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# Identification and Prediction of Latent Classes of Hikers Based on Specialization and Place Attachment

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**Abstract:** The purpose of this study is to extend previous research by combining the specialization and place attachment concepts. Applying a latent profile analysis (LPA) to data from hikers on the Olle Trail of Jeju Island in South Korea ( $N = 428$ ), we classified hikers who share similar profiles based on multiple dimensions of specialization and place attachment, and examined correlates of the derived typologies for drawing managerial implications. We also explored associations between these typologies and outcome variables of hikers. LPA identified three subgroups: “novice” (38%), “affection-driven” (40%), and “expert” (22%). The findings indicated that these groups differed in their past experience and socio-demographic characteristics, such that the “affection-driven” and “expert” groups have more experience in the setting than the “novice” group. These typologies also showed significant associations with hikers’ satisfaction and revisit intention; thus, “novice” hikers tended to be less satisfied with their hiking and the setting. Furthermore, the “novice” group reported lower intention to revisit the setting. Our findings reveal that LPA can be a useful tool for identifying subgroups of individuals who have engaged in particular sets of strategies by incorporating multiple activity-place dimensions.

**Keywords:** hiking; specialization; place attachment; typology; latent profile analysis (LPA); Olle Trail; Jeju Island; Korea; satisfaction; revisit intention

## 1. Introduction

Grouping users into specific market segments can help researchers and managers to understand and adequately respond to users’ desires. Prior typology studies using socio-demographic or geographical variables have made contributions to explain users’ distinct characteristics, but most have provided a limited understanding of outdoor recreationists’ psychological variables [1,2]. Considering the necessity of more detailed information to explain outdoor recreationists’ behaviors and motivation, scholars have been developing various concepts. In this regard, the concept of specialization has been used to comprehend outdoor recreationists, which includes multiple measures for behavioral, cognitive, and affective aspects of activities [1–5]. Setting experience may be regarded as a component of specialization [2]; as people become deeply absorbed in an activity, they also may have affection for a certain place that facilitates their activities. However, specialization mainly focuses on the development process of an “activity” [5–8]. Regarding “place,” studies have paid attention to the extent and intensity of place attachment. It is defined as an affective bond between users and the environment in which users become deeply absorbed in an outdoor recreation activity, and users may build affection for

a certain place that facilitates their activities [9]. Thus, despite different focuses (i.e., activity vs. place), researchers have used specialization and place attachment as useful conceptual frameworks to better understand outdoor recreationists' behaviors and the outcomes [7,10,11]. In particular, both concepts are closely related to sustainable resource management, such as sensitivity to resource and social conditions [11–15] and recreation-related impact [5], conservation involvement [4,6], and environmental behavior [16–18].

Specialization includes the length of time in certain settings where a particular activity takes place [3]. On the side of activity, place attachment measures how much a place facilitates the user's activity [19]. In this sense, previous studies reveal the close relationship between specialization and place attachment [11,20–22]. As a promising way to examine the associations between these two concepts, prior studies tried to create a typology using specialization and place attachment [16–18]. However, there are some limitations in these typology studies. First, previous studies used summative approaches to represent each concept [11,20,23]; that is, they were not able to consider variations in the different dimensions that make up both concepts. Although the conceptual model posits substantial correlations among various components of specialization [3,5], highly specialized people sometimes reduce their participation because of leisure constraints such as pregnancy or injury [24]. Second, previous typology studies have used the mean or median split of both concepts to classify groups [24,25], which has been criticized because of the simplicity of method [26–28]. Also, some typology studies were based on cluster analysis, but ambiguity on how to standardize scores for grouping has been indicated [26,28,29]. This issue may be more relevant in the case of psychological measures such as specialization and place attachment [30,31].

In response to these methodological limitations, Kim and Song [31] used a latent profile analysis (LPA) to identify distinct classes of hikers based on multiple dimensions of specialization. Their findings have shown diverse behavioral patterns of hiking experience, place experience, and hiking experience in a certain place. However, this study has focused on specialization dimensions, which mixes activity- and place-related measures. Thus, it would be helpful to use distinctive measures of specialization and place attachment for deeper understanding of place experience. For example, if the site setting is famous for activities other than hiking, the attachment to the place may be high but the specialization for hiking may be low. In addition, previous typology studies were exploratory and descriptive; they did not examine associations of their typologies with users' various outcomes for practical applications [17,18,24]. Thus, this study aims to expand the horizon of outdoor recreation typology by combining specialization and place attachment to distinguish hikers. In sum, the purpose of this study is (a) to explore a typology of hiker specialization and place attachment using latent profile analysis (LPA) as an improved type of clustering method; (b) to compare hikers' socio-demographic characteristics by membership of derived typologies; and (c) to examine associations between these typologies and the outcome variables of hikers (i.e., satisfaction and intention to revisit).

## 2. Literature Review

### 2.1. Specialization in Recreationists' Behaviors

According to Bryan [3], specialization is a linear hierarchical progression from novice to expert in a certain activity based on technique preferences, setting preferences, experience in the activity, and the relationship of the activity to other areas of life. Since his initial research, this concept expands on the notion to include behavioral (i.e., experience, investment, and setting preference), cognitive (i.e., skill and knowledge), and affective components (i.e., involvement and centrality) in order to define types of recreationists and distinguish among them [1,5]. As a multidimensional aspect of experience measurement, this concept has been recognized as more useful than socio-demographic characteristics or geographical variables for explaining differences in preferences, behavior, and attitudes among people in a leisure activity which takes time and effort to act [1,3,6]. In particular, previous empirical research has attempted to understand the outcome of specialization in the management context.

