well as its applications in various fields (Lee, K., 2011). Armitage and Conner (2001) conducted a meta-analysis on 185 independent TPB application studies. They found that, when weighted by sample size, attitude accounted for 49% of the variance of behavioural intention in115 tests (Huang and Hsu, 2009). Therefore, the following hypothesis was formulated: Attitude has a positive contribution to intention toward disturbance behaviour on birds among Malaysian birdwatchers.

Subjective Norm-Intention

Subjective norms (injunctive norms) reflect perceptions of what others approve or disapprove of and motivate action because of the social rewards and punishments associated with engaging, or not engaging, in the behaviour (Smith*, et al.*, 2012).

As reported by a meta-analysis by Forward (2009), attitude and subjective norms accounted for 33-35% of the variance. Nonetheless, some other studies have shown that non-contribution seems to be more related to subjective norms than attitude, thus perceived behavioural control being the weakest link. Individual differences are one of the explanations presented for this. In some studies, subjective norms are considered the weakest set of influences in studies using TPB(Marzano and Dandy, 2012b). Artimage and Conner (2001) suggest that this is primarily a legacy of poor methodology and measurement, and indeed there is some evidence to suggest that social norms have a significant effect on recreationists behaviour in natural areas (Aipanjiguly*, et al.*, 2003). For example, Aipanjiguly *et al.*(2003) were concerned with understanding the knowledge, attitudes and behaviour of boaters in Florida about manatee (Trichechus manatus latirostris) conservation and compliance with speeding restrictions. The authors suggested that theory of reasoned action (the precursor of TPB) can help to explain and predict behaviours such that target audiences and their beliefs can be incorporated in the design of interventions aimed at changing or maintaining those behaviours. They also highlight that to reinforce or change behaviour, it is necessary to strengthen or change attitudes towards the enactment of that specific behaviour or the subjective/social norms surrounding it. The authors believe that observation of speeding restrictions is managed by normative influences. They suggest increasing knowledge awareness of boaters and using normative messages highlighting societal opinions (e.g. friends and family, other boaters, law enforcers) around speeding (Marzano and Dandy, 2012b).

According to Terry *et al.*(1999), the effectiveness of subjective norms dependents on whether or not the individual identifies themselves with the target group or not. It has also been suggested that individuals are managed by norms or attitudes

(Forward, 2009).The other explanation for the weak impact of subjective norms can be the extreme narrowness of the normative measure and the need to include other norms, such as moral, personal, and descriptive norms as well (Forward, 2009).

However, Hrubes *et al.*, (2001) found that subjective norms significantly contributed to predicting hunting intention. Another study by Nolan *et al*.(2008) showed social norms are the strongest predictor of energy conservation intention. Smith et al. (2012) investigated how two different type of social norms- the descriptive norms and injunctive norms interact to influence intentions to engage pro-environmental behaviour and proved that both of them have a distinct effect on intention. Then, there is a controversy among researchers regarding the strength of influence of subjective norms on intention. In the domain of pro-environmental behaviour, the importance of injunctive and descriptive norms has repeatedly been demonstrated. It looks in conservation and environmental behaviours; it has a significant effect comparing other predictors. Therefore, the following hypothesis was formulated: Subjective norm has a positive contribution to intention toward disturbance behaviour on birds among Malaysian birdwatchers.

Descriptive Norm-Intention

Descriptive norms measure an individual's beliefs about other people behaviour. It has been described as something which is done rather than, as is the case with subjective norms, something which ought to be done (injunctive) (Cialdini*, et al.*, 1990; Forward, 2009; Göckeritz*, et al.*, 2010; Smith*, et al.*, 2012). Deutsch and Gerard (1955) added that it represents something which is seen as normal, regardless if it is morally Correct or not. TPB would also acknowledge the effect of subjective norms since later versions of the model combine subjective norm with the descriptive norm (Fishbein and Ajzen, 2005; Forward, 2009; Smith*, et al.*, 2012). A large number of studies have shown a strong correlation between descriptive normative beliefs and behavioural intentions as well as actual behaviour (Göckeritz*, et al.*, 2010). For example, finding by Nolan *et al*. (2008), where descriptive normative belief was found to be one of the strongest predictors of an individual 's decision to conserve energy in their home (r=0.45).

Furthermore, some studies have not been able to support the combination of subjective norms and descriptive norms, instead they have found that the two variables are distinct from each other(Cialdini*, et al.*, 1990; Conner and Mcmillan, 1999; Forward, 2009; Göckeritz*, et al.*, 2010; Smith*, et al.*, 2012) and at times descriptive norm is a better predictor of intention than subjective norm (Rivis *et al.*, 2006; Smith*, et al.*, 2012). In a meta-analysis based on 14 studies descriptive norm was successful and increased the variance with 5% over and above the variable already in the model (Rivis and Sheeran, 2003). Therefore, the following hypothesis was formulated: Descriptive norm has a positive contribution to intention toward disturbance behaviour on birds among Malaysian Birdwatchers.

Perceived Behavioural Control-Intention

A proposed theory of planned behaviour, an extension of Ajzen and Fishbein's theory of reasoned action incorporates perceived control over behavioural achievement as a determinant of intention (Ajzen and Madden, 1986; Fishbein and Ajzen, 2011; Yzer, 2012).The hypothesised association between perceived behavioural control and intention has been tested in hundreds of studies. It has received considerable empirical support from Meta-analyses of studies across different behavioural domains (Fishbein and Ajzen, 2011; Fornara*, et al.*, 2011; Marzano and Dandy, 2012b; Yzer, 2012).

Studies have shown that the variance further improved 5-12% when perceived behavioural control was added to the model (Armitage and Conner, 2001; Hrubes*, et al.*, 2001). The findings of the study by Hrubes*et al*.(2001), mentioned earlier provides a strong supporting evidence for the effects of TPB as a conceptual framework to predict and understand activities related to wildlife, e.g. hunting. Therefore, the following hypothesis was formulated: Perceived Behavioural Control has a positive contribution to intention toward disturbance behaviour on birds among Malaysian birdwatchers.

Past Behaviour

Past behaviour (PB) in general could be understood as actions or reactions of a person in response to external or internal stimuli in past. In contrast, Habits (HB) could be conceiving as an automatic goal-directed behaviour which is mentally represented. According to Ajzen (1991, p.203), past behaviour and habit are the same (Sommer, 2011).

The role of past behaviour as the predictor of intention and future behaviour has attracted attention in literature in the last two decades. A large body of research is available today on the linkages between past behaviour, intention, and future behaviour. In 2008 and 2009 alone, more than 20 articles, dealing with TPB and past behaviour have been published, indicating up-to-datedness of the topic. There are two lines of research, for example, the one from Ajzen (1991) who declined the relevance of past behaviour as anadditional predictor, or Quellette and Wood (1998) who vote for the predictive relevance under in particular circumstances (Sommer, 2011).

Past behaviour-Intention

Various meta-analysis of TPB has indicated that the inclusion of past behaviour increases the predictive validity of the model. It is suggested that past behaviour can directly inform intentions for future responses through self-perception and cognitive consistency process (Ouellette and Wood, 1998; Hagger *et al.*, 2002).

Several studies (Hagger, *et al.*, 2002; Conner *et al.*, 2007; Smith *et al.*, 2007) also stressed the need for the inclusion of past behaviour in the theory as an important variable for the predictive validity of TPB model. Many researchers concluded that some elements are apparently missing and tried to enrich it by the inclusion of further constructs in TPB. One of the most interesting and most intensely discussed-is Past Behaviour. It has been associated with the intention (Sommer, 2011). Smith *et al*(2007) integrated past behaviour into the model of TPB to improve predictive power. Conner et al. (2007) added past behaviour to TPB model and also could confirm the predictive relevance of past behaviour. Therefore, the following hypothesis was formulated: Past behaviour has a positive contribution to intention toward disturbance behaviour on birds among Malaysian birdwatchers.

Past Behaviour-Perceived Behaviour Control-Intention, Past behaviour–Perceived behavioural Control

The effect of past behaviour on intention should be mediated by perceived behavioural control (Ouellette and Wood, 1998; Bamberg *et al.*, 2003; Forward, 2009). When past behaviour added to the regression equation, past behaviour is typically found to improve the prediction of later behaviour significantly (Bamberg, *et al.*, 2003). Therefore, the following hypothesises were formulated: (1) Past behaviour has a positive contribution to perceived behavioural control toward disturbance behaviour on birds among Malaysian birdwatchers. (2) Perceived behavioural control mediates the relationship between past behaviour and intentions towards disturbance behaviour on birds among Malaysian birdwatchers.

Intention-Behaviour

Despite its well-known complexity, the social behaviour of humans can often be easily predicted. A high variance in actual behaviour can be accounted for by a simple and direct measure of intention. High correlations of .90 (King, 1975) and .96 (Smetana and Adler, 1980) between intention and behaviour have been shown by many studies, although the accuracy of prediction in most cases is less than these measures (Ajzen *et al.*, 2009). Armitage and Conner (2001) meta-analytically reviewed 180 studies which used TPB framework and found that behavioural intentions accounted for an average of 27% of behaviour variance(Ajzen, *et al.*, 2009; Lee, K., 2011).

2.7 Criticisms against Theory of Planned Behaviour

According to TPB, the human social behaviour is reasonable (Armitage and Christian, 2003). Even though individuals' beliefs might be biased or baseless, their attitudes, subjective norms and perceived control over behaviour result from these beliefs, create a corresponding behavioural intention, and eventually lead to behaviour consistent with the beliefs. Some theorists have challenged this view arguing that human behaviour can be performed automatically or out of habit. This

view has been tested through measures of past behaviour. It is claimed that, if human behaviour is reasoned, the past behaviour frequency should only be indirectly related to later behaviour and intention and perceived control should mediate the effects of that behaviour. Nevertheless, when past behaviour is included in the regression equation, it usually increases the prediction of later behaviour significantly, far beyond the impacts of intention and perceived behavioural control. Such findings mean that that certain behaviour, not being entirely reasonable, is partially controlled by the stimulus situation directly, i.e. it turns into a habit if performed repeatedly. Based on this view, past behaviour frequency indicates habit strength and can be used to predict later action independently (Bamberg*, et al.*, 2003).

a. Target, Action, Context and Time (TACT)

A certain behaviour is defined concerning its elements of target, action, context, and time (TACT). Let's consider the example of *jogging on a track in the park every morning during the next month.* The TACT elements are defined quite arbitrarily. In this example, jogging is considered the action part of the behaviour, but every morning can also be included in this element. A track in this case can be considered as the target element and the park could be viewed as the context. The next month refers to the time of performing the behaviour in this example (Ajzen, 2002).

b. Compatibility

Regardless of how we define the TACT elements, the observation of compatibility principle is very critical that requires defining all other constructs including subjective norm, attitude, perceived control, and intention regarding similar elements. Therefore, the compatible attitude for this behaviour will be the attitude towards jogging on a track in the park every morning during the next month, the subjective norm will be the social pressure to perform the behaviour, perceived control is the control over behaviour performance and the intention to perform this certain behaviour needs to be measured as well (Ajzen, 2002).

c. Specificity and Generality

Although the TACT elements in the case above are specific, the generality of some elements can be increased by *aggregation*. The time element 'during the next month' has been defined more generally than, for example, 'tomorrow at 3:00 pm.' To measure the behaviour in our case, we should aggregate the observations over a whole month. The observation of behaviour only once has too limited practical value. In the same way, we might not be interested in a particular context. So, we might attempt to predict the behaviour of jogging on a track, regardless of the context where it happens. The context element can be generalised by recording the frequency of behaviour performance in all possible contexts. A similar argument is

possible to make concerning about the action element. Our focus can be on exercising in general, rather than jogging in the park so that we should be able to generalise to include other types of exercise such as walking, swimming, and running. In doing so, an explicit description of the behaviour is necessary. Asking the respondents simply about exercising would be ambiguous and their attitudes about exercise can be influenced by their recent experiences which make it possible for them to access one or other form of exercise temporarily (Ajzen, 2002).

2.8 Development of theory of planned behaviour

2.8.1 Cognitive Hierarchy

The cognitive hierarchy model has been highlighted by Fulton et, al.(1996) who studied consistency and connectivity of beliefs. From a non-scientific point of view, we usually expect the individuals' beliefs to be uniform and predictable. The structures of cognitive hierarchy include values, value orientations, attitudes, behavioural intentions, normative beliefs, and behaviours, which form an inverted pyramid structure in which these components are built upon another, and few values make the foundation and act as principles to guide individual behaviours (Manohar et al. 2012). The cognitive hierarchy model is shown in Figure 2.3.

Value

Values are fundamental concepts that form the foundation of cognitive hierarchy. According to Vaske and Donelly (2001) values are essential to the beliefs which can be shared by cultural community members as well. In Schwartz's (1192) description, values are abstract and conceptual ideas such as respect, honesty, and obedience which can be either means or aims of deciding to perform a certain behaviour (Manohar *et al.*, 2012).

Basic Beliefs

Basic beliefs are second order cognitions constructed from values. These beliefs form patterns that build value orientations for people(Homer and Kahle, 1988; Fulton*, et al.*, 1996)as ideas that affect decisions related to wildlife. For instance, consider the belief that 'conservation of endangered species is critical.' In this example, 'endangered species' is the object of belief and we can imagine it as a beam; 'conservation is very important' is the attribute which can be taken as a rivet. They can be used with a different object or attribute logically, but if the attribute does not have an object, it is not a belief. A beam with no rivets or vice versa cannot be a bridge. They can be used together and joined to other attitudes, beliefs, and norms to help individuals in decision- making to perform a specific behaviour (Manohar et al., 2012).

Value Orientation

According to Homer and Kahle (1988), bunches of basic beliefs that are interconnected within a definite area are theorised as value orientations. These orientations which act as the average between fundamental values and more specific beliefs, strengthen more general values and give meaning to them (Manohar*, et al.*, 2012).

Vaske *et al*. (2011) refer to cognitions as the mental processes and dispositions such as values and attitudes used by individuals to think about and understand situations. We can best understand them as part of a general to specific hierarchy. The relationship between general values and specific norms/attitudes are examined by the cognitive hierarchy to understand the way they affect individual or agency behaviour such as management actions.

An increasing number of empirical studies have used this theory to evaluate wildlife related behaviour (Manfredo, 2008; Vaske*, et al.*, 2011). The values are differentiated from value orientations by the hierarchy. Values refer to desirable end states or qualities of life held individually or collectively dear such as honesty, freedom, and equality (Vaske, J. J. *et al.*, 2011). These general mental constructs are not related to particular objects or situations. Therefore, an individual who has the 'honesty' value is probably honest in doing business or interaction with people. Values are the reflection of one's basic desires and goals, and they define what is important to people. They are highly resistant to change since they are mostly formed earlier in life, constructed culturally, and are linked with the individual's identity (Vaske*, et al.*, 2011). Values may not be responsible for many variations in particular behaviours since all community members usually share them. However, our thoughts about general object categories or issues are reflected in our basic beliefs, which provide meaning for more global cognitions which are represented in values. Networks of these basic beliefs are referred to as value orientations which organise based on values which give contextual meaning to these values related to a certain domain, e.g. wildlife (Manfredo *et al.*, 2009; Teel and Manfredo, 2010; Vaske*, et al.*, 2011). According to Schwartz (2006), value orientations are the reflection of the effect of ideology on the cognitive hierarchy. Ideology refers to a group of commonly held beliefs which enable individuals to define themselves, understand meaning, and relate to each other(Pratto, 1999). Vaske *et al.*(2011) believe that the strength of ideology and thus value orientations, differ from person to person and attitude and behaviour differences originate from this difference.

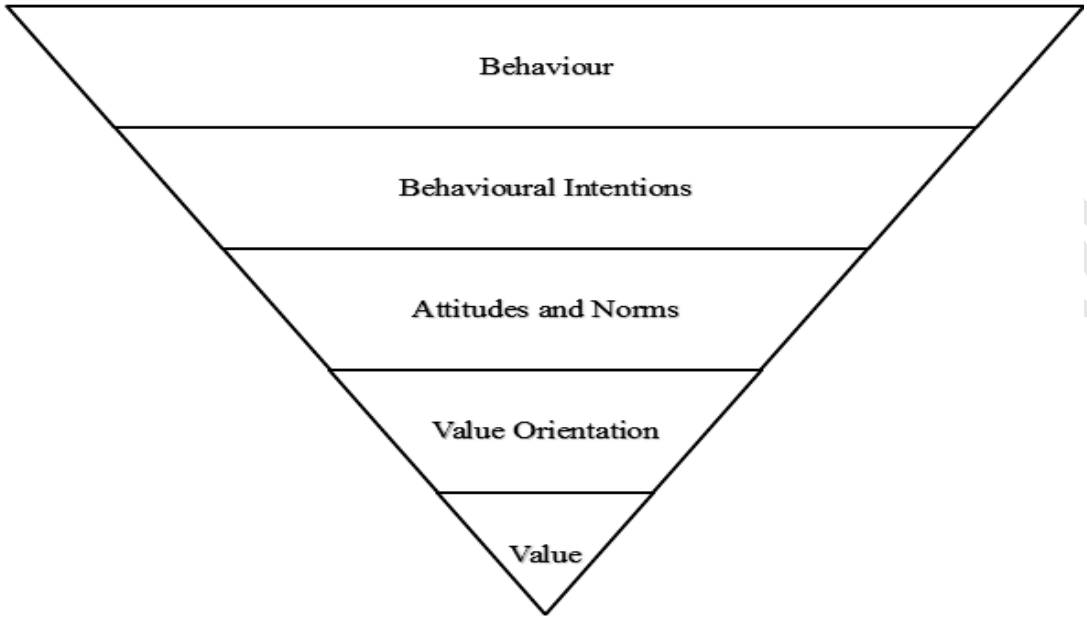


Figure 2.3. Cognitive Hierarchy Model (Fluton et.al, 1996)

Value orientation-Attitude, Value orientation-Intention and Value orientation-Intention-Attitude

Values are distinct from attitude or beliefs because their function as organised guiding principles in life and determinants of attitude and behaviours (Lee, T. H., 2011). Several studies (Dietz *et al.*, 1998; Schultz and Zelezny, 1999) have shown that individuals' value orientation contributes to the explanation of environmental attitude. Value orientation can predict higher-order cognitions such as attitudes and behavioural intentions (Fulton*, et al.*, 1996; Vaske and Donnelly, 1999; Needham, 2010; Lee, K., 2011). The cognitive hierarchy explores the relationships between general values/value orientation and specific attitude/norms to understand how these cognitions influence behaviour (Vaske*, et al.*, 2011). According to Vaske and his colleagues (2011), the relationship between value orientation and intention is sometimes significant. Therefore, the three hypotheses are formulated: (1) Value orientation has a positive contribution to intention toward disturbance behaviour on birds among Malaysian birdwatchers. (2) Value orientation has a positive contribution to attitude toward disturbance behaviour on birds among Malaysian birdwatchers. (3) Attitude mediate the relationship between value orientation and intention disturbance behaviour on birds among Malaysian birdwatchers.

Previous studies related to Wildlife Value Orientations in the world

Fulton et al. (1996) developed the 'wildlife value orientations' (WVO) approach as a foundation for examining links between changes in behaviour and social preferences (e.g. declines in hunting in the USA) with long-term changes in WVOs. It is based on a cognitive hierarchy structure whereby values, basic beliefs, attitudes, norms, behavioural intentions and behaviours are theorised to build upon one another (Manohar*, et al.*, 2012; Ainsworth, 2014). According to vaske (2011) a special issue of the international journal Human Dimensions of Wildlife (volume 12, number 5, 2007) recognised the need for exploring wildlife value orientations cross-culturally and proposed an instrument for qualitatively assessing such orientations (Dayer *et al.*, 2007). The eight articles in that issue provided qualitative and quantitative support for the existence of wildlife value orientations in countries as diverse as Mongolia(Kaczensky, 2007), China (Zinn and Shen, 2007), Thailand (Tanakanjana and Saranet, 2007), Estonia (Raadik and Cottrell, 2007), Malaysia (Jafarpour and Manohar, 2014) and the Netherlands (Teel *et al.*, 2010; Vaske*, et al.*, 2011). Our quantitative study will extend this line of research. The recent findings of Vaske (2011) in Netherland were consistent with quantitative work in the USA(Manfredo*, et al.*, 2009; Teel and Manfredo, 2010), and qualitative (Jacobs, 2007) and quantitative (Teel*, et al.*, 2010) research in the Netherlands. Additional work in other developed and developing countries, however, is necessary to determine the generalizability of the results (Vaske*, et al.*, 2011).

2.8.2 Focus theory of normative conduct

Activation of social norms can be a powerful tool in promoting environmentally beneficial behaviour(Cialdini, 2003; Weir, 2012). The focus theory of normative conduct emphasises the importance of normative social influence in affecting behaviour. A major component of the theory is the distinction between injunctive and descriptive social norms. Injunctive norms specify what is typically approved of, and therefore what out to be done. Descriptive norms refer to what people do, and consequently provide information as to what is typical or normal behaviour (Kallgren *et al.*, 2000). Both types of norms influence behaviour, but do not do so in all situation. Most studies focus on only one norm and do not compare the influence of different norm types on the same behaviour. This constitutes a large gap concerning the applicability of the focus theory normative conduct. There has been the limited exploration into the relative influence of the various types of norm on pro-environmental behaviour. There is a need for studies that examine the differential influences, and thus saliency, of norms, in particular, applied setting. Distinguishing between injunctive and descriptive norms is crucial because both types can exist simultaneously in a setting and can have either congruent or contradictory implication for behaviour (Weir, 2012). In this study, it is explored the role of norms (Descriptive and injunctive norms) on intentions towards disturbance behaviour on birds among Malaysian birdwatchers.

2.9 Theoretical Framework

Theoretical Framework of the present study is based on the theory of planned behaviour (TPB), Theory of Normative Conduct (TNC) and Cognitive Hierarchy Model, See Figure 2.4.

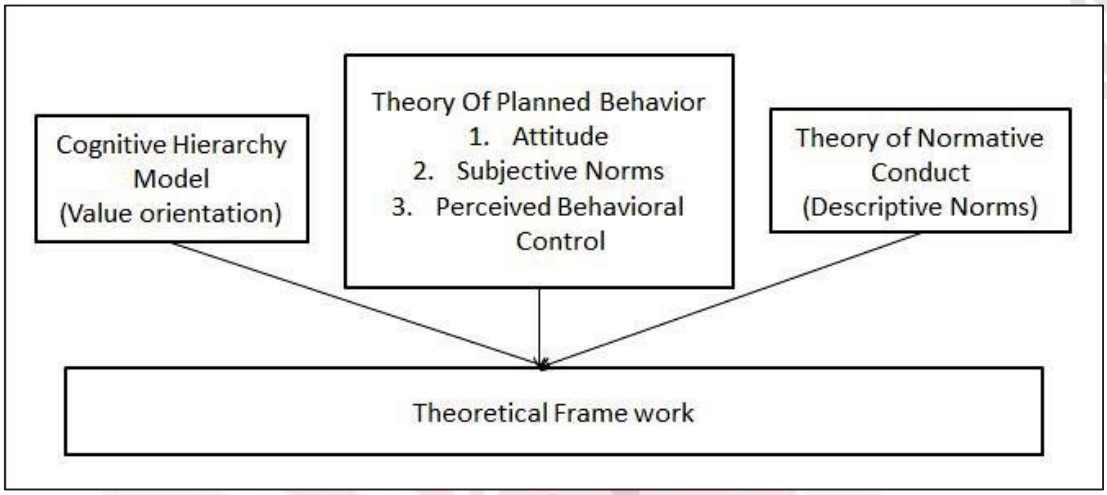


Figure 2.4.Theoretical framework of the study for disturbance behaviour of Malaysian birdwatchers on birds

2.10 Conceptual Framework

A conceptual framework helps in identifying problems, seeking solutions, and getting buy-in. Therefore, environmental psychologists should make use of such models, although imperfect, to cater for arising issue (Kaplan and Kaplan, 2009).

The sixteen hypotheses introduced eight direct relationships. Two mediators are in the model of study. It also showed that the frequency of participation in bird watching acted as a moderator in all six direct relationships between predictors of the model concerning intention towards disturbance behaviour. All intended relationships in this study were based on previous studies:

Regarding subjective norms – intention relationship, while some studies considered subjective norm as a good predictor, this was not the case in few others. The role of subjective norms as a predictor was examined to know the contributing effect of subjective norms on intention towards disturbance behaviour among Malaysian birdwatchers. The descriptive norm is considered as the other predictor for intention towards disturbance behaviour in the model of study. The reason for the inclusion of this new variable in TPB was that there is no general agreement on the important role of the descriptive norm for prediction of intention. The other new variable is past behaviour. The inclusion of past behaviour in TPB was a matter of controversy. There is a need to examine the predictive validity of this variable in

TPB. Some references considered the indirect effect of past behaviour on intention trough perceived behavioural control. Perceived behavioural control is also the other main predictor of intention in TPB. In some studies, this variable was considered as a good predictor, but few others failed to explain the additional variance. Attitude is the other main variable in TPB. There was a controversy regarding the role of this variable as a predictor of behaviour. The other new variable is value orientation. In several articles, the attitude was introduced as a direct predictor of intention while there were other studies which have supported the indirect effect of value orientation on intention through attitude. After that, the mediator role of attitude in a relationship between value orientation and intention was also examined.

As Figure 2.5 illustrates, there are fourteen paths in the conceptual framework of the present study, among them six paths are directly linked to Intentions towards disturbance behaviour on birds, these paths are value orientation- intention, subjective norms - intention, descriptive norms - intention, past behaviour-intention, perceive behaviour control-intention and attitude-intention toward disturbance behaviour on birds. There are two paths are linked indirectly to intention, these links are between value orientation- attitude and past behaviour - Perceived behavioural control. The remained six paths are between frequency of participation on the relationships between value orientation-intention, attitude-intention, subjective norms-intention, descriptive norms-intention, past behaviour-intention and perceived behavioural control-intention

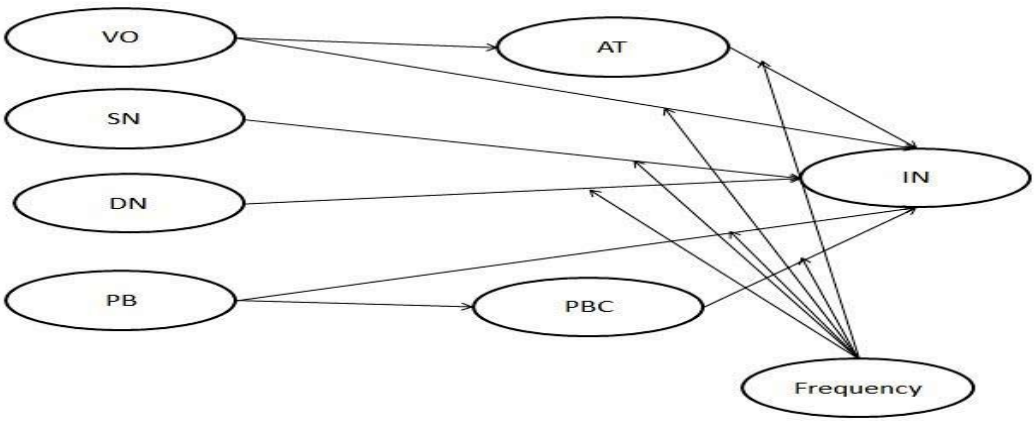


Figure 2.5.Conceptual framework for the predictive model of disturbance behaviour on birds among Malaysian birdwatchers

Notes: VO=Value Orientation, SN=Subjective Norms, DN=Descriptive Norms, PB=Past Behaviour, PBC= Perceived Behavioural Control, AT=Attitude, IN=Intention, Frequency= Frequency of participation in birdwatching.

CHAPTER III

RESEARCH METHODOLOGY

3.1 Introduction

This present study aims to examine the model for introducing influential factors for disturbance behaviour on birds among Malaysian birdwatchers. This chapter discusses the procedures used to conduct this research. In the first section, the research design is elaborated and then procedure of data collection as well as SEM-PLS requirement and census technique explained; next, steps for survey formative questionnaire development are explained and finally, data analysis procedures are shown.

3.2 Research Design

Research design is a comprehensive plan for data collection in an empirical research project. It is a "blueprint" for empirical research aimed at answering specific research questions or testing specific hypotheses, and must specify at least two main processes for this research (1) the data collection process(2) the instrument development process (Bhattacherjee, 2012).

