

## Article

# The Green Accommodation Management Practices: The Role of Environmentally Responsible Tourist Markets in Understanding Tourists' Pro-Environmental Behaviour

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**Citation:** Kim, A.; Kim, K.P.; Nguyen, T.H.D. The Green Accommodation Management Practices: The Role of Environmentally Responsible Tourist Markets in Understanding Tourists' Pro-Environmental Behaviour. *Sustainability* **2021**, *13*, 2326. <https://doi.org/10.3390/su13042326>

Academic Editor: Lóránt Dénes Dávid

Received: 29 January 2021

Accepted: 17 February 2021

Published: 21 February 2021

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**Abstract:** The green accommodation sectors are increasingly committed to implementing environmental management practices while enhancing guests' pro-environmental behaviour. However, it is not easy to change tourists' behaviour as there are many factors influencing tourists' participation in green management actions. This paper argues that a combination of multiple factors such as visitor characteristics or previous environmental experience needs to be examined to determine how these factors are differently associated with the type of pro-environmental behaviour. In particular, this study also investigates how environmentally responsible tourist markets can engage differently in different types of pro-environmental behaviour. Visitors staying at the green accommodation in Kangaroo Island, South Australia, were studied using self-administered questionnaires. The findings of this study confirmed the significant role of environmentally responsible travel experience as a strong predictor of two types of pro-environmental behaviour (e.g., energy-saving and recycling vs. eco-product consumption behaviour) and its moderating effects on the relationship between visitor characteristics and pro-environmental behaviours (PEBs). Furthermore, this environmental-responsibility-based segmentation approach provides green-oriented accommodation sectors with some managerial implications for improving green accommodation practices that can be operated on different principles for two different targeted markets based on their environmental responsibility. This study recommends that more in-depth investigations of other barriers or facilitators of pro-environmental behaviour are necessary to fully address this issue and to ultimately influence tourists' responsible support for environmental management practices implemented by the green accommodation sector.

**Keywords:** tourists' pro-environmental behaviour; environmental responsibility; previous environmental involvement; environmental attitudes; environmental management strategies; green accommodation

## 1. Introduction

The hospitality industry has gradually adopted a green practice for managing environmental issues and implementing sustainable business practices. The economic benefits of adopting green practices in the hotel and tourism industry have been highlighted as part of a win-win green and competitive position [1–4]. Such a green commitment by the hotel industry has influenced the growth of the green accommodation sector (e.g., green hotels, eco-lodge, caravan, camping), which is committed to setting up an environmentally friendly guideline for sustainable business practices, educating consumers to be more aware of the green practices, and engaging in pro-environmental behaviour such as energy saving, recycling, water management, and waste management for environmental conservation outcomes [1–3]. The term pro-environmental behaviour (PEB) is often used

interchangeably with environmentally responsible behaviour, environmentally friendly behaviour, or environmental conservation behaviour, referring to any actions involved in protecting the environment [5]. While there are many different types of pro-environmental behaviours targeting site-specific and general environmental activities that are encouraged by the green accommodation sectors, there is little known about how individual guests actually participate in specific types of PEBs and why people engage differently in PEBs, especially when staying at the green accommodation sector. Thus, this study aims to distinguish two types of PEBs that are commonly implemented in the accommodation area, categorised as general (i.e., energy saving/recycling) versus specific actions (i.e., buying eco-products), and to identify key factors influencing different types of PEBs.

Previous researchers have argued that various additional predictors of PEBs need to be identified and integrated into the behavioural change model that combine not only psychological factors but also individual characteristics such as environmental responsibility, previous experience, personality traits, habits, and other socio-demographic factors [5–10]. There is growing evidence that the individual characteristics are useful indicators for identifying and profiling different types of tourist groups who demonstrate different levels of their environmental concerns and support for environmental conservation activities [6,8,11,12]. In the tourism research, however, much of previous research has focused on each type of PEBs separately and a few selected predictors of PEBs, mostly environmental attitudes or knowledge, while excluding environmental responsibility-related variables, past experience, or individual characteristics. Less attention has been paid to understanding individual involvement in personal responsibility for environmental protection while travelling in the tourism setting [5,13].

Thus, this research highlights the significant role of environmental responsibility as another core predictor of PEBs as environmental responsibility is considered to be more stable in predicting PEBs [5,10]. Kaiser et al. [14] argue that PEB would be predicted more accurately by including the morally related concept of personal obligation (i.e., feelings of responsibility). In fact, environmental responsibility appears to be the only construct that has been consistently found to be predictive, as opposed to many attitudinal or socio-demographic measures, which have led to contradictory findings. This suggests that the inclusion of environmental responsibility in behavioural modification models appears to add new insight into past efforts. In this way, the conceptual framework of this study is based on a combination of three levels of key determinants drawn from Hines et al.'s [7] and Cottrell's [6] environmental responsible behavior models. Considering heterogeneous characteristics of tourists with different attitudes and individual backgrounds, the main objective of this study is to conceptualise two types of PEBs relating to green management practices and to investigate key determinants of two types of PEBs—i.e., energy-saving/recycling and eco-consumption behaviours. In particular, we ask a different research question, namely to what extent and how different predictors are associated with each type of PEBs, especially targeting market segmentation of tourists based on their environmental responsibility levels (high versus low environmental responsibility). Such a segmentation approach will help to understand the descriptors of environmentally responsible tourists that are useful to and actionable for both the accommodation sector and environmental management strategies in general.

## 2. Literature Review

### 2.1. Environmental Management Practices in the Green Accommodation Sector

Many accommodation sectors have increasingly implemented environmental management practices in order to demonstrate their environmental commitment to sustainable business management [4,15]. In general, environmental management practices (EMP) refer to implementing energy saving, waste management, recycling, eco-friendly products and eco-tours as part of the accommodation sector's business operation practices to achieve the goals of environmentally sustainable development strategies [1,16,17]. For example, making minor changes in the construction of the accommodation building, building man-

agement and use of technology results in a cost-saving of 20–25% in the areas of energy usage, cleaning products or waste disposal [18]. The towel and linen reuse programme is the most common sustainability practice in the accommodation sector [19,20]. As another practice, the green accommodation guests are increasingly encouraged to engage in PEBs relating to green practices such as reducing their electricity and water consumption, which is informed through information stickers in bedrooms and bathrooms [4,15,16]. For example, ecotourists who stay at an eco-lodge or green accommodation tend to be more involved in environmental matters than other types of nature-based tourists [21,22]. Targeting the guests staying in green hotels, a recent study by Han et al. [1] provides empirical evidence indicating that green accommodation practices help the hotel guests to be aware of the benefits of the EMP and support the EMP at the hotel. As a result, it was also found that the green hotel guests tend to have a stronger intention to engage in the PEBs. Another study by Lee and Moscardo [23] also showed that the accommodation guests in Australia appeared to engage in PEBs related to EMPs when they were more informed about the benefits of the EMPs. This indicates the significant impact of the green hotel experience on tourists' behavioural change [1,9,24].

Despite such evidence, however, it is not clear to what extent and how guests engage in PEBs pertaining to environmental management practices while staying at green accommodation. Some research argues that tourists (including hotel guests) tend to engage in certain types of behaviour that require less time, cost and comfort, such as not harming the wildlife, not damaging the environment and turning off the light when they leave the room [8,23]. Other researchers suggest that it is difficult to change tourist's behaviour as tourists are not willing to be involved in other types of general environmental practices (e.g., energy saving by using an only ceiling fan, recycling, and buying eco-friendly products) when they are staying at the accommodation as they prefer to have more pampering experience—for example, using a fresh towel everyday, unlike at their home [25]. Given the contradictory results from past research, further research is also required to identify what type of tourist markets engage in which aspects of the environmental management practices while staying at the green accommodation.

