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# Place Attachment and its Impacts Towards Pro-Environmental Behavior Intention Among Urban Park Visitors

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### ABSTRACT

Numbers of studies showed that there was a consistent connection between a sense of place and pro-environmental behavior intention. It is crucial to understand what makes people feel attached to the place and the factors that contribute to its behavior intention. Limited research has been done to investigate the interaction between place attachment and pro-environmental behavior especially in green space settings. This study investigated the relationship between place attachment and pro-environmental behavior intention at Temerloh Lake Garden, Pahang, Malaysia. The intensity of place attachment and pro-environmental behavior intention were measured using the structured questionnaire followed by an analysis of the relationship between these two constructs using correlation analysis and descriptive statistics analysis. A total of 376 respondents were involved in this study and found out that there is a positive correlation between valuing a place and their willingness to volunteer in environmental activities. However, visitation pattern to the park indirectly influenced the intensity of place attachment thus affecting their pro-environmental behavior intention. This study provides valuable insights in examining the pro-environmental behavior intention among park visitors that park managers should focus to improve the effectiveness of the green space setting in delivering numerous benefits for human quality of life.

## 1. Introduction

The world is currently facing critical environmental issues such as climate change, flash floods and destruction of natural resources which are mainly caused by irresponsible environmental-related actions [2]. The World Meteorological Organization (WMO) reported the increasing trends in global warming rates and greenhouse gas emissions in a report on global climate in 2021. Researchers have shown great interest in examining the factors that influence the motivation of people to participate in environmental conservation efforts to help tackle the issue [4,6]. Urban parks are one of the most

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critical elements in urban development strategies and become popular spots among urban communities for types of recreational activities.

The natural setting does provide ecosystem services and promotes psychological well-being among visitors as a response to the rapid urbanization rate. For these reasons, people tend to seek greenery areas that ultimately hold a special meaning to them [5] resulting in the dependence on the settings that eventually meet their needs and expected experiences [15]. Frequent visitation to the area brings consequences to the environmental pressure making it necessary for the natural resources protection efforts to be formulated [10]. Therefore, it is very important to make provision in park planning and management, especially in urban areas.

To support the protection of natural resources and landscape design in an area, planners and managers are starting to be interested in finding out what factors that motivate people to support conservation efforts [6]. With the support from the people, the conservation efforts of natural resources may bring positive impacts to enhance the sustainability of the area as well as reduce the financial requirements for the approach. It is the main question to discover how to encourage pro-environmental behavior among people that contributes to the willingness in participating environmentally efficient usage such as reducing energy use and engaging in sustainable transportation [15]. There is a need for stakeholder engagement in increasing the awareness level to adopt environmentally friendly practices [1]. Determining the level of place attachment and the factors that influence the place attachment among the community could be a great help for stakeholders' groups in identifying shared meanings and values towards the place for better planning strategies of the area [6,13].

Vaske *et al.*, [17] highlighted that individual's positive attitudes towards nature-based settings such as parks and gardens contribute to global environment protection and may be strongly influenced by the positive attachment to that place. However, green space elements such as accessibility and maintenance play a role in allowing users' behavior and promoting social interaction within the space [19]. Furthermore, there are numbers of studies that revealed a positive link between place attachment and pro-environmental behavior in the specific place rather than studies that focus on the general pro-environmental behavior [6]. Although existing studies on the significance of place attachment towards pro-environmental behaviors portray some evidence, the validity of the findings are questionable since the two elements are contradictory and less conclusive [15]. This may be because the relationship between place attachment and pro-environmental behavior has been determined by various fields of study Halpenny [6] and Vaske *et al.*, [17] and only few studies identified that place attachment could be comprised of different dimensions including place dependence, place affect and place identity [13].

