Explaining pro-environmental behavior by a relative sense of place attachment to neighborhood and city

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住区と市に対する愛着の相対的感覚差と環境配慮行動の関係

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要約

場所愛着は環境配慮行動を促進することが知られているが、異なる場所スケールに対するこれらの関係は検討されていない。本研究は、住区と市に対する愛着の相対的な感覚差が環境配慮行動の従事度合いに与える影響について、つくば市在住成人男女を対象とする質問紙調査により検討した（n = 277）。t 検定の結果、回答者の住区および市に対する愛着は市への愛着の方が高いことがみとめられた。さらに場所愛着の相対的感覚差別に回答者を群分けし、10 種類の環境配慮行動ごとに行動従事の程度を比較した結果、住区規模での環境改善に関係すると考えられる自動車利用抑制および節水について住区愛着選好群の行動従事度が市愛着選好群より有意に高いことがみとめられた。また、地球環境問題と関係すると考えられる省エネルギー製品購入について、場所愛着選好なし群が住区もしくは市愛着選好群よりも程度が高いことが示された。このことから、場所愛着と環境配慮行動との間には、場所スケールの観点から合理的な関係性があることが示唆される。

Key words

place attachment, territorial scale, neighborhood, city, pro-environmental behavior

1. Introduction

Humans have commonly settled certain places for relatively long periods to develop cities, consuming natural and environmental resources available in and outside these cities, utilizing human resources and land for producing goods and services, and developing a platform of economic, social, and cultural interactions (United Nations Human Settlements Programme (UN-Habitat), 2013). Cities attract people for many reasons including convenient living conditions and economic opportunities. On the other hand, the global society is increasingly aware of recent imbalances in human-environment relationships, particularly due to excessive growth of the human population and its concentration in cities (OECD, 2012). Therefore, people living in cities should be environmentally responsible through their everyday behavior to ease and reverse human impacts on the environment.

An essential first step for facilitating environmentally responsible behavior, namely pro-environmental behavior, should involve clarification of factors that encourage such behavior (Steg & Vlek, 2009). Among the diverse factors that determine pro-environmental behavior, recent research has suggested that place attachment facilitates pro-environmental attitudes and behaviors (Hernández, Martín, Ruiz, & Hidalgo, 2010; Scannell & Gifford, 2010; Vaske & Kobrin, 2001). Place attachment is a sense of place, or generally positive affect that a person feels in connection to a particular place/area that is one's living or working place, place for leisure, or other (Lewicka, 2011). Vaske & Kobrin (2001) revealed that place attachment is positively related to community cleanup and conserving water. Also, Scannel & Gifford (2010) found that place attachment and affinity for nature is positively related to pro-environmental behavior. These findings suggest that place attachment, generally on a neighborhood scale, plays a significant role in facilitating pro-environmental behavior in the living or visiting place which a person feels connected to (Carrus, Scopelliti, Fornara, Bonnes, & Bonaiuto, 2014). However, research on whether a sense of place attachment is related to specific pro-environmental behaviors in different environmental domains in a different manner, and if so how, has not yet been undertaken. That is, place attachment may perform a significant role in facilitating a pro-environmental behavior in particular domains (e.g. reducing car use) but not in the other domains (e.g. purchasing environmentally friendly products).

Place attachment, as its nature suggests, can be measured with different territorial scales. Individuals' have different degrees or senses of attachment to their residence (house, apartment), neighborhood, district, and city. A pioneer empirical study in this field revealed that place attachment to house, neighborhood, and city in Spain reflected a U-shape with higher attachment to house and city and lower attachment to neigh-

borhood (Hidalgo & Hernández, 2001). Similar results were replicated in another study on place attachment in two cities in Poland and Ukraine respectively, but the study also found the U-shaped relationship differed according to city appeal: this relationship was stronger in more attractive cities than less attractive ones (Lewicka, 2010). These findings provide important implications that place attachment, if related to pro-environmental behavior, should reflect its influence on pro-environmental behavior through context, or more specifically, scale of place concerned. As explained earlier, it is known that place attachment (generally neighborhood attachment) facilitates pro-environmental behavior. Further evolving this relationship from a territorial scale perspective, one should consider whether the different degrees of place attachment by territorial scale facilitate pro-environmental behavior differently. Pro-environmental behaviors in different domains can also be considered by territorial scale, as impacts of human behavior on the environment may be very local (e.g., noise, light), regional (e.g., air and water pollution), and global (e.g. climate change). It is thus important to explore the relationship between place attachment and pro-environmental behavior by territorial scale in order to design effective interventions to encourage pro-environmental behavior by utilizing a sense of place attachment among people. However limited research has been undertaken on this.