To answer research questions of the study the quantitative survey method (cross-sectional field survey) is employed to identify what extent of dependent variable (intention) is explained by the independent variables as (a) value orientation (b) past behaviour (c) subjective norm (d) descriptive norm, (e) perceived behaviour control and (f) attitude. Attitude and perceive behavioural control are mediator variables. Based on the literature review, the moderator variable, frequency of participation in bird-watching is investigated.

3.3 Procedure of data collection

Data collection can be broadly grouped in two categories: positivist and interpretive. Positivist methods, such as survey research are aimed at theory testing. It employs a deductive approach to research, starting with a theory testing using empirical data. In contrast, an interpretive method employs an inductive approach and tries to derive a theory about the phenomenon of interest from the observed data. Quantitative and qualitative data refer to the type of data being collected. Positivist approaches predominantly use quantitative data but qualitative research relies heavily on qualitative data; one of the popular examples of research design is field survey. (Bhattacherjee, 2012).

In this research, the positivist method employs quantitative data with questionnaire field survey design. Field surveys are non-experimental designs. Cross sectional field survey was used in this study (independent and dependent variables are measured at the same point in time). The strength of field surveys are their external validity (since data is collected in field setting), their ability to capture and control for large number of variables with large number of informants and their ability to study a problem from multiple perspectives using multiple theories (Bhattacherjee, 2012).

The target population is all Malaysian birdwatchers who have, at least once, experienced birdwatching. The most important and active organisation regarding this topic is the Malaysian Nature Society (MNS). According to the MNS, there are 450–500 Malaysian birdwatchers who participate monthly in events organised by the MNS. Respondents are Malaysian birdwatchers who participated in birdwatching events from March 2013–August 2014 (main test) in different locations, see Table 3.1. The total number of respondents is 421 birdwatchers. Census technique was used for data collection. Census seem often (though not always, nor necessary) to obtain better coverage than sample surveys. Thus they tend to be more inclusive in population extent than sample surveys. This is partly because it is less difficult to check the whole than the sample coverage (Agardh*, et al.*, 2011).

In fact, Census technique used and data was collected from 90% (450) of total population (500). Among the 450 questionnaires, 29 were incomplete and also, only the same scale (e.g., disagree) had been ticked for all the items in the questionnaire. Therefore, the researcher did not key them into SPSS and totally 421 questionnaires key into SPSS.

Table 3.1. Locations and dates for data collection

Dates	Locations
9/10/2012	Indoor Talk: Thinking like an owl-Why should we protect these nocturnal hunters
17/11/2012	Indoor talk at MNS Auditorium Hornbill Conservation in Thailand (Speaker: Prof Pilai Poonswad)
9-10/3/2013,	Raptor watch 2013
7/4/2013	Bukit Rengit
25/8/2013	Day Trip to Gunung Nuang Recreation Forest, Hulu Langat, Negeri Sembilan, Malaysia
8/9/2013	Taiping Lake Garden
14-17/9/2013	Kuala Koh
16/10/2013	Indoor Talk - Beginner's guide to waders identification, MNS Auditorium
20/10/2013	Waders watching Trip to Tanjung Karang
26/10/2013	Taiping Raptor Festivals (Perak bird group)
27/10/2013	Permaipura Golf and country club bedong, kade
10/11/2013	Taiping Lake Garden nature walk2
8/12/2013	Taman Pertanian, Bukit Cahaya Seri Alam, Shah Alam
27/1/2014	Bidor Chikus
23/2/2014	Kg Kemensah
23/3/2014	Daytrip to Banting
7/4/2014	Sekinchan and Pantai Jeram
6/3/2014	Harrier identification workshop
14/3/2014	Tanjung Tuan Melaka (Port Dikson)
5-9 /4/2014	Long trip to Kinabatangan and Sepilok, sabah
24/4/2014	Indoor talking Birding in Nepal
25/4/2014	Wings of Kuala Kubu Bharu (KKB) at Awana Genting Highland
25/5/2014	Day trip to Frim, Kepong
28/6/2014	Bird group together
13/7/2014	Hutan pekreasi Sungai Congkak, Hulu Langat, Kuala Lumpur, Malaysia
17/7/2014	Indoor talk on Haluk mountain sanctuare

3.4 SEM-PLS Sample Requirement and Census Technique

As a rough guideline, the minimum sample size in a PLS-SEM analysis is recommended by rule of thumb. Table 3.2 shows the minimum sample size requirements necessary to detect minimum R^2 values of 0.10, 0.25, 0.50and 0.75 in any of endogenous constructs in the structural model for significance levels of 1%, 5%, and 10%, assuming the commonly used level of statistical power of 80% and a specific level of complexity of the PLS path model. For instance in current research, when the maximum of independent variables in measurement and structural model is six, one would need 50 observations to achieve a statistical power of 80% for detecting R^2 values at least 0.50 (with 5% probability of error) (Hair Jr *et al.*, 2013).The minimum sample size of 50was used to run PLS-SEM for the initial test., see Table 3.2.

Table 3.2. Sample size Recommendation in PLS-SEM for a statistical Power of 80%

Maximum Number of Arrows pointing at a construct	Significance level											
	1%				5%				10%			
	Minimum R^2				Minimum R^2				Minimum R^2			
6	0.10	0.25	0.50	0.75	0.10	0.25	0.50	0.75	0.10	0.25	0.50	0.75
	217	103	66	53	157	75	48	39	128	62	40	32

3.5 Survey formative questionnaire development

In developing a formative questionnaire for survey studies, the first consideration is to adequately define the construct domain. This requires clear conceptual thinking and organisation to ensure that the domains of the variables are outlined methodologically.

Secondly, the measurement model must be correctly specified with the scale development procedures indicating that causality flows from the latent constructs to the measures, and each measure should representing an imperfect reflection of the underlying construct. Several researchers have noted that, in most cases, indicators do not reflect the characteristics of the underlying latent construct, but sometimes causality flows from indicators to the construct (Bollen and Lennox, 1991; Goertz, 2006; Hair Jr*, et al.*, 2013). This kind of specification is a formative one, whereby item indicators are specified for the purpose of questionnaire development. However, it is worthwhile to note that it is possible to have biasedstructural estimates when indicators that ought to have been modelled as having formative relationships are modelled with the construct as having reflective relationships (Mackenzie *et al.*, 2011). Further discussion on formative and reflective measurement models will be discussed in the next sections. There are important issues that should be considered for the development of the questionnaire, as listed in the next subsections(Mackenzie*, et al.*, 2011):

3.5.1 Develop a conceptual definition of the construct

Developing a conceptual definition of the construct requires identifying what the construct is purported to represent or capture conceptually, and discussing the differences between the construct and other related constructs (Mackenzie*, et al.*, 2011). The conceptual definition of constructs follows the stages recommended for constructing a TPB questionnaire by Ajzen (2011a). These steps include:

1. Defining the behaviour: For example, the disturbance behaviours were defined before developing the questionnaire, which includes nine categories: feeding, catching, and keeping birds, intentional or unintentional killing of birds, using spotlights on birds, making noise to a large group,

approaching birds for photography, and trampling the nests of birds. This definition covers most of the possible negative effects on wildlife, particularly on birds (Green and Higginbottom, 2001), particularly birds.

2. Specifying the research population: For example, in this study, Malaysian birdwatchers are selected as a population.

3. Formulating items for direct measure according to the definition of each construct. An example of a statement of an attitude construct is "I am interested in keeping wild birds in my house".

3.5.2 Generation of the items

The process of item generation is vital for producing the most appropriate set of items that captures all essential aspects of the domain of the construct being investigated. Items may be sourced from various literature collections or past empirical research on the focal construct. Congruently, suggestions may be sought from experts in the field and interviews or focus group discussions could be held with a sizeable representation of the population(s) from which the focal construct is expected to be investigated (Mackenzie*, et al.*, 2011).

Furthermore, at this stage of the scale development, there are several other concerns regarding the indicators that need to be considered. First, items must be presented in a logical and concise pattern that will be easily understandable to the respondents. Secondly, items should not be allowed to convey double meanings rather, the researcher should split such items in two and ensure that each item deals with a single idea. However, where this becomes difficult to achieve, it is recommended that the double barrel item should be eliminated from the scale. It is also important to simplify or avoid complicated syntax and to ensure that ambiguous, or unfamiliar terms in the statements are clarified or avoided (Mackenzie*, et al.*, 2011).

3.5.3 Assessment of the content validity of the items

Two related judgements must be made when assessing content validity (Mackenzie*, et al.*, 2011):

1. Do specific items represent appropriate aspects of the content domains of the constructs?

2. Do specific sets of items collectively represent the entire content domains of specific constructs?

The negative effects on birds caused by birdwatchers can be classified into three groups: "(1) disruption of activity, (2) direct killing or injury, and (3) habitat alteration (including the provision of food)". This definition covers most of the potential negative effects on wildlife(Green and Higginbottom, 2001),particularly birds. In addition to the literature review, the content validity of items also was confirmed by experts, see Appendix B.

3.5.4 Formally specification of the measurement model

The next step is to specify formally a measurement model that is capable of capturing the expected relationships between the indicators and the constructs of interest (Mackenzie*, et al.*, 2011).Depending on the researchers' theoretical expectations regarding how constructs relate to each other and their conceptual definitions, items may be modelled in formative or reflective patterns (Mackenzie*, et al.*, 2011; Hair Jr*, et al.*, 2013).

There are two types of measurement models: reflective and formative. The reflective model has arrows (relationships) pointing from the construct to the observed indicators in the measurement model. If the construct changes, it leads to a simultaneous change of all items in the measurement model. Thus, all indicators are highly correlated. In contrast, the formative model has arrows pointing from the indicators in the measurement model to the constructs. Hence, all indicators together form the construct, and the selected formative indicators must represent all relevant elements of the domain. Since formative indicators represent an independent source of the construct's content, they do not necessarily need to be correlated (in fact, they should not be highly correlated).

The selection of the measurement model and indicators must be based on theoretical/conceptual reasoning before data collection. A reflective specification would use different indicators than a formative specification of the same construct. One usually uses reflective constructs as target constructs of the theoretically/conceptually established PLS path model, while formative constructs may be particularly valuable as explanatory sources (independent variable) or drivers of these target constructs (Hair Jr*, et al.*, 2013).

In this research, indicators were used to define every formative construct in the model of study. A formative measurement model was chosen for this study due to the following reasons from Hair Jr. et al. (2013):

1. The causal priority between the indicator and construct is from indicators to the construct.
2. The items mutually are not interchangeable.
3. The indicators represent the cause of the construct rather than a consequence.

3.5.5 Data collection to conduct pre-test

As soon as the measurement model is specified formally, data has to be collected from a sample of respondents to examine the psychometric properties of the scale and evaluate its convergent and discriminant validity. A critical factor should keep in mind when choosing an appropriate sample is to ensure that the target population for which the measure is designed is well represented. Another factor that is traditionally considered at this stage is the size of the sample (Mackenzie*, et al.*, 2011).

This study involves 50 respondents for the pre-test, which allows the running of proper statistical testing procedures. Respondents were reasonably aware of the objectives of the research and were familiar with the birdwatching environment in Malaysia. According to Hair Jr et Al, page 21(2013), if the maximum number of arrows pointing at the construct is six, at a significance level of 5% and a minimum R^2 of 0.50 for a statistical power of 80%, a sample size of minimum 48 is recommended for PLS-SEM. This issue was considered this issue when selecting the sample size for the pre-test because Smart-PLS was used in this study. This number is consistent with other studies using pilot tests.

3.5.6 Scale purification and refinement

The methods for evaluating a newly developed scale have been widely discussed in the literature. According to Hair Jr. (2013) page 130, formative indicators should never be discarded simply even by statistical outcomes. Before removing an indicator from the measurement model, you need to check its relevance from a content validity point of view. Again, omitting a formative indicator means that you omit some of the construct's content.

3.5.7 Assessment of validity of indicators

Validity, often called construct validity, refers to the extent to which a measure adequately represents the underlying construct that it is supposed to measure (Bhattacherjee, 2012).The quality of research designs can be defined regarding four key design attributes: (1) internal validity, (2) external validity (generalizability), (3) construct validity, and (4) statistical validity.

(1) Internal Validity (or causality): examines whether the observed change in a dependent variable is indeed caused by a corresponding change in the hypothesised independent variable, and not by variables extraneous to the research. Field surveys usually have poor internal validity because of their inability to manipulate the independent variable (cause), and because cause and effect are measured at the same point in time, which defeats temporal procedure making it equally likely that the

expected effect might have influenced the expected cause rather than the reverse (Bhattacherjee, 2012).

(2) External Validity: refers to whether the observed associations can be generalised from the sample to the population, or to other people, organisations, contexts or time (ecological validity). Survey research, where data is sourced from a wide variety of individuals, firms or other units of analysis, tends to have broader generalizability than laboratory experiments where artificially contrived treatments and strong control over extraneous variables render the findings less generalizable to real life settings where treatments and extraneous variables cannot be managed (Bhattacherjee, 2012).

1. Construct Validity: examines how well a given measurement scale is at measuring the theoretical construct that it is expected to measure (Bhattacherjee, 2012).There are two types of construct validity for formative constructs: (1) content validity, and (2) criterion-related validity such as convergent validity. However, both approaches are needed to adequately ensure the validity of a measure in social science(Mackenzie, et al., 2011; Bhattacherjee, 2012).

As is explained later, for the assessment of the convergent validity of formative indicators using Smart-PLS must be tested whether the formatively measured construct is highly correlated with global items or (reflective measure) of the same construct. The strength of the path coefficient linking the two constructs is indicative of the validity of the designed set of formative indicators in tapping the construct of interest. However, including sets of reflective multi-item measures is not always desirable, since they increase the survey length. Long surveys are likely to result in respondent fatigue, decrease response rates, and increase the number of missing values. Furthermore, established, reflective measurement instruments may not be available, and constructing a new scale is difficult and time consuming. An alternative is to use a global single item that summarises the essence of the construct that formative indicators purport to measure, see page 122 (Hair Jr*, et al.*, 2013).

2. Statistical Conclusion Validity: examines the extent to which derived conclusions using an analytical procedure are valid: includes the correct statistical method, sample size, distributional requirement and so forth (Bhattacherjee, 2012).

3.5.8 Assessing the reliability of indicators

Reliability is the degree to which the measure of a construct is constant or dependent. In other words, if this scale is used to measure the same construct multiple times, are roughly the same result obtained every time (assuming the underlying construct is not changing). There are many ways of estimating reliability (Bhattacherjee, 2012).

For the constructs with reflective indicators, Cronbach's alpha has traditionally been used to estimate the internal consistency and reliability of the measures (Hair Jr*, et al.*, 2013).

However, for the constructs with formative indicators (as seen in this research), the traditional notion of internal consistency and reliability does not apply because the model does not predict that the indicators will be correlated (Bollen and Lennox, 1991). Formative indicators may be negatively correlated, positively correlated, or completely uncorrelated. Consequently, measures of reliability based on the idea of internal consistency, like Cronbach's alpha and Fornell and Larcker's construct reliability index, are not appropriate, and if applied, may result in the removal of indicators that are essential to the domain of the construct (Diamantopoulos and Winklhofer, 2001; Mackenzie, 2003; Mackenzie*, et al.*, 2011).

Formative indicators are assumed to be error free, which means the internal consistency and reliability are inappropriate. Unfortunately, most researchers notice this issue after data collection, whereas this important concern must be considered before designing the questionnaire and collecting data to select an appropriate approach for data analysis (Hair Jr*, et al.*, 2013).To test the reliability of the individual indicator, indicator reliability should be tested using test-retest reliability for every indicator to show if individual indicators are expected to be stable over time, see Table 3.3 in the result section.

3.5.9 Results of pre- test

First, test-retest reliability via Spearman correlation coefficient was conducted using the Statistical Package for Social Sciences (SPSS) to evaluate the reliability of every indicator. According to the results, all correlation coefficients were above 0.7, which indicates that all items were reliable. Thus, the model of the study was reliable, see Table3.3.

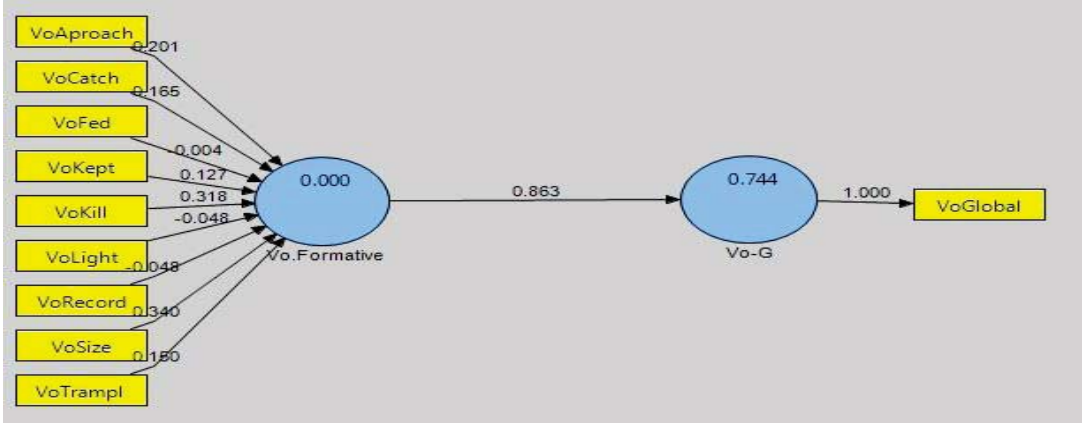
Table 3.3. Spearman Correlation between test and retest surveys for all items

Item	r	Items	r	Items	r	Items	r
AtFed	0.914**	DnFed	0.911**	PbFed	0.953**	InFed	0.982
Atkept	0.791**	DnKept	0.964**	PbKept	0.902**	InKept	0.892
AtSize	0.756**	DnSize	0.886**	PbSize	0.912**	InSize	0.919
AtCatch	0.951**	DnCatch	0.966**	PbCatch	0.939**	InCatch	0.894
AtApproach	0.864**	DnApproach	0.925**	PbAproach	0.904**	InApprach	0.942
AtLight	0.945**	Dnlight	0.959**	PbLight	0.937**	InLight	0.894
AtRecord	0.920**	DnRecord	0.845**	PbRecord	0.933**	InTrample	0.894
AtTrample	0.950**	DnTrample	0.900**	PbTrample	0.965**	InKill	0.959
AtKil	0.850**	DnKil	0.948**	PbKil	0.893**	InGlobal	0.935
AtGlobal	0.903**	DnGlobal	0.970**	PbGlobal	0.914**		
SnFed	0.861**	PbcFed	0.962**	VoFed	0.932**		
SnKept	0.878**	PbcKept	0.958**	VoKept	0.933**		
SnSize	0.930**	PbcSize	0.958**	VoSize	0.956**		
SnCatch	0.921**	PbcCatch	0.940**	VoCatch	0.926**		
SnAproach	0.865**	PbcAproach	0.980**	VoAproach	0.921**		
SnLight	0.851**	PbcLight	0.964**	VoLight	0.925**		
SnRecord	0.926**	PbcRecord	0.885**	VoRecord	0.925**		
SnTrample	0.896**	PbcTrample	0.939**	VoTrampl	0.925**		
SnKil	0.923**	PbcKill	0.938**	VoKil	0.917**		
SnGlobal	0.980**	PbcGlobal	0.974**	VoGlobal	0.936**		

Note: Attitude: At; Subjective norms: Sn; Descriptive norms: Dn; Perceived behavioural control: PBC; Past behaviour: Pb; Value orientation: Vo; Intention: In. ** shows significance levels higher than 0.7.

The next step was to evaluate the convergent validity of the model of study; thus, a redundancy analysis was conducted. Convergent validity is the extent to which a measure correlates positively with other measures (indicators) of the same construct. When evaluating formative measurement models, it must be tested whether the formatively measured construct is highly correlated with a reflective measure of the same construct, or a global single item must be used as an alternative to a reflective measure f construct. This type of analysis is also known as a redundancy analysis. Ideally, a magnitude of 0.90 (or at least 0.80 and above) is desired for the path between formative and reflective constructs, which translates into an R^2 value of 0.81 (or at least 0.64). The strength of the path coefficient linking the two constructs is indicative of the validity of the designated set of formative indicators in tapping the construct of interest. To do this, a separate redundancy analysis was carried out for every construct, which showed all the magnitude paths between every formative construct and single global item; the values were higher than the threshold of an R^2 value of 0.80, see Figures (3.1 -3.7).

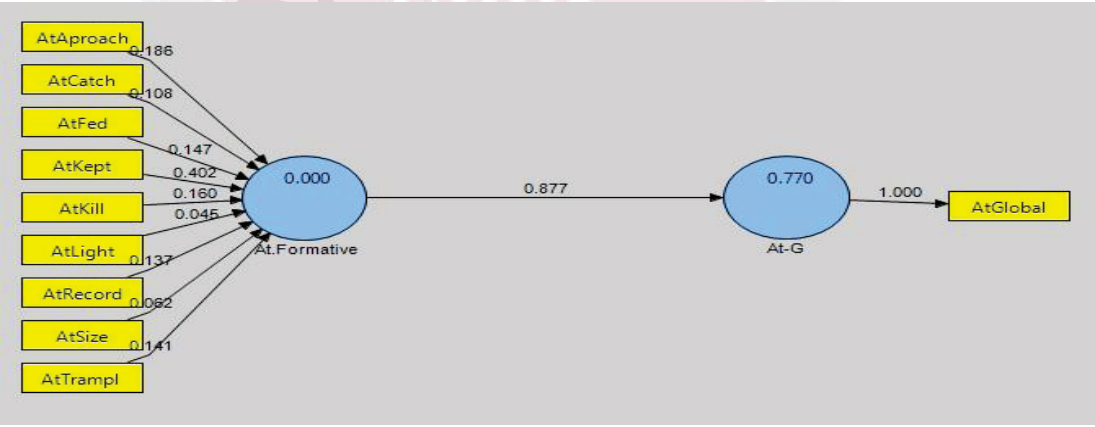
Firstly, the redundancy analysis between the formative measure of the value orientation construct with a related, single global item shows an R^2 value of 0.863, which is a valid measure because it is above 0.80 (Fig3.1).



Notes: Vo:Value orientation, G: Global Single Item, The numbers in circles show R^2 and the numbers on paths between formative construct and construct related to a single item show the path coefficient value. The numbers show on paths between formative construct with items show outer weight value

Figure 3.1. Value orientation redundancy analyses result for disturbance behaviour of Malaysian birdwatchers on birds

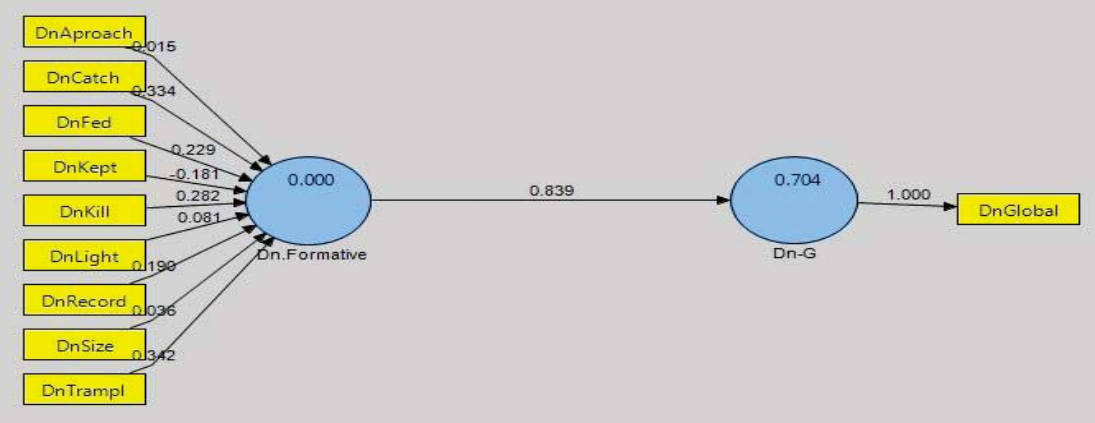
Secondly, the redundancy analysis between the formative measure of original attitude construct with a related, single global item shows R^2=0.877, which is a valid measure because it is above the threshold of 0.80 (Fig3.2).



Notes: Notes: At:Attitude, G:Global Single Item, The numbers in circles show R^2 and the numbers on paths between formative construct and construct related to a single item show the path coefficient value. The numbers show on paths between formative construct with items show outer weight value.

Figure 3.2. Attitude redundancy analyses result for disturbance behaviour of Malaysian birdwatchers on birds

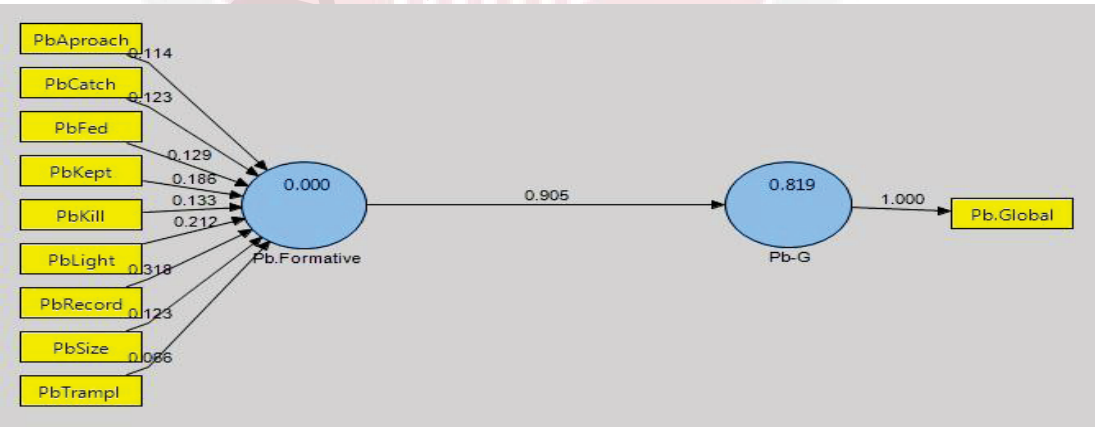
Thirdly, the redundancy analysis between the formative measure of descriptive norm construct with a related, single global item shows R^2=0.839,which is a valid measure because it is above the threshold of 0.80 (Fig3.3).



Notes: DN: Descriptive norms, G: Global Single item. The numbers in circles show R^2 and the numbers on paths between formative construct and construct related to a single item show the path coefficient value. The numbers show on paths between main formative construct with items show outer weight value.

Figure 3.3. Descriptive norm redundancy analyses result for disturbance behaviour of Malaysian birdwatchers on birds

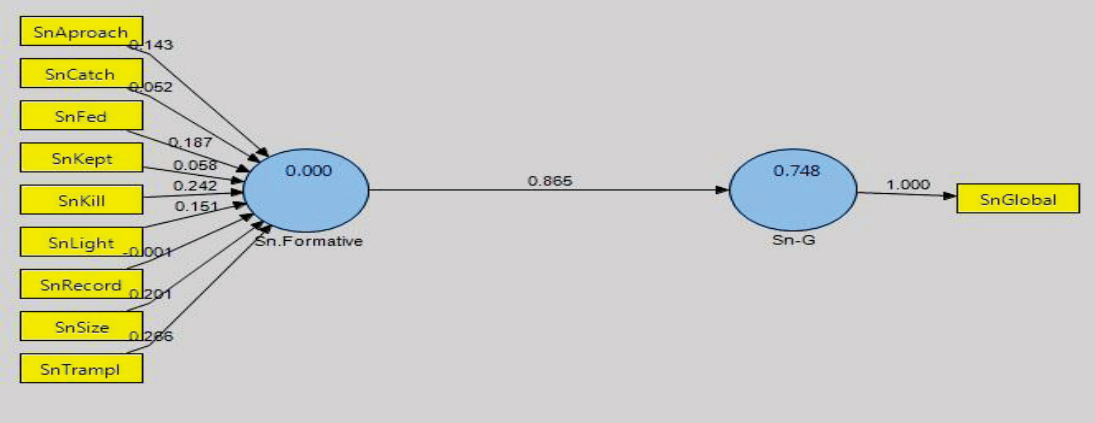
After that, the redundancy analysis between the formative measure of past behaviour construct with a related, single global item shows R^2= 0.905, which is a valid measure because it is above the threshold of 0.80 (Fig3.4).



Note: Pb=Past Behaviour, G=Global Single Item, The numbers in circles show R^2 and the numbers on paths between formative construct and construct related to a single item show the path coefficient value. The numbers show on paths between main formative construct with items show outer weight value.