Halpenny [6] found out the need to explore how leisure and recreation experiences may contribute to the individual's attitude towards the natural settings particularly the place where they indulge in the activities. According to Daryanto *et al.*, [3], a sense of place refers to the affective and cognitive connection that an individual might possess towards certain places. By being attached to that place, it will promote a sense of belonging and lead to involvement in civic activities such as pro-environmental behavior. Jiao *et al.*, [7] added that it is very important to investigate the reasons, timing and circumstances of how individuals could decide to participate in pro-environmental behavior. Jiao *et al.*, [7] discovered that a sense of pride contributes to the level of attachment to a place and their efforts in taking care of the place that could be called as an "ecological responsibility". It is very important to encourage pro-environmental behavior among people in environmental psychology research although it is a big challenge to be achieved it needs to be done to ensure the sustainability of the environment [18]. Larson *et al.*, [9] highlighted that pro-environmental behavior is a key component in the formulation of human-interaction research. For instance, the current

literatures provide a wide range of evidence of the positive relationship between place attachment and pro-environmental behavior and highlight its importance in influencing pro-environmental behavior, particularly in urban green space settings. However, additional research is required to fully grasp the multifaceted aspects of place attachment and its impacts on pro-environmental behavior. Therefore, this study aimed to investigate the relationship between a sense of place and pro-environmental behavior among visitors at Temerloh Lake Garden as one of the lake gardens in Malaysia.

## 2. Place Attachment

According to Meng *et al.*, [11], the attitudes of an individual can be determined by evaluating their emotional, cognitive and actions-based responses for an assessment of certain areas. Halpenny [6] conceptualized the place attachment by two dimensions namely place identity and place dependence. As regards to the psychological bonds, place attachment is also being considered as a positive bond towards a place by emotions Junot *et al.*, [8], Meng *et al.*, [11] and Scannell *et al.*, [15] identified place attachment as a concept used to influence people's behavior in their willingness to protect meaningful places for them. Usually, people who highly feel connected to a certain place would portray positive emotions such as feeling happy during their visit and allow these people to show a positive attitude towards the place dimensions including the social and physical features of the place [3,15]. Similar context can be found in tourism management when foreign tourists might develop a sense of pride in a destination after having their personal experiences in the area [3].

Zhang *et al.*, [19] identified four dimensions of place attachment in the context of urban green space through confirmatory factor analysis which are place dependence, place identity, affect attachment and social bonds. It was reported that the closer the connection to the local park, the higher the rate of well-being among the nearby community complemented by the easy accessibility and great function of the area. In contrast, Junot *et al.*, [8] stated that even though place attachment influences the decision to be involved in pro-environmental behavior, each of the dimensions may not have the same influence. Instead, Junot *et al.*, [8] suggested that place identity and place dependence may bring different effects towards the well-being of people and pro-environmental behavior as well as may sometimes oppose each other. Therefore, Meng *et al.*, [11] proposed the generalization concept of the word "place attachment" as a globally used concept that should explain people's connection or emotions towards a place.

On the other hand, a sense of place has been implemented in ecosystem services research since the 1990s and derives from a variety of fields such as architecture, built environment, geography and urban planning. The integration of this concept into the ecosystem services framework are mainly because of its recognition that people cannot be excluded from the ecosystem settings and how ecosystem services management is all about getting to know how people use, perceive and manage the ecosystem that would affect the conflicting the ecosystem uses and values [14].

Zhang *et al.*, [19] supported the fact that the level of place attachment should have been linked to certain physical features of the place to make it closer to the place [19]. Žlender, *et al.*, [20] believed that a sense of place is the ultimate concept that creates opportunities for researchers to understand the types of space that people would prefer to visit which makes it crucial for policy making decision-making process. A sense of place can be referred as a dimension principle that includes emotional and functional bonds to a particular space [20]. Jiao *et al.*, [7] formulated the definition of place attachment related to the affective and cognitive connection towards a place as factors that might contribute to the actions that bring benefits to the natural environment and promote sustainable use of natural resources known as pro-environmental behavior. Moulay *et al.*,

[12] identified that the sub-dimension approach in place attachment particularly in recreational settings influenced by the complex interaction between people and the environments.

