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Conceptualization and Measurement of the Recreationist-Environment Fit

Sheng-Hshiung Tsaur
National Chiayi University

Ying-Wen Liang
Jinwen University of Science and Technology

Wei-Rong Lin
National Chiayi University

Abstract

This article extends the person-environment fit concept from institutional to recreational settings. Specifically, we conceptualized and developed the recreationist-environment (R-E) Fit Scale (REFS). Both qualitative and quantitative approaches were employed. Based on Attention Restoration Theory and Affordance Theory, the R-E fit is conceptualized as the compatibility between recreationists and recreation environments that is present when at least one entity provides what the other needs and/or recreationists and environment managers share similar values. The 19-item REFS was developed and validated to quantify the fit between recreationists and their environment. Six factors were identified: natural resources, interpersonal opportunities, environmental functions, facilities, activity knowledge/skills, and operation/management. The results show that both the six-factor model and the three-factor (i.e., needs-supplies fit, requirements-abilities fit, and supplementary fit) higher order model are acceptable models to measure R-E fit. Implications of these findings for application and areas for future research are also provided.

KEYWORDS: Complementary fit, supplementary fit, needs-supplies fit, requirements-abilities fit

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Shen-Hshiung Tsaur is a professor and Wei-Rong Lin is a doctoral student with the Graduate Institute of Recreation, Tourism, and Hospitality Management, National Chiayi University, Chiayi City, Taiwan, ROC.

Ying-Wen Liang is an associated professor in the Graduate Institute of Tourism and Hospitality Management, Jinwen University of Science and Technology, New Taipei City, Taiwan, ROC.

Address correspondence regarding this article to: Ying-Wen Liang, 5F-1, No. 72, Section 1, Xing-Long Road, Wen-Shan District, Taipei City, Taiwan, ROC, TEL: 886-2-29316448, E-mail: stliang@ms4.hinet.net OR englishl@just.edu.tw

Introduction

Research into the person–environment (P-E) relationship from an instrumental perspective has viewed the environment as a facilitator of behavioral and economic goals (Stokols, 1990). An aim of these studies is to build models to predict human behaviors in specific circumstances (Vorkinn & Riese, 2001). The drawback of this approach is that it neglects the more dynamic features of the human-environment relationship or the social meaning attributed to the environment (Stokols, 1990; Vokinn & Riese, 2001). The core proposition of social ecology suggests that the well-being of people is affected by the characteristics and health of their physical and social environments (Stokols, 1992).

Research investigating P-E interactions in organizational and residential environments has been particularly important in establishing that these environments have positive impacts on individuals. Research into the P-E fit in management generally focuses on matching individuals to various work environments. Kristof (1996), for example, proposed two types of person–organization (P-O) fits: the supplementary fit and the complementary fit to measure the congruence between employees and organizations. In institutional contexts, high levels of P-O fit have been associated with a lower employee turnover and high levels of job satisfaction and performance (O'Reilly, Chatman, & Caldwell, 1991). Other researchers have focused on the residential environment (Kahana, 1982; Lawton, 1979). The P-E fit in a community context is deemed as a key antecedent of residential satisfaction and well-being (Kahana, Lovegreen, Kahana, & Kahana, 2003). In summary, P-E fit studies have provided an avenue to understand personal well-being and quality of life.

Even though the P-E fit research has been popular in other areas of study, it has been sparse in recreation and leisure literature. This is surprising given that recreation and leisure activities are considered to be one of the most significant contributors of personal well-being and quality of life (Iso-Ahola, 1993, 1997). Previous studies of P-E interaction in the recreation literature focused on what recreationists attain in recreation environments such as recreation benefits (Driver, Brown, & Peterson, 1991) and recreation experience (Lee & Shafer, 2002). However, these studies only investigated the perspective of the recreation participants, while ignoring the characteristics of the recreation settings which might require the recreationist to possess certain abilities in order to function effectively. Other theories that touch upon the concept of fit are Attention Restoration Theory (ART) from environmental psychology and Affordance Theory from ecological psychology. ART (Kaplan & Kaplan 1989) asserts that for restorative experience to take place a setting should possess compatibility; that is, it should be a good match between personal desires and environmental characteristics. Affordance Theory explicates that affordances are the environmental characteristics that allow specialized individuals to execute certain actions (Turvey, 1992). The aforementioned research has revealed the importance of fit between the recreationists and the environment. Nevertheless, no further study examines fit between recreationists and their recreational environment.

To date, no clear or widely accepted definition of the recreationist-environment (R-E) fit has been developed. The absence of such a concept, good operational definitions, and validated measures may hinder research into the congruence between recreationists and their recreational environments. Based on ART and Affordance Theory, the purposes of this study are to conceptualize R-E fit and subsequently develop an instrument to measure it. This scale is thought to be useful for providing recreation managers with information regarding the alignment between the desires and motivations of their customers and the amenities and characteristics of recreation sites. The remainder of this article is structured as follows. First, the literature related to relationship between recreationists and the environment is reviewed. Then, the model of R-E fit is conceptualized. Next, the R-E Fit Scale is developed and validated. Finally, this paper provides managerial implications and suggestions for further research.