Figure 3.4.Past behaviourredundancy analyses result for disturbance behaviour of Malaysian birdwatchers on birds.

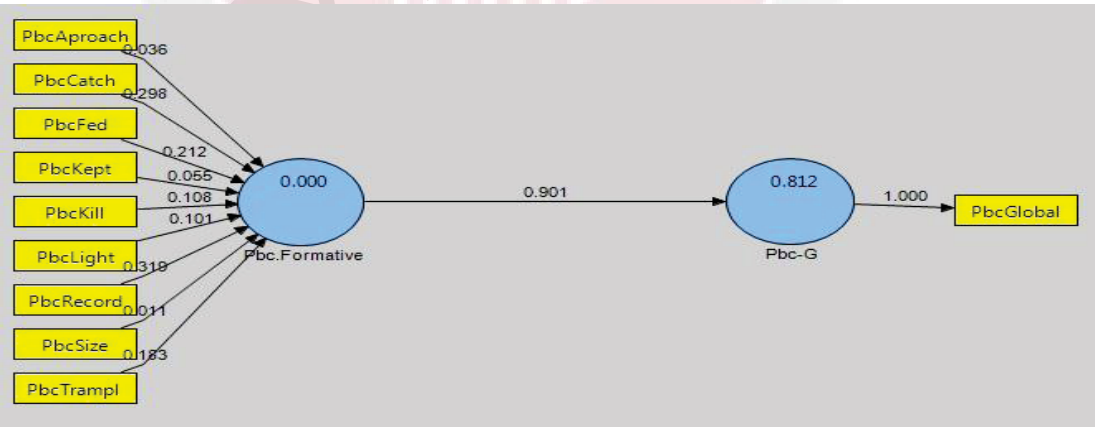
Next, the redundancy analysis between the formative measure of subjective norm construct with a related, single global item shows R^2=0.865, which is a valid measure because it is above the threshold of 0.80 (Fig3.5).



Notes: SN= Subjective norm, G=Global Single Item. The numbers in circles show R^2 and the numbers on paths between formative construct and construct related to a single item show the path coefficient value. The numbers show on paths between main formative construct with items show outer weight value.

Figure 3.5. Subjective norm redundancy analyses result for disturbance behaviour of Malaysian birdwatchers on birds.

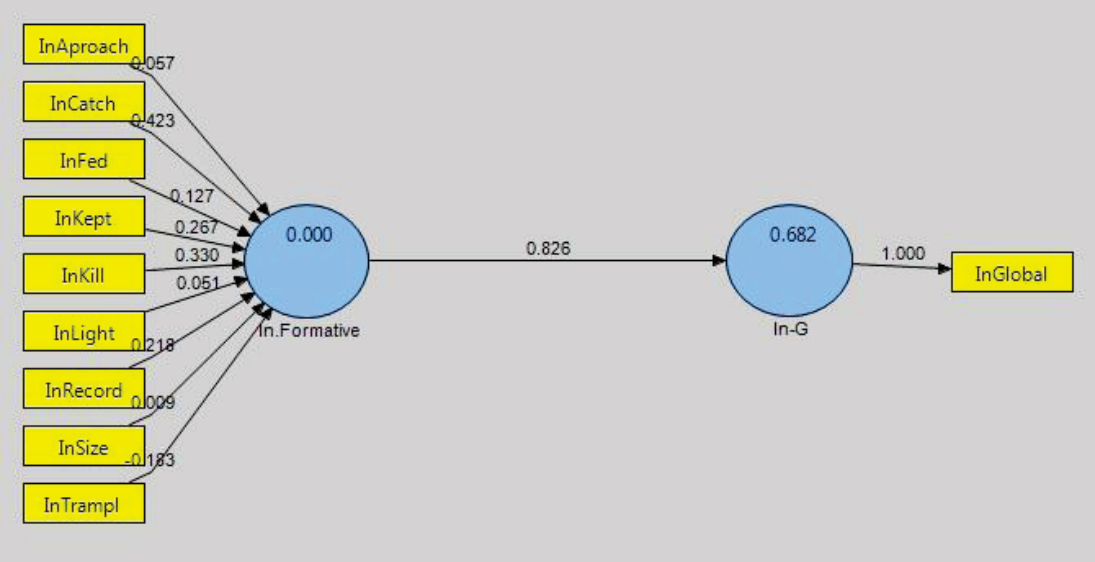
Sixthly, the redundancy analysis between the formative measure of perceived behavioural control construct with a related, single global item shows R^2=0.901 that is a valid measure because it is above the threshold of 0.80 (Fig3.6).



Note: Pbc=Perceived Behavioural Control, G=Global Single Item, The numbers in circles show R^2 and the numbers on paths between formative construct and construct related to a single item show the path coefficient value. The numbers show on paths between main formative construct with items show outer weight value.

Figure 3.6. Perceived behavioural control redundancy results for disturbance behaviour of Malaysian birdwatchers on birds

Finally, the redundancy analysis between the formative measure of intention construct with a related, single global item shows R^2=0.826 that is a valid measure of validity because it is above the threshold of 0.80 (Fig3.7).



Notes: Note: Intention as the original formative construct is labelled as Sn-Formative; the global assessment of intention of the model of the study using a single item construct is labelled with In-G. The numbers in circles show R^2 values and the numbers on paths between formative constructs and constructs related to a single item show the path coefficient values. The numbers show on paths between main formative constructs with items show outer weight values.

Figure 3.7. Intention redundancy results for disturbance behaviour of Malaysian birdwatchers on birds

Furthermore, the test-retest reliability, Spearman correlation coefficient was conducted by SPSS software to evaluate the reliability of every indicator. According to the results, all correlation coefficients were above 0.7 which indicates that all items are reliable. Then the model of the study is reliable, see Table3-3.

3.5.10 Final Instrumentation

In social sciences, instrumentation is a set of instruments (e.g., questionnaires, interviews, and observations) and procedures that assist researchers to collect data (Fraenkel *et al.*, 2012). Among research instruments, questionnaires are favoured tools that provide an easy way to gather information (usually numerical data) in a manageable and structured way without the presence of the researchers (Wilkinson and Birmingham, 2003).

In the present study, the research instrument is a questionnaire divided into two parts: A and B. Part A collected demographic information through three closed-ended questions and one open-ended question. Meanwhile, Part B consisted of seven sections (one to seven), which measured the constructs of the study (63 items). Section seven consisted of seven single, global items.

There was no direct existing measure to study disturbance behaviour of birdwatchers on birds; therefore, a new scale was created. The questionnaire included seven factors (all of which contained nine formative items and one single, global item): value orientation, attitude, subjective norms, past behaviour, perceived behaviour control and intention. An example of a single global item is "My interest has priority over the conservation of birds".

Therefore, the six-factor questionnaire included 70 items, and each was measured via a five-point Likert scale (1 = "strongly disagree", 5 = "strongly agree"). The seven-factor questionnaire measured 10 items on a five-point Likert scale (1 = "strongly disagree" to 5 = "strongly agree").

Demographic questionnaire comprised items of the background of the participant of study which is information of the Malaysian birdwatcher as gender, age, ethnicity, Frequency of participation, See full questionnaire in appendix A and examples of main statements in Table 3.4.

Table 3.4. Malaysian birdwatchers scale towards disturbance behaviour on birds

Main constructs	Example of formative items	No
Value Orientation	Feeding birds should not be allowed.	9
Attitude	I enjoy feeding birds.	9
Subjective Norm	My family thinks it is enjoyable to hunt birds.	9
Descriptive Norm	Most Malaysian bird watchers who are important to me keep birds in their gardens.	9
Past Behaviour	I have captured birds for sale.	9
Perceived Behaviour Control	There is a possibility that I would feed birds.	9
Intention	I intend to feed birds next time.	9
Total		63

3.6 Data Analysis

This research used SPSS version 18.0 to analyse data in the first stage for descriptive statistics. This software is broadly employed by researchers as a data analysis tool (Zikmund, 2003).In the second phase, Structural Equation Modelling (SEM), specifically, smart PLS (Partial Least Square) version 2 (retrieved from http://www.smartpls.com), was used to analyse the data.

SEM is a second-generation multivariate data analysis method. Multivariate data analysis contains the application of statistical methods that concurrently analyse multiple variables indicating measurements related to individuals, companies, events, activities, situations, and so forth. SEM is used to either explore or confirm a theory. Exploratory modelling includes developing theories, whereas confirmatory modelling tests theories. There are two forms of SEM: one is covariance based (CB-SEM), and the other is variance based (PLS-SEM). CB-SEM is used to confirm (or reject) theories. Variance based structural equation modelling (i.e., PLS-SEM) is mainly used to develop theories(Hair, 2010; Hair, Joseph F *et al.*, 2012).

3.6.1 Model Characteristics

There are two ways to estimate the relationships in a structural equation model (Hair, 2010; Hair *et al.*, 2011b). One is more broadly applied CB-SEM approach (covariance based), and the other is PLS-SEM (variance based). Each is proper for a different research context, and researchers need to realise the difference to apply the correct method. To answer the question of when to use PLS-SEM versus CB-SEM, the researchers should focus on the features and objectives that differentiate the two approaches. In circumstances where theory is less developed, researchers should consider the use of PLS-SEM as a substitute approach to CB-SEM. This is mainly true if the key objective of applying structural modelling is prediction and explanation of target constructs.

The estimation method for PLS-SEM is an ordinary least squares (OLS) regression –based method rather than the maximum likelihood (ML) estimation method for CB-SEM. PLS-SEM uses accessible data to evaluate the path relationships in the model with the objective of minimising the error terms (i.e., the residual variance) of the endogenous constructs. This feature accomplishes the predictive goal of PLS-SEM. Hence, PlS-SEM is the chosen method when the research objective is theory development and explanation of variance (prediction of the constructs). For this reason, PLS-SEM is considered as a variance-based approach to SEM.

Several considerations are important when deciding whether or not apply PLS-SEM. These considerations also have theory roots in the method's characteristics. There are four important subjects related to the use of PLS-SEM (Hair *et al.*, 2011a; Hair*, et al.*, 2012; Hair, Joe F. *et al.*, 2012; Ringle, Christian M *et al.*, 2012): (1) data, (2) model properties, (3) the PLS algorithm, and (4) model evaluation issues.

PLS-SEM works efficiently with small sample sizes and complex models and makes particularly no assumptions about the underlying data (for example, regarding data distribution). Besides, PLS-SEM can easily handle reflective and formative measurement models as well as single items construct, with no identification problems. Then it can be applied in a wide range of research

situations. When applying PLS-SEM, researchers should benefits from high efficiency in parameter estimation, which is manifested in the method's greater statistical power than that of CB-SEM. Greater statistical power means that PLS-SEM is more likely to provide a particular relationship significant when it is, in fact, significant in population.

Also, PlS-SEM's statistical properties provide very robust model estimation with data have normal as well as extremely non-normal (I.e., skewness and/or kurtosis) distributional properties (Reinartz *et al.*, 2009; Ringle, Christian M. *et al.*, 2009). Other model specification requirements that constrain the use of CB-SEM, such as distributional assumptions, are not relevant with PLS-SEM, it is however valuable to consider the distribution when working with PLS-SEM (Hair Jr*, et al.*, 2013). The data was tested for normality and it was normal, see Appendix C. For the test of normality, Skewness and Kurtosis were acceptable for the value between -2 and 2 (George and Mallery, 2010).

The univariate outliers were identified by considering frequency distributions of Z - scores of the observed data (Kline, 2005). However, no univariate outlier was identified for this study, because it utilised a 5 points Likert scale ranging from 1 to 5. For imputed data Outliers were identified using univariate (box-plots and standardised Z-score). According to Hair (1998) for large sample size, Z score should be between -4 and 4. The result showed that the standardized (z) scores of the imputed variables ranged from -3.74 to 1.91, indicating that none of the variable exceeded this threshold. Boxplots for all variables also showed that there were no critical outliers, see Appendix D.

There are, however, several limitations of PLS-SEM. The technique cannot be applied when structural models contain casual loops or circular relationship between the latent variables. Since PLS-SEM does not have an adequate global goodness of model fit measure, its use for testing and confirmation is limited.

The result for CB-SEM and PLS-SEM typically do not differ much, and PLS-SEM estimates can, therefore, be good proxies of CB-SEM results. In certain case, particularly when there is little a priori knowledge on structural model relationships or the measurements of constructs or when the emphasis is more on exploration than confirmation, PLS-SEM is an attractive alternative to CB-SEM. Furthermore, when CB-SEM assumptions are violated about normality of distribution, minimum sample size, and maximum model complexity, or related methodological anomalies occur in the process of model estimation, PLS-SEM is a good methodological alternative for theory testing. Thus, researchers should consider both CB-SEM and PLS-SEM when deciding on the appropriate analysis approach for structural model assessment. Researchers need to apply the SEM technique that best suits their research objective, data characteristics, and model setup. (Hair Jr*, et al.*, 2013).

3.6.2 Partial Least Squares -Structural Equation Modelling (PLS-SEM)

The Partial Least Squares (PLS) is a useful and flexible tool for statistical model building. The flexibility and scope of PLS facilitates the analysis and investigation of large and complex path models, particularly in the more exploratory fashion, as in this research. In addition, PLS can easily handle reflective and formative measurement models as well as single item construct. It can therefore be applied in a wide variety of research situations. When applying PLS-SEM, researchers also benefit from high efficiency in parameter estimation, which is manifested in the method's greater statistical power than that of CB-SEM. Greater statistical power means that PLS-SEM is more likely to render a specific relationship significant when it is, in fact significant in the population.

PlS was selected as a proper tool for current research because it can handle formative models and also our research is more exploratory than confirmatory. The continuous moderator also can carry out in PlS-SEM more easily than CB-SEM.

3.6.3 Estimation of path model

Path models are diagrams used to display visually the hypothesis and variable relationships that are examined when structural equation modelling is applied. Four basic elements must be understood when developing path models: (1) constructs, (2) measured variables, (3) relationships, and (4) error terms. Constructs are latent variables that are not directly measured and are sometimes called unobserved variables. They are represented in path models as circles or ovals. Measured variables are directly measured observations (raw data). Generally referred to as either indicators or manifest variables, and are represented in path models as a rectangle. Relationships represent hypothesises in path models and are shown as arrows that are single headed, indicating a predictive/causal relationship. Error terms represent the unexplained variance when path models are estimated and are shown as circles connected the (endogenous) constructs and (reflectively) measured variables by single-headed arrows. In contrast, the formatively measured indicators do not have error terms.

Path models also distinguish between the structural (inner) model and the measurement (outer) model. The role of theory is important when developing the structural model. The theory is a set of systematically related hypothesis developed following the scientific method that can be used to explained and predict outcomes. Measurement theory specifies how the latent unobservable variables (constructs) are measured. Latent variables can be modelled in two different ways. One approach is referred to as reflective measurement, and the other is a formative measurement. Structural theory shows how the latent variables are related to each other. Latent variables are classified as either endogenous or exogenous (Hair Jr et al., 2013).

3.6.4 Evaluation of formative measurement models

According to Hair Jr et al. (2013)[page 121], there are three steps to assess the formative measurement models. Step1). Assess convergent validity of formative measurement models, step2). Assess formative measurement models for collinearity issues, step 3). Assess the significance and relevance of the formative indicators.

The first step involves assessing the formative measurements model's convergent validity by correlating the formatively measured construct with a reflective measure (or single global item) of the same construct (step1). At the indicator level, the question arises as to whether each indicator indeed delivers a contribution to the formative index by carrying the intended meaning. There are two situations in which researchers should critically examine whether a particular indicator should enter the construct or not: First, an indicator's information could be redundant if it exhibits high correlations with other indicators of the same construct. This requires examining collinearity among the indicators (step2). Second, an indicator may not significantly contribute to the construct both relatively and absolutely. This can be assessed by examining the (statistical) significance and relevance of the formative indicators (step3).

3.6.4.1 Step1. Assess convergent validity

Convergent validity is the extent to which a measure correlates positively with other measures (indicators) of the same construct. When evaluating formative measurement models, we have to test whether the formatively measured construct is highly correlated with a reflective measure (or single global item) of the same construct. This type of analysis known as the redundancy analysis (Chin, 1998).The term redundancy analysis stems from the information in the model being redundant in the sense that it is included in the formative construct and again in the reflective (or single global item). Specifically, one has to use the formatively measured construct as an exogenous latent variable predicting an endogenous latent variable operationalized through one or more reflective indicators (Hair Jr*, et al.*, 2013) [page121].

The strength of the path coefficient linking the two construct is indicative of the validity of the designated set of formative indicators in tapping the construct of interest. Ideally, a magnitude path of o.90 or at least 0.80 and above is desired (Chin, 1998) for the path between $Y_1^{formative}$ and $Y_1^{reflective}$, which translate into an R^2 value of 0.80 or at least 0.64. If the analysis exhibits the lack of convergent validity (i.e., the R^2 Value of $Y_1^{reflective}$does not contribute at a sufficient level to its intended content. The formative constructs need to be theoretically/conceptually refined by exchanging and/or adding indicators.

Furthermore, established reflective measurement instruments may not be available, and constructing a new scale is difficult and time-consuming. An alternative is to use a global item that summarises the essence of the construct the formative indicators purport to measure. Note that while situations that allow for the inclusion of single item measures are rather rare in research, using a single item for validation purposes is a compromise to balance the problems of questionnaire length and the need to validate formative constructs (Hair Jr*, et al.*, 2013).

3.6.4.2 Step 2.Assess formative measurement models for collinearity issues

Unlike reflective indicators, which are mostly interchangeable, high correlations are not expected between items in two formative measurement models. In fact, high correlations between two formative indicators also referred to as collinearity, can prove problematic from a methodological and interpretational standpoint. Note that when more two indicators are involved, this situation is called multi collinearity (Hair Jr*, et al.*, 2013).

High levels of collinearity between formative indicators are a crucial issue because they have impacts on the estimation of weights and their statistical significance. More specifically, in practice, high levels of collinearity often affect the results of analysis in two respects. First, collinearity increases the standard errors and therefore decreases the ability to show that the estimated weights are significantly different from zero. This issue is especially problematic in PLS-SEM analysis based on smaller sample sizes where standard errors are larger due to sampling error. Second, high collinearity can result in the weights being incorrectly estimated, as well as in their signs being reversed.

To assess the degree of collinearity, researchers should calculate the tolerance. A related measure of collinearity is the variance inflammation factor (VIF), defined as the reciprocal of the tolerance (i.e., $VIF_X=1/TOL_x$). In the context of PLS-SEM, a tolerance value 0.2 or lower and a VIF value of 5 and higher respectively indicate a potential collinearity problem (Hair*, et al.*, 2011b). The smart PLS software does not provide users with VIF values. Statistical software packages such as IBM SPSS present collinearity statistics in their linear regression modules(Hair Jr*, et al.*, 2013) [page123]

3.6.4.3 Step3.Assess the significance and relevance of the formative indicators

Another main criterion for evaluating the contribution of a formative indicator, and thus its relevance, is its outer weight. The outer weight is the result of a multiple regression with the latent variable scores as the dependent variable and the formative indicators as the independent variables(Hair, 2010). Since the construct itself is formed the indicator scores and the outer weights in the formative measurement model, running such a multiple regression analysis yields an R^2 value of 1. The values of outer weights can be compared with each other, and can,

therefore, be used to determine each indicator's relative contribution to the construct, or its relative importance. The estimated values of outer weights in formative measurement models are often smaller than the outer loadings of reflective indicator. The important question that emerges is whether formative indicators contribute to forming the construct. To answer this question, we must test if the outer weights in formative measurement models are significantly different from zero using the bootstrapping procedure.

In bootstrapping, subsamples are randomly drawn from the original set of data. Then, each sub-samples used to estimate the model. This process is repeated until a large number of random subsamples have been created, typically about 5000. The parameter estimates estimated from the subsamples are used to derive standard errors for the estimates. With this information, t-values are calculated to assess each indicator weight's significance.

Non-significant indicator weights should not automatically be interpreted as indicative of poor measurement model quality. Rather, researchers should also consider a formative indicator's absolute contribution to its construct-that is, the information an indicator provides without considering any other indicators. The absolute contribution is given by the formative indicator's outer loading, which is always provided along with the indicator weights. Different from outer weights, the outer loadings stem from single regressions of each indicator on its corresponding construct.

When an indicator's outer weight is non-significant but its outer loading is high (i.e., above 0.50), the indicator should be interpreted as absolutely important but not as relatively important. In this condition, the indicator would generally be retained. But when an indicator has a non-significant weight and the outer loading is below 0.50, the researcher should decide whether to retain or delete the indicator by examining its theoretical relevance and potential content overlap with other indicators of the same construct.

If the theory-driven conceptualization of the construct strongly supports retaining the indicator (e.g., using expert assessment), it should be kept in the formative measurement model. But, if does not support an indicator's inclusion, the non-significant indicator should most likely be remove from further analysis.

Eliminating formative indicators that do not meet threshold levels in terms of their contribution has, from an empirical perspective, almost no effect on the parameter estimates when re-estimating the model. However, formative indicators should never be discarded simply basis on statistical outcomes. Before removing an indicator from formative measurement model, you need to check its relevance from content validity point of view. Again, omitting a formative indicator means that you eliminate some of the construct's content[see page126-131] (Hair Jr*, et al.*, 2013).

3.6.5 Evaluation of structural model

Assessment of the structural model results enables you to determine how well empirical data support the theory/concept and therefore to decide if your theory/concept has been empirically confirmed. Before we describe this analysis, however, we need to examine the structural model for collnearity (step1). The key criteria for assessing the structural model in PLS-SEM are the significance of the path coefficients (step2), the level of the R^2values (step3), the f^2 effect size (Step4), the predictive relevance (Q2), and the q^2 effect size (step5).By interpreting these results, you can identify the key constructs with the highest relevance to explaining the endogenous latent variable (s) in the structural model, see page169 (Hair Jr*, et al.*, 2013).

1. Collinearity assessment

Analogous to the evaluation of formative measurement models, each set of predictors in the structural model for collinearity. Each predictor construct's Variance Inflammation Factor (VIF) should be lower than 5. Otherwise, one should consider eliminating constructs, merging predictors into a single construct, or creating higher-order constructs to treat collinearity problems(Hair Jr*, et al.*, 2013).

2. Structural model Path Coefficient

After running PLS-SEM algorithm, estimates are obtained for the structural model relationships (i.e., the path coefficients), which represent the hypothesised relationships among the constructs. The path coefficients have standardized values between -1 and +1.Estimated path coefficients close to +1 represent strong positive relationships (and vice versa for negative values)that are almost always statistically significant (i.e., different from zero). The closer the estimated coefficient are to 0 are usually no significant (i.e., not significantly different from zero).

Whether a coefficient is significant ultimately depends on its standard error that is obtained using bootstrapping to compute the practical T value. We would enter the original path coefficient estimate and bootstrap standard error in the following formula: T Value=Path coefficient/Se*. Analogous to the description for formative evaluation, when the empirical t value is larger than the critical value, we say coefficient is significant at a certain error probability (i.e., significance level). Commonly used critical values for two-tailed tests are 1.65 (significance level=10%), 1.96 (significance level=5%), and 2.57 (significance level=1%). The choice of significance level in social science usually assumes 5%.

We also talk about Bootstrap Confidence Intervals because the construction of the interval is based on the standard errors obtained from the bootstrapping procedure. The confidence interval for path coefficient is given by (Path coefficient $\pm Z_{1-\alpha/2}$.Se)

Where Z1-α/2 stems from the standard normal (Z) distribution table. With a significance level of 5%, Z 1-α/2=1.96.

The aim of PLS-SEM is to recognise not only significant path coefficient in the structural model but significant and relevant effect. The structural model path coefficient can be interpreted about one another. If one path coefficient is higher than another, its effect on the endogenous latent variable is larger. If the path coefficient is statistically significant, its value indicates the amount to which the exogenous construct is related with the endogenous construct.Moreover, Researchers are frequently interested in evaluating not only construct's direct effect on another but also its indirect effects via one or more mediating constructs. The sum of direct and indirect effect is mentioned as the total effect.

3. Evaluation of the coefficient determination (R^2 values)

The PLS-SEM method was developed mainly for prediction purposes. The R^2values (i.e., coefficient of determination) represent the extent of explained variance of the endogenous constructs in the structural model. A well-built path model to explain certain main target constructs (e.g., Intention) should bring sufficiently high R^2 value depends on the particular research discipline. R^2 values of 0.25, 0.50, and 0.75 for target construct are reflected as weak, medium, and substantial, respectively.

4. Evaluation of f^2 effect size

The F^2effect size enables us to analyse the relevance of constructs in explanation certain endogenous latent construct. More precisely, we examine how much a predictor construct contributes to the R^2 value of a targeting construct in the structural model. Primarily, we estimate the R^2 value with a certain predecessor construct. Without the predecessor construct, the result is a lower R^2 value. On the basis of the difference of the R^2 value for estimating the model with and without the predecessor construct, we acquire the f^2 effect size. This effect size can be considered as f^2= (R^2 include-R^2exclude)/ (1-R^2included). Results of 0.02, 0.15, and 0.35 are interpreted as small, medium, and large f^2 effect size, respectively.

3.6.6 Explanation of mediator analysis

Mediation focuses on a theoretically established direct path relationship (i.e., path p_{13} in Figure3.8) between Y_1 and Y_3, as well as an additional theoretically related element Y_2, which indirectly delivers evidence on the direct effect via its indirect effect (i.e., $p_{12}.p_{23}$) from Y_1 to Y_3 via Y_2 (Figure 3.8).Thus, the indirect relationship from Y_1 to Y_3 in the mediator model.

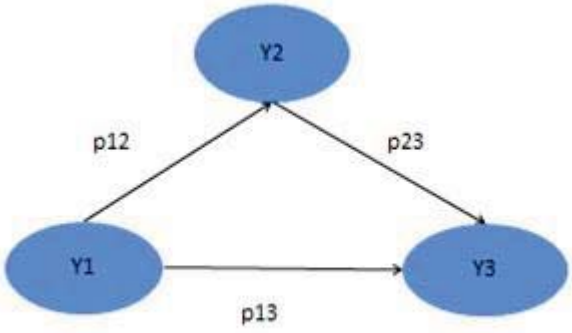


Figure 3.8. General Mediator Model

A commonly used approach for testing mediating effect is the Sobel (1982) test. This test relies on distributional assumptions. Moreover, the Sobel test needs unstandardized path coefficients as input for the statistics and lacks statistical power.

When testing mediating effects, the researcher should rather follow Preacher and Hayes (2008) and bootstrap the sampling distribution of the indirect effect. Bootstrapping makes no assumptions about the shape of variable's distribution or the sampling distribution of the statistics and can be applied with more confidence for PLS-SEM. Therefore this approach perfectly suited for PLS-SEM.

To begin with, the direct effect should be significant if the mediator is not involved in the model. Even though is not a necessary condition (Zhao *et al.*, 2010), this kind of situation make the mediator analysis much easier to understand and interpret. This significance test is conducted by carrying out the bootstrapping procedure. If this relationship is significant, the mediator may absorb some of this effect or the entire effect. Hence we continue the mediator analysis if there is a significant direct relationship between exogenous and endogenous latent variables and include the mediator construct in the PLS model.

When including the mediator, the indirect effect (P_{12}*P_{23}) must be significant. The significance of each path for example, P_{12} and P_{23} is a requirement for this condition. If the indirect effect is significant, the mediator absorbs some of the direct effect (Hair Jr*, et al.*, 2013), see Figure 3.8.

The variance accounted for (VAF) determines the size of the indirect effect to the total effect (i.e., direct effect+ indirect effect): VIF= ($p_{12}.p_{23}$)/ ($p_{12}.p_{23}$+p_{13}). Thereby, we can determine the extent to which the variance of the dependent variable directly explained by the independent variable and how much indirect relationship explains the target constructs' variance via the mediator variable.

If the indirect effect is significant but does not absorb any of the exogenous latent variable's effect on the endogenous variable, the VAF is quite low. This happens when the direct effect is high and declines only very slightly after a mediator variable with a significant, but very small indirect effect is included. In this situation, The VAF would be less than 20%, and one can achieve that (almost) no mediation take place. In contrast, when the VAF has very large outcomes of above 80%, one can assume a full mediation. A situation in which the VAF is larger than 20% and less than 80%can be characterised as partial mediation.

3.6.7 Continuous moderator effects

The cause-effect relationship in a PLS path model implies that exogenous latent variables affect endogenous latent variables without any systematic influences of other variables. In many instances, however, this assumption does not hold. In this study, however, a continuous moderator variable is assumed that affect the strength of one specific relationship between two latent variables.