### 2.1 Place Identity

In general, place identity is a psychological connection that has been developed over a period between an individual and a setting that contributes to a sense of pride and helps in encouraging positive responses towards the elements setting in a place [6]. Zhang *et al.*, [19] added that place identity should be viewed as a dimension that interprets the individuals' personal identity relating to the physical environment thus developing beliefs, preferences and values that seem relevant to the sustainable development of natural settings. It is supported by Song *et al.*, [16] but emphasized that place identity makes him/ her different from other people who are not feel attached to the place.

Our identities are mainly influenced by the interaction between people and the surroundings and these identities eventually affect our performed behavior and how we interpret environmental threats [4]. Place attachment is the emotional connection that forms between individuals and a particular setting environment and this connection is portrayed by the behavior that helps to contribute to the significance of a place to a person [18]. On the other hand, Devine-Wright [4] emphasized the differences between place identity and environmental identity that could be differentiated by the geographical elements of each aspect.

### 2.2 Place Dependence

In the context of tourism and leisure, place dependence viewed as a level of attachment among visitors to a specific place and their appreciation towards its unique characteristics thus contributing to the actions that fulfill their needs and demands during the travel [13]. Generally, place dependence refers to an individual's activities or behavioral towards a specific place that represents the cognitive domain [6] and can be identified as a third dimension in the place attachment concept [16]. In the field of urban green space management, place dependence represents a situation when residents are highly dependent upon a green space in their neighborhood area for types of recreational activities and might be reluctant to use any other green space settings [19]. Additionally, place dependence refers to the relationship between individuals and their environment, especially reflecting how efficient the element of the area is in fulfilling the needs and demands of the users [13].

### 2.3 Place Affect

Halpenny [6] proposed that place affect should be recognized as individuals' emotions and feelings towards a place. It was believed that a person who is exposed to the natural environments and gains experience with them will show positive bonds and stronger attachment towards those settings compared to those who did not experience the setting [13].

## 3. Pro-Environmental Behaviour

People who encounter positive experiences within a place may portray positive emotional bonds towards the place and eventually encourage them to do actions that benefit the environment settings of the place [3] stated that pro-environmental behavior may be influenced by individual motivation such as place attachment and contextual drivers such as culture. Daryanto *et al.*, [3] emphasized the

importance of the relationship between settings that produce attachment feelings and the types of behavior to promote pro-environmental behavior since place attachment is the main reason for the behavior to occur. Pro-environment behavior can be defined as the actions of an individual or group that actively promotes sustainable use of natural resources [6,13]. Žlender *et al.*, [20] found out that great satisfaction towards a place that provides external stimuli to enhance the natural surroundings is a great motivation to engage in pro-environmental behavior. [9] emphasized the urgency in determining the characteristics of place-based behavior which is believed to play a critical role in environmental quality research.

Wilkie *et al.*, [18] defined pro-environmental behavior as any actions that could harm the environment as little as possible or actions that could produce benefits to the environment including any household routines, participating in any environmental awareness campaign or recycling. However, for the purpose of research on climate change issues, pro-environmental behavior has always been seen as a “one size fit all” approach to make people understand what it is. The range of the behavior may differ starting from simple tasks like turning off lights and taking a quick shower to more involved actions such as contributing financially to any environmental programs or participating actively in any environmental awareness events. Respondents evaluate the frequency of their engagement on a scale from 1 (not involved within the past year) to 10 (once in a day). The mean value was calculated to indicate the average frequency of the behavior and the coefficient 0.89 represents strong internal consistency [18].

General attitude typically demonstrates less efficiency in predicting behavior compared to more specific attitudes, yet they can predict a broad spectrum of outcomes [4]. For instance, individuals who possess a stronger sense of attachment towards a place typically perceive a higher resemblance with animals compared to those with a lower place attachment sense [4]. However, it is always a challenge to foster pro-environmental behavior among people since the rewards cannot be seen directly. Song *et al.*, [16] found out that the dimensions of place attachment that can promote pro-environmental behavior might be different from each other depending on the demands and efforts. It will cause a dilemma among people as the benefits of engaging in pro-environmental actions are not tangible, immediate or even cannot be calculated in a monetary form.