Thus, further research is required to understand which antecedents influence distinct types of environmental behaviour for the effectiveness of behavioural intervention strategies [26,27].

#### 2.1.1. Environmental Attitudes towards Green Accommodation

Substantial attention has been given to understanding tourists' environmental attitudes in order to predict environmental behaviour from their own rational-choice perspective. Rational-choice-oriented research has often applied Ajzen and Fishbein's [28] Theory of Reasoned Action and Ajzen's [29] Theory of Planned Behaviour, which highlight the important role of attitudinal factors (e.g., beliefs, attitudes and social norms) as predictors of environmental actions. Environmental attitudes commonly refer to the learned beliefs and affects that a person holds regarding environmentally related activities or issues [30]. However, the environmental attitude has been conceptualised and measured in various ways, ranging from general environmental concerns to specific environmental attitudes [14]. Of these various measures, specific environmental attitudes have been commonly measured by tourism researchers, focusing on key specific dimensions of environmental attitudes that consist of three elements—awareness of a particular issue/behaviour; consequences of behaviour; and affects (or feelings) associated with the behaviour [1,2,31].

It is claimed that specific environmental attitudes are better predictors of a given particular behaviour over socio-demographic characteristics, rather than general environmental attitudes (e.g., [27,28]). For example, in the context of green accommodation, Han et al. [1] applied the Theory of Planned Behaviour (TPB) for measuring specific beliefs and affects in relation to the green hotel. The beliefs were measured with the benefits of staying at the green hotel for protecting the environment, and affects were measured with the level of tolerance or concerns about the environmental practices. They confirmed

that guests' intention to stay at a green hotel was strongly influenced by their favourable evaluation of a green product and perceived ease of visiting a green hotel. Other recent studies have also focused on hotel customers' attitudes towards visiting a green hotel [16], willingness to pay for green hotel [3] and eco-product consumption [32,33]. The results of these studies confirm that specific environmental attitudes and beliefs are strong predictors of a particular type of behaviour.

However, other empirical research has shown contradictory and inconsistent findings on the relationships between environmental attitudinal variables and PEBs, depending on tourists' characteristics and the type of behaviours [3,6,25]. It is argued that the attitude-based approaches (e.g., the Theory of Reasoned Action) seem too simplistic to apply to tourism, as tourist environmental behaviour is significantly influenced by numerous other factors such as the heterogeneous characteristics of tourist/guest groups, different habits, a lack of reasoned thought and a lack of responsibility [6,25]. Another reason is that people respond differently to distinctive types of PEBs as it is difficult to perform environmental actions that require time, the sacrifice of comfort or cost (e.g., energy-saving or buying eco-friendly products), rather than other specific types of low-impact behaviour such as 'not feeding animals' or 'following the code of conduct' in a tourism site [8,11,34]. This may be because many people with highly environmentally conscious attitudes do not always demonstrate the same general environmental behaviours such as volunteer work, recycling and energy-saving in tourist destinations as they do at home [35]. Given the gaps in the existing literature, this study focuses on asking a more specific question by examining how specific environmental attitudes towards green accommodation have the greatest influence on which type of PEB and in which type of market segments.

### 2.1.2. Socio-Demographic Characteristics

Much attention has been given to demographic profiling, with somewhat contradictory results. Previous research has shown different effects of demographic variables on environmental concerns and behavioural indicators in terms of age [36,37], gender [20], education and income [8]. With regards to age, it was considered that older people have shown a higher level of environmental concerns and actions than younger people [1,8]. Others show there were no effects of age on environmental concerns or behaviour [9]. Gender and education are often reported as the important indicator of pro-environmental outcomes [19,20,38], but in other research, it was found that there is little effect on visitors' perceptions of environmental impact and environmental actions in relation to gender [39], education or income [8]. However, much of the previous tourism studies have tended to examine the differences in environmental attitudes and behaviour between subgroups of the sampled populations (e.g., [40,41]) rather than examining the degree of predictive ability of socio-demographics to various types of PEBs. Thus, it is worth noting that further investigation is needed to gain a better understanding of when and how behavioural change may occur among a range of visitors in different situations.

### 2.1.3. Previous Environmental Involvement

While most studies tend to examine the effects of demographic characteristics on environmental behavioural outcomes, only a few studies have focused on the role of past environmental involvement in influencing individuals' development of environmental concern and environmental actions in the context of tourism and hospitality research. It is noted that individuals have various life experiences with environmental issues in different settings such as environmental practices at home (e.g., energy-saving, recycling), informal learning, outdoors activities, staying at green hotels [1,2] or travelling to nature-based tourism sites (e.g., picking up litters, following code of conduct for environmental conservation) [6,8]. Such previous involvement from nature-based tourism destinations can help tourists to establish their stronger environmental attitudes that influence post-behaviour better than other attitudes drawn from indirect experiences (e.g., learning in school), and this premise has been supported by several empirical studies [34,42,43]. For

example, Ballantyne et al. [43] suggested that recreation experience within the context of nature-based tourism allows tourists to observe nature, thus causing them to reflect on their past behaviours and to engage in more positive environmental practices.

Despite the positive impacts of previous nature-based experience, its ability to predict environmental behavioural outcomes has been questioned [11,43]. It is noted that people's previous environmental experience can strongly influence environmental behaviour only in some situations, especially depending on the type of pro-environmental behaviour [8,44] or particular settings (at home versus at a travelling destination) [25] at a green hotel [1]. Other studies found that the green experience at a tourism site has little effect on tourists' environmental behaviour [43]. In other words, the previous green experience may be more effective in determining habitual behaviour than rational or intentional behaviour, as the latter appears to be more influenced by attitudes or social norms [45,46]. Moreover, such an argument has not been investigated adequately with consideration of the heterogeneous characteristics of tourists who stay in the green accommodation in a tourist site. This study will examine how differently previous environmental involvement in different settings—home versus green accommodation can be associated with which type of PEBs.

## 2.2. Environmental Responsibility-Oriented Travel Experience

It has been argued that previous environmental involvement during their travelling would not convert all tourists into environmentally responsible markets as some researchers address that people tend to behave in a different way when travelling. Miller et al. [25] point out the premise that tourists generally prefer to enjoy their holiday without considering the environmental responsibility (i.e., moral obligation), although they are more environmentally committed in home settings. The conceptualisation and measurement of responsibility have been studied as a multifaceted concept, which was measured in terms of moral obligation, responsibility feelings or ascription of responsibility (i.e., responsibility judgement) in reference to the environment as a whole or a specific environmental issue [14]. That is, environmental responsibility is synonymous with a person's moral obligation that depends on their responsibility judgement, feelings and level of awareness of the consequences of a given behaviour [14]. Kaiser et al. [14] provide empirical evidence that an individual's responsibility (i.e., moral obligation) can determine more accurately and consistently environmental actions compared to attitude-related variables. Other researchers also confirm that environmental responsibility has a major influence on various types of PEBs such as energy conservation and recycling [10,47].