Thus, researchers found associations between specialization and a number of recreation-related attitudes, such as acceptance and support for the rules and norms and conservation with the certain activity [4–6,16,18,32,33]. In particular, in the view of sustainable management action, Hvenegaard [6] pointed out that advanced-experienced groups were more likely to be a member of a conservation club. Thapa et al., [18] also revealed the positive impact of specialization on environmental knowledge and engagement in environmentally responsible behaviors.

Regarding the measurement of specialization, however, the general consensus is sparse. Empirical studies have either measured the specialization concept as a multidimensional index [34,35] or have examined individual underlying dimensions, such as experience, skill, and commitment, separately [5,10,33]. Although the summative approach has merits in its simplicity, it is based on researcher-determined groups and obscures the explanatory detail of each dimension [5,26]. For instance, some people may partake continually and become more involved in a particular activity, but their skill or knowledge may not rise proportionately. Others may recreate irregularly but exhibit high skill and involvement [26,27]. Since specialization is a multidimensional construct, each dimension should be individually examined, as combining the multiple measures into a composite index may lead to conceptual ambiguity of the construct. An individual-centered approach (e.g., typology) would be appropriate to capture individual dimensions of multidimensional concepts within individuals [31].

There are various categories of unique characteristics and distinct types of users in various activities [3]. For example, the indicators of specialization for anglers and hunters are slightly different from those for hikers. Discrete groups show different needs and behaviors. Using recreation specialization as a tool allows researchers to segment users into meaningful subgroups and to grasp better management preferences, motivations, perceptions, and social norms of outdoor recreation participants [2]. For example, Bryan [36] classified anglers into four categories, while other researchers have classified recreationists into two [37], three [16], and even six categories [29]. However, little consensus is found among researchers on the number of groups across different activities. In this context, we will focus on the unique characteristics of “hiking” and attempt to identify distinct types of users in hiking.

## 2.2. Place Attachment in Recreationists' Behaviors

Experience with a particular setting may accumulate to create attachment to that setting [9]. Place attachment is defined as the extent an individual value with a particular environmental setting, which is commonly measured by emotional (i.e., place identity) and functional aspects (i.e., place dependence) [10,11]. Place attachment is one of the important factors in determining recreation behavior, including environmental attitudes, satisfaction, and behavior loyalty [38]. As part of incorporating place attachment into a recreation management context, Kaltenborn and Williams [12] argued that understanding place attachment can serve a crucial role in attracting people and improving the quality of experiences. Warzecha and Lime [39] also supported the usefulness of place attachment as a good indicator of user preferences, motivations, and satisfaction. According to Tsai [40], place attachment plays a valuable role in eliciting attitudinal loyalty and re-visitation through an attachment-nurturing foundation that is composed of emotional pleasure, cognitive stimulation, psychological growth, self-expressiveness, and commitment awareness. Place attachment has also been studied as a solution to social and ecological sustainability [13,16,17,39,41]. Halpenny [17] identified a positive association between place attachment and pro-environmental intention among park visitors. Walker and Chapman [41] also showed a positive impact of place attachment on perspectives of park management, intention to volunteer, and intervention in devaluation of certain settings.

Meanwhile, the place-based typology has been studied as a way to better understand management contexts. Kyle et al. [7] have classified hikers into three categories using their attachment level to the setting: high, medium, and low. The high-attached group tended to favor hiking alone but enjoyed sharing information with people who had a similar attitude towards hiking and the

setting. The medium-attached group showed more activity-based needs than setting-related needs. The low-attached group expressed more social motivation than the other two groups. However, this study overlooked the various forms of attachment in the psychological context by using mean split. In this regard, Hutson and Montgomery [42] considered various aspects of place meaning by using a qualitative approach (i.e., an exploratory Q); they identified three types of place meaning among stakeholders (i.e., intensity seekers, sense of self seekers, and spirituality seekers). These findings suggest that more attempts to capture different dimensions or views of place meaning would be warranted.

### *2.3. Specialization-Place Attachment Typology in Recreationists' Behaviors*

The concept of Recreation Opportunity Spectrum (ROS) posits that the recreation experience is affected by the activity and the setting in which it occurs. As experience-based setting management, the ROS divided settings to match desired experience of recreationists with activities, motivations, and benefits [43]. Researchers have tried to conceptualize the relationship between specialization and place attachment in that the activity always occurs in some place. Whether level or degree of activity specialization has influence on the formation of place attachment is unclear. However, as people repeat an interaction with an activity in a particular place, they may naturally become more attached [6]. Among the individual dimensions of specialization, past use experience [11,20], skill level [10], commitment [20], centrality [10], and activity involvement [11,23,25] appeared to have some links with place attachment.

Previous studies showed that high involvement in an activity leads to strong loyalty, which increases the possibility of long-term continuation of participation and accumulation of attachment to a place [11,36,37]. Several studies have found a positive relationship among affective dimensions of specialization (i.e., activity involvement), place attachment, and outcome variables such as satisfaction [44–46], motivation [24], and behavior [1,23,39]. Furthermore, few scholars have used an involvement-place attachment typology to categorize patterns of behavioral characteristics [17,18]. As a result, these studies have shown associations among the individual dimensions of both concepts; considering individual dimensions of specialization and place attachment simultaneously may be a good tool for segmenting hikers. Although previous studies found a significant relationship between the level of place attachment and prior expectation with consideration of involvement level, these studies assumed that activity involvement and place attachment have equal influence on users' behavior; thus, they did not consider the complex and dynamic nature of psychological measurement. In this sense, in the present study, we identified latent typologies of Korean hikers on multiple dimensions of specialization and place attachment concepts. To profile these groups, we investigated how the derived groups differ in terms of their demographics and past experience in the setting. We also examined associations of latent class membership with the outcome variables of satisfaction and intention to revisit.