However, moderators may also change the direction of relationships. For example, a path coefficient may be positive for those observations that high value in the moderator variable, whereas the structural relationship is negative for observation where this is not the case. In both cases, this kind of heterogeneity explained by a continuous moderator variable occurs when the relationship between latent variable is not constant but rather depends on the values of the moderating variable.

In PLS-SEM, two approaches are usually used to create the interaction term. One is Product indicator approach. The next one is a two-stage approach. When the exogenous latent variable or the moderator variable has formative measurement model, researchers should use the two-stage approach that extends the product indicator approach to formative measures by explicit use of PLS-SEM's advantage to estimate latent variable scores(Henseler and Chin, 2010; Rigdon *et al.*, 2010; Hair Jr*, et al.*, 2013). The two stages are as follows:

Stage1: The main effects model is estimated without the interaction term to obtain the scores of the latent variables. These are saved for further analysis in the second stage.

Stage2. The latent variable scores of the exogenous latent variable and moderator variable from stage 1 are multiplied to create a single-item measure used to measure the interaction term. All other variables are represented by using single items of latent variable scores from stage one. Henseler and Chin's (2010) simulation study on the use of these alternative approaches in PLS-SEM shows that when prediction represents the major or only purpose of analysis, however, researchers should use the two-stage approach.

3.6.8 Goodness of Fit Index

Tenenhaus et al. (2004) proposed a PLS goodness index (GOF) as "an operational solution as an index for validating the PLS model globally". Hensler and Sarstedt (2012)lately challenged the usefulness of the GOF both theoretically and practically. Their research shows that the GOF does not show a goodness of fit criterion for PLS-SEM, not able to separate valid models from invalid ones. Since the GOF is also not applicable to formatively measurement models and does not penalise over parameterisation works, researchers are recommended not to use this measure (Hair Jr*, et al.*, 2013) [page 185].

3.6.9 Importance-Performance Matrix Analyses (IPMA)

An essential characteristic of PLS-SEM method is the extraction of latent variable scores. Importance-performance matrix analysis (IPMA) is useful in extracting the findings of the basic PLS-SEM outcomes using the latent variable scores (Fornell *et al.*, 1996; Hock *et al.*, 2010; Völckner *et al.*, 2010). The extension builds on the PLS-SEM estimates of the path model relationships and adds a dimension to the analysis that considers the latent variables' average values. For a specific endogenous latent variable representing a key target construct in the analysis, IPMA constructs the structural model total effects (importance) and the average values of the latent variable scores (performance) to highlight significant areas for the improvement of management activities (or the specific focus of the model). More specifically, the results permit the identification of determinants of relatively high importance and relatively low performance. These are major areas of improvement that can subsequently be addressed by marketing or management activities. An essential PLS-SEM analysis identifies the relative importance of constructs in the structural model by extracting estimations of the direct, indirect, and total relationships. The IPMA extends these PLS-SEM results with another dimension, which includes the actual performance of each construct.

Executing an IPMA first requires identifying a targeting construct. To complete an IPMA of a particular target construct, the total effects and the performance values are needed. The importance of latent variables for an endogenous target construct – as analysed using an impotence-performance matrix emerges from these variables' total effects. In PLS-SEM, the total effects are derived from PLS path model estimation. We need to obtain the performance values of the latent variables in the PLS path model. To make the results comparable across different scales, we use a performance scale of 0 to 100, whereby 0 represents the lowest and 100 the highest performance. Rescaling the latent variables to obtain index values requires the following computations to be performed: Subtract the minimum possible value of the latent variable's scale (i.e., 1 for a scale of 1 to 7) from an estimated data point and divide this data point by the difference between the minimum and maximum data points of the latent variable's scale (i.e., 7-1=6 for a scale of 1 to 7):

$$\mathbf{Y_{i^{rescaled}}} = \frac{(\mathbf{Yi} - \mathbf{Minscale[Y]})}{(\mathbf{Maxscale[Y]} - \mathbf{Minscale[Y]})} . \mathbf{100}$$

Whereby Y_i represents the ¡th data point (e.g., i=5 with respect to the latent variable score of the fifth observation in the data set) of a specific latent variable in the PLS path model(Anderson, E. W. and Fornell, 2000; Tenenhaus *et al.*, 2005; Höck *et al.*, 2010; Hair Jr*, et al.*, 2013).

This procedure results in rescaled latent variable scores on a scale of 0 to 100. The mean value of these scores of each latent variable produces the index value of their performance (Hair Jr*, et al.*, 2013).

CHAPTER IV

RESULTS AND DISCUSSION

4.1 Introduction

This chapter consists of nine main sections. Following the introduction, the second section presents descriptive statistics of the profile of respondents which includes their demographic profile, the percentages of agrees and disagrees to each category of defined disturbance behaviour for every construct and descriptive statistic for thefrequency of participation. The next part reports the results of path model estimation of the model of study. After that, it comprises the results for the assessment of formative measurement model which are convergent validity, collinearity issues as well as the significance and relevance of formative indicators. Section four includes evaluation of the structural model. Sections five and six provide reports of mediator and moderator analysis. Section seven contains Importance Performance Matrix analysis. Next part includes the discussion section derived from findings and finally the summary of finding.

4.2 Descriptive statistics

4.2.1 Profile of Malaysian birdwatchers

The results that are presented are based on a comprehensive survey on 421 Malaysian birdwatchers which was conducted from July 2013 until August 2014 for almost 13 months. Table 4.1 presents a demographic profile of respondents. The sample contains a total of 421 respondents. The majority of respondents are Indian (40.9%), followed by Malay (25.4%), Chines (23.5%) and other races who are the resident of Malaysia (10.2%). As for gender, more than2/3 of respondents (71.4%) are male and the remaining (28.2%) are female. As for age, the number of respondents over 40 years is more than 2 times of respondents under 40 years old.

Table 4.1. Profile of Malaysian birdwatchers

Demographic Summary	Number of Respondents (n=421)	Valid Percentages (%)
Gender		
Male	119	28.6
Female	302	71.4
Race		
Malay	107	25.4
Chines	99	23.5
Indians	172	40.9
Others	43	10.2
Age		
Under 40 years old	171	41%
Over 40 years old	250	59%

4.2.2 The percentages of agreements and disagreements for every statement

It is worth mentioning the percentages of agreements and disagreements for every category of defined disturbance behaviour of each construct of the model of study. Table (4.2 to 4.8) shows these percentages.

Table 4.2.The percentage of agreement and disagreement for items of attitude towards disturbance behaviour of Malaysian birdwatchers

Attitude	Agreement	Neutral	disagreement
Feeding birds	21%	36%	45%
Keeping birds	11%	20%	69%
Group size	10%	19%	71%
Catching birds	13%	32%	55%
Photography Approach	5%	33%	61%
Spot Lighting	10%	64%	26%
Recording sounds of birds	16%	55%	29%
Trampling nest of birds	10%	62%	28%
Killing birds	7%	59%	34%

Notes: The agreement shows the summation of percentages of strongly agrees and agrees of the five Likert Scale and disagreement shows the summation of percentages of strongly disagree and disagree.

Table 4.3.The percentages of agreement and disagreement of respondents for subjective norms towards disturbance behaviour of Malaysian birdwatchers

Subjective Norms	Agreement	Neutral	disagreement
Feeding birds	14%	28%	59%
Keeping birds	16%	16%	68%
Group size	8%	28%	64%
Catching birds	11%	21%	68%
Photography Approach	7%	20%	73%
Spot Lighting	6%	23%	71%
Recording sounds of birds	6%	31%	63%
Trampling nest of birds	10%	50%	40%
Killing birds	5%	27%	68%

Notes: The agreement shows the summations of percentages of strongly agree and agree of the five Likert Scale and disagreement shows the summation of percentages of strongly disagree and disagree.

Table 4.4. The percentages of agreement and disagreement of respondents for descriptive norms construct towards disturbance behaviour of Malaysian birdwatchers.

Descriptive norms	Agreement	Neutral	disagreement
Feeding birds	17%	27%	56%
Keeping birds	12%	24%	64%
Group size	11%	17%	72%
Catching birds	19%	31%	50%
Photography Approach	14%	43%	42%
Spot Lighting	8%	36%	56%
Recording sounds of birds	10%	39%	51%
Trampling nest of birds	5%	37%	56%
Killing birds	5%	33%	60%

Notes: The agreement shows the summations of percentages of strongly agree and agree of 5 Likert Scale and disagreement shows the summation of percentages of completely disagree and disagree.

Table 4.5.The percentages of agreement and disagreement of respondents for perceived behaviour Control construct towards disturbance behaviour of Malaysian birdwatchers.

Perceived Behavioural Control	Agreement	Neutral	disagreement
Feeding birds	21%	36%	43%
Keeping birds	13%	24%	63%
Group size	20%	24%	54%
Catching birds	14%	23%	63%
Photography Approach	14%	55%	31%
Spot Lighting	5%	45%	50%
Recording sounds of birds	6%	48%	46%
Trampling nest of birds	12%	48%	40%
Killing birds	6%	43%	51%

Notes: The agreement shows the summations of percentages of strongly agree and agree of 5 Likert Scale and disagreement shows the summation of percentages of completely disagree and disagree.

Table 4.6. The percentages of agreement and disagreement of respondents for intention construct towards disturbance behaviour of Malaysian birdwatchers.

Intention	Agreement	Neutral	Disagreement
Feeding birds	6%	43%	51%
Keeping birds	18%	42%	40%
Group size	8%	15%	77%
Catching birds	8%	18%	74%
Photography Approach	8%	14%	78%
Spot Lighting	6%	19%	75%
Recording sounds of birds	6%	34%	60%
Trampling nest of birds	2%	28%	70%
Killing birds	13%	25%	62%

Notes: The agreement shows the summations of percentages of strongly agree and agree of 5 Likert Scale and disagreement shows the summation of percentages of completely disagree and disagree.

Table 4.7. The percentages of agreement and disagreement of respondents for past behaviour construct towards disturbance behaviour of Malaysian birdwatchers.

Past Behaviour	Agreement	Neutral	Disagreement
Feeding birds	12%	13%	75%
Keeping birds	10%	11%	78%
Group size	10%	10%	80%
Catching birds	8%	12%	80%
Photography Approach	15%	29%	56%
Spot Lighting	18%	29%	53%
Recording sounds of birds	9%	41%	50%
Trampling nest of birds	26%	39%	33%
Killing birds	4%	29%	67%

Notes: The agreement shows the summations of percentages of strongly agree and agree of 5 Likert Scale and disagreement shows the summation of percentages of completely disagree and disagree.

Table 4.8.The percentages of agreement and disagreement of respondents for value orientation construct towards disturbance behaviour of Malaysian birdwatchers.

Value orientation	Agreement	Neutral	Disagreement
Feeding birds	12%	26%	62%
Keeping birds	13%	28%	59%
Group size	12%	26%	62%
Catching birds	14%	26%	60%
Photography Approach	12%	22%	66%
Spot Lighting	12%	27%	61%
Recording sounds of birds	15%	29%	56%
Trampling nest of birds	9%	35%	56%
Killing birds	15%	26%	59%

Notes: The agreement shows the summations of percentages of strongly agree and agree of 5 Likert Scale and disagreement shows the summation of percentages of completely disagree and disagree.

4.2.3 Frequency of participation

The Table 4.9 has shown the descriptive statistic for the frequency of participation in the events by respondents. The birdwatchers had at least one time experience for bird watching.

Table 4.9. Frequency of participation of Malaysian birdwatchers in the events

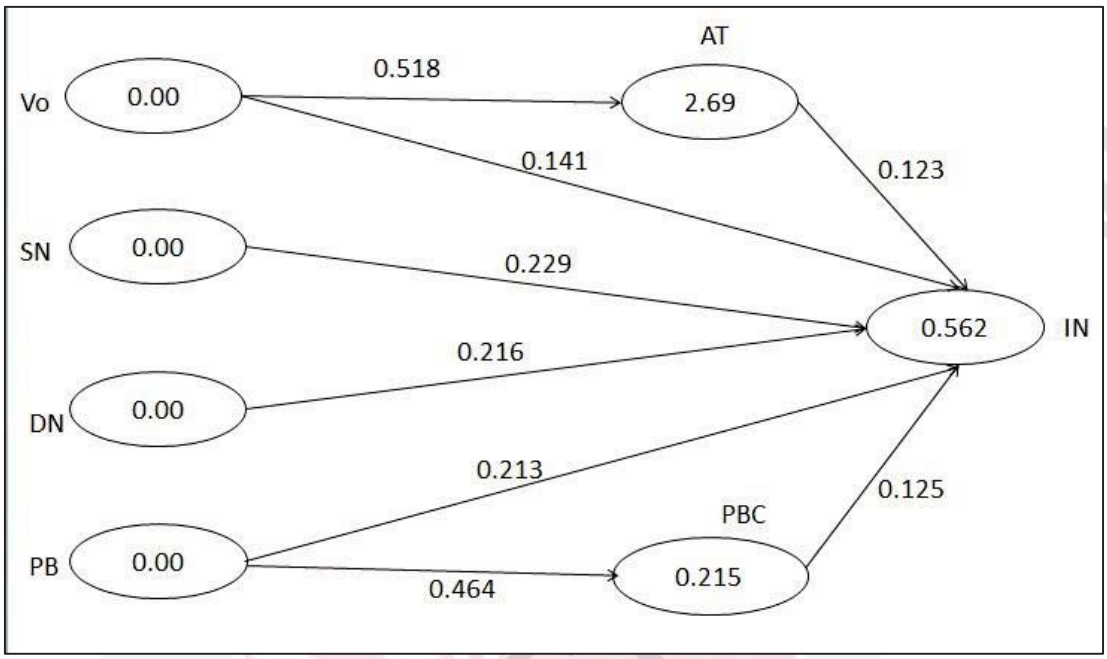
	N	Min	Max	Mean	Std. Devation
Frequency	421	1	365	19.83	36.389

4.3 Path model estimation results

The path model estimation allowed us to conclude, for instance, that the subjective norms had the strongest effect on intention (β=0.229), followed by the descriptive norms (0.213) and past behaviour (β=0.216), value orientation (β=0.141), perceived behaviour control (β=0.125) and attitude (β=0.123).

Moreover, the six constructs explained 56.2% of the variance of the endogenous construct 'intention' (R2=0.52), as indicated by the value in the circle. Value orientation explained 26.9% of the variance of the endogenous construct 'attitude' (R2=0.269) and past behaviour explained 21.5% of the variance of endogenous construct 'perceived behaviour control' (R^2=0.215). Path coefficients with standardised values above 0.20 are usually significant, and those below 0.10 are usually insignificant, see Figure 4.1. Nevertheless, making definite statements about a path coefficient's significance requires determining the coefficient estimate's standard error (Hair Jr*, et al.*, 2013), which is a part of the evaluation of

structural model and more exact results are presented in next sections of this chapter.



Notes: Value orientation : VO: Value Orientation, SN: Subjective Norm, DN: Descriptive Norm and PB: Past Behaviour; the numbers which have shown in circles are R^2 and the numbers on Arrows are Path Coefficients (β).

Figure 4.1. The Path model estimation towards disturbance behaviour on birds among Malaysian birdwatchers

4.4 Assessing formative measurement model

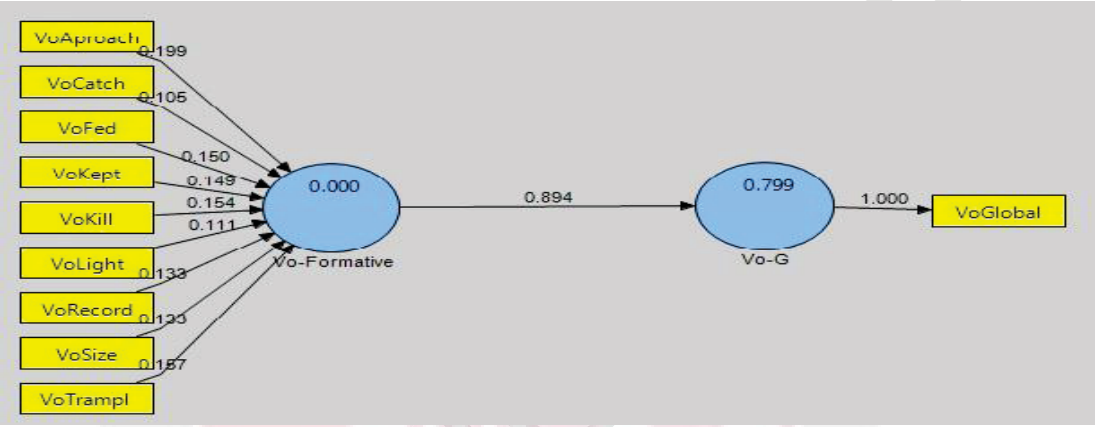
As it is explained in chapter3, the model of the study was formative measurement. Thus, the important criteria for the assessment of the measurement model should be considered. There were three steps to assess the formative measurement models: 1) assessment of the convergent validity of formative measurement models, 2) assessment of formative measurement models for collinearity issues, and 3) assessment of the significance and relevance of the formative indicators (Hair Jr*, et al.*, 2013).

4.4.1 Step 1: Assessment of the convergent validity

Convergent validity is the degree to which a measure correlates positively with other measures (indicators) of the same construct. When evaluating formative measurement models, it should be tested whether the formatively measured construct is highly correlated with a reflective measure of the same construct or a global, single item should be used as an alternative to a reflective measure of the construct. This type of analysis is also known as a redundancy analysis. Ideally, a

magnitude of 0.90 (or at least 0.80) is desired for the path between formative and reflective constructs, which translates into an R2 value of 0.81 (or at least 0.64). The strength of the path coefficient linking the two constructs is indicative of the validity of the designated set of formative indicators in tapping the construct of interest. To do this, separate redundancy analysis for each construct were carried out (Hair Jr*, et al.*, 2013), (see Figures 4.2–4.8).

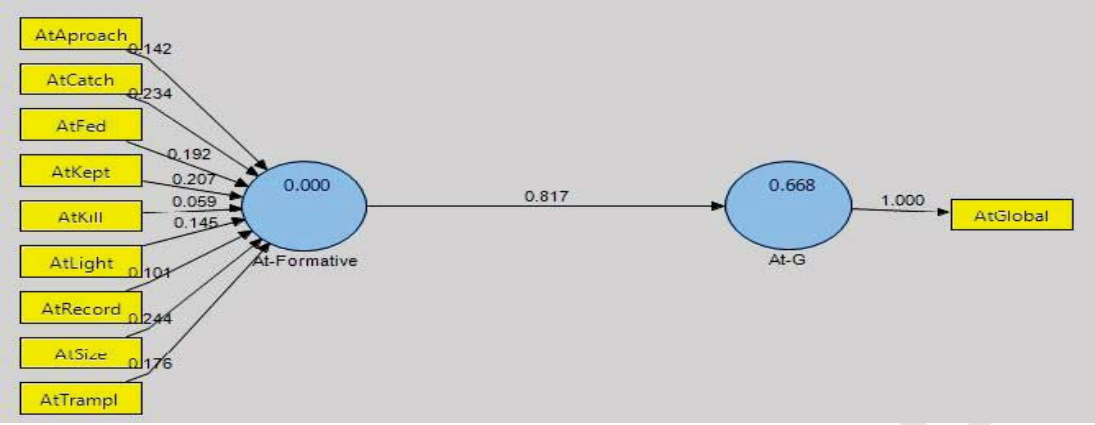
Firstly, the redundancy analysis between the formative measure of the value orientation construct with a related single global item shows R^2=0.894, which is a valid measure because it is above the threshold of 0.80 (Fig 4.2).



Notes: Vo=Value orientation, G=Global Single Item, The numbers in circles show R^2 and the numbers on paths between formative construct and construct related to a single item show path coefficient value. The numbers show on paths between the formative construct with items show outer weight value.

Figure 4.2. Value orientation redundancy analyses result for disturbance behaviour of Malaysian birdwatchers on birds

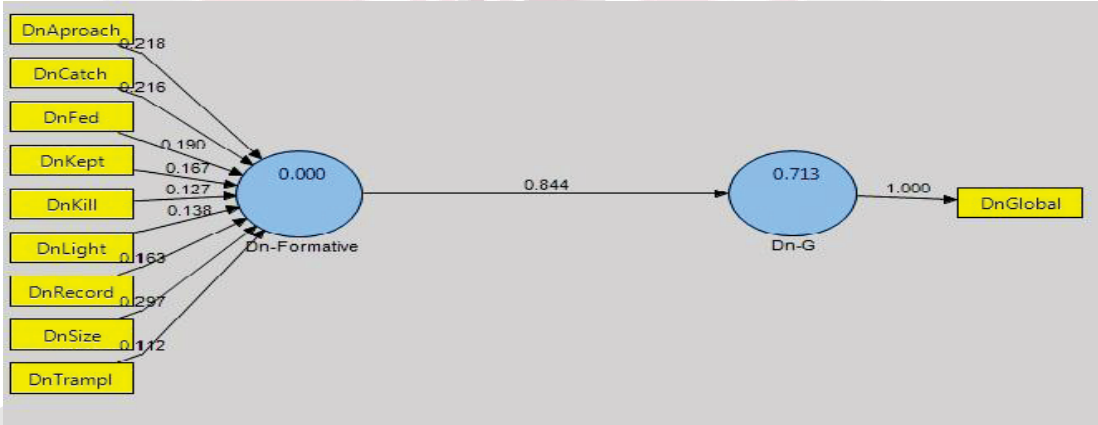
Secondly, the redundancy analysis between formative measure of original attitude construct with a related single global item shows R^2=0.817 and whcih is a valid measure because it is above the threshold of 0.80 (Fig 4.3).



Notes: Notes: At=Attitude, G=Global Single Item, The numbers in circles show R^2 and the numbers on paths between formative construct and construct related to a single item show path coefficient value. The numbers show on paths between the formative construct with items show outer weight value.

Figure 4.3. Attitude redundancy result for disturbance behaviour of Malaysian birdwatchers on birds

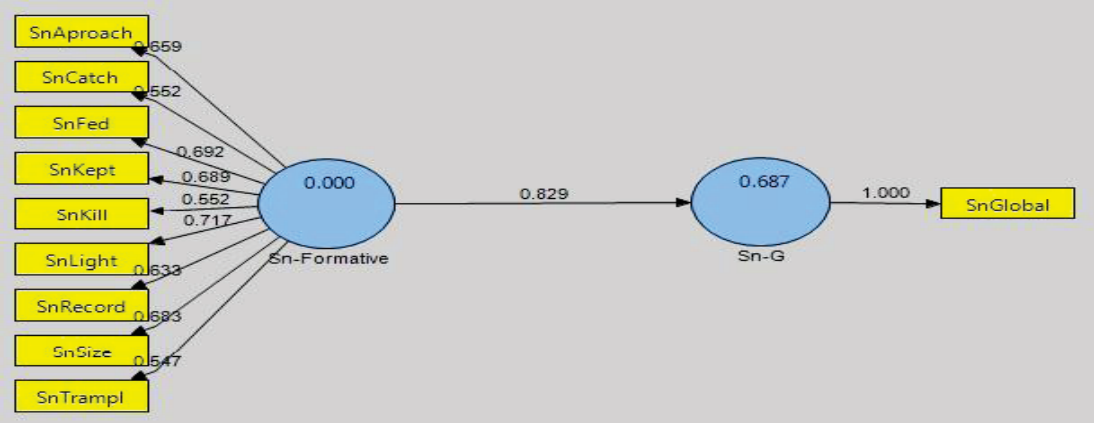
Thirdly, the redundancy analysis between the formative measure of the descriptive norm construct with related single global item shows R^2=0.844, that which is a valid measure because it is above the threshold of 0.80 (Fig 4.4).



Notes: DN= Descriptive norms, G=Global Single item. The numbers in circles show R^2 and the numbers on paths between the formative construct and construct related to a single item show the path coefficient value. The numbers show on paths between the main formative construct with items show outer weight value.

Figure 4.4. Descriptive norm redundancy results for disturbance behaviour of Malaysian birdwatchers on birds

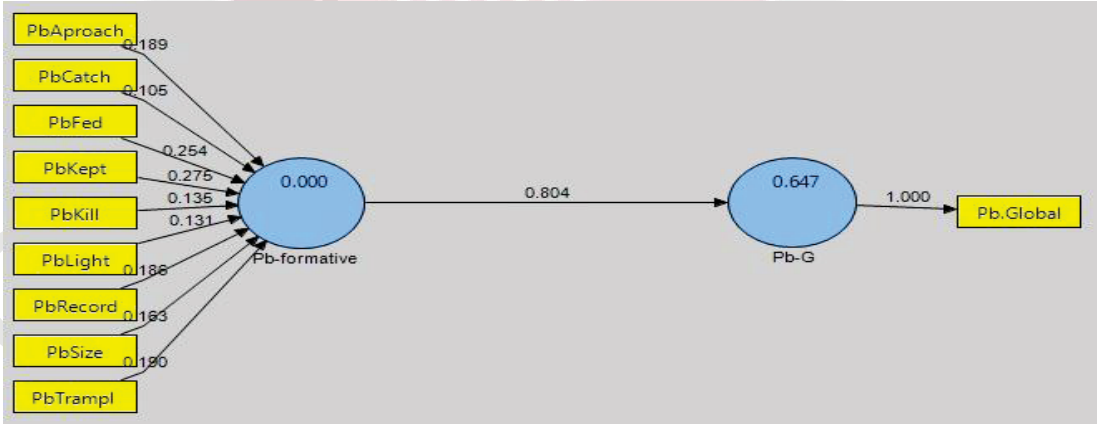
Next, the redundancy analysis between the formative measure of the subjective norm construct with a related single global item show R^2=0.832, which is a valid measure because it is above the threshold of 0.80 (Fig 4.5).



Notes: SN= Subjective norm, G=Global Single Item. The numbers in circles show R^2 and the numbers on paths between the formative construct and construct related to a single item show the path coefficient value. The numbers show on paths between main formative construct with items show outer weight value.

Figure 4.5. Subjective norm redundancy results for disturbance behaviour of Malaysian birdwatchers on birds

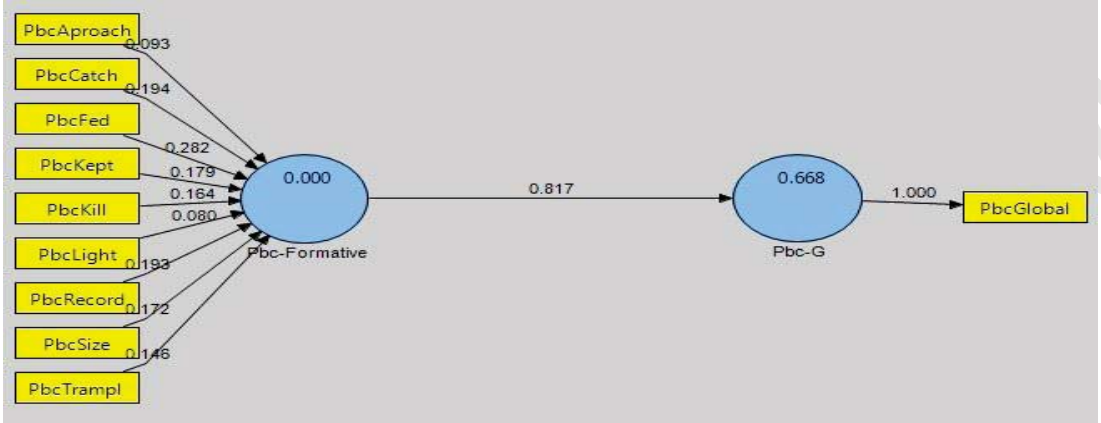
After that, the redundancy analysis between the formative measure of the past behaviour construct with a related, single global item shows R^2= 0.804, which is a valid measure because it is above the threshold of 0.80 (Fig 4.6).



Notes: Past behaviour as the original formative construct is labelled with Sn-Formative; whereas the global assessment of Past behaviour of the model of the study using a single-item construct is labelled with Pb-G. The numbers in circles show R^2 and the numbers on paths between the formative construct and construct related to single item show the path coefficient value. The numbers show on paths between main formative construct with items show outer weight value.