However, there is an ongoing debate over heterogeneity in tourists' sense of environmental responsibility and its relationship to environmental behaviour. Depending on the type of responsibility constructs used in each study, their relationships to pro-environmental behaviour tend to vary across previous studies. Thus, the best way of measuring environmental responsibility is suggested to be salient to the target behaviour at a particular setting (i.e., at a tourist destination or a green accommodation for this study) to improve the validity and reliability of the measures [14]. As another factor influencing the different predictive ability of environmental responsibility, Dolnicar and Leisch [5] acknowledge that a distinctive heterogeneity exists in tourists' environmental responsibility levels and that the moderating effects of the heterogeneity in tourist groups needs to be integrated into examining its relationship to environmental behaviour. Dolnicar and Leisch [5] found significant differences between two different tourist groups (high vs. low environmental responsibility) in terms of socio-demographic, psychological characteristics and environmental behaviours. Their study confirmed that environmentally responsible tourists are highly aware of environmental issues and interested in ecolabels and tend to make personal sacrifices to reduce negative impacts of their behaviour while making some efforts to travel in an environmentally responsible way. Another study by Kang and Moscardo [13] points out that little attention has been paid to addressing tourists' previous responsible involvement during their travelling and its impact on post-responsible



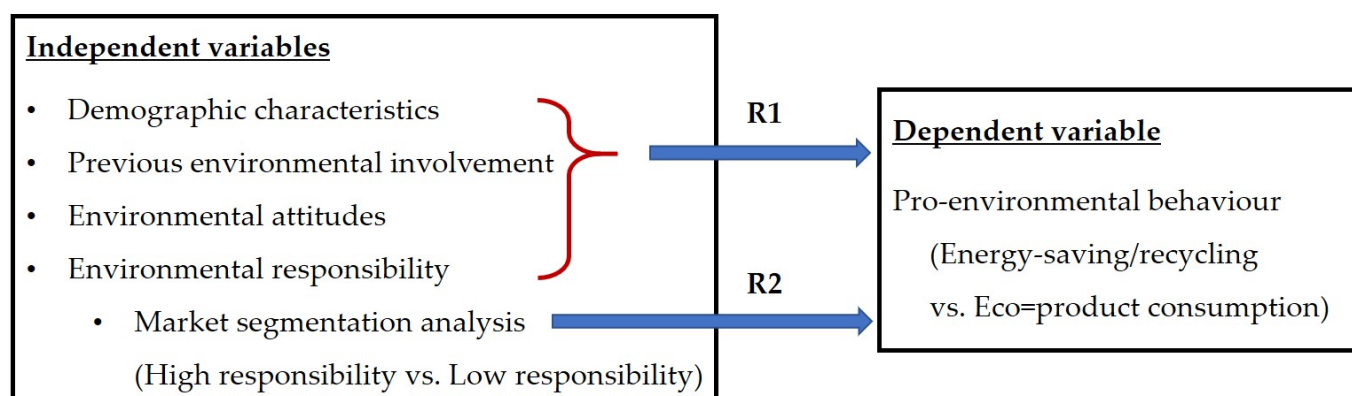
behaviour, and they suggest that this is an area for further extension of the responsibility scale in future research.

However, the link between environmental responsibility and individual characteristics has not, to our knowledge, been investigated in the green accommodation context. Indeed, little is known about the profile of tourists who are highly responsible during their travelling, which seems a lucrative market. Environmental responsibility has often been excluded as one of the key predictors that could be encouraged for promoting positive environmental activities through environmental management strategies in either the green accommodation sectors or tourist destinations [10,25,48]. Heterogeneous aspects of the responsible tourist markets can be identified to examine who they are and which type of PEB they prefer to do. Such information would prove helpful to improve the merits of various educational programs or management strategies (i.e., interpretive programmes such as a brochure, tour guide, etc.), which can determine to what degree tourists can be encouraged to be environmentally responsible depending on the type of environmental behaviour.

### 3. Research Methodology

#### 3.1. Research Objectives

The literature presents complex and inconsistent relationships in determining the influences of various factors on PEB. As discussed above, individual demographic characteristics, environmental attitudes and environmental responsibility may have different levels of explanatory power for two types of PEBs. Thus, a better and more precise understanding of tourist environmental profiles is necessary in order to guide tourist choices and behaviours towards environmental conservation outcomes. To bring greater clarity to this debate, there are two parts of this research as shown in Figure 1. The first research objective is to focus on identifying the direct effects of these individual characteristics on two types of PEBs—general (e.g., energy-saving and recycling) and specific (e.g., eco-product consumption behaviour) contexts—using the regression analysis. It is expected that two dependent variables could be differently influenced by a set of demographic variables (i.e., age, gender, education and income), previous experiences (e.g., environmental involvement at home, previous green accommodation experience), environmental responsibility-oriented travelling experience and environmental attitudes. The second research objective is to identify distinct clusters of environmentally responsible tourist markets based on environmental responsibility levels and then to examine the significant differences in key determinants of two types of PEBs among different groups of environmental responsibility-oriented market segments (high versus low environmental responsibility). It is expected that higher environmental responsibility tourist markets' PEBs would show different types of determinants compared to those determinants influencing the lower environmental responsibility tourist markets' PEBs.



**Figure 1.** The proposed conceptual framework of the research. Note: R1 = Research objective 1; R2 = Research objective 2.

### 3.2. Method

Kangaroo Island was selected as a case study site for this research. This area is a well-known nature-based tourism destination in South Australia, Australia. The case study site features a unique natural and coastal environment, wildlife animals and plants, caves and other nature-based tourism activities. Kangaroo Island (KI) has long been protected under several national conservation designations including National Parks and Wilderness Protected Areas [49]. The Tourism Optimisation Management Model (TOMM) has been implemented by the local KI tourism authority not only to conserve unspoilt coastline of special scenic landscape and environmental value from undesirable development but also to provide recreational opportunities to visitors [50].

Kangaroo Island is accessible through ferry or flights and has become one of the popular tourist destinations to attract a large number of tourists each year, including both domestic and international tourists as well as local residents, and it is particularly popular during summertime from October to March. This case study site attracts more domestic visitors, yet it has a higher proportion of international tourists than anywhere else in South Australia. Many of the visitors are mostly motivated by relaxation and nature-based tourism activities. It is noted that the profiles of visitors to the Kangaroo Island from this study is similar to those of recent visitors' profiles from another statistical data reported by the South Australian Tourism Commission (SATC) [51]. The profile of international visitors tends to be younger (between 25 and 34 years old) and prefer to stay in hotels/motels or private accommodation rather than camping/caravan parks for a short stay (1–2 days on an average length of stay), while the domestic market tends to be older (over 55 years old) and likes to stay at caravan parks/camping sites or rented houses rather than hotels/motels for a longer stay (4 to 7 nights on an average length of stay) [51].

There are different types of green accommodations in Kangaroo Island, which include eco-lodge, camping site, caravan parks and environmentally friendly accommodation. All types of green accommodation implements the minimum environmental management practices at some level in terms of using solar energy panel, rainwater storage, waste management, recycling, providing eco-tours, etc. Different types of responsible behaviour at the accommodation are also encouraged for environmental conservation and visitor's own safety. These include energy-saving, recycling, water-saving, eco-product purchasing behaviour, eco-tour options and general tourist behaviour for environmental production [52].

### 3.3. Data Collection

The self-administrated questionnaire surveys were conducted by four research assistants and tour guides across various places such as eco-lodge or green accommodations and at the entrance of the ferry station over two months between April to May, which is the autumn season of the year. Given the exploratory nature of the study, participants were selected based on a convenience sampling method, targeting independent day visitors who were over 18 years of age. Local residents and students were excluded from this study. Of the 500 questionnaires distributed, a total of 371 valid questionnaires were used for data analysis, representing 74% of the response rate.