#### **4. The Relationship Between Place Attachment and Pro-Environmental Behavior in Green Space Settings**

The profound relationship between place attachment and pro-environmental behavior in urban green space settings play a vital role in supporting environmental conservation efforts. In the field of leisure research, few studies have proved that there is a positive link between place attachment and how people act or behave towards the environment [6]. Therefore, this issue is receiving more attention among policy makers, planners and managers to investigate how place-dependence among people would contribute to the resource preservation plan, especially in green space planning and management.

Ramkissoon *et al.*, [13] gave an example of small action such as picking up other’s litter in the park, that might be resulted from the strong tendency of attachment towards the park. However, [15] stated that place attachment could not be a determinant of pro-environmental behavior because human tends to look for high-quality environmental settings. According to place attachment theory, [3] agreed that emotional bonds possessed by people will produce positive behavior towards the place as it will encourage people’s responsibility in protecting the place thus maintaining the sustainability of the place.

## 5. Methodology

In this study, a quantitative approach was employed to determine the relationship between place attachment and pro-environmental behavior among park visitors in Temerloh Lake Garden, Pahang. Structured questionnaires were distributed and a total of 376 respondents were involved in the data collection process. Section A of the questionnaire provided the demographic profile and visitation pattern of the respondents followed by section B aimed to assess the intensity of place attachment among respondents. Section C examined the relationship between place attachment and pro-environmental behavior intentions while the last section of the questionnaire comprised of open-ended questions that asked respondents how to improve their emotional bonds towards the place.

### 5.1 Descriptive Statistics Analysis

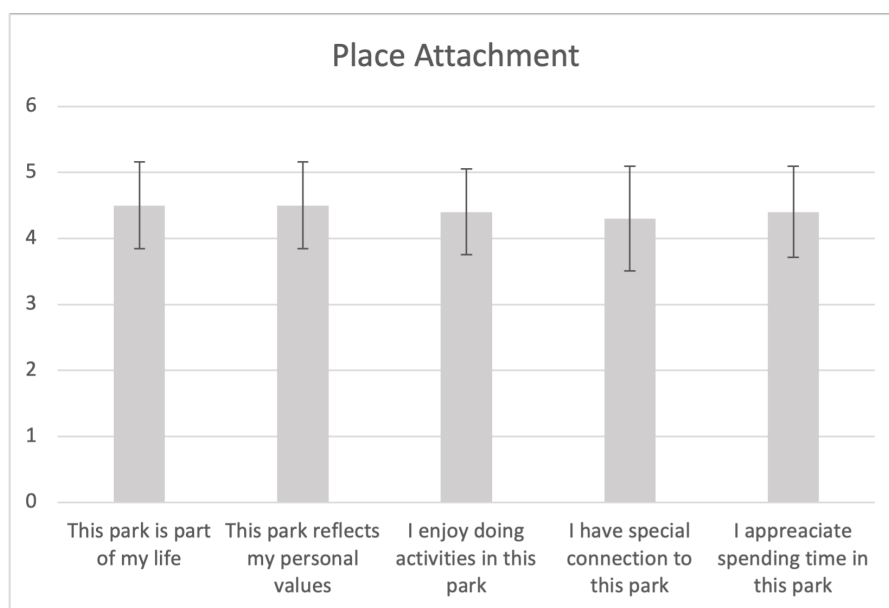
To understand the relationship between place and pro-environmental behavior, SPSS software was used to employ the quantitative method of the study and involved demographic profile analysis, mean and standard deviation calculation as well as the exploratory factor analysis. A Cronbach's alpha value of 0.927 has been recorded for the pro-environmental behavior indicator which consisted of 14 items. This indicates the excellent reliability of the scale, showing that the items consistently measure the intended construct.

