

Appalachian Trail Hiking Motivations and Means-end Theory: Theory, Management, and Practice

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The current study examined benefits associated with hiking the Appalachian Trail (AT) and analyzed the use of means-end theory in understanding motivations for participation in outdoor pursuits. The results may provide information critical in better programming, evaluating, promoting, and justifying funding for hiking. Data collected from AT hikers via an internet-based survey revealed a relationship existing between attributes (ATTRIB), consequences (CONSEQ) and values (VAL), thus, supporting the means-end theory constructs. Internal and external validity analyses and reliability analyses showed the Benefits of Hiking Scale (BHS) to be an accurate and consistent measure of the constructs and dimensions of means-end. No statistically significant differences were found among hiker types with respect to any dimension of the means-end theory (i.e., ATTRIB, CONSEQ and VAL).

KEYWORDS: attributes, benefits of hiking scale, consequences, hiking, means-end, values

Introduction

Chronic disease has become a major topic of concern in America. Chronic diseases are associated with 1.7 million American deaths annually and 10% of all Americans experience a major limitation in activities of daily living due to a chronic disease (Centers for Disease Control [CDC], 2007). Physical inactivity is a contributing factor in many chronic diseases, due to its association with weight gain and obesity (CDC, 2007; U.S. Department of Health and Human Services, 2001). The role parks and recreation professionals and amenities may play in increasing physical activity and combating chronic disease has recently received attention. For instance, the National Recreation and Park Association and Department of Health and Human Services have collaborated in order to use recreation facilities as places for health and exercise (Healthy People 2010, 2002).

Additionally, Secretary of the Interior, Dirk Kempthorne (2007), acknowledged that National Parks should play a role in efforts to reduce obesity, chronic illness, and adult-onset diabetes. Efforts to use parks and recreation areas in order to address the societal concern of physical inactivity, and associated chronic illnesses, may utilize information gained from research using the means-end theory to better program, manage, and promote fitness using information about the attributes, consequences, and values of current users.

Literature Review

The Appalachian Trail

In the 1920s and 1930s, the Appalachian Trail Conference and volunteer hiking clubs structured, designed, and marked the Appalachian National Scenic Trail (AT), colloquially referred to as the “A-T” (Manning, Valliere, Bacon, Graefe, Kyle, & Hennessy, 2000). The National Trails System Act designated the AT as our nation’s first official National Scenic Trail in 1968. However, the first section of the AT was designed over forty years prior, 1921, and completed more than thirty years prior in 1937 (Appalachian Trail Conservancy, n.d.b; Manning et al., 2000). The AT consists of approximately 2,175 continuous miles of footpath (Appalachian Trail Conservancy, n.d.a). The footpath stretches from Georgia to Maine and winds through fourteen states (Appalachian Trail Conservancy, n.d.a; National Park Services [NPS], 2007). The path extends through numerous state and local parks, several state and local forests, six national parks, and eight national forests (Appalachian

Trail Conservancy, n.d.a). For its diversity of plant and animal species and its length, the AT is considered to be a one-of-a-kind park (Appalachian Trail Conservancy, n.d.a; U.S. National Park Service, 2007; Manning et al., 2000).

The AT is also known as the “People’s Path,” as nearly two-thirds of all Americans reside within a day’s drive of the trail (U.S. National Park Service, 2007). Two-thirds of the American population, according to the U.S. Census Bureau (2006) equaled approximately 200 million in 2006. The U.S. National Park Service (NPS) estimated that four million people visit the AT yearly (U.S. National Park Service, 2007).

The AT is a resource offering a variety of activities of varying durations (Appalachian Trail Conservancy, n.d.a). Because of its length and structure, the AT is relatively accessible to the majority of Americans (U.S. National Park Service, 2007; Appalachian Trail Conservancy, n.d.a). Additionally, user perception of safety is high (Manning, Bacon, Graefe, Kyle, Lee, & Burns, 2001). Healthy People 2010 (2000) reported that “lack of time, lack of access to convenient facilities, and lack of safe environments in which to be active (p.27)” were major obstacles for increasing physical activity. Because the AT is relatively accessible, and user perception of safety is high, managers and hiking trip leaders may see fit to use programming, promotion, and management of the AT as a model for how recreation amenities may be used to advocate increased physical activity and, consequently, healthy living. A national model may help state and local trail managers as well as trip leaders in promoting use of local trails. Increasing use of trails is one way recreation professionals may address the individual and societal need to increase physical activity, which is essential because of the dramatic increase in America in health issues directly correlated with lack of exercise.