### 3.4. Measurement of Variables

The questionnaire includes a series of questions about respondents' socio-demographic characteristics, previous environmental involvement at home, the number of green accommodations used in the past, and tourists' environmental responsibility. Three scales (e.g., previous environmental involvement at home, the frequency of the green accommodation experience in the past, and the level of tourists' involvement in environmentally responsible activities at a tourist destination) were measured based on a 5-point Likert scale, ranging from 1 = never to 5 = at every opportunity. The measures of environmental-responsibility-oriented travel experience consisted of 5 statements (i.e., while I am travelling, "I try to make sure that some of the money I spend goes into funds for nature conservation", "I try to learn about and understand the natural environment", "I try to

obey the nature conservation rules that apply at the places I visit”, “I try to not visit sites where the environment can be damaged” and “I try to participate in environmental education program”). Kang and Moscardo [13] developed a specific measure for tourists’ responsibility relating to all social, cultural and environmental aspects in minimising their negative impacts on the host destination. For this study, only environmental responsibility-related statements were selected from Kang and Moscardo [13].

The second part of the questionnaire included additional questions about attitudes towards green accommodation and pro-environmental behaviour in relation to environmental management practices at the green accommodation. All these concepts were measured based on a 5-point Likert type scale (1 = strongly disagree to 5 = strongly agree). The measures of green accommodation-oriented attitudes and PEBs were adapted to represent environmental management practices implemented in the green accommodation (i.e., energy-saving, recycling, waste management or eco-consumption products). The attitudinal measure consisted of 10 statements that reflected perceived awareness of the positive consequences of staying at the green accommodation, positive or negative feelings towards staying at green accommodation (e.g., likelihood of staying at the green accommodation regardless of the expensive price, discomfort and inconvenience). The attitudinal statements were developed and modified from the existing items used in the previous studies [1,28].

Finally, visitors were asked to indicate the level of their actual participation in various types of PEBs in the green accommodation sectors, which consisted of two sub-dimensions: (i) general environmental practices in the accommodation (3 items); (ii) eco-product consumption (4 items). Multiple-act criteria for environmental actions were employed and developed from statements used in previous studies [1,23,53]. These items were measured based on a 5-point Likert scale, ranging from 1 = never to 5 = at every opportunity.

### 3.5. Data Analysis

The data analysis was performed in two phases. In the first phase, a series of factor analyses and cluster analyses were conducted. Exploratory factor analyses (EFA) with Varimax rotation were first used to assess the construct validity and identify the underlying sub-dimensions of each measurement (e.g., tourists’ environmental responsibility, environmental attitudes towards green accommodation and pro-environmental behaviour). A cluster analysis was conducted to classify respondents into subgroups based on survey responses to the five items of environmental responsibility because their psychological tendency to environmental responsibility would be expected differently to moderate the relationships of independent variables to PEBs.

The second phase of the analysis involved multiple regression analyses with step-wise methods to identify the determinants of two types of PEBs and differences in the determinants of PEBs between two clustered environmentally responsible tourist markets. Two types of PEBs (i.e., recycling and energy-saving and eco-product consumption behaviour) were modelled as the dependent variables with various demographic, previous experience and environmental attitude variables as predictor variables. The antecedents of two dependent variables were also regressed separately between subgroups of environmentally responsible tourist markets.

## 4. Results

### 4.1. Individual Characteristics

The majority of the respondents were younger-aged groups (48.4%) between 18 to 35 years old and relatively well-educated visitors with 77% having a college diploma or university degree. The majority of respondents had either lower income levels at \$20,000 to \$60,000 (44.2%) or higher income levels at over \$100,001 (19.4%). Half of the respondents (54.6%) were males. The majority of tourists (61.1%) were international tourists from overseas, while about 38.9% were domestic tourists from Australia. About 73.9% of all respondents indicated that they had been mostly or at every opportunity



involved in environmental conservation activities (e.g., recycling, renewable energy, water conservation) at home. In relation to past experience with the green accommodation, about one-third of respondents (45.4%) mostly or at every opportunity stayed in the green accommodations, while 26.1% of respondents did sometimes or occasionally get stayed in the green accommodation.

#### 4.2. Environmental Attitudes toward the Green Accommodation

Regarding environmental attitudes towards green accommodation, most of the respondents had high levels of attitudes regarding the benefits of green accommodation for protecting the natural environment (mean scores were above 3.9). However, respondents had lower levels of tolerance towards green accommodation (mean scores were generally lower than 3.0). The results of exploratory factor analysis (EFA) on environmental attitudes yielded two factors that corresponded with cognitive or affective aspects of attitude towards the green accommodation, as shown in Table 1. Two factors explained 68% of the total variance, confirming that the results of Kaiser-Meyer-Olkin index (KMO) and Bartlett's Test were acceptable (KMO = 0.889; Chi-Square = 1953.997;  $df = 45$ ;  $p < 0.001$ ). The two factors extracted are labelled as "environmental awareness of the green accommodation" (Factor 1: Eigen-value = 4.401, variance explained = 44%) and "environmental tolerance towards the green accommodation" (Factor 2: Eigen-value = 2.418, variance explained = 24%). The factor loadings for the 10 items ranged from 0.65 to 0.89, within the threshold value  $> 0.40$  suggested by Hair et al. [54]. It showed that the Cronbach Alpha statistics for the two sub-factors were internally consistent and satisfactory, exceeding the recommended level of 0.70 for the exploratory research (Factor 1  $\alpha = 0.931$ , Factor 2  $\alpha = 0.774$  respectively; see Table 1). Both of the measures were found to be internally reliable, exceeding the minimum standard (0.60) [54].

#### 4.3. Pro-environmental Behaviour

Respondents were asked to indicate the level of their involvement in relation to green environmental management practices during their visit to Kangaroo Island. In general, the majority of respondents participated in general environmental behaviour (e.g., energy saving and recycling) (mean scores were over 3.99). However, the respondents had a moderate level of participation in eco-product consumption (mean scores ranged from 2.58 to 3.43). The same EFA procedure was used to explore the underlying dimensions of environmental actions as shown in Table 2. Factor analysis identified two factors of PEBs, explaining 61% of the total variance with the satisfactory results of KMO and Bartlett's Test (KMO = 0.778, Chi-Square = 563.254,  $df = 21$ ,  $p < 0.001$ ). The first factor (four items) was labelled "eco-consumption behaviour" (34.5% of the total variance, eigen-value = 2.415). The second factor (3 items) was named "energy-saving and recycling behaviour" (26.7% of the total variance, eigen value = 1.874). The factor loadings for all the 7 items were above 0.7. Cronbach's alpha tests were used to determine the reliability and internal consistency of the two factors (Cronbach's alpha = 0.779 for "eco-consumption behaviour" and 0.628 for "energy-saving and recycling behaviour").