Figure 4.6. Past behaviours redundancy results for disturbance behaviour of Malaysian birdwatchers on birds

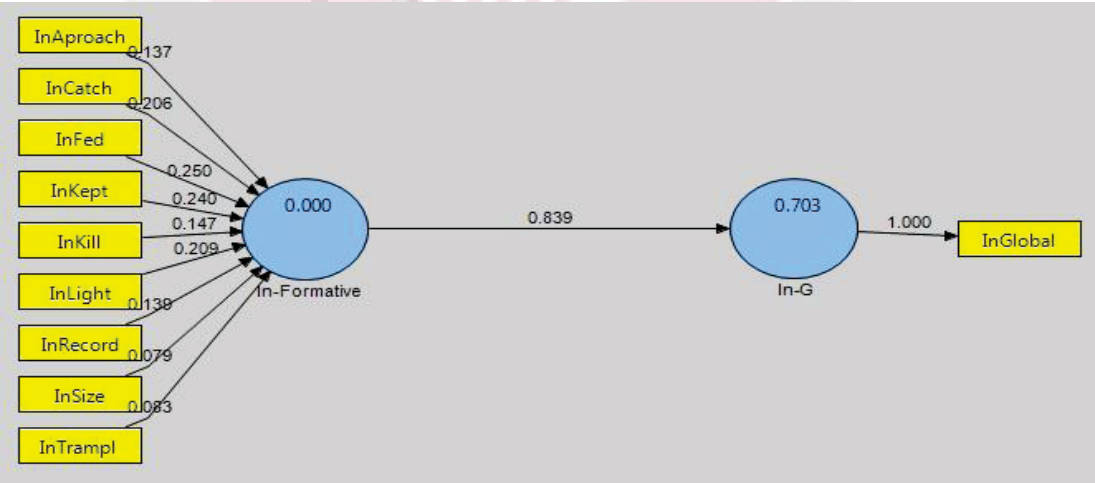
Sixthly, the redundancy analysis between the formative measure of the perceived behavioural control construct with a related, single global item shows R^2=0.817, which is a valid measure because it is above the threshold of 0.80 (Fig 4.7).



Notes: Pbc=Perceived behaviour control, G=Global Single Item, The numbers in circles show R^2 and the numbers on paths between formative construct and construct related to a single item show the path coefficient value. The numbers show on paths between main formative construct with items show outer weight value.

Figure 4.7. Perceived behavioural control redundancy results for disturbance behaviour of Malaysian birdwatchers on birds

Finally, the redundancy analysis between the formative measure of the intention construct with a related, single global item shows R^2=0.839, which is a valid measure because it is above the threshold of 0.80 (Fig4.8).



Notes: Intention as the original formative construct is labelled with In-Formative; whereas the global assessment of intention of the model of the study using a single-item construct is labelled with In-G. The numbers in circles show R^2 and the numbers on paths between the formative construct and construct related to a single item show the path coefficient value. The numbers show on paths between main formative construct with items show outer weight value.

Figure 4.8. Intention Redundancy Results for disturbance behaviour of Malaysian birdwatchers on birds

4.4.2 Step2. Assessment of formative measurement models for collinearity issues

In this step, the collinearity of indicators was checked. High correlation between two formative indicators is referred to as collinearity. To assess the level of collinearity, researchers should compute the tolerance or Variance Inflammation Factor (VIF), defined as the reciprocal of the tolerance. Each indicator's VIF value should be lower than five (Hair Jr*, et al.*, 2013).The VIF value for every indicator of formative constructs was tested. Each value was greater than five; thus, there were no collinearity issues between indicators. The VIF values are reported in Tables (4.9 to 4.16).

4.4.3 Step3. Assess the Significance and Relevance of the formative Indicators

In this step, each indicator's outer weight (relative importance) and outer loading (absolute importance) were examined, and bootstrapping was used to assess their significance. When an indicator's weight is significant, there is an empirical support to retain the indicator. When an indicator's weight is not significant but the corresponding outer loading is relatively high, the indicator should be retained. If both outer weight and outer loading are non-significant and there is no empirical support to maintain the indicator, it should be detached from the model(Hair Jr*, et al.*, 2013). Tables4.10 to 4.16 show outer weight significance testing Results and VIF values.

Looking at significance levels for attitude formative indicators in Table 4.10, it is seen that all formative indicators regarding attitude were significant for outer weights except attitude toward approaching birds, attitude toward catching birds, attitude toward killing birds, attitude toward using recorded bird songs and attitude toward trampling the nests of birds. Indicators with significant outer weights were considered relatively importance; however, for non-significant outer weights, looking at t-values for outer loading, all were clearly above 2.57, which indicated that their outer loadings were significant and that they could be considered with absolute importance ($t\text{-value}>2.57$, $p<0.01$).

Table 4.10. The significance and relevance of the formative indicators for attitude construct towards disturbance behaviour on birds among Malaysian birdwatchers

Relationship between Attitude and related indicators	Weight	t Statistics For weight	loading	T Statistics For loading	Importance	VIF
AtAproach-> AT	0.065	0.658	0.379	4.156***	absolute	1.355
AtCatch -> AT	-0.114	1.043	0.600	8.855***	absolute	2.475
AtFed -> AT	0.330	3.553**	0.751	13.860	relatively	1.658
AtKept -> AT	0.327	2.803**	0.866	20.119	relatively	2.562
AtKill -> AT	0.089	1.036	0.398	4.819***	absolute	1.355
AtLight -> AT	0.188	1.964*	0.364	3.927	relatively	1.413
AtRecord -> AT	-0.049	0.567	0.190	1.994***	absolute	1.360
AtSize -> AT	0.496	4.733**	0.876	18.331	relatively	2.029
AtTrampl -> AT	-0.086	1.026	0.184	2.038***	absolute	1.37

Note: At: attitude; AtApproach: attitude towards approaching birds; AtCatch: attitude towards catching birds; AtFed: attitude towards feeding birds; AtKept: attitude towards keeping birds; AtKill: attitude towards killing birds; Atlight: attitude towards spotlighting birds; AtRecords: attitude towards recording sounds of birds; Atsize: attitude towards group size for birding; AtTrample: attitude towards trampling the nests of birds. *p< 0.10, **p<0.05,***p<0.01

Looking at significance levels for value orientation formative indicators in Table 4.11, all formative indicators regarding value orientation constructs were significant for outer weights except value orientation towards catching birds, value orientation towards keeping birds, value orientation towards using light, value orientation towards using recorded songs of birds, value orientation towards size of the group for birdwatching and value orientation towards trampling the nest of birds. These indicators were considered with relative importance; however, all t-values for outer loadings were clearly above 2.57, which indicated that the outer loading values were significant. These indicators were considered with absolute importance (t-value>2.57, p<0.01). The only non-significant indicator (for both outer loading and outer weighting values) was catching birds. This indicator was retained even though it was non-significant because the literature review and definition of disturbance behaviour in this research provided support for the relevance of this indicator for capturing the content validity of the formative construct of value orientation toward disturbance behaviour on birds.

Table 4.11. The significance and relevance of the formative indicators for value orientation construct towards disturbance behaviour on birds among Malaysian birdwatchers

The relationship between value orientation and related indicators	Weight	t Statistics For weight	loading	T Statistics For loading	Importance	VIF
VoAproach -> VO	0.242	2.448**	0.597	8.025	relatively	2.301
VoCatch -> VO	-0.186	1.251	0.231	1.285	absolute	1.886
VoFed -> VO	0.310	2.592***	0.858	18.383	relatively	2.402
VoKept -> VO	0.123	1.224	0.732	11.653***	absolute	1.842
VoKill -> VO	0.330	2.659***	0.870	20.438	relatively	2.350
VoLight -> VO	0.005	0.045	0.657	8.528***	absolute	1.988
VoRecord -> VO	0.125	1.016	0.788	13.896***	absolute	1.898
VoSize -> VO	0.083	0.721	0.737	10.958***	absolute	2.297
VoTrampl -> VO	0.092	0.850	0.695	10.022***	absolute	1.779

Notes: NS=not significant, Value orientation=Vo, VoApproach = Value orientation towards approaching birds, VoCatch = Vlaue orientation towards catching birds, VoFed =Value orientation towards feeding, VoKept =value orientation towards keeping birds, VoKill= Value orientation towards killing birds, Volight= value orientation towards spot lighting on birds, VoRecords= Value orientation towards recording sounds of birds, Vosize= Value orientation towards group size for birding, VoTrample=Value orientation towards trampling the nests of birds,***p<0.01**p<0.05

Looking at significance levels for descriptive norm formative indicators in table 4.12, some formative indicators were significant for outer weights including catching birds and size of the group (P<0.01). These indicators were considered with relevance importance; however, for non-significant outer weights, looking at t-values of these indicators for outer loading, it can be seen that all outer loadings were clearly above 2.57 which indicates their outer loading were significant and these indicators were considered with absolute importance. These indicators including descriptive norms towards approaching birds, descriptive norm towards feeding birds, descriptive norms toward keeping birds, descriptive norms towards killing birds, descriptive norms toward using light, descriptive norms towards using recorded song of birds and descriptive norms towards trample nest of birds (t Value>2.57, P<0.01). Thus, all indicators were retained for descriptive norms construct.

Table 4.12. The significance and relevance of the formative indicators for descriptive norm construct towards disturbance behaviour on birds among Malaysian birdwatchers.

The relationship between descriptive norm and related indicators	Weight	t Statistics For weight	loading	T Statistics For loading	Importance	VIF
DnAproach -> DN	-0.048	0.512	0.269	2.876***	absolute	1.423
DnCatch -> DN	0.297	2.693***	0.731	11.353	relatively	1.620
DnFed -> DN	0.124	1.213	0.658	9.699***	absolute	1.601
DnKept -> DN	0.167	1.525	0.620	8.971***	absolute	1.689
DnKill -> DN	0.074	0.722	0.417	4.262***	absolute	1.401
DnLight -> DN	0.088	0.816	0.385	4.110***	absolute	1.470
DnRecord -> DN	0.121	1.306	0.383	4.748***	absolute	1.633
DnSize -> DN	0.572	6.043***	0.839	14.236	relatively	1.332
DnTrampl -> DN	0.049	0.433	0.422	4.862***	absolute	1.956

Notes: Descriptive norm =Dn, DnApproach = Descriptive Norms towards approaching birds, DnCatch = Descriptive Norms towards catching birds, DnFed = Descriptive norms towards feeding, DnKept = Descriptive norms towards keeping birds, DnKill= Descriptive norms towards killing birds, Dnlight= Descriptive norms towards spot lighting on birds, DnRecords= Descriptive norms towards recording sounds of birds, Dnsize= Descriptive norms towards group size for birding, DnTrample= Descriptive norms towards trampling the nests of birdsp<0.01***

Looking at significance levels for subjective norm formative indicators in Table 4.13,It is seen that some formative indicators including subjective norm towards keeping birds, subjective norm towards killing birds, subjective norms towards using light and subjective norms toward trampling nest of birds are significance (P<0.01) and (p<0.05) for outer weights were significant. These indicators were considered relative importance, but for non-significant outer weights, t-value for outer loadings of subjective norms towards approaching birds, subjective norms towards catching birds, subjective norms towards feeding birds and subjective norms towards recorded song of birds were significant (t Value>2.57, P<0.01) and these indicators were considered with absolute importance. Thus, all indicators were retained for the subjective norms construct.

Table 4.13. The significance and relevance of the formative indicators for subjective norm construct towards disturbance behaviour of Malaysian birdwatchers on birds

The relationship between subjective norms and related indicators	Weight	t Statistics For weight	loading	T Statistics For loading	Importance	VIF
SnAproach -> SN	0.068	0.734	0.612	8.995***	absolute	1.566
SnCatch -> SN	-0.070	0.539	0.407	3.180***	absolute	1.343
SnFed -> SN	0.004	0.037	0.448	5.555***	absolute	1.742
SnKept -> SN	0.304	3.120***	0.680	8.920	relatively	1.724
SnKill -> SN	0.349	3.371***	0.754	12.712	relatively	1.304
SnLight -> SN	0.493	4.885***	0.796	14.129	relatively	1.804
SnRecord -> SN	-0.081	0.875	0.311	3.260***	absolute	1.498
SnSize -> SN	-0.082	0.808	0.488	6.396***	absolute	1.516
SnTrampl ->SN	0.207	2.123**	0.481	6.036	relatively	1.285

Notes: Subjective norm =Sn, SnApproach = Subjective norm towards approaching birds, SnCatch = Subjective Norms towards catching birds, SnFed = Subjective norms towards feeding, SnKept = Subjective norms towards keeping birds, SnKill= Subjective norms towards killing birds, Snlight= Subjective norms towards spot lighting on birds, SnRecords= Subjective norms towards recording sounds of birds, Snsize= Subjective norms towards group size for birding, SnTrample= Subjective norms towards trampling the nests of birds **p<0.05**, ***p<0.01

Looking at significant levels for past behaviour formative indicators in Table 4.14, it is found that some formative indicators were significant for outer weights including Past behaviour for Catching birds, Past behaviour for feeding birds, Past behaviour for keeping, past behaviour for using light and Past behaviour for trampling the nest of birds were significant (P<0.01).These indicators were considered with relative importance; however, for non-significant outer weights, looking at t-value of these indicators for outer loadings, it can be seen that all were clearly above 2.57 which indicated their outer loading were significant (t Value>2.57, P<0.01)and these indicators were considered with absolute importance including approaching birds, killing birds, using recorded song of birds and group Size. Thus, all indicators were retained for the past behaviour construct.

Table 4.14. The significance and relevance of the formative indicators for past behaviour construct towards disturbance on birds among Malaysian birdwatchers

The relationship between past behaviour and related indicators	Weight	t Statistics For Weight	loading	T Statistics For Loading	Importance	VIF
PbAproach -> PB	0.109	1.133	0.536	6.379***	absolute	1.335
PbCatch -> PB	0.266	2.687***	0.712	9.691	relatively	1.596
PbFed -> PB	0.345	3.332***	0.775	11.596	relatively	1.575
PbKept -> PB	0.235	2.405*	0.711	9.572***	relatively	1.608
PbKill -> PB	-0.017	0.131	0.413	3.785***	absolute	1.481
PbLight -> PB	0.297	3.260***	0.564	7.300	relatively	1.247
PbRecord -> PB	0.092	0.742	0.451	4.262***	absolute	1.465
PbSize -> PB	0.183	1.334	0.715	10.635***	absolute	2.032
PbTrampl -> PB	-0.154	1.977**	0.095	0.991	relatively	1.080

Notes: Past Behaviour =Pb", PbApproach = Past Behvaior towards approaching birds, PbCatch = Past Behvaior towards catching birds, PbFed = Past Behvaior towards feeding, PbKept = Past Behvaior towards keeping birds, PbKill= Past Behvaior towards killing birds, Pblight= Past Behvaior towards spot lighting on birds, PbRecords= Past Behvaior towards recording sounds of birds, Pbsize= Past Behvaior towards group size for birding, PbTrample= Past Behaviour towards trampling the nests of birds,*p< 0.10. **p<0.05.***p<0.01

Looking at significance levels for perceived behavioural control formative indicators in Table 4.15, it is seen that some formative indicators were significant (P<0.01) and (p<0.1) for outer weights including catching birds, feeding birds and group size of birding. These indicators were considered with relative importance; however, for non-significant outer weights looking at t-Value for outer loadings, it can be seen that all t-value for these indicators were clearly above 2.57, which indicated their outer loading were significant (tValue>2.57, P<0.01) and these indicators were considered with absolute importance including approaching the nest of birds, Keeping birds, Killing birds, using Light, using recorded song of birds to attract birds, and trampling nests of birds. Thus, all indicators were retained for the perceived behavioural control construct.

Table 4.15. The significance and relevance of the formative indicators for perceived behavioural control construct towards disturbance behaviour on birds among Malaysian birdwatchers

The relationship between perceived behavioural control and related indicators	Weight	t Statistics For weight	loading	T Statistics For loading	Importance	VIF
PbcAproach -> PBC	0.039	0.399	0.461	4.713***	absolute	1.491
PbcCatch -> PBC	0.464	4.627***	0.861	16.403	relatively	1.825
PbcFed -> PBC	0.260	2.400***	0.741	12.177	relatively	1.609
PbcKept -> PBC	0.296	1.895*	0.849	16.812	relatively	2.646
PbcKill -> PBC	0.197	1.566	0.549	4.946***	absolute	1.726
PbcLight -> PBC	0.047	0.491	0.416	5.302***	absolute	1.474
PbcRecord -> PBC	-0.004	0.036	0.401	4.326***	absolute	1.573
PbcTrample -> PBC	-0.075	0.586	0.401	8.896***	absolute	2.475
PbcSize -> PBC	0.614	0.6797	0.608	3.210***	relatively	1.343

Notes: Perceived Behavioural Control =PBC, PBCApproach = Perceived Behavioural Control towards approaching birds, PbcCatch = Perceived Behavioural Control towards catching birds, PbcFed = Perceived Behavioural Control towards feeding, PbcKept = Perceived Behvairal Control towards keeping birds, PbcKill= Perceived Behavioural control towards killing birds, Pbclight= Perceived behavioural Control towards spot lighting on birds, PbcRecords= Perceived Behavioural Control towards recording sounds of birds, Pbcsize= Perceived Behavioural control towards group size for birding, Perceived Behavioural control, PbcTrample= Perceived Behavioural control towards trampling the nest of birds, *p< 0.10. **p<0.05.***p<0.01

Looking at significant levels for intention formative indicators in Table 4.16, it is found that some formative indicators significant (P<0.01) for outer weighs including intention towards approaching nest of birds, Intentions towards keeping birds, Intention towards Killing birds, Intentions towards group size for birdwatching. Indicators with significant outer weight are considered with relative importance; however, for non-significant outer weights looking at t-value, it can be seen that all are clearly above 2.57 which indicated their outer loadings were significant (tValue>2.57, P<0.01) and these indicators were considered with absolute importance including intention towards catching birds, intentions towards feeding birds, intention towards using light, intention towards using recorded song of birds, intention towards trampling nest of birds. Thus, all indicators were retained for the intention construct.

Table 4.16. The significance and relevance of the formative indicators for intention construct towards disturbance behaviour on birds among Malaysian birdwatchers

The relationship between intention and related indicators	Weight	t Statistics For weight	loading	T Statistics For loading	Importance	VIF
InAproach -> IN	0.427	4.881***	0.855	22.832	relatively	1.941
InCatch -> IN	0.072	0.969	0.784	19.906***	absolute	2.384
InFed -> IN	0.032	0.445	0.379	4.635***	absolute	1.270
InKept -> IN	0.179	2.583***	0.795	19.686	relatively	2.168
InKill -> IN	0.241	3.297***	0.730	16.356	relatively	1.758
InLight -> IN	0.061	0.741	0.485	5.414***	absolute	1.541
InRecord -> IN	-0.011	0.129	0.357	3.926***	absolute	1.531
InSize -> IN	0.236	2.314**	0.849	22.618	relatively	2.946
InTrampl -> IN	0.053	0.737	0.424	4.971***	absolute	1.690

Notes: Intention =IN, InApproach = Intention towards approaching to birds, InCatch = Intentin towards catching birds, InFed = Intention towards feeding, InKept = Intention towards keeping birds, InKill= Intention towards killing birds, Inlight= Intention towards spot lighting on birds, InRecords= Intention towards recording sounds of birds, Insize= Inention towards group size for birding, InTrample= Intentions towards trampling the nest of birds, *p< 0.10. **p<0.5.***p<0.01

In short, the information from all Tables (4.9-4.16) shows that all the items were important because, as can be seen from the results, from the view of importance, some items were of absolute importance and others were of relative importance. As explained in previous sections, it would not be easy to remove any items from the formatively designed questionnaire. The relative importance was given by outer weight, and the absolute importance was given by outer loading. The analysis of outer weights concluded the evaluation of the formative measurement model of study. Considering the results, all formative constructs exhibited a satisfactory level of quality. Thus, evaluation of the structural model can proceed.

4.5 Evaluation of structural model

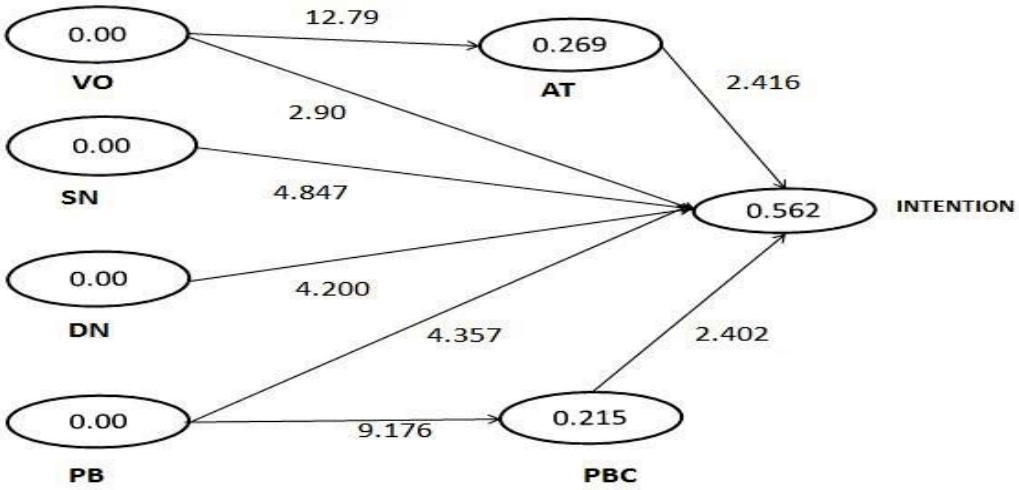
Once it was confirmed that construct formative measures are valid, the next step was to address the assessment of the structural model results. This involved examining the model's predictive capabilities and the relationship between constructs. There are four steps for the evaluation of the structural model in formative measurement models: 1) assess the structural model for collinearity, 2) determine the structural model path coefficients, 3) the coefficient of determination (R^2 value), and 4) the effect size (f^2). To assess collinearity, the same measures were applied as in the evaluation of formative measurement models [i.e., tolerance and VIF (Variance Inflammation Factor)](Hair Jr*, et al.*, 2013).VIF values are shown in Table 4.17.All VIF values for constructs are less than five. Thus, collinearity was not an issue, and there is not a significant level of collinearity among the predictor constructs of the model of study.

Table 4.17. Collinearity assessment for structural model of study for intention toward disturbance behaviour on birds

Construct	Tolerance	VIF
Attitude	0.674	1.485
Descriptive norms	0.591	1.691
Intention	0.451	2.218
Past behaviour	0.654	1.529
Perceived behaviour control	0.635	1.574
Subjective norms	0.634	1.577

Note: VIF=Variance Inflammation Factor

After running the PLS-SEM algorithm, estimates are obtained for the structural model relationship (i.e., the path coefficient), which represent the hypothesised relationships among the constructs. Whether a coefficient is significant ultimately depends on its standard error that is obtained using bootstrapping. Figure 4.9 shows the estimated values after bootstrapping.



Notes: VO=Value Orientation, SN=Subjective Norms, DN=Descriptive Norms, PB=Past Behaviour, AT=Attitude, PBC=Perceive Behavioural Control, IN=Intention, The numbers on paths between constructs has shown T value and the numbers on paths between constructs and items has shown outer weight values after bootstrapping.

Figure 4.9. Structural model after bootstrapping for intentions towards disturbance behaviour on birds among Malaysian Birdwatchers

The significance and relevance of the structural model relationship should also be assessed (step 2). For this purpose, Table 4.17 shows that all relationships (path coefficients) in the structural model were significant at the 5% level ($p<0.5$). The results confirmed the significance of path coefficients in the structural model. The confidence interval was calculated at $p<0.5$, and the results confirmed the significance of all path coefficients in the model of study.

For the assessment of the relevance of the path coefficients, the results showed the path coefficients of the predictors 'descriptive norms', 'subjective norms', 'past behaviour', 'value orientation', 'attitude' and 'perceived behavioural control on intention'. The variables occur in the following order: descriptive norms (β=0.222), subjective norms (β=0.219), past behaviour (β=0.202), value orientation (β=0.148), perceived behavioural control (β=0.128), and attitude (β=0.123). If one path coefficient was larger, its effect on the endogenous variable was greater. Also, the corresponding results for total effects of the exogenous constructs 'attitude', 'value orientation', 'descriptive norms', 'subjective norms', 'perceived behavioural control' and 'past behaviour' on the target construct intention were significant at least at p=0.05. Further results regarding total effect were shown in the analysis of the mediator of the model of study.

The third step was the assessment of the level of the R^2 value. The R^2 value for the target construct (intention) was 0.562 (between 0.75 and 0.50), which can be described as a high level. The path model can explain intention with the medium R^2. On the other hand, the R^2 values for attitude (0.269) and perceived behavioural control (0.215) can be described as medium.

Finally, regarding assessing the effect sizes f^2 (step 4), the f^2 values for the contribution effect of all the predictors (attitude, subjective norms, descriptive norms, value orientation, past behaviour and perceived behavioural control on the intention were between 0.02 and 0.15 and were considered low contributors on intentions towards disturbance behaviour to all endogenous constructs, see Table 4.18.

Table 4.18. Summary of the results of the structural model for intention toward disturbance behaviour on birds among Malaysian birdwatchers

	Path (β)	SE	tValue	pValue	Confidence Interval	Total Effect	F^2 Effect Size
AT -> IN	0.123	0.046	2.664	0.008*	[0.033-0.213]	0.123	0.007
DN -> IN	0.222	0.053	4.175	0.001*	[0.118-0.326]	0.222	0.078
PB -> IN	0.202	0.045	4.473	0.001*	[0.114-0.290]	0.261	0.034
PB -> PBC	0.462	0.049	9.436	0.001*	[0.366-0.558]	0.462	-
PBC -> IN	0.128	0.045	2.820	0.005*	[0.040-0.216]	0.128	0.031
SN -> IN	0.219	0.044	4.968	0.001*	[0.133-0.305]	0.230	0.081
VO -> AT	0.518	0.041	12.642	0.001*	[0.438-0.598]	0.518	-
VO -> IN	0.148	0.045	3.294	0.001*	[0.060-0.236]	0.212	0.042

Notes: VO = Value orientation, = Attitude, SN =Subjective norms, DN =descriptive norms, PB = past behaviour and PBC = perceived behavioural control.* shows significance level,pvalue<0.01

As a summary, from the results of Structural model, eight hypotheses (H1-H8) are accepted.

These eight hypotheses are listed as a following:

H1. Value orientation has a positive contribution to attitude.

H2. Value orientation has a positive contribution to intention.

H3. Attitude has a positive contribution to intention.

H4. Subjective norms have a positive contribution to intention.

H5. Descriptive norms have a positive contribution to intention.

H6. Past behaviour has a positive contribution to perceived behavioural control.

H7. Past behaviour has a positive contribution to intention.

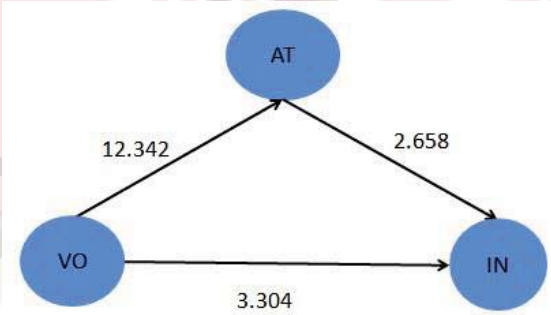
H8. Perceived behavioural control has a positive contribution to intention.

4.6 Mediator analysis

In this step, the constructs that were focused on were value orientation (VO) and past behaviour (PB) and their relationship with the intention (IN). Subsequently, the following questions arose. Firstly, is the Value Orientation (VO)>Intention (IN) mediated by Attitude (AT)? Secondly, is past behaviour (PB)>Intention (IN) mediated by perceived behavioural control (PBC)?

To begin the analysis, the partial least squares (PLS) path model was estimated without the potential mediator variable 'attitude'. The relationship between value orientation and intention was significant (t-value=3.304>2.57, p<0.01). In the next step, the mediator variable must be included. Firstly, the assessment focused on analysing whether the indirect effect of value orientation via attitude (a mediator variable) on intention was significant [$P_{vo\text{-}at}$* $P_{at\text{-}In}$], (t-value=2.60>2.57, p<0.01). Then the indirect effect for this relationship was significant.