## **3. Method**

### *3.1. Sample*

Participants include Korean hikers visiting the Olle Trail (OT) on Jeju Island, the most well-known island and tourist destination in South Korea. The study setting is fit to observe not only the hiking specialization but also place attachment, because OT is famous as one of the best trails and has a reputation as a representative tourism site where OT is located. A total of 500 visitors were interviewed during the summer of 2011. By using a stratified technique for obtaining a representative sample, surveys were conducted at end points of the trail. Data from 428 participants who completed the survey were analyzed for this study (86% response rate). See Table 1 for sample characteristics.

**Table 1.** Socio-demographic characteristics of respondents ( $N = 428$ ).

Characteristics	Mean (SD) or %	
Age	36.38	(14.07)
Gender		
Male	36.2	
Female	63.8	
Marital status		
Single	49.5	
Married	48.1	
Divorced	1.4	
Undefined	0.9	
Education <sup>1</sup>	3.41	(1.44)
1. Some high school	12.6	
2. High school graduate	17.3	
3. Business school, trade school, some college	11.4	
4. College graduate	43.5	
5. Some graduate school	4.7	
6. Masters, doctoral, or professional degree	10.5	
Household income <sup>2</sup>	2.50	(1.61)
1. Less than \$20,000	29.9	
2. \$20,000 to \$39,999	35.3	
3. \$40,000 to \$59,999	14.3	
4. \$60,000 to \$79,000	7.9	
5. \$80,000 to \$99,000	4.7	
6. \$100,000 or more	7.0	
Residence status		
Jeju Island (i.e., residents)	7.2	
Experience of visitation		
First visit to Jeju Island	17.6	
First visit to Olle Trail	74.1	

<sup>1</sup> Rated on a 6-point scale from 1 (*some high school*) to 6 (*masters, doctoral, or professional degree*). <sup>2</sup> Rated on a 6-point scale from 1 (*less than \$20,000*) to 6 (*\$100,000 or more*).

### 3.2. Measures

**Group identification indicators.** We used five indicators to classify Korean hikers: three dimensions of specialization and two dimensions of place attachment. Specialization measures focused on the activity (i.e., hiking) while place attachment measures focused on place-related experiences (i.e., the Olle Trail).

*Specialization.* We measured hikers' specialization using 12 items modified from previous studies [5,10], divided into behavioral, cognitive, and affective dimensions (see Table 2 for descriptive statistics). To make scales, the original behavioral items were recoded and the other two dimensions were rated on a 5-point scale from 1 (*strongly disagree*) to 5 (*strongly agree*). Mean scores for each dimension were calculated. Specifically, the behavioral aspect consisted of three items, including recent hiking experience, visiting experience for hiking purpose, and lifetime hiking experience. The cognitive component was measured using two items reflecting self-reported hiking skill and knowledge levels. The affective aspect was assessed using seven questions regarding levels of hiking involvement.

**Table 2.** Descriptive statistics of grouping and outcome variables.

	Number of Items	$\alpha$	Mean (SD) or %	
<b>Grouping variables</b>				
<i>Specialization</i>				
Behavioral <sup>1</sup>				
How many days have you spent hiking in the last 12 months?	3	0.75	2.75	−1.55
How many times did you visit some place primarily to hike?				
How many years have you been hiking?				
Cognitive <sup>1</sup>				
Skill	2	0.93	1.7	−0.97
Knowledge				
Affective <sup>2</sup>				
Hiking offers me relaxation when life's pressures build up	7	0.94	3.1	−1.1
I can say that I particularly like hiking				
I enjoy discussing hiking with my friends				
I have an interest in hiking				
Hiking is very important to me				
Hiking says a lot about who I am				
I find that a lot of my life is organized around hiking				
<i>Place attachment</i>				
Place identity <sup>2</sup>				
I identify strongly with "Olle Trail"	4	0.91	2.88	−1.02
I am very attached to "Olle Trail"				
Visiting "Olle Trail" says a lot about who I am				
"Olle Trail" means a lot to me				
Place dependence <sup>2</sup>				
No other place can compare to "Olle Trail"	3	0.86	3.13	−1.04
I get more satisfaction out of visiting "Olle Trail" than any other				
I wouldn't substitute any other area for doing the types of things I do at "Olle Trail"				
<b>Outcome variables</b>				
<i>Hiking satisfaction</i>				
Satisfaction enjoyment <sup>2</sup>				
I thoroughly enjoyed the hiking	6	0.73	3.34	−1.01
I was able to get away from the usual demands of life				
The hiking was as enjoyable as I expected it to be				
I enjoyed hiking with the people I hiked with				
I would like to hike more challenging trails				
I learned how to become a better hiker				
<i>Place satisfaction</i>				
Satisfaction with nature <sup>2</sup>				
"Olle" offers a lot in terms of natural scenic beauty	2	0.62	3.92	−0.87
The environment in the "Olle" is clean				
Satisfaction with amenities <sup>2</sup>				
The "Olle" provides a variety of recreational activities	4	0.73	2.83	−1
Variety of food and drink available in rest area				
The "Olle" has festivals, concerts, and events				
The "Olle" has good restaurants				
<i>Intention to revisit</i>				
Have intention to revisit <sup>3</sup>	1	−	80.8	

<sup>1</sup> Rated on a 5-point scale from 1 (*novice*) to 5 (*expert*). <sup>2</sup> Rated on a 5-point scale from 1 (*strongly disagree*) to 5 (*strongly agree*). <sup>3</sup> Coded 1 (*having intention to revisit*) and 0 (*no intention to revisit*).