**Table 1**  
 Demographic profile analysis of respondents

| Variable                  | Item              | Frequency | Percent (%) |
|---------------------------|-------------------|-----------|-------------|
| <b>Gender</b>             | Male              | 170       | 44.0        |
|                           | Female            | 206       | 53.4        |
| <b>Age</b>                | < 18 years old    | 31        | 8.0         |
|                           | 18-25 years old   | 72        | 18.7        |
|                           | 26-30 years old   | 56        | 14.5        |
|                           | 31-40 years old   | 102       | 26.4        |
|                           | 41-50 years old   | 70        | 18.1        |
|                           | >50 years old     | 46        | 11.9        |
| <b>Race</b>               | Malay             | 227       | 57.8        |
|                           | Indian            | 13        | 18.4        |
|                           | Chinese           | 79        | 20.5        |
|                           | Bumiputera        | 4         | 1.0         |
|                           | Other             | 9         | 2.3         |
| <b>Material Status</b>    | Single            | 249       | 64.5        |
|                           | Married           | 128       | 33.2        |
| <b>Occupation</b>         | Government Sector | 99        | 25.6        |
|                           | Retiree           | 24        | 6.2         |
|                           | Private Sector    | 109       | 28.2        |
|                           | Student           | 66        | 17.1        |
|                           | Self Employed     | 76        | 19.7        |
|                           | Other             | 9         | 2.3         |
| <b>Frequency of Visit</b> | 1-2 times/ year   | 28        | 7.4         |
|                           | 1-2 times/ month  | 139       | 37.0        |
|                           | 1-2 times/ week   | 153       | 40.7        |
|                           | Daily             | 56        | 14.9        |
| <b>Reasons of Visit</b>   | Jogging           | 199       | 52.9        |
|                           | Relaxing          | 136       | 36.2        |
|                           | Cycling           | 30        | 7.9         |

|  |                |     |      |
|--|----------------|-----|------|
|  | Events         | 5   | 1.3  |
|  | Skateboarding  | 3   | 0.8  |
|  | Other          | 3   | 0.8  |
| <b>Source of Knowledge about the place</b> | Family         | 134 | 35.6 |
|  | Friends        | 48  | 12.8 |
|  | TV/ Mass Media | 34  | 9.0  |
|  | Social Media   | 154 | 41.0 |
|  | Newspaper      | 3   | 0.8  |
|  | Other          | 3   | 0.8  |

Demographic profile analysis of respondents is important to provide better insights about the background of respondents and how the demographic data contribute to the visitation patterns of the place and their pro-environmental behavior. Table 1 presented an overview of respondents' characteristics involved in this study and showed that females (53.4%) slightly recorded more numbers than males (44%). In terms of age, the majority of respondents fall within the 31-40 years old category (26.4%), with those over 50 years being the least represented (11.9%). On the other hand, visitation patterns show a high frequency of park visits with 40.7% visiting 1-2 times per week and 37% visiting 1-2 times in a month. Activities during park visits are dominated by jogging (52.9%) and relaxing (36.2%) suggesting that the park primarily serves as a place for exercise and leisure activities. Finally, the main source of knowledge about the park comes from social media (41%) and family (35.6%) indicating the importance of personal networks and digital platforms in information dissemination.