Background Literature

Fit Between the Person and the Environment

The results of previous fit research have been fruitful in the streams of organization and community literature. Both areas of fit studies focus on how an individual fits into related psychological or physical spheres. Kristof (1996) defined the person-organization (P-O) fit as "the compatibility between people and organizations that occurs when (a) at least one entity provides what the other needs or (b) they share similar fundamental characteristics, or (c) both" (p. 4). Kristof proposed two types of the P-O fit: supplementary fit and complementary fit. The latter consists of needs-supplies fit and requirements-abilities fit. Supplementary fit occurs when a person "supplements, embellishes, or possesses characteristics which are similar to other individuals" in an environment (Muchinsky & Monahan, 1987, p. 269); thus, it is essentially a model of the person-person fit. The needs-supplies fit is achieved when organizational supplies (i.e., financial, physical, and psychological resources as well as task-related, interpersonal, and growth opportunities) meet employee demands. Additionally, organizations demand contributions from their employees regarding time, effort, commitment, and abilities. The requirements-abilities fit is achieved when employees' abilities meet these requirements. Similarly, in community research Kahana et al. (2003) defined the P-E fit as the match between personal preferences and the environmental characteristics of community. They argued that P-E fit is important for residential satisfaction. To provide taxonomies of environmental features, they considered four physical domains: physical amenities/esthetics, resource amenities, safety, and stimulation/peacefulness as well as two social domains of neighborhood environments: homogeneity/heterogeneity and interaction/solitude, which also form counterparts of personal characteristics. The findings of fit studies in organizations have revealed two concise dimensions, supplementary fit and complementary fit, which serve as references for investigating person-environment fit. On the other hand, the results of fit research in community have shed light on two environmental facets of fit, physical and social domains, which extend our understanding on how environment resources fulfill individuals' needs.

Fit Between Recreationists and the Environment

Although the fit between the recreationists and their environment is a novel construct, several streams of research have explicitly or implicitly discussed the phenomenon. ART discusses fit through compatibility; Affordance Theory describes the process of fit realization in a given environment; and finally, the congruence between recreationists and environmental characteristics is reached when affordances in a particular environment cater to recreationists' needs.

ART proposes that people need to maintain cognitive clarity in order to efficiently accomplish day-to-day functions (Kaplan & Kaplan, 1989). However, people's capacity for directed attention is limited, and mental fatigue occurs by overuse. The depletion of directed attention can be recovered in a refreshing setting which features four properties—being away, extent, fascination, and compatibility. In other words, a restorative environment is different from the ones causing fatigue (being away), has sufficient scope for exploration (extent), grasps attention without requiring an effort (fascination), and supports one's needs and goals (compatibility). Kaplan (2001) identified six categories of incompatibility: deficit of information, distraction, duty, deception, difficulty, and danger. These categories of incompatibility describe either troubles of achieving clarity (the first two), a clash between thought and action (the next two), or a disagreement between what the situation demands and one's skills or abilities (the last two). One approach for providing restoration is to avoid incompatible environmental characteristics and provide amenities and environmental characteristics that are compatible. Thus, good compatibility between the recreationists and their recreational environment implies a good complementary fit.

The concept of affordances from ecological perception theory (Gibson, 1977) was described as the opportunities provided by the environment and perceived by an animal that finally achieves one's goal. In other words, an affordance is a resource that the environment grants to any individual that has the capabilities to perceive and utilize it. Therefore, a complementary relationship exists between the environment and the individuals during the actualization of affordances (Turvey, 1992). Affordance Theory has been applied to leisure and recreation by Pierskalla and Lee (1998), who proposed an ecological perception model of leisure affordances. The environment, which is the focal point of the model, offers clues for leisure functions; the characteristics of a setting affect the opportunities of leisure participants. Nevertheless, the perception of a recreation site's characteristics and resources depends on the individual's preferences and activity skills. For example, river valleys offer resources for trekking, climbing, rappelling, diving, and swimming. The features of each river section provide different options for the recreationists. On the other hand, the perception of these opportunities varies according to the expertise and preferred activities of the recreationists. A novice hiker might sense climbing and swimming in one setting, while a skilled river trekker may see all the affordances in the same setting. In summary, the perception and realization of affordances are affected by the capabilities of the individual. Leisure affordances reflect the complementary relationship that exists between leisure participants and their recreational environments (Pierskalla & Lee, 1998).

Recreation needs can be regarded as motivations for recreation participation. Several researchers have investigated recreational motivators, including social contact, relaxation, excitement, etc. (Crandall, 1980; Kabanoff, 1982). People demand particular settings to engage in recreation activities and further realize desired recreation experiences and benefits. Recreationists prefer restorative settings which supply the affordances compatible with their desires (Dorwart, Moore, & Leung, 2010). For example, recreationists demand relaxation, and would find a good fit in environments providing tranquil hiking. In short, the R-E fit is achieved when the affordances supplied by an environment are congruent with the demands of recreationists.

ART has introduced the concept of compatibility, which is used to assess how the provisions of the environment respond to the goals of the individuals (Kaplan, 1983). Affordance Theory elaborates the mechanism of fit realization in a particular environment. Therefore, drawing on ART and Affordance Theory, we conceptualize the concept of R-E fit to further interpret what aspects of environmental supports are offered to recreationists and what attributes of recreationists are demanded by the environments. In addition, we incorporated supplementary fit as well as complementary fit into the conceptual model and focused on recreation context.

Conceptual Model of the R-E Fit

The central purpose of this section is to explain why the R-E fit is necessary and to describe what it is. Basing on ART and Affordance Theory, we define the R-E fit as the compatibility between recreationists and recreation environments that is present when at least one entity provides what the other needs and/or recreationists and environment managers share similar values. There are several constructs that may appear to be independent but are actually correlated in the recreation/leisure field. R-E fit can serve as an important mediator linking these related constructs. A conceptual model of the R-E fit is depicted in Figure 1 with two specific goals: (1) to link R-E fit with other constructs in the recreation/leisure field and (2) to describe the components of the R-E fit. Figure 1 provides an overall conceptual picture, though it was not tested in the current study. The model comprises components, antecedents, and outcomes of R-E fit. Antecedents include factors such as environmental familiarity and self-efficacy. For example, a recreationist with higher self-efficacy would exhibit higher levels of R-E fit due to his/her abilities meeting the requirements of the environment. The model also predicts that various levels of R-E fit directly impact outcomes such as recreation satisfaction, flow experience, and destination loyalty. For example, a higher level of R-E fit would lead to a higher level of recreation satisfaction and destination loyalty due to the recreation benefits provided by environments meeting the needs of recreationists. In short, this model highlights the mediating effects of the R-E fit for linking its antecedents and outcomes.