*Place attachment.* To measure the two dimensions of place attachment, we adopted items from Kyle et al. [11]. Place identity was assessed using four items, and place dependence was assessed using three items.

## Outcomes

*Satisfaction.* We assessed participants' satisfaction with hiking and place separately. Whereas hiking satisfaction measures enjoyment and achievement from hiking itself (6 items) [47], place satisfaction focuses on satisfaction with the nature (2 items) and amenity (4 items) aspects of the setting [48].

*Intention to revisit.* We also asked whether participants intended to revisit the Olle Trail in the future, and coded 1 for having the intention to revisit and 0 for no.

*Past experience in the setting.* To measure participants' past experience in the setting, we asked whether they had visited Jeju Island in the past, and coded 1 for having experience and 0 for no experience.

*Socio-demographic information.* The participants reported on their demographic characteristics (see Table 1). Age was reported for chronological age (years). Gender was coded 1 for female and 0 for male, and marital status was recoded 1 for married and 0 for not married. Participants rated their education levels using a 6-point scale. Finally, participants indicated their monthly household income in Korean currency, which was converted into US dollars (exchange rate in effect Sep. 1, 2011).

### 3.3. Analytic Strategy

*Identification of typologies.* To classify subgroups, we used latent profile analysis (LPA). Unlike a variable-centered approach (e.g., Structural equation model (SEM), regression) that focuses on the relationships between variables, a person-centered analytic approach (e.g., LPA, cluster analysis) focuses on the structure of cases, categorizing similar patterns of behavioral and psychological characteristics among the population [49]. LPA is a model-based analysis that provides model fit indices, such as the Akaike information criterion (AIC) and Bayesian information criterion (BIC), to compare different model solutions [50]. Also, LPA offers researchers the opportunity to explore the effects of covariates on class membership as well as the relationship between classes and outcomes.

In this analysis, we identified hikers' latent profiles using individual dimensions of specialization and place attachment. Multiple dimensions of specialization and place attachment are ideally suited to demonstrate the strength of LPA and identify profiles of scores that differ quantitatively (profile level) as well as qualitatively (profile shape) [51,52]. We performed LPA using Mplus 6.0. The minimization of both the BIC parsimony index and cross-classification probabilities determines the number of groups. After determining the best number of latent classes using the AIC and BIC, we looked at the mean levels of indicator dimensions of a particular class in order to label the classes. Finally, we checked the probability of class membership for each person to know which individuals belong to which class.

*Validation of typologies.* After deciding on the best-fitting model, we compared the salient features of the latent classes to validate exclusiveness of the classes. We first examined whether hiker types differentiated socio-demographic characteristics of hikers using ANOVA for continuous variables (e.g., age and education) and Chi-Squares for dichotomous variables (e.g., gender and marital status). For the next step, we also assessed the relative magnitude of influence of hikers' characteristics on the specialization-place attachment typology membership using a multinomial logistic regression model. In this step, the independent variables were age, gender, marital status, education, income, and past experience with the Olle Trail.

*Typologies and outcomes of visitation.* We examined the relationship between the specialization-place attachment typology and the visitation outcomes. We considered the dummy-coded typologies of specialization and place attachment, demographic variables, and past experience with the OT as predictors of the outcomes of visitation. We used ordinary regressions for satisfaction outcomes and logistic regression for intent to revisit.

## 4. Results

### 4.1. Description of Sample and Indicator Variables

A descriptive summary of the sample is shown in Table 1. The majority of participants were female (63.8%) and the mean age of participants was 36.4 ( $SD = 14.07$ ). Most participants (83.4%) had some education beyond high school. About two-thirds of the respondents (63.8%) had an annual income under \$40,000, which is close to the median household income in Korea. Most of the respondents were repeat visitors to Jeju Island (82.4%). Although the Olle Trail is becoming popular as a national hiking spot, it was only built about seven years ago, and most people are first-time visitors (74.1%).

In this study, the typology incorporated dimensions of specialization and place attachment (see Table 2). The theoretical conceptualization of three dimensions of specialization and two dimensions of place attachment was validated by results of the confirmatory factor analysis. As indicated by model fit indices (i.e., Chi-square = 332.60;  $df = 125$ ; RMSEA = 0.05; NFI = 0.94; CFI = .96; GFI = 0.92), the model fit was acceptable. The reliability coefficients demonstrated high internal consistency.

We also checked the outcome variables by an exploratory factor analysis. Six items of activity (hiking) satisfaction revealed a single factor, explaining 62% of the total variance. It showed high internal consistency ( $\alpha = 0.73$ ). For place satisfaction, six items formed two factors explaining 61.5% of the total variance: satisfaction with both supporting services and facilities (amenity satisfaction;  $\alpha = 0.73$ ) and satisfaction with the natural environment (nature satisfaction;  $\alpha = 0.62$ ).