Several public and private sectors (e.g., the National Park Service, the USDA Forest Service, several state agencies, the Appalachian Trail Conservancy (ATC), and thirty trail maintaining clubs) manage the trail collaboratively (Appalachian Trail Conservancy, n.d.b). Officially, the trail’s protection is entrusted to the NPS. However, the ATC is in charge of routine management of the footpath (Appalachian Trail Conservancy, n.d.; Nisbett & Hinton, 2005). Research geared toward helping those who manage the AT and those who facilitate recreational ventures along the path has been limited.

In 1999, Manning et al. (2000) explored the use and users of the AT. Nearly 2,000 hikers were surveyed. Manning and colleagues reported that day users (nearly 37%) and overnight users (approximately 32%) composed the largest groups of AT users, while section hikers (slightly more than 15%) and thru-hikers (roughly 16%) combined to equal a third of the AT users. The vast majority (69%) of users was

male, and nearly 97% of users were white. The average age of users averaged in the mid-to-upper thirties. The reported racial, sex, and age demographics showed a fairly homogenous population of users. Health concerns related to lack of physical activity and increased obesity have increased across race, socioeconomic and age categories. One of the challenges for managers of the AT and hiking/backpacking trip leaders may be the encouragement of trail usage by a more diverse population.

Other studies include: two publications that addressed perceptions of security and safety on the AT (Burns, Lee, & Graefe, 1999; Manning et al., 2001), a study analyzing AT thru-hikers' experiences and extent of experience with Flow (Mills & Butler, 2005), a few studies focusing on place attachment (Kyle, Graefe, & Manning, 2004; Kyle, Graefe, Manning, & Bacon, 2003), and a study which explored the motivations of AT hikers with disabilities (Nisbett & Hinton, 2005). While these studies provide valuable insight, Manning (1999) suggests that "...outdoor recreation research might be criticized because individual studies lack broad management implications" (p. 293) and that "management implications of outdoor recreation research become evident after the findings from a number of studies have been reviewed, synthesized and integrated" (p. 278). Recreation may be best defined in terms of benefits and motivations. As such, research regarding the benefits and motivations of those who hike on the AT is needed. The means-end theory is a useful theoretical framework for analyzing recreation benefits and motivations.

Means-end Theory

Intending to develop a methodological approach to the marketing of a product, Gutman (1982) sought to understand how to market a product's physical attributes to a consumer based upon knowledge of the consumer's personal value system. Gutman (1982) connected Rokeach's (1973) value systems with a product's physical attributes in the means-end theory—a theory which postulates that a company can better market a product after understanding the linkages between the customer's value system and a product's physical attributes because the product can then be related to a desired consumer benefit, the lack of an undesired consumer consequence, or the consumer's goal orientation (i.e., a desired end-state, outcome, or value).

Thus, Gutman's means-end theory (1982) is a method used for analyzing the factors driving a consumer's purchasing behavior. Within this theoretical framework consumers are deemed goal-oriented decision makers motivated to choose behaviors leading to specific desirable outcomes/values (Costa, Dekker, & Jongen, 2004). The advantage of

using the means-end theory is that direct consequences can be viewed in relation to the abstract values associated with the consequence.

The connections between the attributes, consequences, and values are depicted as means-end chains. A participant's thought progression from attribute to consequence or consequence to value is encapsulated by each link in the means-end chain. This allows the thought process of the individual to be followed from start to finish. Means-end chains are assembled through a data collection technique identified as laddering. Olson and Reynolds (1983) first conceived the idea of laddering, and the concept was further refined theoretically and applied to consumer behavior by Reynolds and Gutman (1988).

By asking a participant why an attribute is important and consequently why the participant's answer to the previous question is important, means-end chains are generated. The response to the attribute importance question may turn out to be another attribute, a consequence or a desired end-state. By continually asking the participant why each consequent response is important to them, answers reflecting a value state may eventually be uncovered. Each response in laddering has been likened to a rung on a ladder. The rungs are a step toward reaching the top level of the participant's thinking, the value states.