Figure 2 depicts the components of the R-E fit, namely, supplementary fit, requirements-abilities fit, and needs-supplies fit. The supplementary fit is presented when there is congruence between the values of a recreationist and the manager

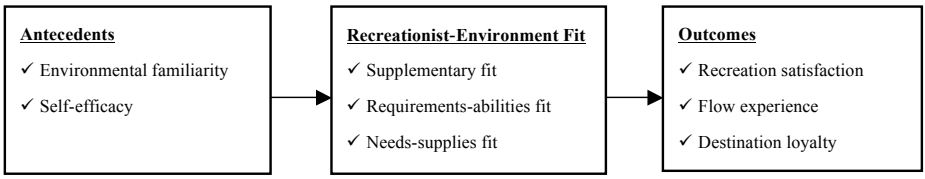

Figure 1. Conceptual Model of the Recreationist-Environment Fit

in charge of the recreational settings. Needs-supplies fit is achieved when the demands of recreationists are accommodated by the environments' supplies, namely natural resources, facilities, environmental functions, and interpersonal opportunities. The requirements-abilities fit is reached when the recreationists' abilities meet the requirements of the environment.

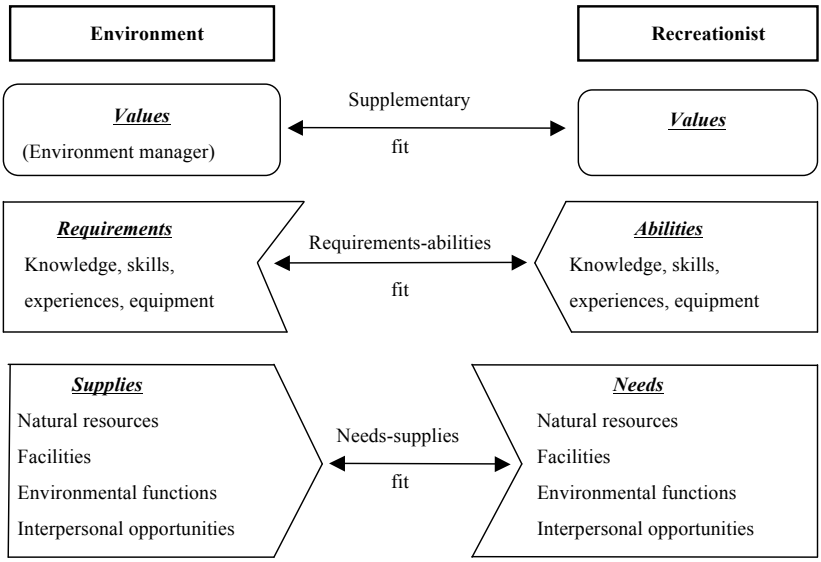

Figure 2. Components of the Recreationist-Environment Fit

Supplementary Fit

Supplementary fit emphasizes the effect of value congruence on the people-people fit. Values are principles that assist individuals in making decisions when their preferences are in conflict and thus reveal what people consider good (Dietz, Fitzgerald, & Shwom, 2005). Environmental values refer to a group of values including an environmental orientation or content. These values can be distinguished into either held values or assigned values; both may be present where a particular individual values an environmental attribute based on a particular orientation (Vining & Tyler, 1999). Held environmental values connote environmental value orientations providing a basis for beliefs, attitudes, and behaviors concerned with

the environment and natural resources (Fulton, Manfredo, & Lipscomb, 1996). Assigned environmental values refer to the relative importance or worth of environmental attributes. For example, Steel, List, and Shindler (1994) proposed environmental value orientation along a bipolar continuum from anthropocentric to biocentric, emphasizing human benefits on one end to ecology on the other end. The environment has been shaped by humans through management and landscape design. Therefore, the held environmental values of the managers in recreation sites can be expressed on the management practices such as regulations, signs, and posters; the assigned environmental values demonstrated by providing various opportunities. Researchers proved that recreationists with different value orientations have corresponding preferences on recreation services (Li, Wang, Liu, & Weng, 2010). By consulting the literature of institutional environment, we define the supplementary fit as the match between a recreationist and a manager of the recreation site when they share similar values. When recreationists identify with the management practices and appreciate the values of the recreation site, they may share similar values with the manager. Therefore, a supplementary fit is achieved if there is value congruency between the recreationist and the site managers. For example, recreationists who value environmental protection will have a higher supplementary fit with the managers who safeguard the recreation environments. Thus, the supplementary R-E fit is higher when recreationists identify and willingly conform to these policies.

Requirements-Abilities Fit

The requirements-abilities fit focuses on fit achieved when the environment's requirements are in accord with the recreationists' abilities. Requirements-abilities fit can be illustrated through the concept of specialization in serious leisure and leisure affordance. Stebbins (1982) defined serious leisure as "the systematic pursuit of an amateur, a hobbyist, or a volunteer activity that participants find so substantial and interesting that, in the typical case, they launch themselves on a career centered on acquiring and expressing its special skills, knowledge, and experience." The abilities of recreationists can be described by specialization, which is measured in terms of knowledge, skills (Scott & Shafer, 2001), prior experience, and equipment (Bryan, 1977). Beyond this, leisure affordance suggests that in recreation settings individuals need to possess capabilities in order to perceive and realize leisure or recreation opportunities (Pierskalla & Lee, 1998). Knowledge, skills, prior experience, and equipment are indispensable for recreationists to function well in recreation sites. Therefore, the requirements-abilities fit uses knowledge, skills, experiences, and equipment as components of abilities. Mountain climbing is used as an example to elaborate the aforementioned ideas. To succeed on a safe mountain climbing expedition requires refined skills, prior experience, the correct equipment, and knowledge, such as the climbing code and rescue procedures. Skilled mountain climbers are more likely to succeed in challenging terrains. Experienced recreationists are better at handling severe conditions (e.g., being lost and bad weather conditions) that they might encounter during a journey. Those with the correct equipment for mountain climbing are also more likely to succeed. Recreationists who have a good knowledge of mountain climbing will be better

equipped than other hikers in decision making during mountain climbing. In summary, there is a requirements-abilities fit between the mountain climber and the environment where the abilities of mountain climbing meet the requirements of climbing in a particular environment.