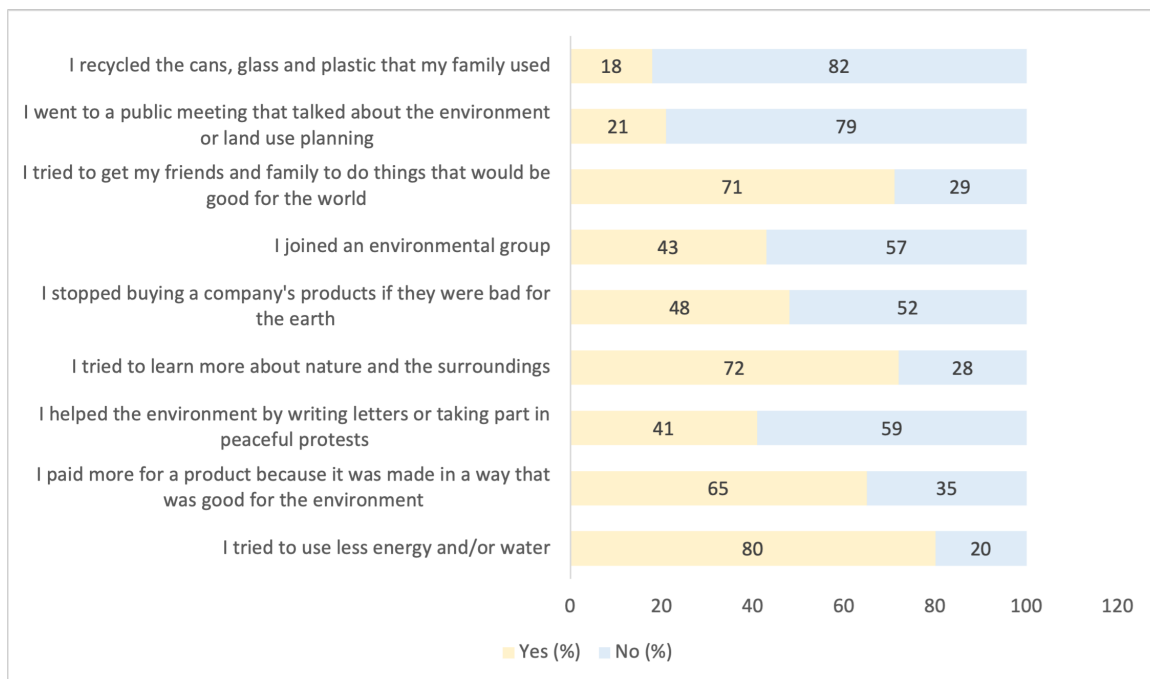


**Fig. 1.** Bar graph illustrating mean and standard deviation (error bars) of items indicating the place attachment tendencies among respondents

Figure 1 provides the mean scores of respondents' appreciation towards the level of place attachment in the context of the study site measured across different statements on a Likert scale. Each bar denotes the average level of agreement that the respondents felt which aimed to investigate the feelings of being attached to the place. The statement "This park is part of my life" shows a mean score of slightly over 4, indicating that the place holds a significant role in their everyday life, and the error bar is not large, suggesting that there is some consensus among the respondents about the

statement. Similarly, “This park reflects my personal values” has a comparable mean score, showing that respondents generally agree with that statement, and the error bar indicates a slightly larger standard deviation compared to the first statement, implying a bit more variability in responses.

“I enjoy doing activities in this park” has a mean score of just below 4, proving that the place is a popular spot for the respondents to enjoy their leisure activities, but possibly slightly less than the sentiments expressed in the first two statements. Overall, the mean score for all the statements representing the place attachment is recorded at the neutral midpoint of the scale, indicating positive feelings of a sense of pride towards the place. The standard deviation is reasonably small, implying there is a general agreement among the respondents. This could be interpreted as a strong feeling of appreciation towards the place, as the respondents value the park as part of their lives and reflective of their values. Next, further statistical analysis would be required to determine the relationship between place attachment and pro-environmental behavior among respondents.



**Fig. 2.** Frequency percentage bar chart illustrating pro-environmental behavior engaged by respondents

The bar chart as shown in Figure 2 illustrates the percentage who engage in various pro-environmental behavior that are diverse from small tasks such as recycling to active participation such as participating in an environmental advocacy. These activities offer a wide range of actions on how an individual could contribute to the sustainability of the environment based on their preferences and capabilities. Firstly, the most common pro-environmental behavior recorded by 80% of respondents stated that they tried their best to use less energy and water proving the high level of awareness and willingness to engage in everyday conservation practices.

72% of respondents agreed that they always learn to learn new things about nature and the surrounding environment showcase a significant interest in environmental education make policy makers or planners to plan more environmental awareness programs. Additionally, the behavior of community-oriented approach by getting their friends and family to be involved in actions that would be good for the environment is also recorded a high frequency which is almost 71% of respondents. Meanwhile, activities such as recycling and participating in environmental planning public talks are among the least recorded behavior, with only 18% and 20% of respondents, this may be due to a lack



of opportunities for recycling activities or public workshops for land use planning. This data reflects more passive forms of environmental activities rather than active participation. In summary, the bar chart shows the percentage of respondents who are actively engaged in a variety of pro-environmental behavior that highlighted that the conservation efforts in daily activities are much more likely to be engaged by people who are attached to the place.