2. Aim and hypotheses

The aim of the present study was to examine whether place attachment to different territorial scales facilitates pro-environmental behavior in a different manner. In order to examine the relationship between place attachment and pro-environmental behavior in detail, the present study focused on two geographical scales of place, that is, neighborhood and city, and pro-environmental behavior in different environmental domains as explained in the following section.

The present study examined three specific hypotheses: (1) place attachment to city is stronger than that to neighborhood, (2) individuals who endorse stronger place attachment to neighborhood than to city are more engaged in pro-environmental behavior than those who do not and vice versa, and (3) the scale effect of place attachment on pro-environmental behavior differs depending on environmental domains: stronger endorsement in neighborhood attachment (i.e., stronger place attachment to neighborhood than to city) exerts positive scale effects only on neighborhood-scale environmental behavior and no significant effects on individual behavior related to global-scale environmental issues. Hypothesis 1 was set to examine whether findings from the present study were in line with previous findings. Hypotheses 2 and 3 were developed as original theories for the present study.

3. Method

3.1 Respondents

A questionnaire survey was conducted during November 2013 in Tsukuba City, Ibaraki Prefecture, Japan. Questionnaires were sent by mail to 1,423 residents, who were randomly selected from the official electoral (20 years old and above) register of Tsukuba City. They were asked to answer questions regarding their sense of place attachment to their neighborhood and Tsukuba City, daily pro-environmental behaviors, and socio-demographic status such as age, family size, and income. Collected questionnaires for analysis totaled 420, and 277 contained useable responses after excluding samples with missing values. Of the respondents, 49.10 % were male, and the average age was 49.40 years old (SD = 14.40). The average family size was 3.21 (SD = 1.47), and average annual household income was JPY5,418,733.

3.2 Measures

The questionnaire consisted of five parts. The present survey was implemented as a self-report questionnaire. The following description focuses upon the two parts used for analysis in the present study. Results using data from other parts of the present survey has been published elsewhere (Kaida & Kaida, 2015a).

3.2.1 Place attachment

The present study employed the place attachment scale used by Hernández et al. (2007). The scale consists of eight items including “I like living in this neighborhood”, “I would regret having to move to another neighborhood”, and “This is my favorite neighborhood to live in” (Hernández, Carmen Hidalgo, Salazar-Laplace, & Hess, 2007). The present study asked respondents their attachment to neighborhood and city by using the description “chonai” (neighborhood) and “tsukuba-shi” (Tsukuba City) in the respective questions. Respondents were asked to provide feelings about their attachment for the eight items in each of the two territorial scales (i.e., neighborhood and Tsukuba City) using a 5-point Likert scale with endpoints of “not at all” to “really a lot”. Place attachment scores for respective territorial scales were then obtained by calculating the average of the scores for the eight items.

3.2.2 Pro-environmental behavior

Questions regarding pro-environmental behavior consisted of ten specific behaviors in different domains: (a) refrain from car use during weekdays, (b) refrain from car use during weekend, (c) car sharing with families and friends, (d) save water use at home, (e) save electricity use at home, (f) set air-conditioning at a moderate temperature at home, (g) recycle cans, glass bottles, and plastic bottles, (h) use one’s own “eco” shopping bag instead of expendable plastic bags provided upon purchase, (i) buy products with an “eco label” (certified environmentally friendly products), and (j) buy energy efficient products. These items

were chosen because they are everyday behaviors and have been commonly examined in previous studies, and also because they cover a diverse scale of place (i.e., home, neighborhood, global) (Kaida & Kaida, 2015b; Nordlund & Garvill, 2002; Steg & Vlek, 2009; Stern, 1999). Behaviors (a)-(c) are related with car use (covering neighborhood to city and region scales), (d)-(f) related with energy and resource saving at home, and (g)-(j) related with consumption behavior that reduces greenhouse gas emissions (global-scale environmental issue). Respondents were asked to rate their engagement in environmental behaviors using a 5-point Likert scale with endpoints of 'never' to 'always'.

3.3 Analysis

Analysis of the questionnaire data was performed step by step to examine the three hypotheses in the present study. First, to test hypothesis 1, a *t*-test was undertaken to compare the scores for neighborhood attachment and city attachment. To test hypotheses 2 and 3, the sample was first separated into three sub-groups based on their relative place attachment by territorial scale: respondents who endorse stronger place attachment to neighborhood than to city (i.e. higher neighborhood attachment score than city attachment score) (NEIGHBORHOOD, $n = 97$), those who endorse stronger place attachment to city than neighborhood (i.e. higher city attachment score than neighborhood score) (CITY, $n = 110$), and those who report an indifferent attachment to neighborhood and city (i.e., equal attachment scores for neighborhood and city) (NEUTRAL, $n = 70$). Through use of a *t*-test ten specific pro-environmental behaviors were then compared between the three sub-groups to ascertain whether the NEIGHBORHOOD group performed more pro-environmental actions compared with the other groups (CITY and NEUTRAL).