### 4.2. Selection of the Latent Class Model

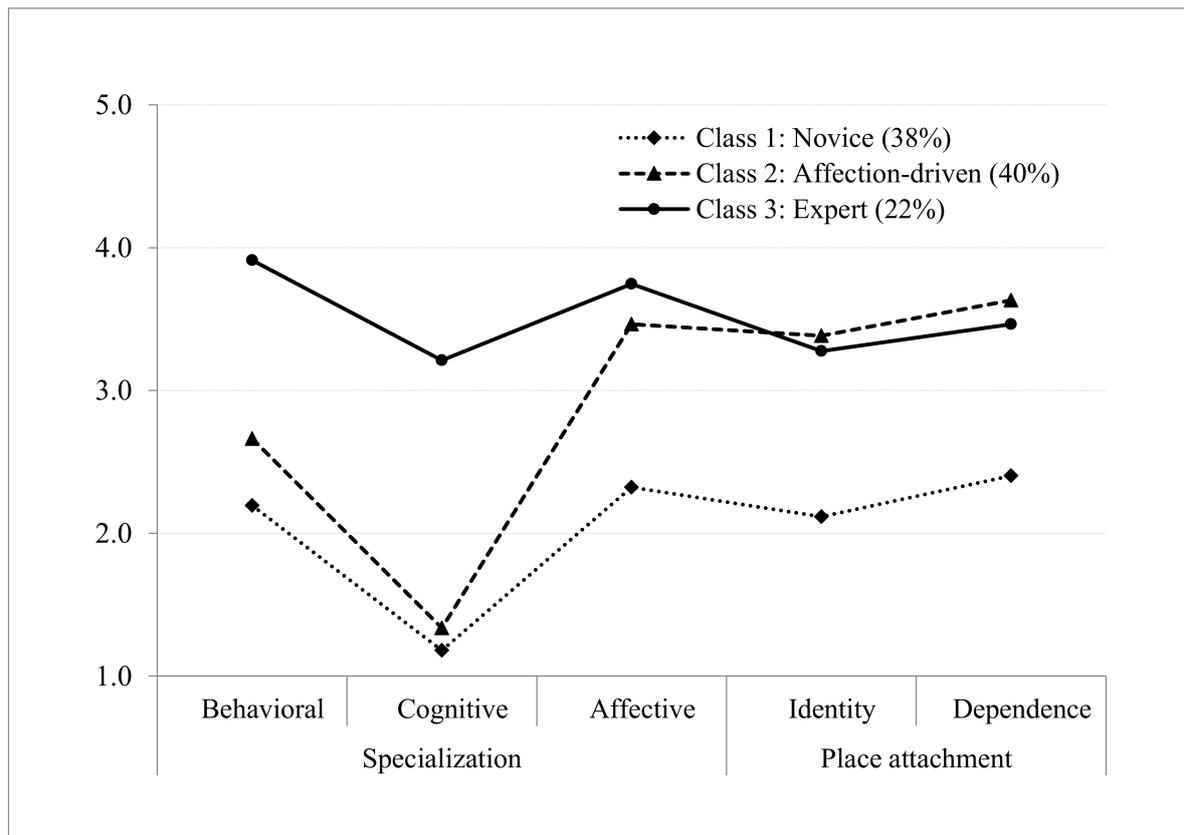
The model fit indices for 2 through 5-class solutions were compared (see Table 3). Although the BIC values continued to decrease with the inclusion of additional classes, they began to level off after the 3-class solution. The Lo-Mendell-Rubin (LMR) likelihood ratio test showed that the 3-class solution was the best fit. Specifically, the  $p$  value indicated that a 3-class solution fit the data better than a 2-class solution, whereas a 4-class solution did not fit the data better than a 3-class solution.

**Table 3.** Latent class model fit indices.

Number of Classes (k)	AIC	BIC	Entropy	LMR LRT $p$ -Value	Adjusted LMR LRT $p$ -Value
2	5600.21	5665.16	0.88	0.02	0.02
<b>3</b>	<b>5369.72</b>	<b>5459.02</b>	<b>0.81</b>	<b>0.00</b>	<b>0.00</b>
4	5285.94	5399.60	0.81	0.32	0.32
5	5240.88	5378.89	0.81	0.33	0.33

Notes. Boldface type indicates the selected model. AIC = Akaike information criterion; BIC = Bayesian information criterion; LMR = Lo-Mendell-Rubin; LRT = Likelihood Ratio Test (comparison with a  $(k - 1)$  class model).

Standardized mean scores and raw scores for the specialization and place attachment measures are shown separately for the three classes in Figure 1 and Table 4. Visual inspection of the data revealed that Class 1 scored lower than Classes 2 and 3 on all measures and was labeled the “novice” group. Class 3 appeared to score higher than Classes 1 and 2 on virtually all measures and was labeled the “expert” group. Class 2 appeared to score in an intermediate range on almost all specialization measures, with relatively higher scores on the affective dimension of specialization and the two place attachment dimensions, and thus was labeled the “affection-driven” group. It should be noted that these labels were assigned based on relative differences between the classes. The greatest separation between groups was observed for the affective dimension of specialization and both dimensions of place attachment in Class 2.