Means-end has been applied frequently and with a great deal of success in the field of marketing (Botschen, & Hemetsberger, 1998; Graeff, 1997; Herrmann, Huber, & Braustein, 2000). However, other practical applications of this theory have not yet been fully explored. It has been suggested that this theory provides a pragmatic approach and plausible framework from which outdoor adventure experience benefits may be examined (Goldenberg, Klenosky, O'Leary & Templin, 2000). Yet, use of the theory in the outdoor recreation setting is limited (Goldenberg, Hill, & Freidt, 2008; Goldenberg, Klenosky, McAvoy, & Holman, 2002; Goldenberg, McAvoy, & Klenosky, 2005; Haras, Bunting, & Witt, 2006; Klenosky, Frauman, Norman, & Gengler, 1998; McAvoy, Holman, Goldenberg, & Klenosky, 2006). Use of means-end theory may allow program managers and hiking clubs to better market an experience once an understanding of the relationships between program/experience attributes, consequences, and values are known (Goldenberg et al., 2002).

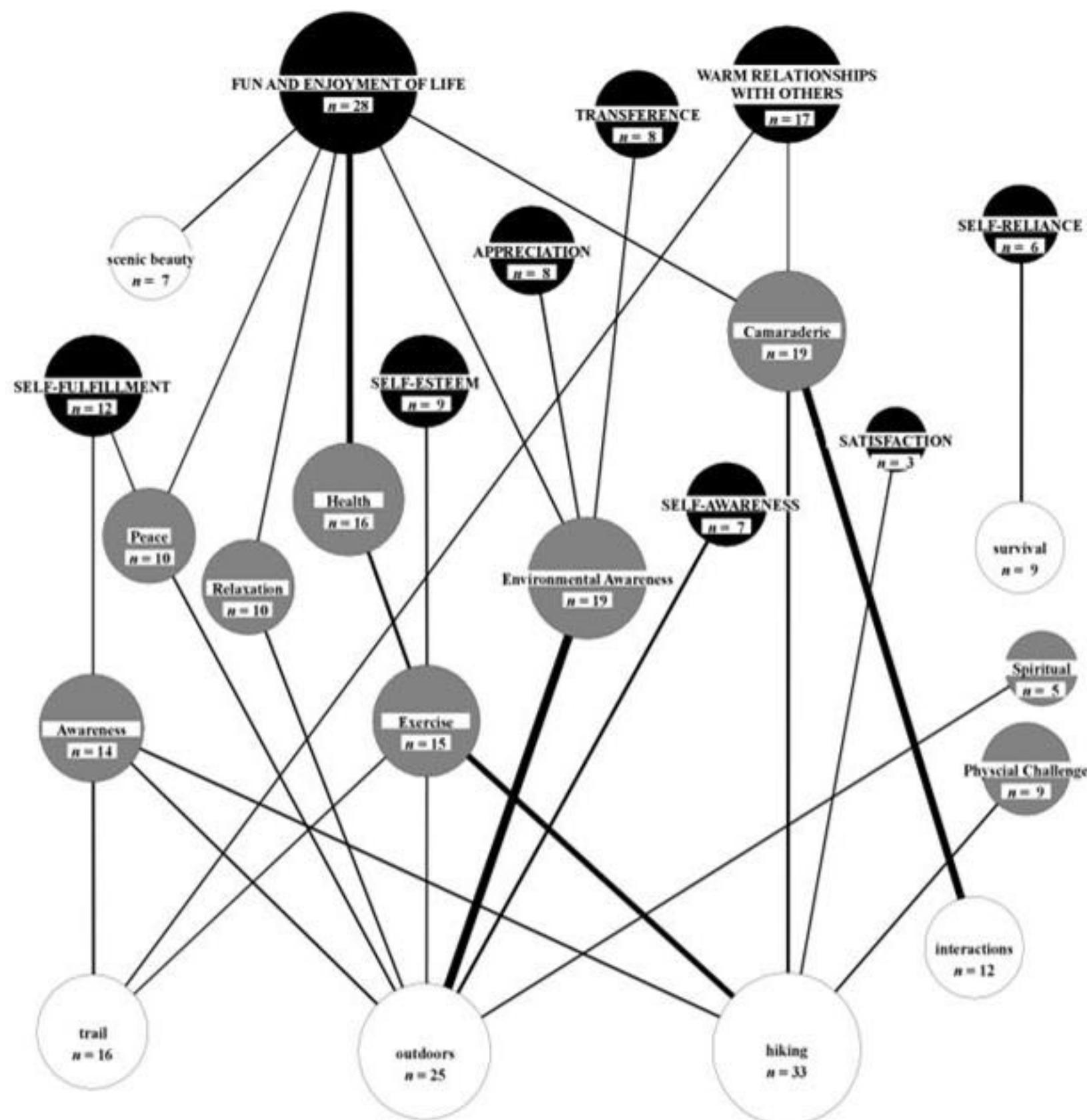
Hill, Goldenberg, and Freidt (2009) attempted to better understand the motivations of hikers through qualitative research using the means-end theory's laddering technique. Data from a convenience sample of 43 AT hikers were collected. After collecting demographic and psychographic information, hikers were asked to self-identify one to three components of the AT experience most meaningful to them. Then, the researchers repeatedly asked the hiker, "Why was that important to you?" In this way, respondents "talked" their way up the ladder of ab-