A necessary (but insufficient) condition was the significance of the relationship between value orientation and attitude (i.e., t-value=12.342>2.57, p<0.01), as well as between attitude and intention (t-value=2.658>2.57, p<0.01). This was confirmed by the result of the structural model in the last section. The direct effect of value orientation on intention was 0.148, while the indirect effect via attitude was 0.064 ($P_{vo\text{-}at}$* $P_{at\text{-}In}$). On the other hand, the total effect had a value of 0.064 + 0.148=0.212. (i.e., direct effect + indirect effect). The VAF (Variance Inflammation Factor) equals the indirect effect divided by the total effect has the value of 0.064/0.21=0.302. Consequently, 30.2% of value orientation's effect on intention is explained via the attitude mediator. Since the VAF is larger than 20% but smaller than 80%, this situation could be characterised as partial mediation. Thus, the first hypothesis of mediation should be accepted. The first mediation hypothesis was H9: Attitude mediates the relationship between value orientation and intention, see Figure 4.10.

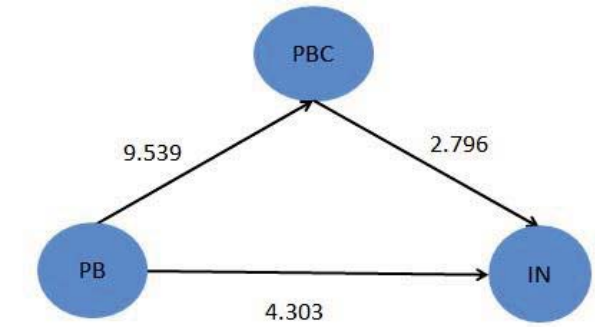


Notes: VO: Value Orientation, AT: Attitude and IN: Intention, The numbers on arrows show t-values for direct and indirect effects of value orientation on intention.

Figure 4.10. Mediator model (Value 0rientation>Attitude>Intention) for behavioural intention toward disturbance behaviour on birds among Malaysian birdwatchers

For the second mediator, PLS path model was used without the potential mediator of perceived behavioural control; the relationship between past behaviour and intention was significant (t-value=4.303>2.57). The same procedure was applied for the effect of past behaviour on intention via the mediator variable (perceived behavioural control). Firstly, the assessment focuses on analysing whether the indirect effect of past behaviour via perceive behavioural control (mediator variable) on intention was significant [$P_{pb\text{-}pbc}$*$P_{pbc\text{-}in}$], (t-value=2.60>2.57, p<0.01). Then the indirect effect for this relationship was significant.

A necessary (but insufficient) condition was the significance of the relationship between past behaviour and perceived behavioural control (i.e., t-value=9.539 >2.57), as well as between perceived behavioural control and intention (t-value=2.796>2.57). This was confirmed by the evaluation of the structural model result in the last section. The direct effect of past behaviour on intention was β=0.202, while the indirect effect via PBC was 0.059 ($P_{pb\text{-}pbc}$*$P_{pbc\text{-}in}$).Then the total effect was 0.059 + 0.202=0.261 (i.e., direct effect + indirect effect). The VAF equals the indirect effect divided by the total effect (0.059/0.261=0.226). Consequently, 22.6% of past behaviour's effect on intention was explained the PBC mediator. Since the VAF was larger than 20% but smaller than 80%, this situation could be characterised as partial mediation. Thus, the second hypothesis of mediation was also accepted. The second hypothesis of mediation was H10: Perceived behavioural control mediates the relationship between past behaviour and intention, see Figure 4.11.



Notes, PB: Past Behaviour, PBC: Perceived Behavioural Control, In: Intention. The numbers on arrows show t-values for direct and indirect variation effect of Past behaviour on intention.

Figure 4.11. Mediator model (Past Behaviour>Perceived Behavioural Control>Intention) for behavioural intention toward disturbance behaviour on birds

4.7 Modelling continuous moderating effects

Initially, there were six hypotheses (H11, H12, H13, H14, H15 and H16) developed to test whether the frequency of participation in birdwatching moderated the relationship between six predictor variables and intention toward disturbance behaviour on birds. For this purpose, it was explored whether the frequency moderator exerted a significant effect on the direct relationship between all six exogenous variables (value orientation, attitude, subjective norms, descriptive norms, past behaviour and perceived behavioural control) and intention. A two-step approach was used, which was discussed in Chapter 3. The bootstrapping procedure was run with 421 cases and 500 samples. There is a need to refer to the moderation interaction terms to interpret the results of the moderation. Interaction terms should be referred to make the interpretation. Consider the following results and the interaction results. A moderation effect is significant when a relative interaction term is statistically significant. Among the six interaction terms, only two were statistically significant ($t=1.767$, $p=0.078$) ($p<0.1$): AT * Frequency -> IN, and VO * Frequency -> IN ($t=2.157$, $p=0.03$) ($p<0.05$). The interaction term for the AT-IN relationships was negative. It means the frequency of participation decreased the strength of the relationship between attitudes and obtained the value of (0.091-0.220=0.229). Then frequency of participation changed the direction of the relationship between attitude and intention. However, the interaction term between value orientation and intention was positive and therefore it increased the effect of attitude on intention and obtained the value of (0.619+0.159=0.158). As an interpretation, the more birdwatchers have frequency of participation in bird watching events, the less effect of attitude on intention towards disturbance behaviour. On the other hand, the more birdwatchers have frequency of disturbance behaviour, the more effect of value orientations on intention towards disturbance behaviour.

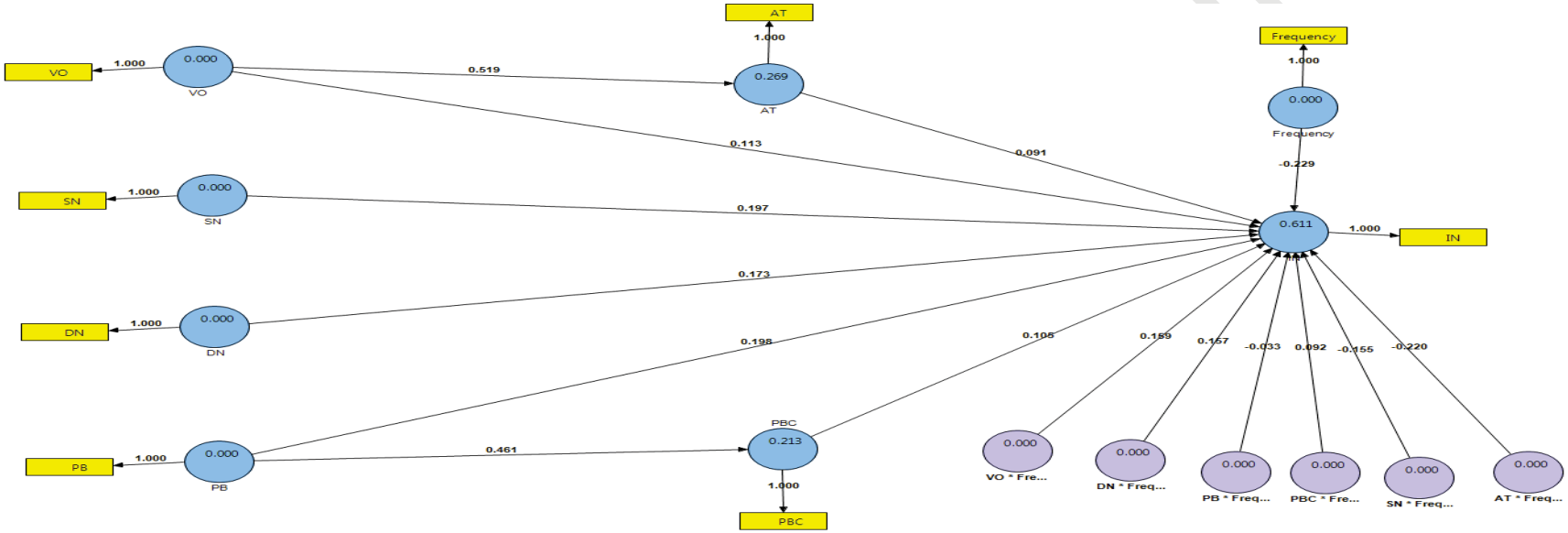
To sum up, the results demonstrated that frequency positively moderated the relationship between value orientation and intention, as well as between attitude and intention. Thus, from the six hypotheses, all were rejected except H11 and H15; H11: The frequency of participation moderates the relationship between value orientation and intention, and H15: The frequency of participation moderates the relationship between attitude and intention, See Table 4.19. The moderator model before bootstrapping, after bootstrapping and the final moderator model are shown in Figures 4.12, 4.13 and 4.14, respectively.

Table 4.19. Hypotheses and summary of the results for the moderating effect of frequency of participation of birdwatchers in the events on the relationship between predictors and intention toward disturbance behaviour on birds

	Hypotheses	P-value	Results
H11	The Frequency of participation moderates the relationship between value orientation and intention.	0.078	Accepted**
H12.	Frequency of participation the relationship between subjective norms and intention.	0.155	rejected
H13	The Frequency of participation moderates the relationship between descriptive norms and intention.	0.736	rejected
H14	The Frequency of participation the relationship between past behaviour and intention.	0.399	rejected
H15	The Frequency of participation moderates the relationship between attitude and intention.	0.222	Accepted*
H16	The Frequency of participation moderates the relationship between perceived behavioural Control and intention	0.030	rejected

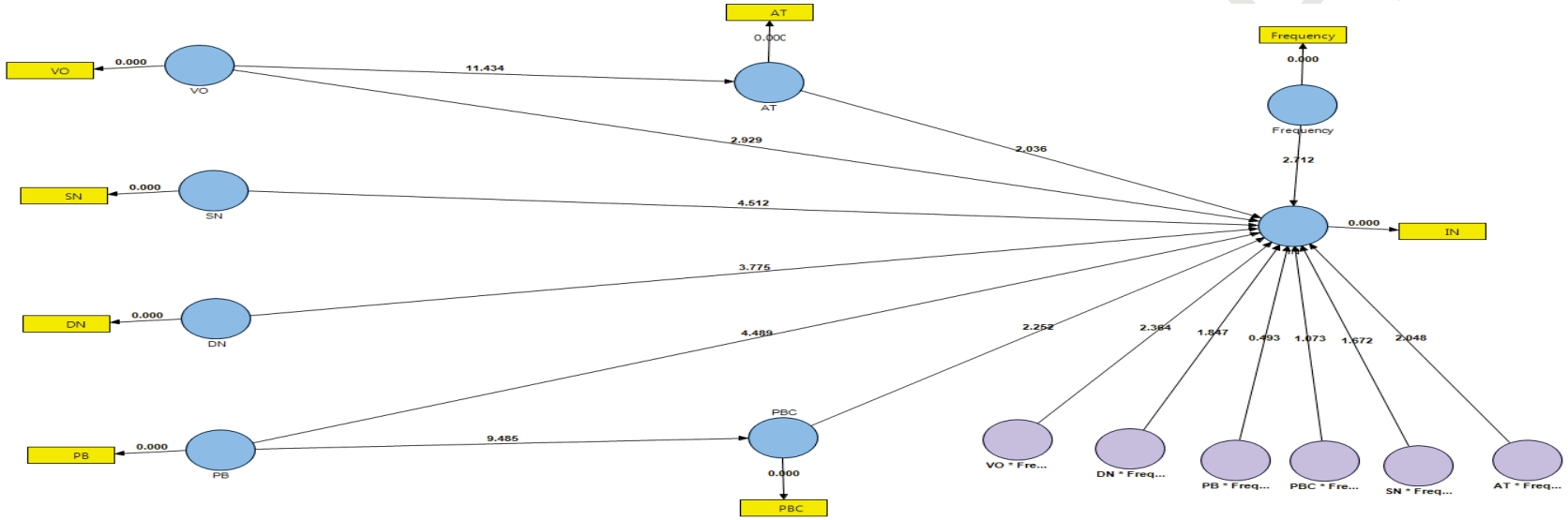
Notes: ** shows significance relationship between interaction term VO*Frequency ($p<0.1$) and *shows significance relationship between Interaction term AT*Frequency of participation ($p<0.1$)

As a summary for moderator model results, it is explored the moderator role of frequency of participation in all defined relationships in the model of study. This research revealed evidence highlighted the importance of frequency of participation (as an index for experience in this research) in moderating the relationship between value orientation and intention toward disturbance behaviour among Malaysian birdwatchers ($p<0.05$)and also shows the moderator role of frequency of participation between Attitude and intention ($p<0.1$). Frequency of participation cannot moderate other defined relationship in the model of study.



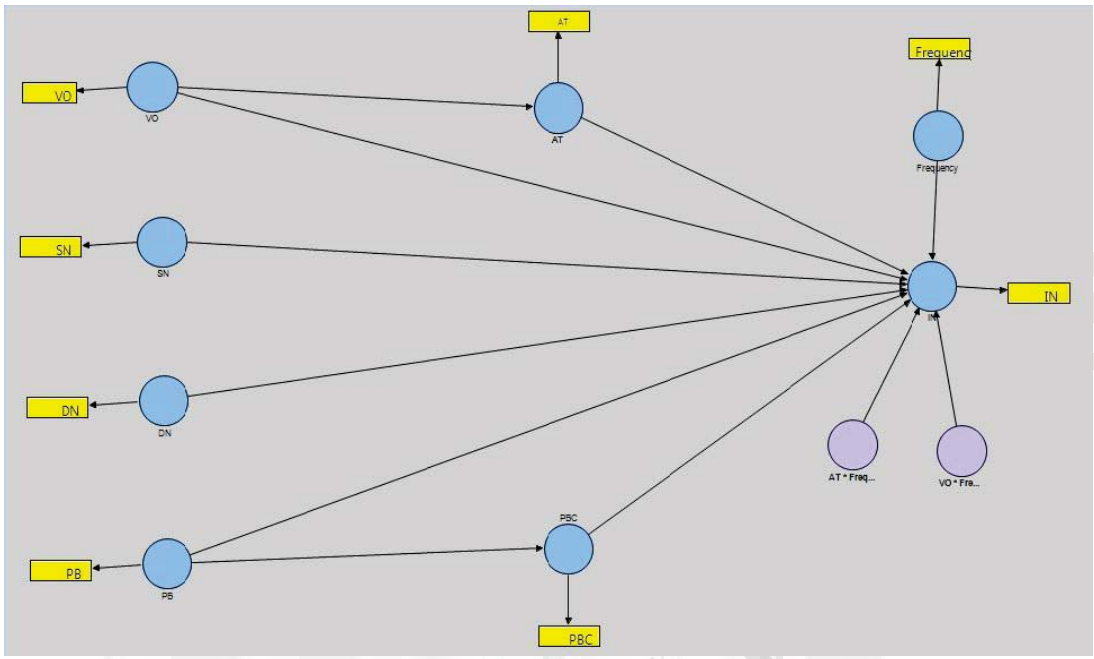
Notes: VO=Value Orientation, SN=Subjective Norms, DN=Descriptive Norms, PB=Past Behaviour, AT=Attitude, PBC=Perceive Behavioural Control, IN=Intention, The numbers on paths between constructs has shown path coefficient (B) and the numbers on paths between constructs and items have shown outer weight values before bootstrapping. The numbers in the circles have shown variances. The interaction terms between every main construct and frequency has shown by VO*Frequency, DN*Frequency, PB*Frequency, PBC*Frequency, SN*Frequency, AT* Frequency.

Figure 4.12.Structural model with moderating effects of Frequency of participation before bootstrapping for Behavioural intention toward disturbance behaviour on birds



Notes: VO=Value Orientation, SN=Subjective Norms, DN=Descriptive Norms, PB=Past Behaviour, AT=Attitude, PBC=Perceive Behavioural Control, IN=Intention, The numbers on paths between constructs has shown T value and the numbers on paths between constructs and items has shown outer weight values after bootstrapping. The interaction terms between every main construct and frequency has shown by VO*Frequency, DN*Frequency, PB*Frequency, PBC*Frequency, SN*Frequency, AT* Frequency.

Figure 4.13.Structural model with moderating effects of frequency of participation after bootstrapping for Behavioural intention toward disturbance behaviour on birds



Notes: VO for Value Orientation, SN for Subjective Norms, DN for Descriptive Norms, PB for Past Behaviour, PBC for Perceived Behavioural Control and At for Attitude. AT*Frequency= interaction term between Attitude and Frequency of participation, VO*Frequency =interaction term between Value Orientation and Frequency of participation in the events by respondents.

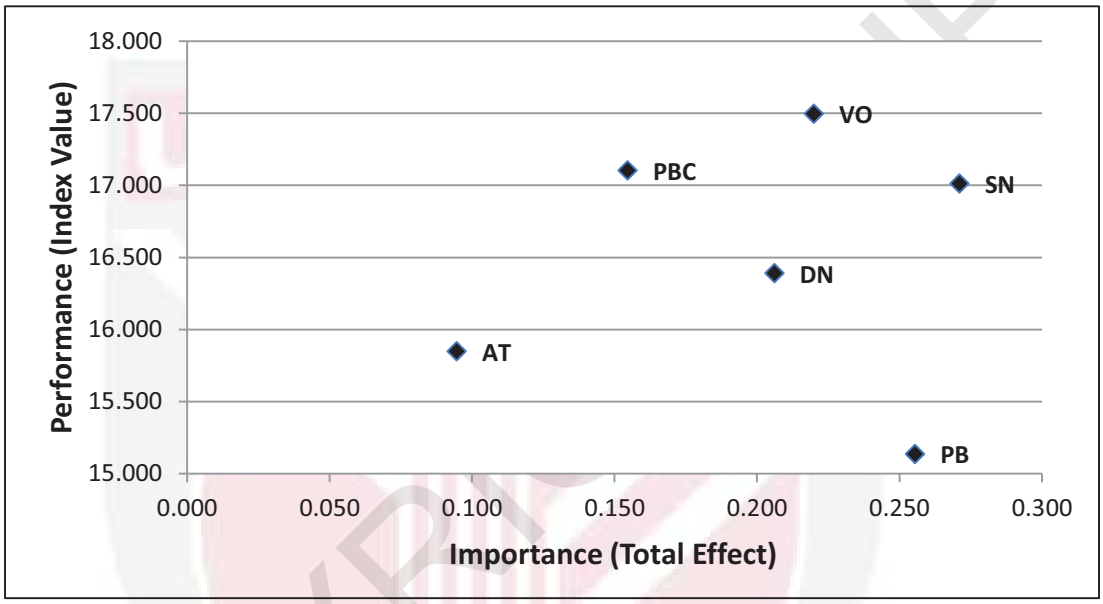
Figure 4.14.Final moderation results with significant paths for behavioural intention toward disturbance behaviour on birds

4.8 Importance –Performance Matrix Analysis (IPMA) results for the intentions towards disturbance behaviours on birds among Malaysian birdwatchers

The goal was to conduct an IPMA of the target construct "intention". Before running the analysis, the data were rescaled. The rescaling of the latent variables and the index value computation are carried out automatically by the Smart-PLS software when rescaled indicator data are used (see Chapter 3). The rescaled data was opened in Smart-PLS. The results from the rescaled data were needed for the IPMA of the target construct "intention". Tables 4.20 presents the results of the total effects (importance) and index values (performance) used for the IPMA. These data allow for creating an IPMA representation, as shown in Figure 4.15.

Table 4.20. Index Values and Total Effects for the Importance –Performance Matrix results for intention construct toward disturbance behaviour on birds among Malaysian birdwatchers

	Importance(Total Effect)	Performance (Index Value)
Attitude	0.095	15.849
Descriptive Norms	0.206	16.389
Past behaviour	0.255	15.137
Perceived behavioural control	0.155	17.103
Subjective norms	0.271	17.011
Value orientation	0.220	17.496



Notes: At = attitude, PBC = perceived behavioural control, Vo = value orientation, DN = descriptive norms, SN = subjective norms, PB = past behaviour.

Figure 4.15.Importance-Performance-Matrix-Analysis representation on intention toward disturbance behaviour on birds among Malaysian birdwatchers

As shown in Figure 4.15, the IPMA of intention revealed that subjective norms were of primary importance for establishing intentions towards target behaviour (disturbance behaviour on birds). In addition, its performance was slightly above average when compared to other constructs. Value orientation was of slightly lower importance, but was still high compared to other constructs (descriptive norms, perceived behavioural control and attitude), and had the highest performance. Descriptive norms almost had a high effect if bothimportance and performance were considered, rather than other constructs, such as past behaviour, which had very low performance or perceived behavioural control, which had rather lower importance. Attitude, on the other hand, had little relevance because it was of low importance and performance. On the other hand, comparing previous analysis results, which show subjective norms and descriptive norms as the strongest predictors, this analysis showed that subjective norms (rather than descriptive norms) had high performance and importance. Although past behaviour had rather

high importance, the performance was low. Perceived behavioural control had almost high performance, and the importance was above average.

4.9 Discussion on findings (H1-H11):

H1. Value orientation predicts attitude toward disturbance behaviour on birds among Malaysian birdwatchers.

Value orientation had a positive, significant effect on attitude (βeta=0.518, p=0.001). Value orientations predicted the attitude toward disturbance behaviour on birds, and explained 26.9% of the variance in attitudes of participants. As mentioned earlier in chapter 2, the relationship between value orientation and attitude, based on the cognitive hierarchy model was significant (Vaske and Donnelly, 1999; Hrubes*, et al.*, 2001; Manfredo*, et al.*, 2009; Voorhies-Holloway, 2009; Teel*, et al.*, 2010; Lee, K., 2011; Vaske*, et al.*, 2011). The results of this study were in agreement with others. Several studies showed that the individual value orientation contributed to the explanation of the environmental attitudes (Dietz*, et al.*, 1998; Needham, 2010; Lee, K., 2011). Furthermore, last studies considered this linear relationship between value orientation and attitude, but this study confirmed the relationship between them in the model of study.

Finally, these findings related the value orientation towards disturbance behaviour to TPB through attitude with the significant relationship. In fact, TPB was extended by including a new variable, value orientation with significant relationship with the attitude of Malaysian birdwatchers towards disturbance behaviour on birds.

H2. Value orientation predicts intention toward disturbance behaviour on birds among Malaysian birdwatchers.

Value orientation had a significant positive relationship on intention. Value orientation predicted intention toward disturbing behaviour on birds (βeta=0.148, p=0.001). The value orientation of participants for explaining intention toward disturbing behaviour on birds had an f^2 effect size of 0.042 (0.02>0.042>0.15). Thus, the f^2 effect size of value orientation on intention was low, which showed how much value orientation contributed to explaining intention. Other studies showed that this relationship was sometimes significant (Vaske*, et al.*, 2011), while the current study showed a significant relationship between value orientation and intention. The inclusion of value orientation furthered our understanding of the role this construct played in determining behaviour related to TPB. Our findings provided evidence in support of a value orientation-intention cognitive hierarchy. This finding was consistent with the results of other studies (Hrubes*, et al.*, 2001).

Finally, these results related the value orientation towards disturbance behaviour to TPB intention with the strong significant relationship. In fact, TPB was extended by including anew variable, value orientation, with significant relationship with the intention towards disturbance behaviour on birds among Malaysian birdwatchers.

H3. Attitude predicts intention toward disturbance behaviour on birds among Malaysian birdwatchers.

Attitude had a positive, significant effect on intention toward disturbance behaviour on birds (βeta=0.123, p=0.008). Other studies based on TPB showed a significant relationship between attitudes and intention (Ajzen, 1985; Yaghoubi, 2010; Lee, K., 2011; Ajzen and Sheikh, 2013).There are a few examples where social behaviour models were used within conservation science (St John*, et al.*, 2011), which have highlighted how information about attitude revealed a limited picture concerning the predictors of the target behaviour (St John*, et al.*, 2011).

In this study, the attitude of Malaysian birdwatchers for explaining intention toward disturbing behaviour had an f^2 effect size of 0.007, which is considered small (0.007<0.02). In previous studies high variance was reported in the survey related to travel motivation (Huang and Hsu, 2009), but St John, et al.(2011) introduced attitude as a week predictor in the conservation science. This finding was consistent with previous wildlife conservation studies.

H4. Subjective Norm predicts intention toward disturbance behaviour on birds among Malaysian birdwatchers.

Subjective norms had a positive, significant effect on intention toward disturbance behaviour on birds (βeta=0.219, p=0.001). Subjective norms for explaining intention had an f^2 effect size of 0.081, which is considered a low effect size.

As mentioned in chapter 2, there was a controversy among studies on the contribution effect of subjective norms on intention (Forward, 2009). The result of this study was consistent with other studies based on TPB, which showed a significant relationship between subjective norms and intention (Yaghoubi, 2010; Smith*, et al.*, 2012; Ajzen and Sheikh, 2013). According to Terry and colleague (1999), the effectiveness of subjective norms dependents on whether the individual identified themselves with the target group or not. Consistent with the results of the current study, subjective norms were important in predicting pro-conservation behaviours such as farm forestry, farm conservation, and obeying boating speed limits in manatee areas (Zubair and Garforth, 2006). Artimage and Conner (2003) suggested that the weak influence of subjective norms in studies using TPB was primarily a legacy of poor methodology and measurement (Marzano and Dandy, 2012b).

H5. Descriptive norm predicts intention toward disturbance behaviour on birds among Malaysian birdwatchers.

Descriptive norms had a positive, significant effect on intention toward disturbance behaviour on birds (βeta=0.222, p=0.001). Descriptive norms for explaining intentions towards disturbance behaviours on birds among Malaysian birdwatchers had an f^2 effect size of 0.078, which was considered a low variance on intention towards disturbance behaviour on birds.

The finding of the current research was consistent with previous studies. There was a significant relationship between descriptive norms and intention. Further, other studies also showed that descriptive norms should be included in the model, as explained in Chapter 2 (Rivis and Sheeran, 2003; Nolan*, et al.*, 2008; Forward, 2009; Fornara*, et al.*, 2011). Descriptive norms were considered an additional norm for the prediction of intention towards disturbance behaviour of birdwatchers. A large number of studies showed a strong correlation between descriptive norms and behavioural intention as well as actual behaviour (Göckeritz*, et al.*, 2010; Fornara*, et al.*, 2011). Nolan et al. (2008) found that descriptive, normative beliefs were the strongest predictors of an individual's decision to conserve energy in their home (r=0.45). On the other hand, in this study, after subjective norms, descriptive norms were the strongest predictors and had the strongest effect on intention towards disturbance behaviour on birds. These findings were illustrative of a large body of research that showed normative beliefs were strongly predictive of both behavioural intentions and behaviour (Göckeritz*, et al.*, 2010). Finally, these findings related descriptive norms towards disturbance behaviour to TPB through intention with strong significant relationship. In fact, TPB was extended by including new variable, descriptive norms, with significant relationship with the intention towards disturbance behaviour on birds among Malaysian birdwatchers.

H6. Past behaviour predicts perceived behavioural control toward disturbance behaviour on birds among Malaysian birdwatchers.

Past behaviour had a positive, significant effect on perceived behavioural control toward disturbance behaviour on birds (βeta=0.462, p=0.001). Past behaviour also explained 21.5% of the variance of perceived behavioural control. As mentioned in Chapter 2, several studies emphasised the need for the inclusion of past behaviour in the theory as an important variable for the predictive validity of TPB model(Bamberg*, et al.*, 2003; Kaplanidou, 2006; Forward, 2009; Sommer, 2011). In addition, if the social behaviour was reasoned, the effect of past behaviour was indirect on behaviour trough intention or PBC (Ouellette and Wood, 1998; Bamberg*, et al.*, 2003; Forward, 2009). Finally, these findings related disturbance past behaviour to TPB through the perceived behavioural control with the strong significant relationship. In fact, TPB was extended by including anew variable, past behaviour, with significant relationship with the intention towards disturbance behaviour on birds among Malaysian birdwatchers.

H7. Past behaviour Predicts intentions toward disturbance behaviour on birds among Malaysian birdwatchers

Past behaviour had a positive, significant effect on intention. Past behaviour predicted intention toward disturbance behaviour on birds (βeta=0.202, p=0.001) and had an f^2 effect size of 0.034, which was considered a low effect size. In this case, past behaviour predicted future behaviour regarding the disturbance on birds.

The inclusion of past behaviour was a matter of controversy (Sommer, 2011). As it was mentioned in the literature review, if the social behaviour was reasoned, the effect of past behaviour on behaviour through intention or perceived behavioural control was indirect (Ouellette and Wood, 1998; Bamberg*, et al.*, 2003; Sommer, 2011). Finally, these findings related disturbance past behaviours to TPB through intention with the strong significant relationship. In fact, TPB was extended by including the new variable, past behaviour, with significant relationship with the intention towards disturbance behaviour on birds among Malaysian birdwatchers.

H8. Perceived behavioural control predicts intention toward disturbance behaviour on birds among Malaysian birdwatchers.