4. Results

Comparison of place attachment scores by territorial scale and *t*-test result is presented in Table 1. The *t*-test found that neighborhood attachment (3.339) was lower than city attachment (3.435) with a statistical significance ($t = –2.48$, $p < 0.01$).

Pro-environmental behavior scores by behavioral domain and territorial scale of attachment are depicted in Figure 1. Comparing the two relative attachment groups, pro-environmental behavior scores were found to be higher in the NEIGHBORHOOD group for all the domains except for saving electricity use (behavior (e)). However, score difference between NEIGHBORHOOD and CITY was confirmed by statistical significance only for (a) less car use during weekdays, (b) less car use during weekends, (d) saving water use, and (i) choosing eco-labeled products. It was also found that the NEUTRAL group was the highest in performing pro-environmental behavior in the domains of (i) choosing eco-labeled products and (j) choosing energy efficient products. Also, comparing the scores between the domains, it was found that (e) saving electricity use, (f) setting air-conditioning at a moderate temperature, (g) recycling cans etc., and (h) bringing own shopping bag were relatively high.

Table 1: Place attachment scores and *t*-test result ($n = 277$)

	Mean	*S.D.*	
Neighborhood attachment	3.339	0.807	
City attachment	3.435	0.828	
Difference	-0.096	0.641	***

Note: Significant at $p < 0.01$ (***).

5. Discussion

The present study examined the relationships between place attachment and pro-environmental behavior focusing on attachment by territorial scale and different domains for such behavior. All three hypotheses were supported by the current results. Comparison analysis using a *t*-test on neighborhood attachment and city attachment revealed that respondents generally endorse stronger attachment to city than to neighborhood. This result is in line with the previous findings (Hidalgo & Hernández, 2001; Lewicka, 2010). However, the difference between city and neighborhood attachment is not very large compared with these previous findings. This may be because Tsukuba City is not necessarily an attractive city in terms of outward appeal and tourism, which may be important as a previous study found in a comparison between relatively popular cities and less known cities in Europe (Lewicka, 2010). Taken together, these results suggest that residents of Tsukuba feel stronger attachment to the city rather than their neighborhood, but it is those with stronger neighborhood attachment that are more engaged in pro-environmental behavior than those with a stronger city attachment.

The interesting findings from the current results are that the intensity of engaging in pro-environmental behavior is different between behavioral domains and is explained by sub-groups with different territorial scale preferences (hypotheses 2 and 3). According to Gustafson (2001), meanings of place and their relations with environment differ by territorial scale (Gustafson, 2001). The NEIGHBORHOOD group presented a higher score for reducing car use during weekdays and weekends. Taking into consideration that (reducing) car use is related with traveling from home, through neighborhood, to office, shopping district etc., it is possible that an individual's stronger attachment to their neighborhood than to city influences their daily pro-environmental behavior as it involves neighborhood being exposed to neighborhood communities and improves the neighborhood environment.

It is also notable that the NEUTRAL group which reported an indifferent attachment preference between neighborhood and city is engaged the most in choosing eco-labeled products and energy efficient products compared with the other two groups