straction to the values associated with the AT attribute previously self-identified as most appreciated. Using LadderMap, a computer program used for analyzing means-end data, a Hierarchical Value Map (HVM) (see Figure 1) was created in order to visually depict the connections respondents made between attributes of the trail, consequences resultant from the trail's attributes appreciated, and the respective personal values/outcomes desired.

Figure 1 graphically summarizes the strength of relationships between attributes, consequences, and values that Hill and colleagues (2009) found to be related to hiking on the AT. The attributes were listed in un-shaded circles. The consequences were depicted in semi-shaded circles. Values were listed in completely shaded circles. The thickness of the line depicted the strength of the relationship between two items. The size of the circle for each item indicated the size of the response. Larger circles indicate a larger number of respondents reported that item was of importance to them.

The HVM in Figure 1 illustrated themes in attributes of the trail that hikers indicated were most meaningful to them. Hill and colleagues (2009) found that being outdoors, hiking, the trail itself, the scenic beauty, the survival element and the interactions to be the most appreciated attributes of the AT. Health, exercise, physical challenge, and camaraderie are examples of consequences which respondents linked to the aforementioned attributes. Values found in Hill and colleagues' 2009 study included: self-esteem and fun and enjoyment of life. Through the use of the means-end laddering technique, the researchers found links between hiking and exercise, exercise and health, and health and fun and enjoyment of life. The researchers concluded that generally people hike on the AT for warm relationships with others and fun and enjoyment of life (Hill, et al., 2009).

The results from the Hill et al. study indicated that motivating factors for respondent use of the trail included the physical challenge, exercise, and health. While this research may be used to provide some very useful data to trail managers, the fact that a convenience sample was used in the research design affected the generalizability of the study's findings. Because of this limitation and because this study was the first to explore this topic, further research was needed to provide support for Hill et al.'s findings. The current study seeks to expand upon the findings of Hill et al. (2009).

Figure 1. Appalachian Trail Hiker Means-end Theory Hierarchical Value Map

Additionally, data about the benefits associated with the recreational experience that were valued by participants may be useful in validating future marketing claims. For instance, knowing consequences, whether desired or not, will help recreation professionals better market the use of AT areas currently lacking visitation. Encouraging the use of relatively unused trail sections by emphasizing consequences and values that those areas may deliver, which are similar to the consequences received on overused sections of trail, could help in combating environmental stress and addressing sustainability concerns (e.g., sections of the Smoky Mountains). Information gained from means-end theory chains or rungs of the ladder and eventual values could be useful for validating funding for the maintenance of the trail. For example, if maintenance of the trails was found to be reflective of desired

attributes, consequences and values among users, this information could be used to appeal for donations or other forms of support for trail maintenance (e.g., volunteering) from users.

The current study seeks to expand upon present knowledge in regards to motivations for hiking the AT, while concurrently expounding upon the usages of the means-end theory in recreational settings. Prior studies utilizing the means-end theory in recreational settings did not report testing the means-end theory model. The current study examines the relationships between the means-end theory components—attributes, consequences and values—with respect to hiking the AT. Additionally, the laddering technique used for data collection in prior means-end focused studies is qualitative in nature and, thus, requires a significant amount of time to analyze. The current study tests the use of a quantitative scale, the Benefits of Hiking Scale (BHS). The BHS scale may be used in place of the laddering technique. Lastly, the current study is unique because it contributes to the general leisure literature via the exploration of the perceived benefits of AT hiking—an identified gap in the literature.