Perceived behavioural control had a positive, significant effect on intention. Perceived behavioural control predicted intention toward disturbance behaviour on birds (β=0.128, p=0.005), and had an f^2 effect size of 0.031, which was considered low. This result can be due to more volitional control of these kinds of activities (Hrubes*, et al.*, 2001).The result was not consistent with other studies in which perceived behavioural control was an important factor in predicting pro-conservation behaviours (Zubair and Garforth, 2006; Marzano and Dandy, 2012b).

Other studies based on TPB have shown a significant relationship between perceived behavioural control and intention (Ajzen, 1985; Yaghoubi, 2010; Fishbein and Ajzen, 2011; Yzer, 2012; Ajzen and Sheikh, 2013). In some studies, the influence of perceived behavioural control on intention was weak, such as in health science (Blue, 1995). Besides, in one study regarding hunting, perceived behavioural control failed to explain an additional variance (Hrubes*, et al.*, 2001). In other studies, however, perceived behavioural control was a good predictor of intention, such as in farm level three planting (Zubair and Garforth, 2006) and exercise activities (Hagger*, et al.*, 2002). The results showed the low variance of perceived behavioural control on intentions towards disturbance behaviours on birds (f^2 effect=0.031); the effect of perceived behavioural control on intention compared to other predictors of the model of the study was low (β=0.128). A likely explanation for this finding is that disturbance behaviour is largely under volitional control in this study. The more volitional control one has over behaviour, the less important perceived behavioural control should be (Hrubes*, et al.*, 2001).

H9. Attitude mediates the relationship between value orientation and intention

As seen in the literature review, linear relationships between value orientation and intention as well as attitude and intention were studied. However, in this study, in addition to these relationships, the mediating effect of attitude between value orientation and intention was assessed in the model of study. Our findings provided evidence in support of a value orientation-attitude-intention cognitive hierarchy. These findings were consistent with the results of other studies, which indicated that the influence of value orientation on intention was mediated by attitude (Hrubes*, et al.*, 2001; Lee, K., 2011). For example, according to Lee (2011), the environmental attitude was found to mediate biosperhic value orientation and behavioural intention.

H10. Perceived behavioural control mediates the relationship between past behaviour and intention

As seen in the literature review, a linear relationship between past behaviour/intention and perceived behaviour/intention studied. However, in this study, in addition to the estimation of direct relationships between past behaviour/intention and perceived behaviour/ intention, the mediating role of perceived behavioural control was examined. The finding showed that perceived behavioural control mediated the relationship between past behaviour and intention towards disturbance behaviours on birds partially. These findings were also consistent with TPB, which states that past behaviour can be a background variable that influences intention indirectly through its influence on perceived behaviour control(Ouellette and Wood, 1998; Bamberg*, et al.*, 2003).

4.10 Summary of findings

Firstly, all defined relationships in the model of the study were significant (H1–H8). Secondly, from the path coefficient view, the effects of predictors on intention were as follows (in decreasing order): descriptive norms (β=0.222), subjective norms (β=0.219), past behaviour (β=0.202), value orientation (β=0.148), perceived behavioural control (β=0.128), and attitude (β=0.123). These findings show that descriptive and subjective norms had the strongest effect on intention; on the other hand, attitude and perceived behavioural control had the smallest effect on intention. Thirdly, regarding f^2 effect size (variance) (in decreasing order): subjective norms (0.081), descriptive norms (0.078), value orientation (0.042), past behaviour (0.034), perceived behavioural control (0.031), and attitude (0.007). These findings show that subjective and descriptive norms had the strongest f^2 effect sizes among other predictors of the model of study, and attitude and perceived behavioural control had the smallest f^2 effect sizes (variance) on intention in the model of study.

Thus, the results from the path coefficient section are slightly different from the results for f^2 effect size. As these two values were compared, it can be seen that descriptive norms had the strongest effect on intention in the model of the studyfrom the path coefficient view, while subjective norms had the highest variance in the model of reserach. Regarding the path coefficient, the effect of past behaviour on intention was more than value orientation on intention; regarding f^2 effect size, the variance of value orientation was greater than past behaviour.

The Importance-Performance Matrix Analysis (IPMA) of intention towards disturbance behaviour on birds reveals that subjective norms are of primary importance for establishing intentions. In addition, this variable's performance is above average. Value orientation, descriptive norms and perceived behavioural control had nearly high performance and importance compared to other two predictors after subjective norms. Past behaviour after subjective norm had the highest importance, but performance was low. This variable has the space for improving performance.

In this study, subjective norms were the strongest predictors of the model of study. These results were similar to Wallen, Warner and Aberg (2008) and Paker et al. (1995), who found subjective norms to be the most important component in drivers' intention to exceed the speed limit. The result is in contrary to Forward'(2009)findings, which showed that attitude had the largest contribution to predict drivers' intention in TPB. Yaghoubi and Bahmani (2010)also found that perceived behavioural control was the most important predictor in online banking. The other research by Smith et al. (2012), examined the impact of injunctive (subjective) and descriptive norms on environmental intentions; they suggested that descriptive norms were the most useful when they focused on the number of people who did the right thing.

In addition, attitude and perceived behavioural control were not good predictors for this model when compared to other predictors. The small variance of perceived behavioural control on intention towards disturbance behaviour on birds may have been due to more the volitional control of these kinds of activities. There are a few examples where social behaviour models have been used within conservation science (St John*, et al.*, 2011).In a study related to wildlife leisure science by Hrubes et al. (2001), it was shown that perceived behavioural control was a significant determinant of intention but did not account for additional variance in hunting behaviour, suggesting that hunting-related activities are largely under volitional control. However, perceived behavioural control was also found to be an important predictor in pro-conservation decision-making (St John*, et al.*, 2011).

Furthermore, this research provided evidence and highlighted the importance of attitude in mediating the relationship between value orientation and intention, as well as perceived behavioural control as the mediator in the relationship between past behaviour and intention toward disturbance behaviour of Malaysian birdwatchers on birds. The results showed that both mediators could be

characterised as partial mediators. Moreover, the results of the mediator analysis of the two hypotheses also showed that attitude and perceived behavioural control played mediator, not predictor role. These results were consistent with the results of the first eight hypotheses that attitude and perceived behavioural control were the poorest predictors in the model of study, which may be because of the mediator role.

In addition, in this research, the moderator effect of the frequency of participation in birdwatching on the defined relationships in the model of the study was also explored. It was found that frequency of participation in birdwatching could moderate the relationship between value orientation and intention ($p<0.05$) and the relationship between attitude and intention ($p<0.1$).

4.11 Conclusion for findings

All predictors in the model of the study including attitude, subjective norms, descriptive norms, perceived behavioural control and past behaviour had the significant contribution to the intention towards disturbance behaviour on birds. The attitude and the perceived behavioural control had mediator role, partially. Frequency of participation in the events had the moderator role on two relationships: 1) the attitude towards disturbance behaviour on intention. 2) Value orientation on intention towards disturbance behaviour on birds. The measurement and structural models of study met the criteria for being a valid formative model and reliable.

In short, the model of the study offers a valid and reliable model for predicting and explaining intentions towards disturbance behaviour on birds among Malaysian birdwatchers. Ultimately, this model of study determined the decision whether to engage birdwatchers in that behaviour or not.

CHAPTER V

IMPLICATIONS AND CONCLUSIONS

5.1 Introduction

This final chapter presents the implications and conclusions from this doctoral research. The chapter is divided into 5 sections. Next, the theoretical, methodological and managerial implications of this study are discussed. Then, the limitations of this research are highlighted. The signposts for future research are suggested in final section and this chapter ends with a brief conclusion.

5.2 Significant implications of the research

Human dimensions of wildlife research are related to the development of the wildlife management profession. The field has increased the understanding of behavioural intentions, which can be applied to developing wildlife management priorities and making wildlife management decisions that are (at least) partly informed by predicted intentions towards conservation behaviours such as disturbance behaviour on birds in the current study. This research also provided further understanding of the concept of disturbance behaviour in Malaysia. The theoretical and managerial, methodological, implications of this research are presented in this section.

5.3 Theoretical implication

The effort to build a cumulative body of knowledge has been hampered by the lack of a sound theoretical foundation. Such a foundation is needed to help integrate the diverse research findings and to provide a framework for the prediction and explanation of wildlife–related activities, The TPB has been used extensively to model the determinants of human social behaviour (Hrubes*, et al.*, 2001). The present study tried to meet this need in the context of the TPB (Azjen, 1991) integrated with the hierarchy model (Fulton*, et al.*, 1996) and the theory of Normative Conduct (Cialdini*, et al.*, 1990).

This study explored some factors contributing to intentions towards disturbance behaviour on birds among Malaysian birdwatchers in ecotourism management, and proposed a structural relationship between intentions towards disturbance behaviour on birds and attitude, value orientation, past behaviour, subjective norms and perceived behavioural control.

Most studies on tourist behaviour investigate behavioural variables or psychological constructs individually, while some examine the linear relationships between or among these variables. However, bivariate or linear relations are insufficient in presenting an overall picture of factors leading to specific tourist behaviour and how these factors interact with each other in forming the behaviour. Thus, the current study examined the structural relationships among influential tourist behavioural determinants and provided a comprehensive theoretical framework for understanding intended behaviour.

Furthermore, the model of the study has been used for the first time for a bird watcher population. In addition, new variables were applied in this context (value orientation, past behaviour and descriptive norms). The new mediating roles of attitude and perceived behavioural control were evaluated. The new moderator role for the frequency of participation in birdwatching events is evaluated in the model of study.

Although studies regarding disturbance behaviour on birds among birdwatchers in Australia and other non-Asian countries have been done (Green and Higginbottom, 2001), they generally correctly report biology; identifying new and threatened species and modelling the limits of ecosystems or studying the effects of disturbance behaviour on birds (St John*, et al.*, 2011). Yet only a few studies have investigated predictors ofbehaviour in a coherent holistic way (St John*, et al.*, 2011).This study attempted to fill the gap of measures from a psych-ecological view by developing new measures in the context of current research.

To date, to the best knowledge of the author, this is the first study empirically using this theory for the prediction of defined disturbance behaviour. The application of a cognitive theory through the concept of disturbance behaviour has, so far, been neglected when explaining disturbance behaviour towards animals, especially birds, particularly among Malaysian birdwatchers. This research also provided several important implications for the theory. First, disturbance behaviour literature was expanded through this research, which investigates disturbance behaviour within the organisational context in Malaysia. It also tested the concept of disturbance behaviour in Malaysia, a tropical country, as an important hotspot of birds. This country also is a multi-culture society with Malays, followed by Indians, Chinese people, and other races. Based on significant findings of the relationship between latent constructs of the model of the studyin the prediction of defined disturbance behaviour of Malaysian birdwatchers, without doubt, this study highlighted the significant applicability of social cognitive theory in providing further explanation on the issue of “green” reputation groups, such as bird watchers, in sustainable development.

Value orientation-attitude-intention

From a theoretical perspective, the context value orientation-attitude-intention model provided an expanded framework for understanding and predicting defined disturbance behaviours towards birds including feeding, keeping and catching birds, approaching them for photography, trampling nests, killing them, intentionally or unintentionally, and attracting them using a spotlight, making noise to a large group or using recorded voices. Because this new model considered contextual environments, it was arguably more suitable and comprehensive for explaining the formation process of conservational behaviour against disturbance behaviour in reality.

Subjective norms and descriptive norms-intention implication

Regarding theoretical implication, to date, the little research that exists suggests that there is a discrepancy between what people approve of and how people actually act (Smith et al., 2012).

The importance performance matrix analysis results of intentions towards disturbance behaviours (such as feeding birds, birdwatching with noisy groups, using a spotlight, etc.) of Malaysian birdwatchers on birds showed that subjective norms were of primary importance with performance above average for defined negative activities. Descriptive norms, on the other hand, had less relevance because of low importance and performance when they were compared to subjective norms. Our research highlighted the importance of distinguishing between injunctive and descriptive norms, and considered the way in which these norms interacted to influence behaviour.

This current result supported the meta-analysis by Rivis and Sheeran (2003) , and two other studies by Artimage and Christan (2003)and Fornara (2011),which found that descriptive norms represented an additional variance within TPB. From previous studies, different reasons have been provided for the conflicting results of including descriptive norms as an additional predictor of TPB (Forward, 2009). This research revealed that descriptive norms also had additional variance on intention towards disturbance behaviour of Malaysian birdwatchers on birds.

Past behaviour-perceived behavioural control-intention

From a theoretical perspective, this research presented an extended model of TPB, which aimed to integrate properly past behaviour towards disturbance behaviour intentions. The theoretical contribution of this research was twofold. First, why and how past behaviour can be properly integrated into TPB was shown. Second, intentions towards disturbance behaviour of birdwatchers on birds in Malaysia were linked to TPB, overcoming deficiencies of the few earlier works in this field.

In this model of study, past behaviour towards disturbance behaviour intention (after norms) was the most influential predictor in the model of study.

5.4 Managerial implication

Firstly, managers should focus on norms, including subjective and descriptive norms, to decrease intentions towards disturbance behaviour on birds. Important people can be leaders who hold or conduct birdwatching events, or people who direct workshops as an introduction to birdwatching. What these important people think or do are the most influential factors. Organisers should ask leaders to be as a role model for participants and help them for doing correct action. This can be done through guidelines, images, direct lectures or even informal talking. Even birdwatchers with destructive attitudes can change their intentions towards the target behaviour by following social norms. Value orientation towards disturbance behaviour on birds, however, showed high importance and almost high performance compared to other predictors in the model of study. Although change in support for management may be difficult to accomplish because value orientations are relatively stable over time, they should not be constructed as never-changing(Needham, 2010).

Most people practising outdoor activities, such as birdwatching, do not think that their activity affects wildlife, particularly birds. Even if they see animals, such as birds, reacting, people generally do not feel responsible for causing trouble, especially if they have followed the instructions they were potentially given. Natural habitat managers are not always aware that they are sources of disturbance (Blanc*, et al.*, 2006).For example, many birders may not understand the effect of using spotlights on birds during night birding, or birding with large and noisy groups. From a biological view, these activities (especially during breeding periods) can reduce the population and (over the long-term) can endanger the survival of the populations by instantly influencing birds' behaviour(Steven*, et al.*, 2011).

Furthermore, some straightforward measures can allow a strong reduction of the negative consequences of leisure activities. First, people must respect existing rules in protected area and beyond, for example laws linked with feeding birdor those limiting the use of spotlights. Then people must become more aware of species protection in general; potential restrictions will be more respected if they are well-known and understood. Limiting the diffusion of human disturbance in natural habitats can be an efficient tactic; having people stay on delimited pathways, for example, would be an acceptable comprise, which would be easy to enforce if it was well explained. Providing hides well integrated in the habitat could also strongly reduce the negative effect of approaching. Eventually, limiting or banding completely the most disturbing activities during period of higher sensivity (cold spell, hibernation, reproduction), in areas whose size should be delimited after the animal species requirement, may sometimes become necessary. Most proposed management measures would be easy to enforce, especially in already protected

area. For example, the creation of reserved networks along bird migration routes should provide efficient shelter from the extension of human leisure disturbance. With very few noticeable exceptions, disturbance has mostly been recorded at the site level. Estimation of disturbance levels at a broader geographical scale appears as a crucial need in the future.

Value orientation-attitude-intention management implications

From the management perspective, value orientations were important because they can be determinants of more specific attitudes that, in turn, can help explain patterns of human intentions and behaviours towards wildlife, particularly birds. Although the effecting change in support for management may be difficult to accomplish because value orientations are relatively stable over time, they should not be construed as never-changing.

Research showed that value orientations in many countries are changing slowly as societies are shifting to more protectionist or bio-centric orientations toward wildlife. Value orientations are formed early in life and during socialisation; they are relatively stable and resistant to immediate change. Shifts in orientations, therefore, may continue to occur only gradually. As a result, attempts to inform individuals with protectionist orientations toward birds to consider adopting a favourable attitude and voting in support of actions that may be harmful to birds should be considered.

The attitude had a low effect on decision making as the predictor for disturbance behaviour. However, the attitude towards disturbance behaviour decreased the effect of value orientations on intention for disturbance behaviour on birds. A negative attitude toward approaching birds, for example, would be efficient to reduce the effect of positive value orientation towards approaching birds.

Applying the finding into practice in Malaysia, the government and conservational organisations (such as the Malaysian Nature Society) should encourage leaders/trainers to educate positive and correct attitude toward wildlife (bird) protection. Leaders or trainers in birdwatching should advocate the correct attitude towards wildlife, especially regarding birds, in their social circles. For example, birdwatchers may not know positive attitude towards feeding, are considered as a disturbance behaviour (Green and Higginbottom, 2001). Approaching birds for photography or feeding birds may prompt an alteration in their behaviour or physiological processes (e.g., flight response or increased heart rate). In areas that are subject to frequent human disturbance, a reduction in breeding performance or the number of breeding sites may occur, which can have long-term, negative effects on bird populations (Steven*, et al.*, 2011).

Subjective norm and descriptive norm implication

From a management perspective, the results of this study showed that manager should focus on normative messages, including subjective and descriptive norms, as effective predictors of intentions towards disturbance behaviour on birds to decrease these behaviours.

Subjective norms are of primary importance and play a large role in defined disturbance behaviour. Descriptive norms, on the other hand, are less relevant because of low importance and performance compared to subjective norms. Thus, subjective norms (opinion of others) and descriptive norms (acceptable or unacceptable behaviours towards birds) had high performance for managerial application besides theoretical importance. For example, feeding wild birds is considered disturbance behaviour. May birdwatchers are interested in feeding birds to attract birds to the place of birdwatching. Leaders or experienced birdwatchers who conduct the events should inform bird watchers that feeding birds is not always acceptable. Some people do not know that their activity can hurt birds. The leader should display and express the correct opinions and actions to people as a role model. Because birdwatchers are usually people who want to conserve wildlife, when they realise that their actions have adverse effects on birds, they may change their negative intention to positive one.

In addition, we should consider what messages should be disseminated to behaviour change agents about how they can use norms effectively. First, it is important to consider the framing of the message. The current research suggests that norms will be the most effective predictors of disturbance behaviours of Malaysian birdwatchers. The present research sought to further understand the way in which information about what others do and approve of can guide and shape behaviour. It is clear that norms are powerful determinants of our behaviour, but the power is precarious, as we are bombarded by normative messages from multiple sources; we may often receive conflicting normative information from multiple sources. If we wish to fully harness the power of norms to promote positive (and prevent negative) actions, we need to gain a more complete understanding of how individuals respond to the contradictory normative messages they receive. Our research highlights the importance of distinguishing between injunctive and descriptive norms, and of considering how these norms interact to influence behaviour.

Past behaviour-perceived behavioural control-intention

In measuring perceived behaviour control, psychologists quantify the extent to which individuals think that they can do a given behaviour. They measure the perceived presence of requisite resources, skills and other requirements, as well as the amount of power that individuals perceive these requirements have in making

behaviour performance easier or harder (Ajzen, 1990). These factors influence decision making since, as argued by Conner and Sparks (1996), individuals who feel that they possess the required resources and believe that there is an opportunity for behaviour performance (with little barriers) are more likely to perform the behaviour.

Considering the meaning of perceived behavioural control, managers should first know what is considered as the disturbance behaviour. Within the literature review of the current research, the negative effects (disturbance behaviours) on birds were defined as feeding, catching, and keeping birds, using spotlights, making noise by participating in a large group for birding, killing wild birds and trampling the nests of birds.

The next step after identifying the disturbance behaviour,managers or organisers of events should decrease the resources and possibility of disturbing behaviour occurring. For example, for feeding activity, after making people aware that feeding is not allowed, they should decrease/stop the possibility of people feeding birds. As another example, small groups for birding should be organised to avoid making noise in nature, and the use of recordings to attract birds should be forbidden. As a result, disturbance behaviour should decrease.

As seen from IPMA, although past behaviour had rather high importance, the performance was lowand it showed that past behaviour have a space for improving performance by managerswhile Perceived behavioural control had a high performance and above average importance (see Figure 4.15). Thus, the managers should focus on perceived behavioural control to facilitate an increase in the amount of access to the perceived presence of requisite resources, skills and other requirements for the conservation of birds. Managers should prevent actions that lead to disturbance behaviour.

In addition, the mediator role for perceived behavioural control showed that existing possibilities and requirements towards doing disturbance behaviourdecreased the influence of past behaviour of birdwatchers on decision making for negative or positive activities on birds in future.

To su up, managers would not be able to change the past behaviours of birdwatchers; however, they can control the future behaviour of birdwatchers, especially beginner ones by preventing them from some disturbance behaviours such as approaching birds, feeding birds and making noise.

5.5 Methodological implications

This research was new in all aspects such as research design (analysis strategy, and questionnaire development), and application of theory to conservation issues.

Questionnaire development was one of the important methodological implications for this study. The choice of statistical analysis was the other significant methodological implication. This research was among a very few studies of human disturbance on wildlife that used PLS-SEM. By applying PLS-SEM, the researcher was able to handle formative models and single global items, with no identification problems. PLS-SEM provided high efficiency in parameter estimations, which was manifested in the method's greater statistical power than that of the CB-SEM. Greater statistical power meant that PLS-SEM was more likely to render a specific relationship significant when it is, in fact, significant in the population. In addition, PLS-SEM was used to explore the role of continuous moderators in the model, which is not easy in CB-SEM (see page 14) (Hair Jr*, et al.*, 2013).Moreover, most research has more focused on reflective measurement than on formative measurement models. Therefore, one of the contributions of this research is its provision of a scale of development for the formative model of the research.

5.6 Limitation of the research

Despite the theoretically meaningful findings, it should be noted some limitations of the data.

Firstly, each scientist can perform only a relatively small number of major studies in a lifetime. This leaves insufficient time to do all that is required to specify the domain of a construct, develop the measure of the construct, and relate these measures to other variables of interest (Mackenzie*, et al.*, 2011).

Furthermore, the items that are considered for every construct are taken from definition of disturbance behaviour as well as the definition of every latent variable. If we expand the definition for the disturbance behaviour on birds may more items to every construct can be added in future.

In addition, the individual for this research derived from Malaysian birdwatchers that participated in the events and cannot be generalised to other countries and may need some modifications.

Last but not least, It is should be noted as a limitation that the present study only deals with the prediction of behavioural intention; it did not consider actual behaviour.

5.7 Signpost for future research

Current threats to global biodiversity have lead many scientists to study the consequence of human-induced disruption on wildlife. These potential threats have already been well documented, and many conservation measures aim at reducing their impacts. On the other hand, disturbance induced by non-consumptive leisure, such as birdwatching activity has long been neglected. This will require quantifying the effect of disturbance behaviour of non-consumptive leisure activities on wildlife, and also being able to assess how adapted management may mitigate the effects of disturbance on wildlife. Such objectives will probably require heavy works, but these researches are crucially needed if we want to be able to combine legitimate non-consumptive human leisure activity and wildlife needs for sustainable development of tourists in future.

Finally, realising this could be the first empirical research to analyse the proposed relationships in Malaysia. Replication of this research in future using samples from other countries could be fruitful attempt to confirm a robust conclusion of the finding.

5.8 Conclusion

This doctoral research presented an investigation on the prediction of defined disturbance behaviour among Malaysian birdwatchers. Although the impacts of birdwatchers on birds have been widely researched, most previous research has focused on the outcomes of disturbance behaviours. There were no direct measures regarding the disturbance behaviours on birds.

This research confirmed and explored the relationship between all predictors of the model including descriptive norms, subjective norms, past behaviour, value orientation, and perceived behavioural control with the intention toward disturbance behaviour on birds among Malaysian birdwatchers. All of the predictors had significant contributions to the prediction of disturbance behaviour on birds. The successful application of the theory of planned behaviour to disturbance behaviour is consistent with other researches in which the theory effectively predicted certain behaviours in a variety of recreational activities. The theory of planned behaviour was quite effective in predicting disturbance behaviour on birds among Malaysian birdwatchers. In accordance with the theory, attitude toward disturbance behaviour on birds, subjective norms, and perception of behavioural control were significant determinants of intentions. Subjective norms had the most variance among predictors for explaining intentions towards disturbance behaviour on birds. Subjective norms also had the most performance and almost high importance when compared to other predictors in the model of research. Thus, managers should focus on subjective norms as the most important and effective factor for the improvement of intentions towards conservation behaviour on birds. The value orientation of birdwatchers towards disturbance

behaviour should also be considered effective because of high performance and almost high importance. Managers should focus on this factor for improving value orientations towards conservation behaviours when birdwatchers beginning to birdwatch. Perceived behavioural control decreased the effect of the past behaviour on intentions towards disturbance behaviour because of its mediator role. In addition, the attitude towards disturbance behaviour was a weak predictor compared to other predictors of disturbance behaviour in the model of study. However, it was an effective mediator which decreased the effect of value orientation on intention towards disturbance behaviour on birds. Furthermore, frequency in participation in bird-watching events affected the relationship between value orientation and intention as well as attitude and intention towards disturbance behaviour.

This research also provided a valid formative designed questionnaire for the prediction of disturbance behaviour among Malaysian birdwatchers using Smart-PLS as the effective tool for assessing the validity and reliability of formative questionnaires for the first time.

Furthermore, by testing all hypothesised relationships in the model for Malaysia, this research helped to provide a useful starting point and created a more conclusive picture of disturbance behaviours among Malaysian birdwatchers. Aside from adding new knowledge in the literature review of disturbance behaviours on birds among Malaysian birdwatchers, the findings were to help managers deal with various negative effects of tourists in the field of birdwatching. They also can mitigate such behaviours that are not yet known as disturbance behaviours. Birdwatchers can change their negative behaviours by becoming aware of the adverse effects of their behaviour on birds.

In the area of management, the role of leaderswas considered effective to decrease these negative effects. Firstly, the normative messages from important people such as leaders, from the viewpoints of opinion and action are the most important factors on decision making of birdwatchers.Secondly, the value orientation, although difficult to change, it is possible by educating of the beginner birdwatchers. Moreover, the attitudes of birdwatchers towards disturbance behaviour decreased the effect of value orientations on decision making towards target behaviour. Thirdly, the perceived behavioural control is an effective factor for preventing destructive disturbance actions but is not as influential as normative messages. Moreover, this factor decreased the effect of past disturbance behaviour on decision making towards disturbance behaviour.

To conclude, understanding a conclusive definition of disturbance behaviour in a valid and reliable model among Malaysian birdwatchers could be a valuable study in the sustainable development of tourism in the future. The development of sustainable and responsible tourism is no longer an option; it has become a necessity and it is not possible unless researchers study the behaviour of tourists as a starting point to effectively minimise various negative effects by birdwatching tourists.

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APPENDICES

Appendix A

English Questionnaire

Dear participant

My name is Marjan, I am a PhD student in University Putra Malaysia.

For my thesis, I am researching on the human dimension of Malaysian birdwatchers toward wild birds. Because you are Malaysian birdwatcher, I am inviting you to participate in this research study by completing this questionnaire.

There is no compensation for responding. If you choose to participate in this project, please answer all questions as honestly as possible.

Thank you for taking the time to assist me in my educational endeavors. The data collected will provide useful information regarding sustainable management. If you require additional information or have questions, please email me at: bird-watching2013@yahoo.com

If you are not satisfied with the manner in which this study is being conducted, you may report me.

Thanks in advance

Best Regards

Marjan

Part A: In this part we are going to gain some demographic information. Questions one through three and you should tick (×) the right answer. Question four is an open ended question.

1. What is your gender?

   Male☐ Female☐

2. How old are you?

   Under 40 ☐ Above 40☐

3. What is your race

   Malay☐ Chines ☐ Indian ☐ Others☐

4. How many times you have gone for bird-watchingfrom last year ago until now?

Part B: This part has eight sections. In each section, please read each statement and then tick (×) one of the scales.