Needs-Supplies Fit

The needs-supplies fit looks at fit obtainment from the satisfaction of the recreationists' needs by environment's supplies. Recreation needs can be illustrated as a function of push and pull motivation factors, as suggested by tourism researchers (Crompton, 1979; Dann, 1977). Recreationists are pushed by internal sociopsychological motives such as social interaction, excitement, relaxation, and challenge (Crandall, 1980; Kabanoff, 1982). Pull factors are site attributes that attract recreationists to a particular environment with a promise of need satisfaction. Noe and Uysal (1997) suggested that features of recreation settings can be classified as instrumental and expressive attributes. Instrumental elements are means utilized by the recreationists to achieve their ends. These attributes include natural resources and facilities. For example, natural resources, such as cliffs and summits, provide mountain climbers the opportunities for challenge. Facilities such as shelters, huts, and base camps offer mountaineers refuge during expeditions. The expressive attributes are social and psychological benefits of recreational activities such as social interactions and recreation functioning. For example, rock climbers would search rock formations which allow climbing and have compatible climbing partners. In summary, the needs-supplies fit is acquired when the needs of recreationists are satisfied by the instrumental and expressive attributes of a recreation setting, namely natural resources, facilities, environment functions, and interpersonal opportunities.

Methodology

After the conceptualization of the R-E fit, the next step is to develop a corresponding scale, the R-E Fit Scale (REFS). The development of REFS can aid in the actual assessment of compatibility between recreationists and recreation environment, avoid inconsistent interpretation when measuring the R-E fit, and allow the relationship between the R-E fit and psychology or behavior of recreationists to be further explored. This study incorporated both qualitative and quantitative methods to develop a scale to measure REFS. The steps employed in constructing the scale closely parallel the scale development guidelines provided by DeVellis (1991). The overall procedure of developing the REFS was divided into four separate parts. Part one was the items generation. Part two was the first data collection and purification of measures. Part three was the second data collection and confirmation of measures. Part four was model comparison. Each of the above four parts are depicted in Figure 3 and details are described as follows.

Part One: Items Generation

A comprehensive and representative set of items of the REFS was developed to establish content validity. According to Churchill (1979), a scale must be rigor-