Methods

Sample

The current study is ancillary to a larger study. All users of the AT were the target population for this study. The Statistical Abstract of the United States (U.S. Census Bureau, 2006) estimated that there were 35.6 million backpackers and hikers, and the National Park Service (NPS) estimated four million users visit the AT annually (U.S. National Park Service, 2007). Individuals over the age of 18 years with internet access who were viewers of websites associated with the AT (e.g., Whiteblaze.net), members of AT trail maintaining clubs (e.g., the Tidewater Appalachian Trail Club), and AT hikers otherwise informed of the survey composed the accessible population sample for this study.

In 2006, the Appalachian Trail Conservancy (ATC) had 42,000 members and was partnered with 30 trail maintenance clubs (Appalachian Trail Conservancy, n.d.b). All 30 trail-maintaining clubs were asked via electronic mail to participate in the current study. Additionally, two outdoor recreation equipment providers agreed to post fliers about the study, and a popular hiking website volunteered to post both the link to the survey and a description of the study on the general forum portion of the website.

Approximately 37,000 members from clubs and websites combined were exposed to the survey. All 37,000 members who were informed of

the study may not have been AT hikers (i.e., some members may be hikers who have not hiked on the AT or may not hike at all but rather participate only in trail maintenance). For a population of 40,000 a sample size of 380 was needed (Guadagnoli & Velicer, 1988).

Instrumentation

The Benefits of Hiking Scale (BHS) was utilized in this study. The BHS was created by using a modified, quantitative version of Reynold's and Gutman's (1988) means-end theory's qualitative laddering technique and information gathered from the study by Hill et al. (2009). A section of the questionnaire was designed to measure the relationships between attributes, consequences, and values associated with the AT by its users. Answers given were measured on a 7-point, Likert-type scale where 1 = never/not applicable, 2 = very much not like me, 3 = moderately not like me, 4 = somewhat not like me, 5 = somewhat like me, 6 = moderately like me, and 7 = very much like me. The BHS measured both demographics (e.g., gender and age) and usage patterns (e.g., hiker typology and time spent on the trail).

Data Collection Procedures

After review by an expert panel and pilot-testing for understanding, general flow, and length (time), the BHS was presented as an online survey, using Inquisite 8.0. Inquisite 8.0 is an online survey software akin to Survey Monkey, based in Austin, TX, and utilized by the lead author's institution. After pre-testing but prior to posting the full survey online, the Appalachian Trail Conservancy (ATC) was invited to review the survey. After review by the ATC, changes were made to the initial survey and a convenience sample of three graduate students, who were interested in hiking, also field-tested the survey. Respondent feedback was taken into consideration and slight modifications were made to the survey instrument. No prior analysis of the instrument was performed during the pre-test as there was not a large enough pre-test sample to validly or reliably assess the components. However, validity and reliability coefficients for both the items and the respective scales are presented later in this paper.

Five weeks prior to publishing the BHS survey online, a description of the study was sent via electronic mail to each of the 30 ATC-partnering trail maintaining clubs. The initial letter, electronically mailed, outlined the study's intent, introduced the researcher and asked for the cooperation and willingness of the managers in publishing the

link to the survey on the cooperating agency's website, electronically mailing the survey link to the agency's list serve, and announcing information about the study at trail club meetings. Those agencies expressing a desire to participate were sent a second electronically mailed letter. This letter contained the survey link, a paragraph for use in introducing the study to agency/club members and a request to confirm participation by electronically mailing a statement containing the methodology used to disseminate survey information and the membership number exposed to the survey.

After four weeks from the initial participation request, clubs and agencies that had not yet responded were sent another request to participate. The second request included an update with respect to the study's current club response rate, the survey response rate, and the information from the initial letter. Forwarded contact information for other clubs and other agencies (e.g., Whiteblaze.net) that might be interested in participating in the study were also sent an invitation to participate. A final participation request to non-responsive ATC-partnering clubs was sent after another four weeks passed. Post data collection, a thank you letter was sent to each of the participating organizations.