1=Completely agree	2= Agree	1. Neutral	4= Completely Disagree	5=Disagree

……

Section 1: Attitude

NO.	Statements	1	2	3	4	5
1	I enjoy feeding wild birds	☐	☐	☐	☐	☐
2	I am very interested in keeping wild birds in my house.	☐	☐	☐	☐	☐
3	I prefer to go with other birdwatchers in a large group for bird watching	☐	☐	☐	☐	☐
4	I enjoy catching wild birds as a hobby	☐	☐	☐	☐	☐
5	I enjoy approaching wild birds for photography	☐	☐	☐	☐	☐
6	I prefer to use a spotlight while night birding	☐	☐	☐	☐	☐
7	I enjoy using the recorded sounds/songs of some species of birds to attract them to place of birding	☐	☐	☐	☐	☐
8	I don't like to kill wild birds even for safety reasons/research	☐	☐	☐	☐	☐
9	I am very interested in photography even if I trample the ground nests of birds.	☐	☐	☐	☐	☐

Section 2: Subjective Norms

NO.	Statements	1	2	3	4	5
1	Most Malaysian bird watchers, whose opinions are important to me, think that I should feed wild birds.	☐	☐	☐	☐	☐
2	Most people that are important to me think that I should not collect wild birds.	☐	☐	☐	☐	☐
3	Most birdwatchers that I know think that I should take part in small groups for bird-watching.	☐	☐	☐	☐	☐
4	My family, whose opinions I value would approve of hunting birds as an enjoyable hobby for me.	☐	☐	☐	☐	☐
5	Most people that are important to me think that I should not use spotlights during night birding.	☐	☐	☐	☐	☐
6	Most people that are important to me think that I should not approach the nests of birds	☐	☐	☐	☐	☐
7	Most people that are important to me think that I should not use the recorded bird's songs to attract birds while bird-watching.	☐	☐	☐	☐	☐
8	Most people that are important to me think that I should not killwild birds even for safety reasons or research.	☐	☐	☐	☐	☐
9	Most people that are important to me think that I should not trample the ground nest of birds.	☐	☐	☐	☐	☐

Section 3: Descriptive Norms

NO.	Statements	1	2	3	4	5
1	Most birdwatchers that I know feed wild birds.	☐	☐	☐	☐	☐
2	Most Malaysian bird watchers that are important to me keep wild birds in their gardens.	☐	☐	☐	☐	☐
3	Most of my friends participate with small groups	☐	☐	☐	☐	☐
4	Most of my friends hunt wild birds as their hobby.	☐	☐	☐	☐	☐
5	Most birdwatchers, whose opinions are important to me, use spotlights during night birding.	☐	☐	☐	☐	☐
6	Most birdwatchers, whose opinions is important to me,approach wild birds for photography	☐	☐	☐	☐	☐
7	Most of my friends use recorded bird songs to attract some species of birds to the place of birding.	☐	☐	☐	☐	☐
8	Most bird watchers that I know kill wild birds when their safety/property is concerned, or there are benefits involved.	☐	☐	☐	☐	☐
9	Most bird watchers that I know trample the ground nests of birds while birding.	☐	☐	☐	☐	☐

Sction4: Perceived Behavioural Control

NO.	Statements	1	2	3	4	5
1	There is a possibility that I would feed wild birds.	☐	☐	☐	☐	☐
2	The decision to hunt birds is an easy task.	☐	☐	☐	☐	☐
3	It is possible that I would keep some species of wild birds in my garden.	☐	☐	☐	☐	☐
4	There is a greater possibility of me joining a large group than a small group.	☐	☐	☐	☐	☐
5	It is possible that I would approach wild birds.	☐	☐	☐	☐	☐
6	It is possible that I would use a spotlight during night birding.	☐	☐	☐	☐	☐
7	It is possible that I would attract some species of birds to place of birding using recorded songs.	☐	☐	☐	☐	☐
8	If the birds are a threat to my life/property, there is a possibility that I would kill them.	☐	☐	☐	☐	☐
9	It is possible that I would trample the nests of birds while birding.	☐	☐	☐	☐	☐

Section 5: Intention

NO.	Statements	1	2	3	4	5
1	I plan to feed wild birds next time.	☐	☐	☐	☐	☐
2	I intend to keep some species of wild birds in my garden as pets.	☐	☐	☐	☐	☐
3	I might hunt birds next time.	☐	☐	☐	☐	☐
4	I intend to accompany large groups of birders instead of small groups.	☐	☐	☐	☐	☐
5	I plan to approach birds for photography.	☐	☐	☐	☐	☐
6	I intend to use spot light during night birding.	☐	☐	☐	☐	☐
7	I intend to use recorded song of some wild species of birds to attract them to the place of birding.	☐	☐	☐	☐	☐
8	I do not intend to kill wild birds even for safety reasons or other benefits.	☐	☐	☐	☐	☐
9	I do not plan to trample the nest of birds next time.	☐	☐	☐	☐	☐

Section 6: Past Behaviour

NO.	Statements	1	2	3	4	5
1	I have fed wild birds.	☐	☐	☐	☐	☐
2	I have kept some species of birds as pets in my house/my garden.	☐	☐	☐	☐	☐
3	I have participated more in large-size groups rather small groups for birding.	☐	☐	☐	☐	☐
4	I have hunted birds for food.	☐	☐	☐	☐	☐
5	I have approached the nest of birds for photography.	☐	☐	☐	☐	☐
6	I have used a spot light during night birding.	☐	☐	☐	☐	☐
7	I have used recorded sounds of some species of birds to attract them to the place of birding.	☐	☐	☐	☐	☐
8	I have killed birds for safety reasons.	☐	☐	☐	☐	☐
9	I have trampled the eggs of ground nesting birds.	☐	☐	☐	☐	☐

Section7: Value Orientation

NO.	Statements	1	2	3	4	5
1	Feeding wild birds should not be allowed.	☐	☐	☐	☐	☐
2	It is ok for me to keep some species of wild birds that I like in my garden.	☐	☐	☐	☐	☐
3	It is acceptable for me to participate to a large group for bird-watching.	☐	☐	☐	☐	☐
4	People who want to hunt birds should be provided with the opportunity to do.	☐	☐	☐	☐	☐
5	Approaching the nest of birds for photography is ok for me.	☐	☐	☐	☐	☐
6	It is acceptable for me to use a spotlight during night bird watching.	☐	☐	☐	☐	☐
7	Using recorded song of wild birds to attract them to the place of birding should not be allowed.	☐	☐	☐	☐	☐
8	It is acceptable for me to use wild birds in research even if it may kill them.	☐	☐	☐	☐	☐
9	It is acceptable for me to trample the nest of birds while I am birding.	☐	☐	☐	☐	☐

Section8: Single Global Items

No.	Statements	1	2	3	4	5
1	My interests take priority over bird conservation.	☐	☐	☐	☐	☐
2	I prefer personal benefits to the bird's life.	☐	☐	☐	☐	☐
3	Most important people in my life think that human decisions take priority over a birds' life.	☐	☐	☐	☐	☐
4	Most birdwatchers, whose opinions are important to me, birdwatch without caring how much they may hurt birds.	☐	☐	☐	☐	☐
5	I have used wild birds for my personal interest.	☐	☐	☐	☐	☐
6	There is a possibility for me to use wild birds for my personal interest.	☐	☐	☐	☐	☐
7	I don't intend to harm wild birds under any condition.	☐	☐	☐	☐	☐

Appendix B:

Letters of Content Validity

UPM
UNIVERSITI PUTRA MALAYSIA
BERILMU BERBAKTI

FAKULTI PERHUTANAN
FACULTY OF FORESTRY

Dr. Badrul Azhar Md. Sharif
Jabatan Pengurusan Hutan
Fakulti Perhutanan

1 September 2012

LANTIKAN SEBAGAI PANEL PENGESAHAN INSTRUMEN

Perkara diatas adalah dirujuk

Sukacita dimaklumkan bahawa tuan/puan telah dilantik sebagai pakar untuk menjalankan pengesahan bagi Instrument Kajian bertajuk *"Assessment of the disturbance behavior among Malaysian birdwatchers based on the Theory of Planned Behavior."* Kajian ini dijalankan oleh Marjan Jafarpour (GS27925), pelajar PhD (*Ecotourism and Recreation Services*)

Dengan ini disertakan objektif dan persoalan kajian berserta Instrument kajian. Kerjasama dan Sekian Terima Kasih

Yang benar,

Assoc.Prof.Dr.Manohar Mariapan

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FACULTY OF FORESTRY

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Jabatan Pengurusan Hutan
Fakulti Perhutanan

1 September 2012

LANTIKAN SEBAGAI PANEL PENGESAHAN INSTRUMEN

Perkara diatas adalah dirujuk

Sukacita dimaklumkan bahawa tuan/puan telah dilantik sebagai pakar untuk menjalankan pengesahan bagi Instrument Kajian bertajuk *"Assessment of the disturbance behavior among Malaysian birdwatchers based on the Theory of Planned Behavior."* Kajian ini dijalankan oleh Marjan Jafarpour (GS27925), pelajar PhD (*Ecotourism and Recreation Services*)

Dengan ini disertakan objektif dan persoalan kajian berserta Instrument kajian. Kerjasama dan Sekian Terima Kasih

Yang benar,

Assoc.Prof.Dr.Manohar Mariapan

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Appendix C:

Normality Test Result

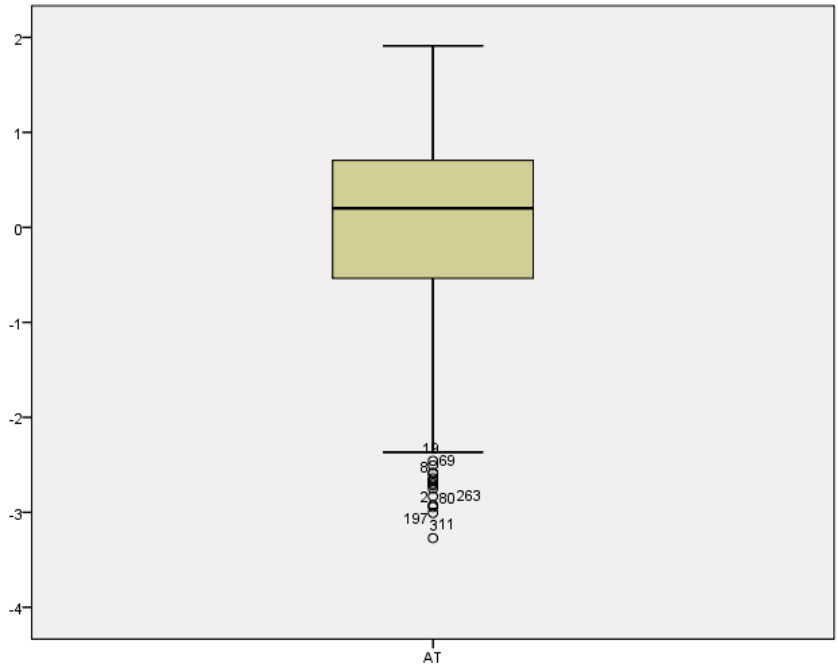
Items	Mean		Std. Deviation	Skewness		Kurtosis	
	Statistic	Std. Error	Statistic	Statistic	Std. Error	Statistic	Std. Error
AtFed	3.31	.047	.974	-.119	.119	-.495	.237
AtKept	3.87	.050	1.026	-.755	.119	-.001	.237
AtSize	3.96	.053	1.095	-.975	.119	.345	.237
AtCatch	3.51	.043	.891	-.385	.119	-.159	.237
AtAproach	3.66	.035	.725	-.309	.119	.149	.237
AtLight	3.18	.031	.631	.245	.119	.624	.237
AtRecord	3.14	.034	.707	.122	.119	-.085	.237
AtTrampl	3.20	.031	.634	.151	.119	.400	.237
AtKill	3.27	.031	.643	-.053	.119	.701	.237
AtGlobal	3.48	.032	.649	-.414	.119	-.264	.237
SnFed	3.58	.051	1.040	-.558	.119	-.116	.237
SnKept	3.79	.058	1.182	-.788	.119	-.300	.237
SnSize	3.71	.043	.887	-.474	.119	.040	.237
SnCatch	3.88	.052	1.065	-.773	.119	-.035	.237
SnAproach	3.71	.037	.752	-1.128	.119	1.923	.237
SnLight	3.80	.039	.799	-.571	.119	.375	.237
SnRecord	3.68	.039	.792	-.641	.119	1.084	.237
SnTrampl	3.32	0.034	0.707	0.310	.119	0.310	.237
SnKill	3.74	.034	.694	-.424	.119	.264	.237
SnGlobal	3.68	.029	.598	-.676	.119	.487	.237
DnFed	3.59	.056	1.144	-.517	.119	-.469	.237
DnKept	3.67	.048	.978	-.684	.119	.196	.237
DnSize	3.97	.053	1.095	-.993	.119	.336	.237
DnCatch	3.45	.051	1.054	-.258	.119	-.552	.237
DnAproach	3.32	.039	.795	-.262	.119	-.067	.237
DnLight	3.55	.036	.744	-.447	.119	.375	.237
DnRecord	3.47	.039	.794	-.181	.119	-.179	.237
DnTrampl	3.61	.035	.724	-.096	.119	-.235	.237
DnKill	3.65	.038	.777	-.252	.119	.052	.237
DnGlobal	3.58	.031	.638	-.624	.119	.063	.237
PbcFed	3.33	.050	1.028	-.013	.119	-.668	.237
PbcKept	3.73	.052	1.057	-.512	.119	-.478	.237
PbcSize	3.52	.055	1.131	-.378	.119	-.724	.237
PbcCatch	3.72	.052	1.067	-.514	.119	-.527	.237
PbcAproach	3.22	.037	.759	-.126	.119	.618	.237
PbcLight	3.51	.036	.748	.023	.119	.051	.237
PbcRecord	3.43	.037	.754	-.153	.119	.489	.237
PbcTrampl	3.32	.040	.811	-.035	.119	.045	.237
PbcKill	3.48	.038	.782	-.315	.119	.485	.237
PbcGlobal	3.49	.032	.664	-.255	.119	-.229	.237
InFed	3.26	.039	.808	-.037	.119	-.324	.237
InKept	4.11	.049	1.002	-1.153	.119	.887	.237
InSize	4.06	.047	.968	-1.069	.119	.882	.237
InCatch	4.01	.049	1.002	-.984	.119	.657	.237
InAproach	4.19	.044	.899	-1.080	.119	.763	.237
InLight	3.62	.036	.731	-.457	.119	.603	.237
InRecord	3.84	.035	.712	-.431	.119	.738	.237
InTrampl	3.68	.035	.723	-.234	.119	.319	.237
InKill	3.91	.046	.944	-.705	.119	.203	.237
InGlobal	3.74	.031	.627	-.959	.119	1.611	.237
PbFed	4.09	.054	1.118	-1.104	.119	.272	.237

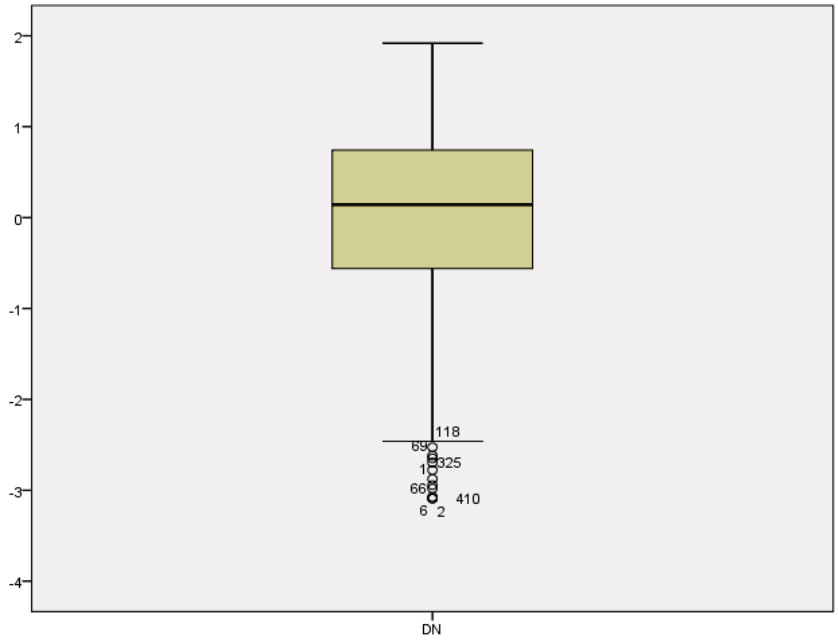
PbKept	4.23	.052	1.075	-1.445	.119	1.350	.237
PbSize	4.18	.052	1.070	-1.401	.119	1.331	.237
PbCatch	4.10	.049	1.012	-1.230	.119	1.180	.237
PbAproach	3.60	.050	1.029	-.332	.119	-.574	.237
PbLight	3.56	.051	1.056	-.184	.119	-.897	.237
PbRecord	3.46	.038	.776	-.338	.119	.345	.237
PbTrampl	3.16	.049	.996	.098	.119	-.510	.237
PbKill	3.77	.037	.750	-.315	.119	.101	.237
Pb.Global	3.74	.032	.660	-1.064	.119	1.612	.237
VoFed	3.66	.049	.998	-.599	.119	.009	.237
VoKept	3.61	.047	.959	-.465	.119	-.155	.237
VoSize	3.68	.049	1.014	-.640	.119	.065	.237
VoCatch	3.65	.049	1.009	-.543	.119	-.165	.237
VoAproach	3.75	.052	1.062	-.736	.119	.031	.237
VoLight	3.67	.050	1.023	-.566	.119	-.109	.237
VoRecord	3.56	.047	.968	-.347	.119	-.434	.237
VoTrampl	3.58	.042	.868	-.279	.119	-.073	.237
VoKill	3.63	.048	.983	-.583	.119	-.012	.237
VoGlobal	3.69	.035	.721	-.557	.119	.236	.237

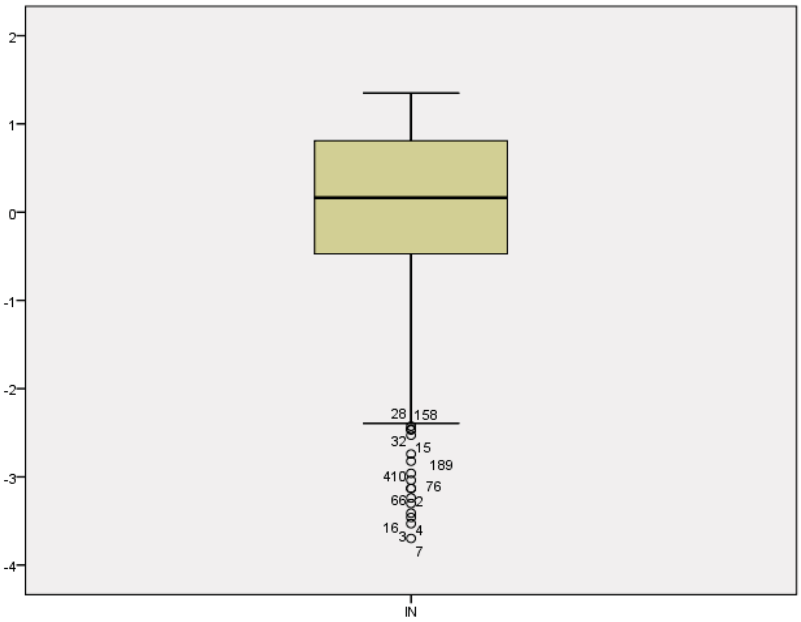
Notes: VO = Value orientation, At=Attitude, PB=Past Behaviour, PBC=perceived Behavioural Control, SN=Subjective Norms, DN=Descriptive Norms. Fed=feeding birds, Kept=Keeping birds, Size=Size of group for birding, Catch=Catching birds, Approach= Approaching birds for photography, Light=using spot light, Record=Recording the song of birds for attracting them in the place of bird-watching, Trample=Tramping the nest of birds, Kill=killing birds, Global=single Item global

Appendix D

Outlier (Boxplots and Z-score table)



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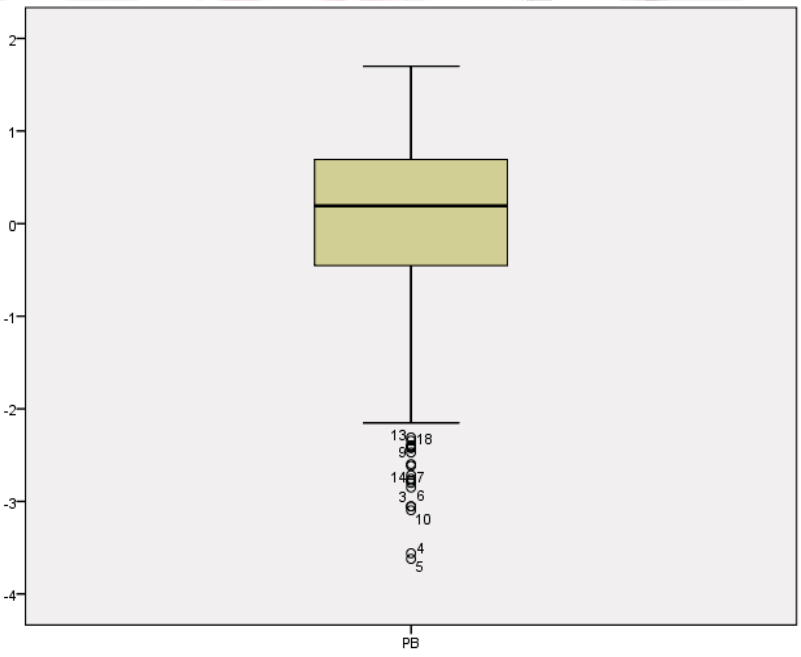
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13
18
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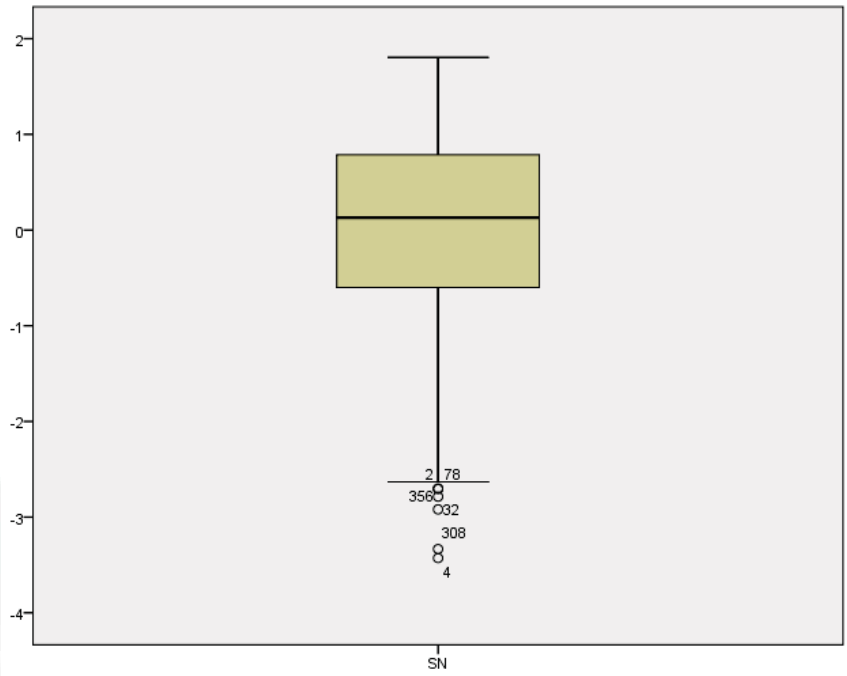
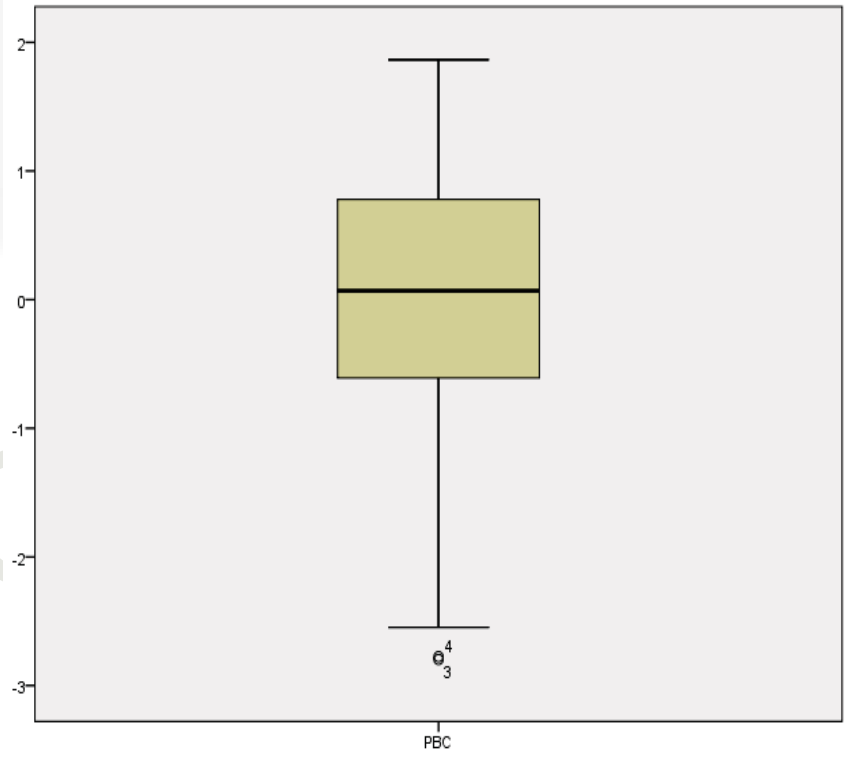
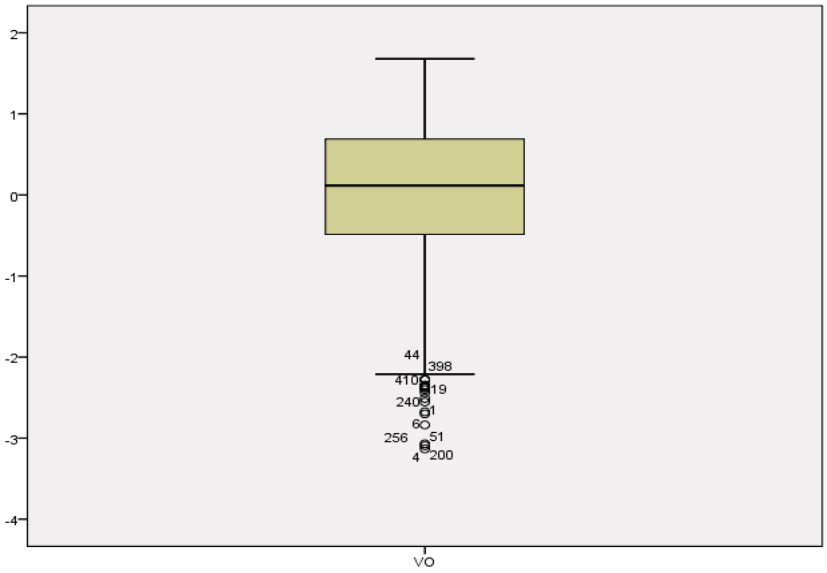
5
PB







Z-score table

Z-score	Minimum	Maximum
Attitude	-3.268	1.909
Descriptive Norm	-3.087	1.915
Intention	-3.693	1.348
Past Behaviour	-3.740	1.741
Perceived Behavioural Control	-2.794	1.862
Subjective Norms	-3.424	1.801
Value Orientation	-3.128	1.676

Notes. All Z-scores were between -4 and 4. Then there is no critical outlier.

BIODATA OF STUDENT

Marjan Jafarpour received PhD in Recreation and Ecotourism Services from Universiti Putra Malaysia (UPM), Recreation and Ecotourism Department, Forestry Faculty in Malaysia (2016). She was Research and Teaching Assistant during PhD for Human and Wildlife project in UPM. She was received Master Degrees (Plant Systematic Botany) and Bachelor (Biology) from Shiraz University-Iran. She was a lecturer for Plant Systematics course and Laboratory in Shiraz Azad University, Kazerun Branch in Iran. Her Focus is now on Wildlife Tourist, Human Dimension of Wildlife and Environmental Psychology.

LIST OF PUBLICATIONS

Articles

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Talebi, A. B., Talebi, A. B., & Jafarpour, M. (2012). Identify the lethal dose of EMS and Gamma radiation mutagenesis in Rice MR 219. Presented at International Conference on Environment Science and Biotechnology in Malaysia. DOI (Vol. 10). Link:http://www.ipcbee.com/vol48/005-ICESB2012-B00014.pdf,

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Jafarpour, M., & Nulit, R. (2011, September). An overview of genetic engineering of PEPC, PPDK and NADP-ME enzymes from C_4 plants to C_3. This paper was Presented at National Postgraduate Conference (NPC) in Malaysia, 2011 (pp. 1-3) and was Published online at IEEE Press (Scopus).Link: http://ieeexplore.ieee.org/xpls/abs_all.jsp?arnumber=6136455

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In Preparation:

Jafarpour, M, Manohar M., The moderator role of frequency of participants in the predictive model for conservation behaviour of tourist.

Jafarpour, M, Manohar M., Importance-Performance Matrix Analysis for tourist behaviour towards wildlife.

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