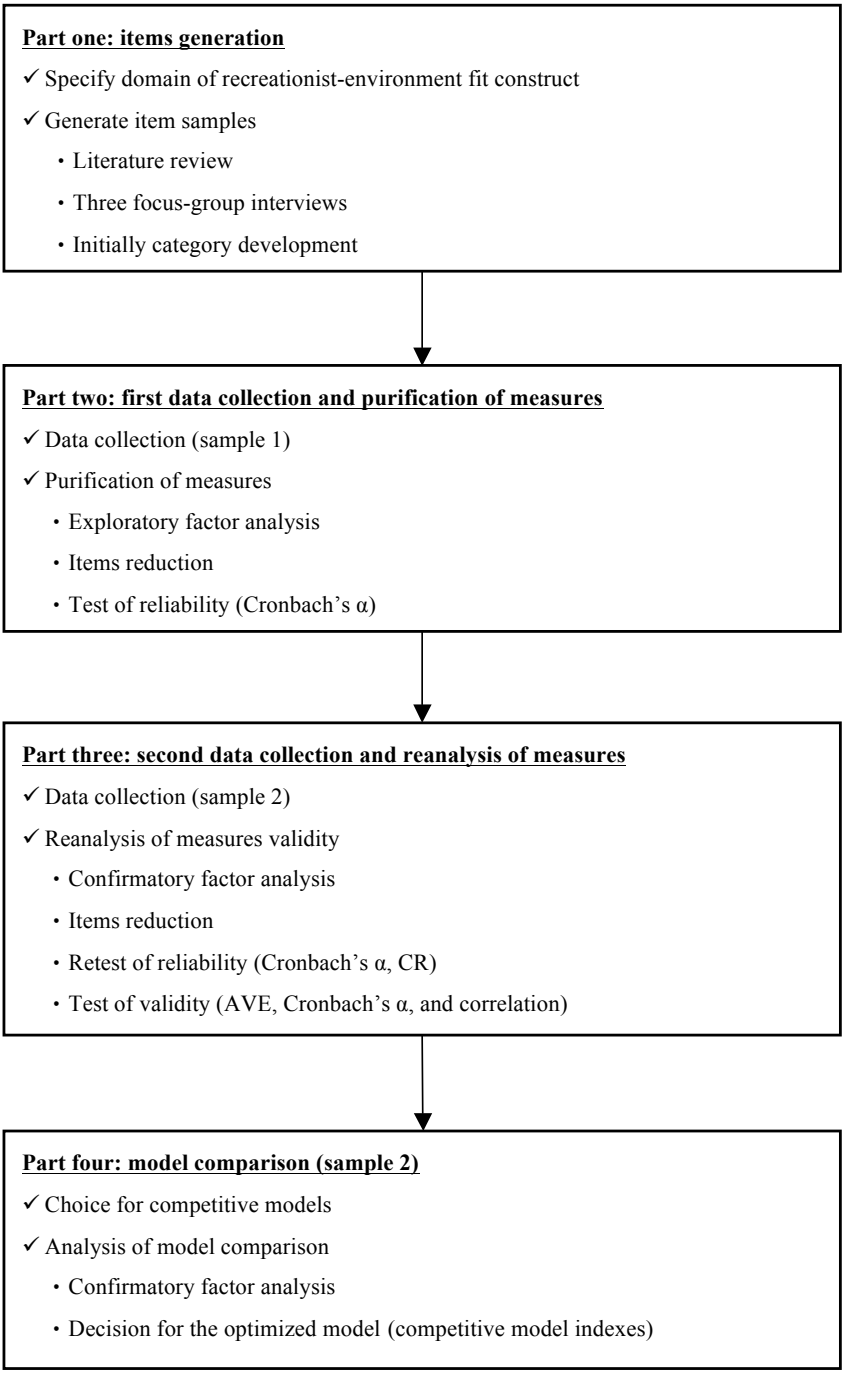

Figure 3. Flow Chart of the Scale Development Procedure

ous in delineating what is included in and excluded from the conceptualization. Therefore, a complete item list was generated in two ways: a literature review and by three focus groups.

Based on the literature review, the researchers generated items to adequately reflect the conceptual domains of the R-E fit. The items describe the nature of the R-E fit using three aforementioned perspectives of fit: the supplementary fit, requirements-abilities fit, and needs-supplies fit. In order to avoid setting- and activity-specific wording and content, three managers from different activities were asked to double check each item. This process generated 46 items, of which seven are used to assess the supplementary fit, nine assessed the requirements-abilities fit, and 30 measured the needs-supplies fit.

Three focus groups were conducted to characterize the R-E fit. There were 24 participants in the study: seven leisure/recreation researchers, eight graduate students majoring in recreation and sport management, and nine volunteers from the Wild Bird Society of Taipei. Each focus group lasted approximately 1.5-2 hours and took place at a university in Taipei. These participants comprised 14 males and 10 females aged 25-55 years. Before the focus groups, we established the definition of the R-E fit. In the focus group interviews, open-ended questions were asked about a participant's idea of R-E fit. Questions were then developed and divided according to the definition of the R-E fit, which included supplementary fit, requirements-abilities fit, and needs-supplies fit. An example of a question for the needs-supplies fit was "According to your personal leisure experiences, what needs do you expect to have met?" The conversations in the three focus groups were tape-recorded and then transcribed. Two researchers served as assessors and independently coded the transcriptions into 96 units of measurement and then categorized them into 44 items.

The literature search and focus group interviews yielded 90 items (46 from the literature review and 44 from the three focus group interviews). The single-classification concept for category development was employed. Two assessors iteratively read, classified, reread, and reclassified items. This in turn produced 42 items. The intra-assessor reliability (Davis & Cosenza, 1993) was above 0.90, and no new items emerged. The aforementioned two approaches used to generate items along with the categorization process indicated that the scale had content validity.

Initially, the 42 items were formatted to form a battery of items that were rated by responses on a 7-point-agreement scale, with "1" being *strongly disagree* and "7" being *strongly agree*. There were no verbal labels for scale points 2-6. Two recreation researchers (not the authors) with primary research interests in recreational behavior and psychology examined the general applicability and redundancy of the items. Two other researchers with primary research interests in recreational behavior and management then served as assessors. The assessors were given our definition of the R-E fit and asked to place each item into one of the three categories: *clearly representative*, *somewhat representative*, and *clearly not representative*. A total of 32 items were deemed as either "clearly representative" or "somewhat representative" of the R-E fit concept, and thus retained for the first survey. The 32-item instrument was subjected to three stages of data collection and refinement: (1) condensing the instrument by retaining only those items capable of good dis-

crimination between respondents, (2) exploration of the underlying factor structure, and (3) a confirmatory reevaluation of the factor structure by analyzing data from different samples.

Part Two: the First Data Collection and Purification of Measures

The first survey focused on surfers, who were active participants of maritime activities including surfing and scuba diving. Data were collected from July 4 to July 9, 2007. We conducted face-to-face interviews with surfers at two popular surfing locations in Taiwan. A sample of recreationists was chosen using the next-to-pass method. After excluding cases with missing values, repeated cases, and cases with no surfing experience, 117 responses were retained for analysis. The data were subjected to exploratory factor analysis (EFA) using a varimax rotation to reduce the number of items.

An iterative-scale purification procedure was used to develop a reduced and parsimonious scale. First, item-to-total correlations were computed for the 32 items. Items that produced a corrected item-to-total correlation lower than 0.30 were discarded. As individual items were removed, α values were recomputed for the remaining items, and the newly corrected correlations were evaluated to identify further candidate items to delete. Thirty items remained after this process. Next, the few items that had an almost equal loading on more than one factor were removed by applying a principal-component analysis with oblique rotation (Gerbing & Anderson, 1988). We then checked for possible overlap of items across all factors. To achieve a more meaningful solution and to allow for a more parsimonious scale, items were deleted if they loaded equally onto more than one factor and their loadings were smaller than 0.55. Twenty-two items remained after this procedure. The EFA confirmed that the following six factors were underlying the R-E fit construct: natural resources, interpersonal opportunities, environmental functions, facilities, activity knowledge/skills, and operation/management. The results of the factor analysis and associated statistics are presented in Table 1. Combined factor loadings accounted for 74.7% of the total variance in the factor pattern. Reliability coefficients of the REFS were calculated to examine the internal consistency of the factors (Table 1). The value of coefficient α ranged from 0.76 to 0.90, which indicates that the REFS exhibits good internal consistency.

Part Three: the Second Data Collection and Reanalysis of Measures

The next stage of scale development was to reevaluate the factor structure of the REFS using confirmatory factor analysis (CFA). The scale's convergent and discriminant validities were also examined. In order to increase the generalizability to a wide range of outdoor activities, in contrast to the first survey (which emphasized maritime activities), the sample for the second survey was drawn from mountain climbers. An on-site survey was conducted so as to achieve a good respondent identification and probable response rate. Following next to pass sampling, surveys were distributed immediately after recreationists finished mountain climbing on Mt. Yushan in Taiwan. Data were collected from July 18 to September 22, 2007. After excluding cases with missing values, 302 useful questionnaires were collected and analyzed.