Clubs participated by announcing information about the survey during trail club meetings, e-mailing club members, and/or posting a link to the survey on the club website. Members of a website frequented by AT hikers, www.whiteblaze.net, also participated in the study. In addition, fliers about the survey were posted at two outdoor equipment providers' places of business.

Results

The data were collected and analyzed using the Statistical Package for the Social Sciences (SPSS 15.0). A total of 454 usable surveys were collected. The number of usable surveys was determined through the screening question: "I consider myself to be a: day hiker, overnight hiker, section hiker, thru-hiker, or multi-use hiker." Descriptive statistical analyses provided an overview of perceptions and demographic information. Confirmatory Factor Analyses (CFAs) were performed to establish the internal and external validity of hypothesized constructs for means-end theory, and Chronbach's Alpha was used as the reliability analysis. Additionally, correlation analyses were utilized to ascertain the relationship between attributes, consequences and outcomes. One-way between-subjects ANOVAs were used to analyze the relationship between hiker types (i.e., day hiker, overnight hiker, section hiker, thru-hiker, and multi-use hiker) and the dimensions of the means-end

theory (i.e., attributes, consequences and outcomes). The p-value of 0.05 was used to determine statistical significance among the variables.

Descriptive Statistics

Fourteen ATC partnering clubs participated in the current study. Thus, the club response rate was 46.6%. Demographic information was provided by 422 of the 454 respondents surveyed. Study participants were predominantly male (70.1%). Those who identified themselves as Caucasian constituted the majority of respondents in the current study (94.3%), while no respondents indicated African American/Black heritage and 3.1% of respondents declined to answer. The largest group, in terms of marital status, was married people (59.5%). Household incomes were reported by 394 respondents. Of those who reported household income level, 36.8% earned between 40,001 and 80,000 dollars, 25.4% earned between 80,001 and 120,000 dollars, 18% earned less than 40,000 dollars, and 14.2% earned more than 120,000 dollars. The majority of hikers identified themselves as section hikers (34.6%), while 26.2% identified themselves as day hikers, 16.5% as multi-use hikers, 13.0% as thru-hikers, and 9.7% as overnight hikers.

Inferential Statistics

The BHS was created using attributes, consequences, and values identified in a study on the motivations of AT hikers by Hill et al. (2009). Two conceptual models (see Figures 2 and 3) emerged from the literature. The first model reflects the laddering methodology used to measure means-end theory, and assumes that ATTRIB (Attributes) drive CONSEQ (Consequences) and CONSEQ drive VAL (Values) (see Figure 2). The second conceptual model derived from the literature on the means-end theory indicated that the ATTRIB may lead to CONSEQ or directly to VAL (see Figure 3). Confirmatory factor analysis (CFA) using Varimax Rotation was conducted to determine if the variables within each of the subscales (ATTRIB, CONSEQ, VAL) were valid measures of the means-end theory. Tabacknick and Fidell (1996) indicated values of 0.60 for the Kaiser-Meyer-Olkin (KMO), and $p < 0.05$ for Bartlett's Test of Sphericity (BTS) are required for factor analysis.

KMO (> 0.60) and Bartlett's Test of Sphericity (BTS) ($p < 0.05$), with respect to the ATTRIB, CONSEQ, and VAL subscales, confirmed sampling adequacy in that the subscales met both the KMO and BTS criteria. Guadagnoli and Velicer (1988) concluded that factors/constructs are well defined when they have factor loadings of 0.60

or higher. Thus, items were omitted from further analyses if factor loadings were less than 0.60. Table 1 illustrates items used to determine internal and external validity with respect to the means-end construct and related subscales. The subscales were assessed for internal and external validity (factor analysis) and reliability (Cronbach's alpha).