**Figure 1.** Standardized mean scores of the specialization-place attachment measures for each class.

**Table 4.** Sample characteristics by class.

	Class 1 (38%)		Class 2 (40%)		Class 3 (22%)		F or $\chi^2$	
	"Novice"		"Affection-Driven"		"Expert"			
	Mean	(SD)	Mean	(SD)	Mean	(SD)		
<i>Specialization</i>								
Behavioral	2.20	(1.04)	2.68	(1.21)	3.80	(0.11)	61.69	***
Cognitive	1.18	(0.38)	1.33	(0.44)	3.24	(0.56)	724.19	***
Affective	2.29	(0.77)	3.49	(0.65)	3.74	(0.63)	177.34	***
<i>Place attachment</i>								
Identity	2.07	(0.63)	3.42	(0.61)	3.25	(0.76)	194.97	***
Dependence	2.37	(0.73)	3.66	(0.65)	3.45	(0.77)	146.96	***
<i>Demographics</i>								
Age	32.92	(13.75)	36.26	(13.57)	42.43	(13.58)	13.86	***
Female (%)	64.4		71.1		49.5		12.45	***
Married (%)	41.9		44.5		65.3		14.58	***
Education	3.20	(1.56)	3.46	(1.31)	3.71	(1.40)	4.11	**
Income	2.29	(1.51)	2.48	(1.55)	2.93	(1.84)	4.77	**
<i>Past experiences</i>								
Have visited Jeju Island (%)	78.0		85.5		87.4		4.94	
Have visited Olle Trail (%)	18.1		27.2		36.8		11.10	***
<i>Satisfaction</i>								
Activity	2.86	(0.74)	3.58	(0.68)	3.74	(0.67)	63.95	***
Nature	3.70	(0.76)	4.03	(0.71)	4.10	(0.65)	12.72	***
Amenity	2.66	(0.75)	2.95	(0.72)	2.90	(0.71)	7.03	**
Intention to revisit (%)	65.6		88.4		92.6		38.89	***

\*\*  $p < 0.01$ . \*\*\*  $p < 0.001$ .

In summary, the 3-class model yielded the following three classes: (a) a “novice” class in which hikers reported the lowest levels of both specialization and place attachment (38%); (b) an “affection-driven” class in which hikers reported a lower level of behavioral and cognitive specialization and higher level of affective specialization and place attachment (40%); and (c) an “expert” class in which hikers reported higher levels of both specialization and place attachment (22%), although place attachment was slightly lower than in class 2.

#### 4.3. Characteristics of the Classes

Table 4 indicates that the three classes differed significantly on all 5 specialization-place attachment measures. Among class identification indicators, post-hoc tests revealed that the “expert” class exhibited the highest scores for all specialization dimensions, in particular, for the behavioral and cognitive dimensions. Meanwhile, among the place attachment dimensions, the “affection-driven” class displayed the greatest place identity and place dependence, but did not differ significantly from the “expert” class.

The classes differed in terms of age, gender, marital status, and education. Compared with the “novice” class, the “expert” class reported more education and were more likely to be married. In addition, the “expert” class was comprised of older hikers and more male hikers compared with the “novice” class. In particular, the “novice” class reported less satisfaction with their activity ( $F = 63.95$ ,  $p < 0.001$ ), the nature ( $F = 12.75$ ,  $p < 0.001$ ), and amenity dimensions ( $F = 7.03$ ,  $p < 0.01$ ) of setting satisfaction than did the “affection-driven” and “expert” classes. While there were no significant differences among the three classes for past experience with Jeju Island, we found a significant difference for past experience with the Olle Trail ( $\chi^2 = 11.10$ ,  $p < 0.01$ ). While all hikers showed a high intention to revisit, the “novice” class showed relatively less intention to revisit the Olle Trail than the “affection-driven” and “expert” classes ( $\chi^2 = 38.9$ ,  $p < 0.001$ ).

#### 4.4. Predicting Latent Class Membership

As shown in Figure 1 and Table 4, the “novice” class had overall lower levels and the “expert” class had higher levels on the specialization-place attachment dimensions. Both groups also showed significant associations with the outcome variables. For the “novice” and “expert” classes, profiles in each class differed mainly in terms of quantitative levels (e.g., uniformly high or low scores across all components of the profiles). However, the “affection-driven” class was comprised of mixed levels, scoring low on behavior and cognitive specialization and high for the affective dimension of specialization and both dimensions of place attachment, and they displayed a different pattern in relation to outcomes, ranking in the middle among the three classes. This pattern of the “affection-driven” class suggests that an LPA of multiple dimensions of specialization and place attachment should result in groups of hikers with qualitatively different profiles: groups with opposite levels, as well as groups that differ in terms of overall levels (i.e., uniformly high or low). In particular, there may be an idiographic approach (i.e., discovery of a particular fact and process as distinct from general law) in the formation of different attachments to activity and place, suggesting that a person-centered approach is needed. Thus, the “affection-driven” class indicates the need to use LPA for identifying different tendencies in the profiles. We used the “affection-driven” class as the reference group.

The following individual characteristics were included as predictors of the latent classes of the specialization-place attachment typology: socio-demographic variables and hikers’ past experience with the Olle Trail. Results of the overall model predicting latent class membership from the entire set of covariates are shown in Table 5. Marital status, education, income, and past experience with the Olle Trail were not significant predictors when included in the overall model, while gender ( $p < 0.01$ ) and age ( $p < 0.01$ ) significantly predicted specialization-place attachment latent class membership.

**Table 5.** Odd ratios for effects of socio-demographic characteristics and past experience on membership in specialization-place attachment latent classes ( $N = 428$ ).