Table 1

Results of Exploratory Factor Analysis—Sample 1 (n=117)

Factors/items	Mean	Factor loading	Eigen value	Variance (%)	Cronbach's α
Factor 1: natural resources			5.67	25.78	0.78
The terrain is suitable for this activity.	5.65	0.87			
The resources meet my expectations.	5.50	0.85			
The resources fit my needs for undertaking this activity.	5.68	0.84			
The weather conditions (e.g., temperature and wind) are suitable for this activity.	5.78	0.78			
Factor 2: interpersonal opportunities			3.07	13.95	0.87
This environment allows me to share my experience with other participants of the same activity.	6.17	0.92			
This environment gives me the opportunity to meet with other participants.	5.94	0.89			
This environment allows me and other participants to learn certain activities.	6.03	0.87			
This environment gives me the opportunity to join clubs for certain activities.	5.68	0.77			
Factor 3: environmental functions			2.43	11.06	0.77
This environment provides me with a channel to release pressure.	6.16	0.91			
This environment makes me feel satisfied when undertaking the activity.	6.24	0.89			
This environment enhances my sense of achievement.	6.12	0.83			
This environment fulfills my needs for the leisure experience.	5.50	0.66			
Factor 4: activity knowledge/skills			2.10	9.53	0.90
My skills fit the requirements of this activity/setting.	5.72	0.81			
My equipment fits the requirements of this activity/setting.	5.60	0.74			
My knowledge fits the requirements of this activity/setting.	5.58	0.72			
My past experiences fit the requirements of this activity/setting.	5.74	0.69			
Factor 5: facilities			1.78	8.08	0.76
The public facilities provided by this environment meet expectations.	4.20	0.82			
The facilities provided for certain activities meet my expectations.	4.32	0.82			
The services provided by this environment meet my expectations.	4.24	0.71			
Factor 6: operation/management			1.39	6.31	0.89
I identify with the manager's concepts regarding the maintenance of these facilities.	4.65	0.83			
I identify with the manager's concepts regarding the management of this setting.	4.55	0.81			
When using these facilities, I feel that I share similar values with the manager.	4.66	0.72			

CFA with maximum-likelihood estimation in LISREL 8.3 software was utilized to examine the factor structure of the REFS. The initial estimation of the 22-item, 6-factor structure R-E fit model did not generate a satisfactory result (χ^2 = 773.38, df = 194, χ^2/df = 3.98, GFI = 0.81, AGFI = 0.75, SRMR = 0.087, RMSEA = 0.1, NFI = 0.89, NNFI = 0.9, RFI = 0.87, and CFI = 0.91). The values of these parameters indicated a poor fit between the sample data and the model. We double checked the outputs of the EFA. The following three items with dual loadings across factors were deleted: "The resources meet my expectations," "This environment gives me the opportunity to join clubs for certain activities," and "This environment enhances my sense of achievement." The final 19-item, 6-factor model provided an improved and reasonable fit for the data: χ^2 = 355.89, df = 137, χ^2/df = 2.60, GFI = 0.89, AGFI = 0.85, SRMR = 0.069, RMSEA = 0.073, NFI = 0.93, NNFI = 0.94, RFI = 0.92, and CFI = 0.96 (Kelloway, 1998). Table 2 lists the factors and indicator factor loadings, and the reliability scores. All of the six indicators had loadings ranging from 0.53 to 0.95, which demonstrated that the REFS indicators were moderately strong measures of the six aspects of the R-E fit. In addition, the composite reliability (i.e., variance captured by items versus variance associated with measurement error) for the six factors ranged from 0.72 to 0.91, which exceeded the cutoff for composite reliability of 0.70 (Davis & Cosenza, 1993), thereby indicating the good internal consistency of the REFS.

One way to assess convergent validity is to determine the significance of all factor loadings (Bagozzi, Yi, & Singh, 1991). The convergent validity is also supported since the average variance extracted clearly exceeded 0.50 for all dimensions (Fornell & Larcker, 1981). As indicated in Table 2, all factor loadings differed significantly from zero, as evidenced by consistently large *t* values (range 9.38-21.84), and all the average variances extracted (AVE) were at least 0.50. Therefore, the results of CFA support the existence of a reasonable degree of convergent validity for the constructs.

The discriminant validity of the six-dimensional scale was investigated, as suggested by Bagozzi (1981) coefficient α for each of any pair of constructs should be greater than the correlation between the two constructs. These requirements were met with all pairs of constructs, with the correlation ranging from 0.16 to 0.57 (α ranged from 0.76 to 0.90; see Table 3).

Part Four: Model Comparison

The last part of the analysis is to confirm the final model, which was derived from REFS, with alternative models. The development of REFS was based on three components of R-E fit. The results of the EFA and CFA revealed a six-factor structure of REFS with 19 items. To further support that the confirmed six-factor structure is superior to other models, the researchers compared the fit of four models: (1) a single-factor model; (2) a three-factor model based on the original operationalizations of R-E fit; (3) a six-factor model identified in EFA and CFA; (4) a three-factor higher order model with six subdimensions.