Figure 2. Conceptual Model of Means-end Theory using Laddering

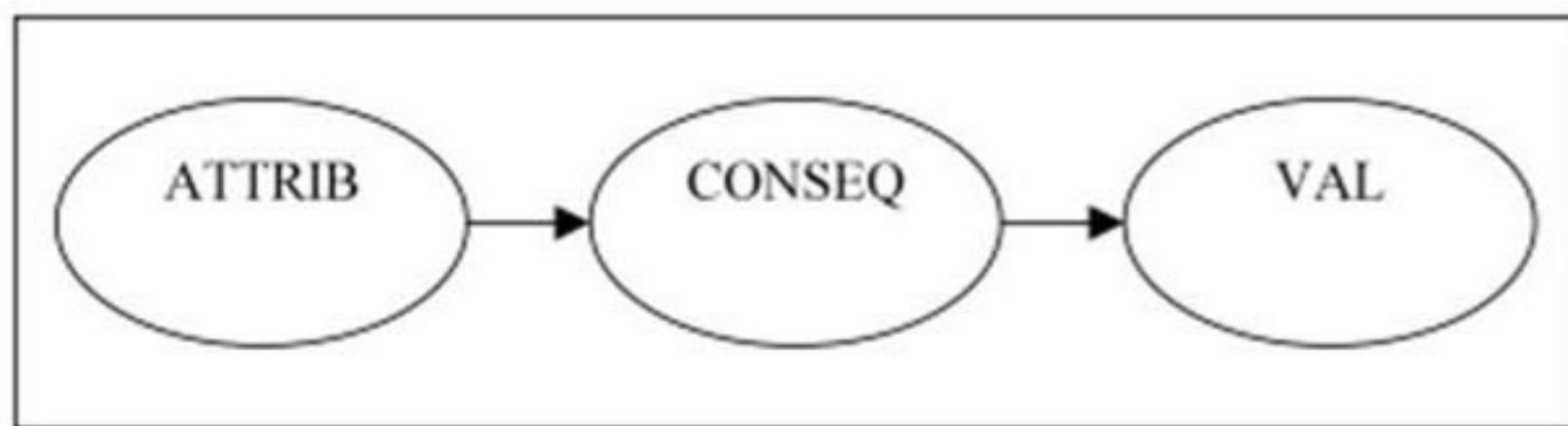
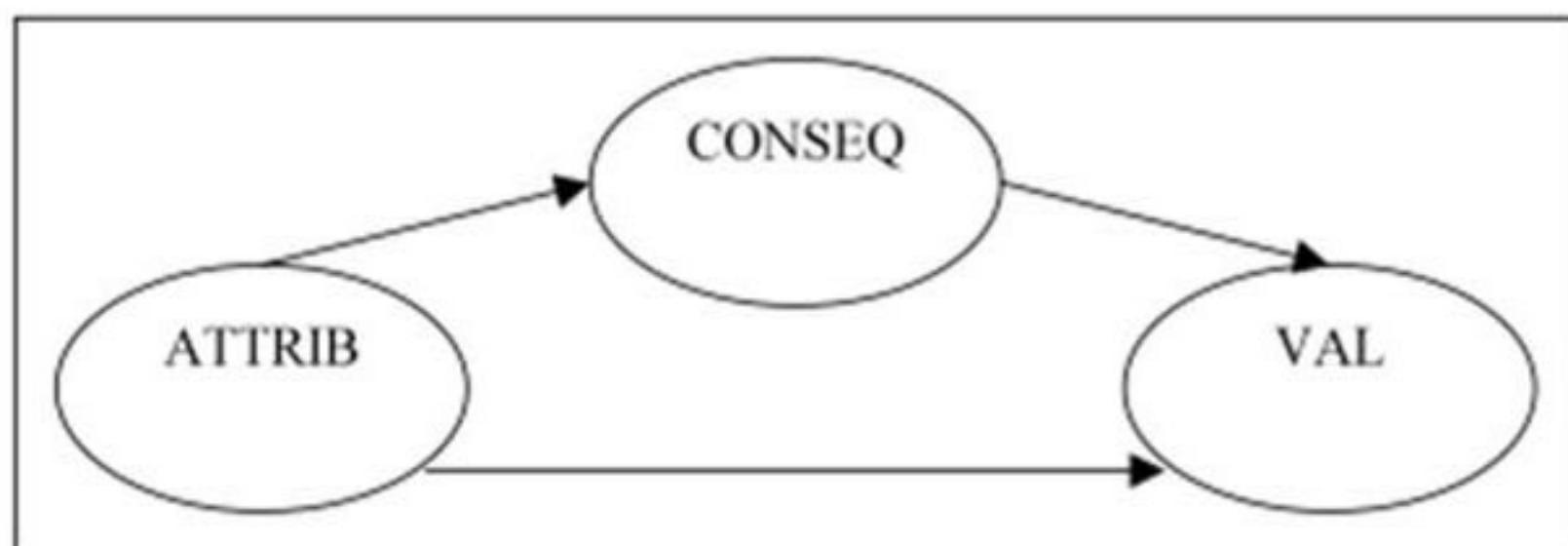