**Table 1.** Factor analysis of environmental attitudes towards the green accommodation (Unit: %).

Attitudes Towards the Green Accommodation	Mean	S.D	Factor Loadings	Eigen-Value	Variance Explained
Factor 1: Environmental awareness of the green accommodation ( $\alpha = 0.931$ )					
Staying in a green accommodation will enable me to protect the natural environment in a place where I am travelling	4.17	0.882	0.892	4.401	44.011
Staying in a green accommodation will enable me to be more environmentally responsible	4.17	0.855	0.877		
Staying in a green accommodation will enable me to experience a healthy environmentally friendly guest room	3.99	0.915	0.874		
Staying in a green accommodation will enable me to perform environmentally friendly practices	4.06	0.886	0.859		
Staying in a green accommodation will enable me to enjoy environmentally friendly products and healthy amenities	3.99	0.939	0.844		
Staying in a green accommodation will enable me to be more aware of environmental issues	4.02	0.968	0.742		
Factor 2: Environmental tolerance towards the green accommodation ( $\alpha = 0.774$ )					
When I travel, I like to stay green accommodation/eco-lodge, even if I am not sure I would like it	2.97	1.031	0.874	2.418	24.182
Even if the green accommodation/eco-lodge is uncomfortable, I can still cooperate actively	2.55	1.112	0.783		
Even if the location of green accommodation/eco-lodge is inconvenient, I like to stay	2.37	1.083	0.708		
Even if the price of green accommodation /eco-lodge is somewhat expensive, I like to stay	2.76	1.027	0.648		

Note: Belief statements using a 5-point scale (1 = strongly disagree to 5 = strongly agree). Communalities of each item are all above 0.5.

**Table 2.** Factor analysis of pro-environmental behaviour (Unit: %).

Actual Participation in the Green Accommodation Practices	Mean	S.D	Factor Loadings	Eigen-Value	Variance Explained
Factor 1: eco-consumption behavior ( $\alpha = 0.779$ )					
When buying something wrapped, I often check whether it is wrapped in recyclable material	2.58	1.270	0.797	2.415	34.495
I use ECO certified products (e.g. shampoo, soap, and cleaning products) during my stay at the accommodation	3.07	1.297	0.791		
I like to take an eco-tour guide which is recommended by the accommodation	3.06	1.270	0.781		
I buy environmentally friendly products	3.43	0.995	0.665		
Factor 2: Energy saving and recycling behavior ( $\alpha = 0.628$ )					
I turn off the light when I leave the room	4.54	0.741	0.819	1.874	26.769
I separate my rubbish for recycling during my stay at the accommodation	3.99	1.213	0.722		
I use ceiling fans only while staying in the room	4.05	1.189	0.716		

Note: a 5-point Likert scale was used ranging from 1 (never) to 5 (at every opportunity). Communalities of each item are all above 0.5.

#### 4.4. Tourists' Environmental Responsibility

Respondents were asked to indicate their level of involvement in environmentally responsible activities during their travel with five items, on a 5-point Likert Scale (ranging from 1 = never to 5 = at every opportunity). Most visitors were favourable to taking responsible obligation for following the nature conservation rules (Mean = 4.52) and learning about the natural environment (mean = 4.25). However, it was also found that respondents had a moderate level of agreement with the three statements, including “not visiting sites where the environment can be damaged” (Mean = 3.93), “spending money for nature conservation funds” (Mean = 3.30), and “participating in environmental education programs” (Mean = 3.02). In order to assess the content validity of this measure, the factor analysis was conducted as shown in Table 3, and the results revealed one factor that accounted for 52% of the total variance (Eigen-value = 2.600). Kaiser–Myer–Olkin index (KMO = 0.739) and Bartlett’s Test of Sphericity (Chi-square = 449.743, df = 10,  $p < 0.001$ ) confirmed that the results were appropriate to explain the data. The factor loadings for all of the five items were above 0.6. The reliability of this construct was acceptable as the Chronbach alpha was 0.747, well above the minimum requirement of 0.60.

**Table 3.** Factor analysis of tourists’ environmental responsibility (Unit: %).

Tourists’ Environmental Responsibility	Factor Loadings	Eigen-Value	Variance Explained
<b>Factor 1 (<math>\alpha = 0.747</math>)</b>			
I try to learn about and understand the natural environment, while I am travelling	0.811	2.600	51.996
I try to not visit sites where the environment can be damaged, while I am travelling	0.761		
I try to obey the nature conservation rules that apply at the places I visit, while I am travelling	0.723		
I try to participate in environmental education programmes, while I am travelling	0.662		
I try to make sure that some of the money I spend goes into funds for nature conservation, while I am travelling	0.635		

Note: Belief statements using a 5-point scale (1 = never to 5 = at every opportunity). Communalities of each item are all above 0.4.

#### 4.5. Cluster Analysis For Environmentally Responsible Tourist Markets

Cluster analysis was conducted to gain a better understanding of responsible tourist segments based on the level of their involvement in environmentally responsible activities items in relation to investigating Research Objective 2. A series of cluster analyses with a non-hierarchical method (k-means) was applied to identify distinct clusters ranging from two to five clusters. Results confirmed that the two-cluster-based solutions divided the sample into much more homogenous groups than any other solutions (a three of five cluster-based solutions). Each cluster showed distinct differences in their environmentally responsible travel experience items, reflecting a low to high continuum distinguishing “environmentally responsible tourists” from “general nature-based tourists”, as shown in Table 4. The ANOVA analysis confirmed that the two clusters were significantly different in terms of all the five items ( $p < 0.001$ ). As shown in Table 4, two distinct clusters were labelled “environmentally responsible tourists” and “general nature-based tourists”. The “environmentally responsible tourists” group ( $n = 237$ , 64%) had a bigger size of the total sample, and they also showed higher levels of involvement in environmentally responsible activities during their travel but were less involved in environmental educational programmes (mean = 3.617) and donating money for nature conservation (mean = 3.860) during their travel. The “general nature-based tourists” group ( $n = 134$ , 36%) had a smaller size of the total sample and they were moderately interested in environmentally responsible-related

activities including “obeying the nature conservation rules” (mean = 4.102) and “learning about the natural environment” (mean = 3.664) but they were not interested in other environmental-related activities (mean scores were less than 3.204). The result of ANOVA analysis confirmed that significant differences between the two clusters were found in all five items with  $p < 0.001$ .

The results of a series of Chi-Square tests showed that two groups have similar visitor profiles in terms of the green accommodation experience, the place of residence, education and gender. However, there were significant differences between the two groups in relation to age (Chi-Square = 18.989,  $p = 0.001$ ) and previous environmental involvement (Chi-Square = 18.761,  $p = 0.001$ ). It indicates that “environmentally responsible tourists” tend to be older and more frequently engaged in environmental activities in the past, compared to “general nature-based tourists” who are younger, between 18 and 35 years old, and had a lower level of previous environmental involvement.

#### 4.6. Multiple Regression Analysis

Multiple regression analyses were conducted to determine key antecedents of two types of PEBs and examine the moderating effects of tourists’ environmental responsibility in relation to investigating two research objectives (R1 and R2). A set of individual characteristics variables included demographic (age, gender, education and income) and previous experience variables—the green accommodation experience (high vs. low), previous involvement in environmental activities at home (yes vs. no involvement) and the level of environmental responsibility-oriented travel experience (high vs. low). All six individual demographic and previous experience variables were transformed and coded as dummy variables (1, 0) before the regression analyses. Composite index scores for each of the factors (e.g., environmental attitudes, environmental responsibility and two types of PEBs) were computed for regression analyses.