A single-factor model tests whether the REFS measures one overall factor, rather than six individual factors. Support for this model would suggest that individuals do not differentiate among types of REFS and that this phenomenon is

Table 2

Results of Confirmatory Factor Analysis—Sample 2 (n=302)

Factors/ Items	Factor loading	*t*-value	Reliability	CR	AVE	Cronbach's α
Factor 1: natural resources				0.82	0.61	0.80
The terrain is suitable for this activity.	0.89	17.92	0.79			
The resources fit my needs for undertaking this activity.	0.80	15.61	0.64			
The weather conditions (e.g., temperature and wind) are suitable for this activity.	0.64	11.67	0.41			
Factor 2: interpersonal opportunities				0.80	0.59	0.78
This environment allows me to share my experience with other participants of the same activity.	0.82	15.30	0.67			
This environment gives me the opportunity to meet with other participants.	0.53	9.38	0.29			
This environment allows me and other participants to learn certain activities.	0.90	17.31	0.82			
Factor 3: environmental functions				0.85	0.66	0.85
This environment provides me with a channel to release pressure.	0.82	16.29	0.67			
This environment makes me feel satisfied when undertaking the activity.	0.85	17.35	0.73			
This environment fulfills my needs for the leisure experience.	0.77	15.01	0.59			
Factor 4: activity knowledge/skills				0.92	0.74	0.91
My skills fit the requirements of this activity/setting.	0.86	18.33	0.74			
My equipment fits the requirements of this activity/setting.	0.75	14.97	0.56			
My knowledge fits the requirement of this activity/setting.	0.95	21.84	0.91			
My past experiences fit the requirements of this activity/setting.	0.86	18.25	0.73			
Factor 5: facilities				0.74	0.50	0.72
The public facilities provided by this environment meet my expectations.	0.83	14.81	0.70			
The facilities provided for certain activities meet my expectations.	0.57	9.66	0.33			
The services provided by this environment meet my expectations.	0.68	11.90	0.47			
Factor 6: operation/ management				0.88	0.71	0.87
I identify with the manager's concepts regarding the maintenance of these facilities.	0.92	19.73	0.84			
I identify with the manager's concepts regarding the management of this setting.	0.85	17.40	0.71			
When using these facilities, I feel that I share similar values with the manager.	0.75	14.85	0.57			

Table 3

Coefficient α and Correlations between the Latent Factors

	Natural resources	Interpersonal opportunities	Environmental functions	Activity knowledge/ skills	Facilities	Operation/ management
Natural resources	**0.78**					
Interpersonal opportunities	0.26	**0.87**				
Environmental functions	0.57	0.43	**0.77**			
Activity knowledge/ skills	0.28	0.16	0.27	**0.90**		
Facilities	0.38	0.23	0.32	0.30	**0.76**	
Operation/ management	0.42	0.31	0.31	0.26	0.51	**0.89**

Notes: The bold diagonal elements are coefficient α values, and off-diagonal elements are the correlations between the latent factors ($p< 0.01$).

best represented by a unidimensional construct. In the hypothesized theoretical structure, a three-factor model, the items measuring the environment resources (three), interpersonal opportunities (three), environment function (three), and environment facilities (three) were allowed to load onto one latent factor (needs-supplies fit), and items measuring activity knowledge/skills (four) and operation/management (three) were allowed to load onto two other latent factor (requirements-abilities fit and supplementary fit, respectively). In the six-factor model, the environment resources, interpersonal opportunities, environment function, facilities, activity knowledge/skills and operation/management items were only allowed to load onto their respective factors. In the three-factor higher order model with six subdimensions, six subdimensions that come from factor analysis would be organized into the hypothesized three-factor theory structure.

The results of model comparison (Table 4) showed that the six-factor model and three-factor higher order had a significant improvement in fit over the other two models. The following parameter values indicated that the six-factor provided a reasonable overall fit: χ^2=355.89, df=137, χ^2/df=2.59<3, GFI=0.89, CFI=0.95>0.9, and NFI=0.93 >0.9. And the three-factor higher order also provided a reasonable overall fit: χ^2=431.7, df=145, χ^2/df=2.98<3, GFI=0.87, CFI=0.95>0.9, and NFI=0.92>0.9. Though three other fit indices—GFI (0.89 for six-factor, 0.87 for three-factor higher order) is smaller than 0.9, SRMR (0.069 for six-factor, 0.08 for three-factor higher order) and RMSEA (0.073 for six-factor, 0.08 for three-factor higher order) are larger than 0.05, but they are lower than 0.08, and thus are still acceptable (McDonald & Ho, 2002). According to statistics, the six-factor model is the optimal model. However, the model of best fit is decided according to consistency with previous research and theory (Noar, 2003). Since both six-factor and

Table 4

Summary of Model Comparisons

Model	χ^2	df	SRMR	RMSEA	GFI	CFI	NFI	ECVI
Single-factor model	2344.51	152	0.15	0.219	0.55	0.66	0.65	8.04
Three-factor model	1010.21	149	0.10	0.139	0.74	0.85	0.83	3.63
Six-factor model	355.89	137	0.069	0.073	0.89	0.96	0.93	1.53
Three-factor higher order model with six subdimensions	431.7	145	0.08	0.08	0.87	0.95	0.92	1.73

Notes:

Single-factor model: 19 REFS items load on one factor.

Three-factor model: needs-supplies fit (12-items), requirements-abilities fit (4-items), and supplementary fit (3-items).

Six-factor model: natural resources (3-items), interpersonal opportunities (3-items), environmental functions (3-items), facilities (3-items), activity knowledge/skills (4-items), and operation/management (3-items).

Three-factor higher order model with six subdimensions: needs-supplies fit (natural resources, interpersonal opportunities, environmental functions, and facilities), requirements-abilities fit (activity knowledge/skills), and supplementary fit (operation/management).

three-factor higher order are acceptable models, researchers may choose either according to their research purposes.

Summary of Results

In this section, literature review and three focus groups were used to generate a 90-item pool. And, the category development was employed to retain 32 items. Subsequently, we developed and validated an instrument (the REFS) for quantifying the fit between recreationists and environments. Two analyses were conducted to establish and confirm the dimensionality, reliability, and validity of the developed scale. The EFA performed item purification and examination of the dimensionality of the REFS, which yielded a 22-item scale. This was followed by CFA to confirm the hypothesized factor structure, which resulted in the removal of three items to improve the fit between the data and the model, producing a six-factor structure of the REFS with 19 items. Finally, a model comparison shows that both the six-factor and the three-factor higher order are acceptable in measuring R-E fit.