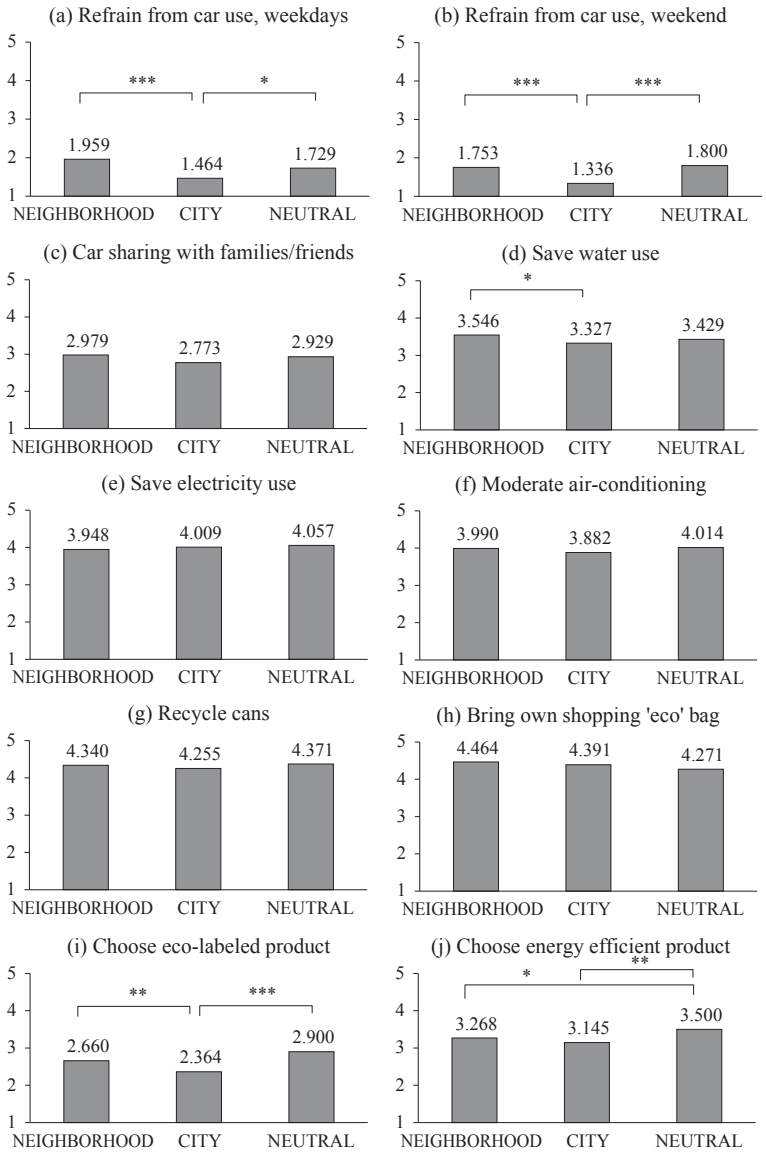

Figure 1: Pro-environmental behavior scores by behavioral domain and place attachment preference group
Note: Significant at $p < 0.1$ (*), $p < 0.05$ (**), and $p < 0.01$ (***). $n = 97$ (NEIGHBORHOOD), 110 (CITY), 70 (NEUTRAL)

of relative attachment preference (i.e., neighborhood or city). This may be because purchasing such products does not directly contribute to improving the neighborhood or city in terms of its environment but is rather expected to reduce climate change impacts on the global scale. Pro-environmental behaviors in other domains ((c), (e), (f), (g), and (h)) presented no statistical difference by place attachment preference. These findings for behaviors (e), (f), (g), and (h) may be understood in two ways. First, these behaviors are not necessarily related with improving neighborhood environments but rather contribute to solving environmental issues on national and global scales (e.g. mitigating climate change). Second, these pro-environmental behaviors are so commonly performed (>= 3.882), and thus difference in relative place attachment in these behaviors may have been saturated. Taken together, the current results suggest that strong neighborhood attachment preference may be related to pro-environmental behavior which involves physical exposure of pro-environmental consequences within a relatively local scale (neighborhood), while place attachment preference by neighborhood and city may not influence pro-environmental behavior that are assumed to be linked to global-scale environmental issues.

The present study acknowledges a few notable limitations. First, although the present results indicate that the difference in performing neighborhood-related pro-environmental behaviors (reducing car use and water use) reflects a relative sense of place attachment, the reasons for this difference was not clearly examined due to a lack of data. There should be important sub-constructs of the neighborhood and city attachment that could explain well its relationships with environmental behavior, such as social capital, locality appeal, and city pride. Also, individual perceptions toward environmental issues that were assumed to

correspond to pro-environmental behaviors were not considered in the present study. These psychological factors in the relationships between place attachment and pro-environmental behavior will be examined in a future study. Second, the present sample from Tsukuba City may be unique in terms of resident characteristics. Tsukuba City is a relatively young city in Japan, established about 40 years ago, and well known as a science city that accommodates a national university and over 200 national and private research institutes. This indicates that a measurable part of residents in this city are relatively recent and highly educated compared to the general population of Japan. Sense of place attachment among residents in Tsukuba may thus be different from the general population, and therefore the present results may not be generalized. Evidence from a more general population should be obtained in future studies.

In conclusion, the present study provides key findings on the relationship between place attachment and pro-environmental behavior: place attachment preference (neighborhood and city) is associated with an individual's tendency for pro-environmental behavior depending on the characteristics of pro-environmental behaviors (scale of the issue and consequence). The results suggest that place attachment is an important factor for understanding pro-environmental behavior from the perspective of diverse scales in environmental issues and appropriate behavior to promote a sustainable livable society.

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