In regression models, six individual background variables were included, and one factor of environmental responsibility and two factors of environmental attitudes were included for the two dependent variables (e.g., energy-saving and recycling and eco-consumption behaviour). The independent variables were not highly correlated with each other. All the independent variables’ tolerance levels were near 1.0 or higher than 0.6, indicating non-violation of the multicollinearity. In the two regression models, it was confirmed that there was a linear association between the two types of behaviour and the independent variables ( $F = 24.065$ ,  $p = 0.000$ ;  $F = 21.552$ ,  $p = 0.000$ , respectively; see Tables 5 and 6).

This study summarises the results of the two regression models for the two types of PEBs as dependent variables. In the following step, the two clusters of environmental responsibility segments were used as a moderator in explaining the relationships between all individual variables and two types of PEB.



**Table 4.** Cluster analysis for environmentally responsible tourist markets.

Tourists' Environmental Responsibility	Total (n = 371)		Environmentally Responsible Tourists (n = 237)		General Nature-Based Tourists (n = 134)		<i>t</i> -Test	
	Mean	S.D	Mean	S.D	Mean	S.D	<i>t</i> -test	<i>p</i>
I try to learn about and understand the natural environment, while I am travelling	4.25	0.080	4.607	0.5264	3.664	0.8250	13.081	0.000
I try to obey the nature conservation rules that apply at the places I visit, while I am travelling	4.51	0.771	4.785	0.4850	4.102	0.8513	9.562	0.000
I try to participate in environmental education programmes, while I am travelling	3.02	1.181	3.617	0.9156	2.080	0.8998	15.440	0.000
I try to not visit sites where the environment can be damaged, while I am travelling	3.93	1.041	4.407	0.7174	3.204	1.0083	13.036	0.000
I try to make sure that some of the money I spend goes into funds for nature conservation, while I am travelling	3.30	1.165	3.860	0.9289	2.445	0.9308	13.906	0.000

**Table 5.** The determinants of eco-product consumption behaviour between two environmental responsibility-based segments.

Independent Variables	All Sample (n = 371)		Environmentally Responsible Tourists (n = 237)		General Nature-Based Tourists (n = 134)	
	Beta	t(Sig.)	Beta	t(Sig.)	Beta	t(Sig.)
<b>Constant</b>	0.569	<b>4.391 (0.000)</b>	0.241	<b>2.294 (0.023)</b>	0.370	<b>4.764(0.000)</b>
<b>Environmental attitudinal factors</b>						
Factor 1: environmental awareness of the green accommodation	0.133	<b>2.664 (0.008)</b>	0.172	<b>2.775 (0.006)</b>	0.073	0.876 (0.383)
Factor 2: environmental tolerance towards the green accommodation	0.339	<b>6.821 (0.000)</b>	0.327	<b>5.197 (0.000)</b>	0.389	<b>4.643 (0.000)</b>
<b>Demographic</b>						
Age		<b>−2.465 (0.014)</b>	−0.150	<b>−2.431(0.016)</b>	0.077	0.895 (0.373)
Gender	−0.077	−1.625 (0.105)	−0.069	−1.100 (0.273)	−0.073	−0.871 (0.386)
Education	−0.008	−0.163 (0.871)	0.045	0.721 (0.472)	−0.062	−0.737 (0.462)
Income	−0.103	<b>−2.118 (0.035)</b>	−0.161	<b>−2.606 (0.001)</b>	0.057	0.657 (0.513)
<b>Previous experience</b>						
Previous environmental involvement at home	−0.076	−1.615 (0.107)	−0.038	−0.618 (0.537)	−0.139	−1.648 (0.102)
Previous experience with the green accommodation	0.127	<b>2.645 (0.009)</b>	0.269	<b>4.296 (0.000)</b>	−0.070	−0.816 (0.416)
<b>Factor 1: tourists' environmental responsibility</b>	0.245	<b>4.876 (0.000)</b>				
<b>R<sup>2</sup></b>	0.313		0.284		0.151	
<b>Adjusted R<sup>2</sup></b>	0.300		0.266		0.144	
<b>F (p)</b>	<b>24.065 (0.000)</b>		<b>15.461 (0.000)</b>		<b>21.557 (0.000)</b>	
<b>Standard Error of the Estimate</b>	0.837		0.816		0.822	
<b>Durbin-Watson</b>	1.719		1.530		1.738	

Note: Bolded numbers indicate a *p*-value of less than 0.05.

**Table 6.** The determinants of “energy-saving and recycling behaviour” between two environmentally responsible tourist segments.

Independent Variables	All sample (n = 371)		Environmentally Responsible Tourists (n = 237)		General Nature-Based Tourists (n = 134)	
	Beta	t (Sig.)	Beta	t (Sig.)	Beta	t (Sig.)
<b>Constant</b>	1.741	<b>8.347 (0.000)</b>	1.253	<b>4.486 (0.000)</b>	1.835	<b>5.849 (0.000)</b>
<b>Environmental attitudinal factors</b>						
Factor 1: environmental awareness of the green accommodation	0.152	<b>2.951 (0.003)</b>	0.102	1.528 (0.128)	0.204	<b>2.525(0.013)</b>
Factor 2: environmental tolerance towards the green accommodation	−0.015	0.308 (0.758)	0.013	0.198 (0.843)	−0.095	−1.210 (0.229)
<b>Demographic</b>						
Age	−0.022	0.449 (0.653)	−0.103	−1.548 (0.123)	0.053	0.658 (0.512)
Gender	0.128	<b>2.622 (0.009)</b>	0.070	1.052 (0.294)	0.195	<b>2.471 (0.015)</b>
Education	0.144	<b>2.952 (0.003)</b>	0.101	1.529 (0.128)	0.181	<b>2.291 (0.024)</b>
Income	0.033	0.670 (0.503)	−0.008	−0.117 (0.907)	0.071	0.903 (0.369)
<b>Previous experience</b>						
Previous environmental involvement at home	0.344	<b>6.905 (0.000)</b>	0.351	<b>5.290 (0.000)</b>	0.363	<b>4.561 (0.000)</b>
Number of the green accommodation experience	−0.041	−0.825 (0.410)	−0.071	−1.072 (0.285)	0.025	0.300 (0.764)
<b>Factor 1: tourists’ environmental responsibility</b>	0.156	<b>3.058 (0.002)</b>				
<b>R<sup>2</sup></b>	0.254		0.123		0.286	
<b>Adjusted R<sup>2</sup></b>	0.242		0.119		0.262	
<b>F (p)</b>	<b>21.552 (0.000)</b>		<b>27.989 (0.000)</b>		<b>11.743 (0.000)</b>	
<b>Standard Error of the Estimate</b>	0.871		0.790		0.990	
<b>Durbin-Watson</b>	1.923		1.840		1.874	

Note: Bolded numbers indicate a *p*-value of less than 0.05.