	$\Delta$ -2 Log-Likelihood <sup>1</sup>	Class 1 “Novice”	Class 2 <sup>2</sup> “Affection-Driven”	Class 3 “Expert”
<b>Demographic characteristics</b>				
Age	627.64 **	0.69	**	(1.00) 1.18
Female ( <i>yes</i> = 1)	624.25 **	0.69		(1.00) 0.45 **
Married ( <i>yes</i> = 1)	618.62	1.91		(1.00) 1.52
Education	616.36	0.95		(1.00) 1.05
Income	615.93	0.96		(1.00) 1.03
<b>Past experience</b>				
Have visited Olle Trail ( <i>yes</i> = 1)	624.87 **	0.70		(1.00) 1.57

Notes. Overall Model  $\chi^2(12) = 53.56, p = 0.000$ ;  $-2 \log$  likelihood = 615.34; Pseudo  $R^2$  (Nagelkerke) = 0.13. <sup>1</sup>  $p$ -values represent the overall effect of each covariates controlling for the others based on a log-likelihood. Difference test ( $\Delta df = 12$ ). <sup>2</sup> Reference class has odds ratio of 1.00. \*\*  $p < 0.01$ .

The estimated log-odds coefficients and the corresponding log-odds confidence intervals were converted into odds ratios. Table 5 shows the increase in odds of membership in the “affection-driven” latent class relative to the “novice” and “expert” latent classes corresponding to a one-unit increase in the covariate. For example, as age increased, the odds of a hiker being a “novice” was over 0.7 times lower (odds ratio ( $OR$ ) = 0.69), compared to an “affection-driven” hiker. Female hikers were less likely to be in the “expert” class than in the “affection-driven” class ( $OR = 0.45$ ).

#### 4.5. Latent Class Membership and Outcomes

Table 6 shows how the latent classes are associated with satisfaction and intention to revisit, controlling for socioeconomic demographics and past experience with the setting. The regression model used dummy-coded groups of hikers. The “affection-driven” class was used as the reference group.

**Table 6.** Regressions for satisfaction and intention to revisit.

	Satisfaction <sup>1</sup>						Intention to Revisit <sup>2</sup>					
	Hiking		Nature		Amenity		B	(SE)				
	B	(SE)	B	(SE)	B	(SE)						
<i>Latent classes</i>												
Class 1 (novice)	−0.68	***	(0.08)	−0.32	***	(0.08)	−0.29	***	(0.10)	−1.23	***	(0.30)
Class 2 (affection-driven) <sup>3</sup>	−			−			−			−		
Class 3 (expert)	0.11		(0.09)	0.07		(0.09)	−0.07		(0.08)	0.31		(0.47)
<i>Socio-demographic characteristics</i>												
Age	0.11	**	(0.04)	0.03		(0.04)	0.01		(0.04)	0.12		(0.16)
Female ( <i>yes</i> = 1)	−0.05		(0.07)	0.10		(0.07)	−0.01		(0.08)	−0.14		(0.29)
Married ( <i>yes</i> = 1)	−0.21	*	(0.11)	−0.07		(0.11)	0.08		(0.11)	0.14		(0.44)
Education	0.05	***	(0.03)	−0.01		(0.03)	−0.03		(0.03)	0.30	**	(0.10)
Income	0.02		(0.02)	0.05	*	(0.03)	0.02		(0.03)	0.06		(0.11)
<i>Past experience</i>												
Have visited the Olle Trail ( <i>yes</i> = 1)	−0.01		(0.08)	−0.10		(0.08)	−0.03		(0.08)	0.62		(0.36)
Constant	3.15	***	(0.14)	3.83	***	(0.15)	2.95	***	(0.08)	0.60		(0.54)
Adjusted $R^2$	0.25		0.06		0.02		0.21					

<sup>1</sup> Ordinary regression models. <sup>2</sup> Logistic regression model; Pseudo  $R^2$  (Nagelkerke) = 0.21;  $-2 \log$ -likelihood = 359.18. <sup>3</sup> Reference group. \*  $p < 0.05$ . \*\*  $p < 0.01$ . \*\*\*  $p < 0.001$ .

While some socio-economic characteristics and past experience with the Olle Trail were not significantly associated with satisfaction and intention to revisit, several covariates were significant predictors of these outcomes. First, more educated hikers were more satisfied with hiking and showed higher intention to revisit the Olle Trail. Second, respondents with higher incomes were more satisfied with nature, and older hikers were more satisfied with hiking itself.

Regarding the relationship of the latent classes to the outcome variables, the coefficients for the “novice” class were negative. Thus, compared to the “affection-driven” class, the “novices” reported less satisfaction with hiking ( $\beta = -0.68$ ) and place ( $\beta = -0.32$  for nature and  $\beta = -0.29$  for amenity). In addition, the “novices” showed less intention to revisit than the “affection-driven” class ( $\beta = -1.23$ ). Meanwhile, more educated respondents showed more intention to revisit ( $\beta = 0.30$ ). The “expert” class showed no significant effect on satisfaction and intention to revisit, compared to the “affection-driven” class.

## 5. Discussion and Implications

Based on the growing attention on the segmentation of target markets through a person-centered approach, this study focused on multiple measurements of hikers’ intensity across activity and place. The purpose of this study was to identify latent profiles of hikers in Korea based on specialization and place attachment and to examine the hiking patterns of the subdivided profiles. This study employed a person-centered quantitative approach which has rarely been used in the outdoor recreation literature.

This study makes the following contributions to the literature. First, this study expands the scope of measurement in research in activity and place. Findings of this study indicate that three dimensions of specialization and two dimensions of place attachment could be fully identified into three profiles, whereas previous research partially connected individual dimensions of both concepts [11,23,24]. This study, furthermore, took an individual-centered approach by using LPA, while previous studies took a more summative approach or simple dichotomized approach [23,25,34,35]. For instance, Morgan and Messenger [23] created the specialization-place attachment typology by using the median spilt method. They assigned equal value to place and activity, thus, their typology neglected the impact of the individual dimensions of both concepts. Meanwhile, the present study found various levels of specialization-place attachment within groups, with the “affection-driven” group reporting the middle level of specialization and the highest level of place attachment, while the “novice” and “expert” groups revealed linear patterns. Considering the inherent occurrence of both activity and place in the development process, this study contributes to the current literature by using the combination of individual dimensions of specialization and place attachment.