## 6. Discussion and Conclusion

The findings of this study strongly proposed how the place attachment develops among respondents may contribute to the pro-environmental behavior predictors but be influenced by the visitation patterns of respondents. This was supported by Halpenny [6] and Jiao *et al.*, [7] who emphasized the early hypothesis of place attachment caused by longer exposure to the setting that resulting to stronger emotional bonds thus allowing pro-environmental behavior to occur. Place affect did not show a clear potential in order to predict pro-environmental behavior, but it seems to have a more vague and widespread influence [6]. This study found out a higher percentage of respondents who are willing to participate in environmental-based programs and this fact is similar to the findings by Devine-Wright [4] who stated that people who are attached to a particular place are likely to engage in any public meeting to express their disagreement if any change is plan for the area as it would directly affect their experience while being in the area.

As the visitation patterns might influence the level of place attachment, it is very important for planners and managers to prioritize in providing a natural setting that could fulfill their needs and demands in leisure activities as it will affect their decision to visit the park [13]. In addition, the negative relation between place attachment and pro-environmental behavior was not found in this study as well as the study conducted by Scannell *et al.*, [15]. However, Zhang *et al.*, [19] found out that the local community who reported a stronger attachment to their neighborhood green space was influenced by the high accessibility and functional space. This was supported by the findings of the study as the majority of respondents visited the park 1-2 times per week and the park is the place for them to perform types of recreational activities.

Additionally, place dependence is able to influence pro-environmental behavior directly as discussed by Halpenny [6], and indirectly based on the place identity and place attachment [13] as highlighted in this study. Ramkissoon *et al.*, [13] emphasized the need to manage the natural area setting since the impacts because of higher uncontrolled visits to the area may lead to the destruction of the setting. This study contributes to the expansion of literature particularly in ecosystem services research to understand how a sense of place is the main management tool to encourage people to do actions that highly value the environmental setting thus lessening the burden for local authorities, planners and managers [14]. The main challenge now is the identification of place and environmental identities that are constantly changing and how to identify these elements that cover a wide range of interests among different stakeholder groups [4].

In conclusion, this study is crucial for authorities and practitioners tasked with the sustainable planning and development of green spaces, as it provides a predictive tool for future decision-making and enhances strategies for engaging communities in environmental maintenance and restoration efforts.

## References

- [1] Ha, Chin Yee, Terh Jing Khoo, and Soo Chin Teh. "Malaysia green residential buildings and factors affecting the willingness of public on buying green residential buildings." *Progress in Energy and Environment* (2023): 33-43. <https://doi.org/10.37934/progee.25.1.3343>.