#### 4.7. Determinants of Eco-Product Consumption Behaviour

As shown in Table 5, the first regression model “eco-product consumption behaviour” was largely determined by tourists’ environmental responsibility ( $\beta = 0.245$ ,  $t = 4.876$ ,  $p < 0.001$ ), environmental tolerance towards the green accommodation ( $\beta = 0.339$ ,  $t = 6.821$ ,  $p < 0.05$ ) and environmental awareness of the green accommodation ( $\beta = 0.133$ ,  $t = 2.664$ ,  $p < 0.001$ ). In addition, previous experience with the green accommodation ( $\beta = 0.127$ ,  $t = 2.645$ ,  $p < 0.05$ ) was also strongly associated with this dependent variable. Of the individual background variables, age ( $\beta = 0.120$ ,  $t = -2.465$ ,  $p < 0.05$ ) and income ( $\beta = 0.103$ ,  $t = -2.118$ ,  $p < 0.05$ ) were also associated with this dependent variable. However, interestingly, previous environmental involvement at home was not a significant predictor for this eco-product consumption behaviour. Further regression analyses were conducted to examine the moderating effects of environmental responsibility-oriented tourist groups on the relationship between independent variables and “eco-product consumption behaviour”. For the “environmentally responsible tourists” group, “eco-product consumption behaviour” was determined by the environmental awareness of the green accommodation ( $\beta = 0.172$ ,  $t = 2.775$ ,  $p < 0.05$ ), environmental tolerance towards the green accommodation ( $\beta = 0.327$ ,  $t = 5.197$ ,  $p < 0.05$ ). Interestingly, two individual factors, namely age ( $\beta = 0.150$ ,  $t = -2.431$ ,  $p < 0.05$ ) and income ( $\beta = 0.161$ ,  $t = -2.606$ ,  $p < 0.05$ ), had significant impacts on this behaviour. That is, “environmentally responsible tourists” who are younger with lower incomes were more likely to participate in “eco-product consumption behaviour”. On the other hand, only one variable, environmental tolerance towards the green accommodation ( $\beta = 0.389$ ,  $t = 4.643$ ,  $p < 0.001$ ) was positively associated with this behaviour for the “general nature-based tourists” group.

#### 4.8. Determinants of “Energy-Saving and Recycling Behaviour”

As shown in Table 6, the results of regression analyses from the second regression model indicated that the dependent variable “energy-saving and recycling behaviour” was determined by environmental responsibility ( $\beta = 0.156$ ,  $t = 3.058$ ,  $p < 0.001$ ) and one factor of environmental attitudes towards the green accommodation, “environmental awareness of the green accommodation” ( $\beta = 0.152$ ,  $t = 2.951$ ,  $p < 0.05$ ), previous environmental involvement at home ( $\beta = 0.344$ ,  $t = 6.905$ ,  $p < 0.001$ ). In terms of individual variables, gender ( $\beta = 0.128$ ,  $t = 2.622$ ,  $p < 0.05$ ) and education ( $\beta = 0.144$ ,  $t = 2.952$ ,  $p < 0.05$ ) were associated with this dependent variable. That is, females with higher education qualifications had higher levels of participation in energy-saving and recycling behaviour at green accommodation than males with less education.

With regards to the moderate effects of environmental responsibility-oriented travel, there were similar determinants influencing energy-saving and recycling behaviour between two environmentally responsible tourist segments. For the “general nature-based tourists” group, the energy-saving and recycling behaviour was significantly influenced by “environmental awareness of the green accommodation” ( $\beta = 0.204$ ,  $t = 2.525$ ,  $p < 0.05$ ), previous environmental involvement at home ( $\beta = 0.363$ ,  $t = 4.561$ ,  $p < 0.001$ ), gender ( $\beta = 0.195$ ,  $t = 2.471$ ,  $p < 0.05$ ) and education ( $\beta = 0.181$ ,  $t = 2.291$ ,  $p < 0.05$ ). For the “environmentally responsible tourists”, “energy-saving and recycling behaviour” was determined by one major determinant, “previous environmental involvement” ( $\beta = 0.351$ ,  $t = 5.290$ ,  $p < 0.001$ ).

Overall, the findings indicate that different determinants influenced two types of pro-environmental behaviour between two environmentally responsible tourist groups. It was also found that the overall explanatory power of the independent variables on “energy-saving and recycling behaviour” was weaker (adjusted R square = 0.242) compared to the first regression model for “eco-product consumption behaviour” (adjusted R square = 0.300).

## 5. Discussion

The purpose of this study was to gain additional insights into the different effects of various determinants on the two types of PEBs in the context of the green accommodation

sector. This research may be one of the few initial studies that have simultaneously examined significant differences in key determinants of two PEBs with special attention to environmentally responsible tourist segments. The conceptual model of this study confirms that the types of various individual characteristics and the extent to which each factor influences specific types of PEBs can be different from one another in terms of types and aspects of behaviour, ranging from general environmental behaviour (e.g., energy-saving and recycling) to specific environmental behaviour (e.g., eco-product consumption). This is also supported by past findings of the environmental psychology research by Kollmuss and Agyeman [26] and Steg and Vlek [27]. Given the influence of tourist market heterogeneity, the comparative analysis from the findings also revealed additional theoretical insights into the importance of adding other individual background variables such as environmental responsibility [10,25] or previous environmental involvement [6,8], with a specific emphasis on relevant settings (e.g., at home or a green accommodation) as a key pathway into behavioural change models. Indeed, it would be too simplistic to apply Ajzen's [29] Theory of Planned Behaviour, which mainly focuses on beliefs, attitudes and norms, to the tourist markets, whose behaviour is heavily influenced by numerous other factors such as demographic characteristics or responsible travel experience, beyond the evaluation of reasoned thoughts or feelings concerning environmental issues [8,9,11].

More importantly, this research confirms that the role of the previous experience with the relevant setting (e.g., at home or the green accommodation), and environmental-responsibility-oriented travel experience was one of the main predictors to both types of PEBs, yet to a different extent for two types of tourist market segments. The results of the multiple regression analysis revealed that previous involvement in environmental activities at home tends to play a significant role in influencing "energy-saving and recycling" among both "high" and "low" environmental responsibility groups, yet it had no influence on "eco-product consumption behaviour" for "general nature-based tourists". One of the reasons might be explained from the findings of Dietz, Stern and Guagnano [55] that previous environmental involvement at home helps general tourists to be awareness of time, skills and strong commitment, which are required for engaging in general environmental activities such as energy-saving or recycling [56,57] compared to other types of site-specific actions such as eco-consumption behaviour relating to the green accommodation. On the other hand, it was found that the "eco-product consumption" behaviour was more influenced by the previous experience with green accommodation practices, but only for "environmentally responsible tourists". That is, tourists' positive previous experience gained from the green accommodation could better help younger tourists, especially those with a higher level of environmental responsibility, to engage in a specific type of PEBs, namely "eco-product consumption behaviour". The findings also show that such engagement for this market can be also stimulated by gaining more environmental awareness and developing environmental tolerance towards the green accommodation practices at the case study site. This study reinforces the growing body of evidence for the need for an environmental responsibility-based approach to environmental behavioural change [5,10,14], rather than simply improving visitors' knowledge and awareness of the environmental problems or issues that are often targeted by tourism and interpretation research [11,40,43].

In relation to environmental attitudes towards the green accommodation practices, our findings also confirm that visitors' specific environmental attitudes are associated with the two types of PEBs, which is similar to the findings of a previous study [1]. More importantly, this study adds further insight into different effects of two specific types of environmental attitudes, namely environmental awareness and environmental tolerance. For example, it was found that people's perceived awareness of the environmental benefits of staying at green accommodation is positively related to both types of PEBs. However, feelings of tolerance toward the green accommodation practices—the level of tolerance for time and cost when staying at the green accommodation—were strongly associated with only the eco-production consumption behaviour but not with the energy-saving and recycling behaviour. The findings imply that a more in-depth theoretical understanding of



the relationship between specific types of environmental attitudes and the type of PEBs is required to effectively influence two distinct types of PEBs to a different extent.