Second, the present study revealed that LPA is an appropriate technique to capture multidimensional concepts [31]. While previous research has heavily relied on linear regression analyses [11,23], the association of specialization and place attachment may not be always linear. Our findings showed that the different profiles reflected a linkage between quantitative differences in the overall level of involvement (e.g., “novice” versus “expert”) and qualitative differences in the shape of the profiles (e.g., the “experts” scored higher on the behavior dimension, whereas the “novices” and “affection-driven” group scored higher on the affective dimension). Traditionally, this difference has been assessed based on an ANOVA in which the “level” is the effect of the mean averaged over all dimensions, but the “shape” is the extent to which there are distinct profiles. Even when the LPA indicators focus on fundamental characters, LPA might be effective in offering cutoff values and prevailing rates for different categories—particularly when the emphasis is on diagnostic classifications such as in exploratory studies. When the LPA groups mirror a combination of level and shape distinctions such as in this study, LPA offers a potentially useful analysis and may compensate for the weakness of variable-centered approaches. As stressed by several researchers [53] and verified in this study, the use of variable approaches (e.g., SEM or regression) and person-centered approaches (e.g., cluster analysis) should be seen as complementary rather than competing.

Third, the present study examined satisfaction and intention to revisit of hikers in Korea segmented by a specialization-place attachment typology. The positive impacts of the typologies on satisfaction and intention to revisit (i.e., behavior loyalty) in this study were also similar with previous studies [39,44–46]. Specifically, the “novice” class revealed a significant negative linear relationship between specialization-place attachment typology, satisfaction, and intention to revisit. Although activity (i.e., hiking) and setting satisfaction (i.e., nature and amenity) increased or decreased

together, all hikers were most satisfied with nature itself, and this tendency was prominent in the “affection-driven” group. These results implied the importance of place attraction for activity to activity-oriented groups (i.e., hikers) as well as place-oriented groups (i.e., tourists).

Fourth, there is an attention-grabbing hiker segment that was identified by the specialization-place attachment typology. The findings of this study revealed a unique pattern of attachment relations that characterized the “affection-driven” group. Only the affective dimension of specialization in this class increased with both the place attachment dimensions and outcome variables. Considering that place attachment is defined as affection for a place, this study indicates that the affective aspects of specialization are more related to place attachment than the others of specialization. Furthermore, although there were no differences in outcomes between the “affection-driven” and “expert” groups, the “affection-driven” group showed different demographics from the “experts.” Compared to the “experts,” the “affection-drive” class was slightly younger and had a higher percentage of females (i.e., not traditional expert hikers). As the study setting, the Olle Trail, was developed primarily as a place of relaxation for women hikers, this study revealed the possibility for relieving the leisure constraints on women and developing the relatively new market for female hikers.

This study provides several managerial implications. First, the results of this study showed that highly attached hikers, the “experts,” were more educated, more likely to be repeat visitors, more satisfied, and reported higher intention to revisit than their less attached counterparts, the “novices.” Thus, hikers’ intensity for hiking and the setting may be important in distinguishing different segments within the hiking population. According to typologies of substitution alternatives by Shelby and Vaske [54], recreationists substitute a different time period when they choose the same activity at the same setting. Likewise, the “experts” are more likely to visit at a non-crowded time such as morning/evening or weekday; thus, managers should consider giving various experiences (e.g., hiking contest, flea market, face-to-face interpretation) to this group.

Second, Bricker and Kerstetter [10] found that highly specialized individuals were more satisfied with their experience due to their high level of knowledge. Thus, the traditional hikers’ management goals are justified by their importance to the experts. Because their participation rates and ownership to the setting are higher than those of novices, they are likely to make a higher economic and psychological contribution to the communities in which their hiking activity occurs. In this study, the experts were older, married, and male. Thus, to retain this important group, managers should continue to pursue the traditional hikers’ goals that enhance experience with more skills and knowledge (e.g., running education courses, specialized clubs, and conferences).

Third, this study also identified the profiles of each segmented class by socio-demographic characteristics and past experience with the Olle Trail of Jeju Island. The findings associated with the “novice” and “expert” groups were generally consistent with previous studies [4,8] that explored the positive effects of education and past experience on specialization and place attachment. In addition, the “novice” and “expert” groups of hikers differed markedly in terms of their socio-demographic characteristics. Although the Olle Trail was developed to target female hikers by offering a place of relaxation for women, and 63.8% of hikers in this study were female, the “expert” group included a relatively higher percentage of male hikers. Even though hiking has recently become increasingly popular among women, traditionally, the main participants of outdoor recreation were men [1]. Considering the positive relation between specialization-place attachment typology and its outcomes (i.e., satisfaction, intention to revisit), the managers should also consider plans to attract not only new customers (i.e., female hikers) but also regular customers (i.e., male hikers).

The present study provides some suggestions for future research. First, specialization and place attachment were measured with various aspects of activity and setting. Researchers could extend the scope to the items that make up each dimension. Second, the validity of the specialization-place attachment typology created in this study needs to be examined. It would be worth testing other recreationists, such as bikers or walkers, and whether the typology is also applicable to hikers in other

nations. Third, future research could test setting-oriented groups (i.e., tourists or residents) rather than activity-oriented groups (i.e., recreationists) to make comparisons.

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