- [2] Ha, Chin Yee, Terh Jing Khoo, and Zheng Yik Koo. "Current status of green building development in Malaysia." *Progress in Energy and Environment* (2023): 1-9. <https://doi.org/10.37934/progee.25.1.19>.
- [3] Daryanto, Ahmad, and Zening Song. "A meta-analysis of the relationship between place attachment and pro-environmental behaviour." *Journal of Business Research* 123 (2021): 208-219. <https://doi.org/10.1016/j.jbusres.2020.09.045>.
- [4] Devine-Wright, Patrick, and Susan Clayton. "Introduction to the special issue: Place, identity and environmental behaviour." *Journal of Environmental psychology* 30, no. 3 (2010): 267-270. [https://doi.org/10.1016/S0272-4944\(10\)00078-2](https://doi.org/10.1016/S0272-4944(10)00078-2).
- [5] Ferreira, Sanette. "Moulding urban children towards environmental stewardship: the Table Mountain National Park experience." *Environmental Education Research* 18, no. 2 (2012): 251-270. <https://doi.org/10.1080/13504622.2011.622838>
- [6] Halpenny, Elizabeth A. "Pro-environmental behaviours and park visitors: The effect of place attachment." *Journal of environmental psychology* 30, no. 4 (2010): 409-421. <https://doi.org/10.1016/j.jenvp.2010.04.006>.
- [7] Jiao, Liying, Zhuo Ren, Zhen Guo, Shuqing Gao, and Yan Xu. "Individual differences in place attachment and pro-environmental behavior: Pride as an emotional tie." *Personality and Individual Differences* 214 (2023): 112357. <https://doi.org/10.1016/j.paid.2023.112357>.
- [8] Junot, Amandine, Yvan Paquet, and Fabien Fenouillet. "Place attachment influence on human well-being and general pro-environmental behaviors." *Journal of Theoretical Social Psychology* 2, no. 2 (2018): 49-57. <https://doi.org/10.1002/jts5.18>
- [9] Larson, Lincoln R., Richard C. Stedman, Caren B. Cooper, and Daniel J. Decker. "Understanding the multi-dimensional structure of pro-environmental behavior." *Journal of environmental psychology* 43 (2015): 112-124. <https://doi.org/10.1016/j.jenvp.2015.06.004>.
- [10] Masterson, Vanessa A., Richard C. Stedman, Johan Enqvist, Maria Tengö, Matteo Giusti, Darin Wahl, and Uno Svedin. "The contribution of sense of place to social-ecological systems research: a review and research agenda." *Ecology and Society* 22, no. 1 (2017). <https://doi.org/10.5751/ES-08872-220149>.
- [11] Meng, Lin, and Wentao Si. "Pro-Environmental Behavior: Examining the Role of Ecological Value Cognition, Environmental Attitude, and Place Attachment among Rural Farmers in China." *International Journal of Environmental Research and Public Health* 19, no. 24 (2022): 17011. <https://doi.org/10.3390/ijerph192417011>.
- [12] Moulay, Amine, Norsidah Ujang, Suhardi Maulan, and Sumarni Ismail. "Understanding the process of parks' attachment: Interrelation between place attachment, behavioural tendencies, and the use of public place." *City, Culture and Society* 14 (2018): 28-36. <https://doi.org/10.1016/j.ccs.2017.12.002>.
- [13] Ramkissoon, Haywantee, Liam David Graham Smith, and Betty Weiler. "Testing the dimensionality of place attachment and its relationships with place satisfaction and pro-environmental behaviours: A structural equation modelling approach." *Tourism management* 36 (2013): 552-566. <https://doi.org/10.1016/j.tourman.2012.09.003>.
- [14] Ryfield, Frances, David Cabana, John Brannigan, and Tasman Crowe. "Conceptualizing 'sense of place' in cultural ecosystem services: A framework for interdisciplinary research." *Ecosystem Services* 36 (2019): 100907. <https://doi.org/10.1016/j.ecoser.2019.100907>.
- [15] Scannell, Leila, and Robert Gifford. "The relations between natural and civic place attachment and pro-environmental behavior." *Journal of environmental psychology* 30, no. 3 (2010): 289-297. <https://doi.org/10.1016/j.jenvp.2010.01.010>.
- [16] Song, Zening, and Didier Soopramanien. "Types of place attachment and pro-environmental behaviors of urban residents in Beijing." *Cities* 84 (2019): 112-120. <https://doi.org/10.1016/j.cities.2018.07.012>.
- [17] Vaske, Jerry J., and Katherine C. Kobrin. "Place attachment and environmentally responsible behavior." *The Journal of environmental education* 32, no. 4 (2001): 16-21. <https://doi.org/10.1080/00958960109598658>.
- [18] Wilkie, Stephanie, and Hannah Trotter. "Pro-environmental attitudes, pro-environmental behaviours and nature-relatedness: Differences based on place preference." *European Review of Applied Psychology* 72, no. 2 (2022): 100705. <https://doi.org/10.1016/j.erap.2021.100705>.
- [19] Zhang, Yang, Terry Van Dijk, Jianjun Tang, and Agnes E. van den Berg. "Green space attachment and health: A comparative study in two urban neighborhoods." *International journal of environmental research and public health* 12, no. 11 (2015): 14342-14363. <https://doi.org/10.3390/ijerph121114342>.
- [20] Žlender, Vita, and Stefano Gemin. "Testing urban dwellers' sense of place towards leisure and recreational peri-urban green open spaces in two European cities." *Cities* 98 (2020): 102579. <https://doi.org/10.1016/j.cities.2019.102579>.