Discussion

The objectives of this study are to conceptualize R-E fit and develop a reliable and valid instrument for use in a recreation context. Six dimensions with 19 items were developed. They are operation/management, activity knowledge/skills, natural resources, interpersonal opportunities, environmental functions, and facilities. REFS identifies both the specific and comprehensive characteristics of recreation settings corresponding to recreationists' desired activities and preferences to ob-

jectively measure fit. This approach follows the suggestion of Kristof (1996) on measure's commensurability, which means measurements need to assess both the person and the organization with the same corresponding and relevant dimensions. Hence, REFS allows an objective and verifiable assessment of supplementarity and complementarity.

Measurement Implications

This study reveals six dimensions of REFS, which correspond to supplementary fit, requirements-abilities fit, and supplies-needs fit. The results provide the following theoretic implications. Operation/management factor with three items measures the level of recreationists' identification with the operation and management of recreation settings; therefore, it represents the supplementary fit indicating the value congruence between the recreationists and site managers. Value alignment involves all the participants, both operation managers and recreationists. Thus, the recreation managers and recreationists can play active roles in improving the level of the supplementary fit. The recreation managers can use educational efforts to raise awareness and gain support for its goals, values, and missions. It is also vital for recreationists to understand the designated purposes of a recreational site and the held values of site managers, since this would allow the supplementary fit to be achieved to an even greater extent.

Using four items, the activity knowledge/skill factor evaluates the degree of fit between recreationists' capabilities and the skill requirements necessitated by the environmental characteristics. Our results support the proposition of Bryan (1977) that different levels of specialization vary with regard to setting preferences and site choice, such that specialized individuals seek settings to test their skill and exert control. According to leisure affordance, recreation settings offer opportunities for leisure functions; however, it depends on the recreationists' perception and activity skills to procure the affordances (Pierskalla & Lee, 1998). Hence, recreationists need to acquire related knowledge, skills, abilities, or experiences for targeted environments so that they can attain sufficient requirement-skill fit. Serious recreationists with advanced skills in a recreation activity will move to sites with requisite characteristics that correspond to their skill level to ensure that boredom doesn't occur.

The other four factors (natural resources, facilities, interpersonal opportunities, and environmental functions) with 12 items assess the level of fit between recreationists' needs and the environment; thus, it expresses the needs-supplies fit. This research distinguished two subdimensions of instrumental attributes: natural resources and facilities. There were also two expressive attributes: interpersonal opportunities and environmental functions. Not only are these four aspects the fundamental elements of a recreational setting, but they are also the key features in assisting recreationists with gratifying their recreational needs.

Our results also identify interpersonal opportunities as one of the recreationists' needs which could be satisfied by their peers in the recreation settings. This finding echoes the research on recreation motivation which cites social interaction as one of the most vital recreation motives (Crandall, 1980; Kabanoff, 1982). Thus, the research of R-E fit on group recreation participants especially needs to

take this factor into account because these participants have more opportunities to establish camaraderie with others through cooperation and experience sharing. If this social need could not be satisfied by a particular environment, then the recreationists are likely to leave the environment to find another site for better fit.

In sum, based on P-O fit, this research has taken the philosophical concepts of compatibility from ART and leisure affordance from ecological perception theory one step further to conceptualize R-E fit and further develop its measurement. The resulting scale (REFS) can assist both researchers and site managers to objectively assess fit between the environment and recreationists.

Research Application

REFS can assist recreation managers to quantify the level of compatibility between the recreationists and recreation settings, and helps identify which dimensions of R-E fit could be enhanced. Appropriate strategies could then be adopted to improve the level of fit. First, the management of recreation sites can employ educational tactics such as public information campaigns and exhibits in visitor centers or on site to deliver its mission and management objectives. Consequently, the participants may perceive and appreciate the values of the recreation sites and further conform to the regulation and management practices. Hence, the supplementary fit between the managers and recreationists can be boosted. Next, if the needs of recreationists were identified, the planning and designing of the recreation environment could be implemented accordingly to meet these needs. By doing so, the supplies-needs complementary fit could be improved. Finally, the content of a recreation site could be organized and marked in terms of the skill requirements or level of challenge. Thus, recreation participants can select their own settings or groups compatible to their level of skills and abilities.

On the other hand, the following advice could be given to recreation participants. They should consider their abilities before participating in recreation activities, settings, or groups. Environment selection or site choice is crucial. Not only does wise site selection ensure a good fit between any given environment and the recreationists, but also unexpected injury or disasters could be prevented. In short, a greater fit between participants and recreation environments is critical for the achievement of better experiences and greater benefits.

Future Research

The REFS achieved good reliability and validity for two activity samples, but since it is a newly developed scale it needs to be analyzed further to ensure its stability over time and across activities and cultures. Since each outdoor activity has its own unique characteristics, future researchers are recommended to investigate other activities in order to further assess the validity of the REFS. The impact of culture on behavior was postulated by Hofstede in 1998. Since the REFS was developed and field-tested in Taiwan, it is important to examine whether respondents conceptualize the construct in identical ways when applying this instrument to measure the R-E fit in other countries with distinctly different cultural backgrounds. Therefore, future researchers could conduct R-E fit in other cultures to improve its robustness and generalization.

The R-E fit is a general construct comprising the fit between the recreationists, potential activities, settings, groups, and managers. Future research into fit should not only consider the overall conceptualization of the R-E fit but also focus on investigating aspects of the R-E fit. Research into specific dimensions of fit enriches our understanding about the multidimensionality of R-E fit. Future studies could also investigate the antecedents and consequences of fit in a range of recreational contexts. Therefore, another avenue that remains to be explored is the relationship between R-E fit and outcomes such as self-efficacy, flow experience, recreation satisfaction, and destination loyalty.

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