With regards to demographic variables, individual characteristics such as education (higher education), gender (being female tourists) and age (younger tourists) seem to be differently associated with two types of environmental behaviour. This result regarding gender is consistent with the findings of some of the previous studies, indicating that female visitors tend to show higher environmental behaviour [19,38,58]. Moreover, younger tourists tend to support consuming eco-products more, especially among the highly environmental-responsibility-oriented tourist group, similar to the finding of the study by Shang et al. [20]. However, it is not clear why only younger people are more supportive of site-specific behaviour but not with energy-saving and recycling behaviour. Indeed, the effect of age is inconsistent with what is found in the literature [7,19,20,26,37]. This situation can be explained by the notion that younger generations have been exposed to environmental issues through media or schools, which may lead them to support green accommodation practices. With regards to the level of income, the findings of this study show that income was one of the determinants influencing only “eco-product consumption behaviour” for only the “environmentally responsible tourists” segment, but there was no effect on energy saving and recycling behaviour for both tourist markets. This implies that younger tourists with lower income tend to be interested in purchasing eco-products compared to people with higher income. It may be that people with lower income stay in a caravan or camping and are likely to consume eco products or eco-tour guides rather than consuming luxurious yet less environmentally friendly products at green hotels [59].

## 6. Implications

The current research provides managerial implications for the development of effective environmental management strategies in order to influence visitors’ different types of PEBs in the green accommodation sector. Given the two environmental responsibility-based market segments identified in this study, these segments should be differently targeted depending on site-specific pro-environmental behaviours or general environmental actions. In this way, different strategies can be developed to adopt a correct positioning towards them and to improve suitable communication programs for the target markets.

In order to promote “eco-product consumption behaviour” in the green accommodation sector, the level of the green accommodation experience seems to be critical in influencing this type of behaviour of individuals with higher environmental responsibility (labelled as “environmental responsible tourists”). Their positive interaction with the green accommodation experience seems to help them to be more supportive of the feelings associated with the green accommodation (e.g., tolerance, comforts and time) which ultimately could lead consumers to engage with eco-product consumption behaviour, e.g., using ecotour guide, eco-friendly products and eco-labels, while staying at the green accommodation. Similar to the study of Ramkissoon et al. [34], it was found that increasing individuals’ positive satisfying experience with and emotional attachment to the place may make it more likely that they will take action to protect the environment. In particular, a cheaper and accessible approach to the green accommodation types such as caravan, camping and eco-cabin places, seem to be appealing to tourists with lower-income and a younger group who like to stay in the green accommodation. Such people can be influenced by travel messages about environmental responsibility, which help them to engage in a specific type of pro-environmental behaviour. On the other hand, for the “general nature-based tourists” (that is, those with low environmental responsibility), their commitments to the specific behaviour (e.g., eco-product consumption behaviour) seem to be only affected by environmental tolerance levels for time or cost. That is, when people do not have stronger responsibility, it seems that their awareness about the consequences of a particular behaviour leads them to engage in specific environmental actions. To shift the current attitudes, responsibility and behaviour of this “general nature-based tourists” group, thus, it would be more effective to address persuasive messages highlighting mini-

time, tolerance and comfort associated with the green accommodation, along with responsible travel messages in order to influence them to engage in further eco-production consumption behaviour.

To be more effective, it is important to target different strategies for fostering general environmental behaviours (e.g., energy-saving and recycling), which are often perceived to be difficult to perform. In this study, the findings reveal that there were no effects of previous green accommodation experience on changing “energy saving and recycling behaviour” for two environmentally responsible tourists groups, but visitors’ direct involvement in environmental activities at home was significantly associated with the two groups’ general energy-saving and recycling behaviour. Instead of a mere green accommodation experience, it would be helpful for tourists to have more direct engagement in energy-saving oriented tours (e.g., solar panel or other alternative energy-saving technology at the green hotels) or volunteer recycling projects at the accommodation or other tourism sites in combination with specific messages on the benefits of such practices, as also suggested by previous researchers [1].

From the long-term perspective, further environmental responsibility messages related to the consequence of a particular behaviour need to be highlighted to both the general tourist and the environmentally responsible tourist markets. In this sense, visitors’ previous experience with similar environmental activities at the relevant settings (either at home or at a tourism site) can help encourage tourists to think about what they are responsible for, develop their tolerance level for money or cost in performing such behaviour and gain specific skill sets on how to behave in a more responsible way [60]. Such efforts may help transform environmentally concerned tourists into responsible citizens who can make their own decisions on what they can contribute to the long-term sustainable green accommodation practices.

## 7. Conclusions

This research attempts to conceptualise two types of pro-environmental behaviour relating to the green accommodation management practices and investigate how different predictors are associated with each type of behaviour, especially targeting two types of tourist markets, namely “environmentally responsible tourists” versus “general nature-based tourists” staying at the green accommodation. In particular, the findings of research provide additional theoretical insights into the role of environmental responsibility as the strongest predictor of both two types of PEBs and its moderating effects on the relationship between visitor characteristics and PEBs. At a practical level, this environmental responsibility-based segmentation approach provides green-oriented accommodation sectors with some important managerial implications for improving green accommodation practices that can be operated on different principles for two different targeted markets based on their environmental responsibility.

This study also suggests future research in response to some limitations of the study. Firstly, this study focuses on tourists’ involvement in responsible activities during their travel, which is more specific to the tourism setting. The measurements of environmental responsibility may need to be improved or supplemented with additional statements to examine its multi-dimensional aspects such as moral obligation, feelings of responsibility or ascription of responsibility, which are often used in the environmental psychology research field, as suggested by Kaiser et al. [14]. This measure could be adapted or modified when applied to various contexts of tourism situations (e.g., green hotels vs. general hotels). Secondly, based on the value of Adj.  $R^2$ , the percentage of variance accounted for two types of PEBs is rather low (lower than 0.3). To improve the variance level, future research may investigate the effect of other factors such as perceived barriers such as time or efforts in engaging in specific types of behaviour.

Furthermore, it needs to be acknowledged that tourists’ overall satisfaction with the green accommodation practices could be added to identify their impacts on PEBs. One potential extension of this study would be to purposefully identify and develop

multidimensional aspects of tourist satisfaction that measure the perceived evaluation of satisfying experiences with various green accommodation practices. This type of measure will be useful to identify different predictive strengths of specific green accommodation practices in the behavioural modification process. Finally, the sampling design was limited in that data collection occurred over a few months in one season, targeting the nature-based tourism markets of people who visit Kangaroo Island, South Australia. In particular, Kangaroo Island appeals to nature-based tourist markets that represent higher levels of environmental responsibility or environmental attitudes than other hedonistic or pleasure-seeking market segments. Thus, other case study sites that are in the city areas or resorts areas may appeal to different types of heterogeneous visitors who have weaker environmental responsibility and attitudes and may not necessarily behave similarly as is expected in this case study site. To compensate for this limitation, future researchers could conduct similar surveys at other types of accommodation sectors, targeting an extended aspect of pro-environmental behaviour with sustainable business strategies and green management practices.

**Author Contributions:** Conceptualisation: A.K.; methodology: A.K.; data analysis: A.K. and K.P.K.; software: A.K. and T.H.D.N.; writing—A.K.; writing—review and editing: K.P.K. and T.H.D.N. All authors have read and agreed to the published version of the manuscript.

**Funding:** This research received no external funding.

**Institutional Review Board Statement:** Not applicable.

**Informed Consent Statement:** Informed consent was obtained from all subjects involved in the study.

**Data Availability Statement:** Not applicable.

**Conflicts of Interest:** The authors declare no conflict of interest.

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