Figure 3. Conceptual Model of Means-end Theory



In the VAL subscale, Item 2 was excluded, resulting in a KMO of 0.92 and a Cronbach's alpha of 0.91. The deletion of any further items would not increase Cronbach's alpha. Item 16 from CONSEQ subscale was omitted because the item factor loading was below 0.60; once this item was deleted, the subscale KMO was 0.74 and Cronbach's alpha was 0.83. Cronbach's alpha for the CONSEQ subscale did not increase with the deletion of any other items. The ATTRIB subscale's Items 21 and 22 did not meet the factor loading criterion and Cronbach's alpha would not increase with the deletion of any other subscale items. The resulting KMO for the ATTRIB subscale was 0.69; Cronbach's alpha was 0.75.

Subsequent to the confirmation of internal validity, external validity was confirmed. The means-end construct's external validity was confirmed with a KMO of 0.87 and BTS $p < 0.01$. Subscale items having higher factor loadings on other subscales did not meet the external validity check (i.e., because a CFA was performed, items measuring higher on factors for which they were not hypothesized should be deleted) and were omitted from the second factor analysis of the means-end subscales (ATTRIB, CONSEQ, VAL). Items omitted from further analyses based on the external CFA results (see Table 1) included items 1, 10, 12, 13, and 14. The means-end subscales passed all validity (factor analysis) and reliability (Chronbach's alpha) tests. The ATTRIB subscale's KMO was 0.69 and Chronbach's alpha was 0.75. The CONSEQ subscale had a KMO = 0.63 and a Chronbach's alpha = 0.77. The VAL subscale's KMO was 0.92, and Chronbach's alpha was 0.91.

The CFA identified three distinct constructs. The first construct was attributes (ATTRIB) and it was comprised of the following items: (a) enjoying scenic beauty, (b) developing survival skills, (c) being in the outdoors, (d) enjoying the act of hiking, and (e) enjoying the characteristics of the trail. The second identified construct was consequences (CONSEQ) and it was made up of the following items for why the respondents hike: (a) physical challenge, (b) increased social awareness, (c) exercise, (d) good for health, and (e) social bonding. Lastly, the third construct was values (VAL) and it consisted of the following items regarding their overall feelings towards hiking: (a) improves appreciation of life; (b) improves self-esteem; (c) improves self-awareness; (d) increases feelings of satisfaction; (e) improves self-reliance; (f) improves self-fulfillment; and (g) that the benefits of hiking the AT are applicable to other areas in life (see Table 1 for specific item deletion/retention).

Using the items confirmed during CFA, the items were combined to represent one composite variable. Consequently, one-way ANOVAs were conducted to investigate the association between user type (i.e., day hiker, overnight hiker, section hiker, thru-hiker, or multi-use hiker) and the dimension of the means-end chain (i.e., ATTRIB, CONSEQ and VAL). A p -value of 0.05 was used to determine statistical significance. No statistically significant differences were found among user types with respect to the ATTRIB, CONSEQ and VAL subscales. The ANOVA analysis of ATTRIB and user types, $F(4, 419) = 1.15$, $p = 0.33$ yielded no significant findings between user types. The ANOVA analysis of means-end subscale CONSEQ and user types, $F(4, 420) = 2.25$, $p = 0.06$, was not significant. Lastly, the ANOVA analysis of VAL and user types, $F(4, 421) = 2.26$, $p = 0.06$, also yielded no significant results. Because no statistically significant differences were found

amongst subcomponents and the user types, post hoc analyses were not performed (see Table 2).

Table 1
Items used to Measure Means-end Theory Components

Items ^a		<i>μ</i>	<i>SD</i>	<i>h^b</i>
<i>Values (VAL, α= 0.91)</i>				
1. Overall, I feel that hiking the AT improves fun and enjoyment of life. ^d	6.39	0.94		
2. Overall, I feel that hiking the AT creates warm relationships with others. ^c	5.22	1.49		
3. Overall, I feel that hiking the AT improves appreciation of life.	6.30	1.03	0.71	
4. Overall, I feel that hiking the AT improves self-esteem.	5.53	1.6	0.76	
5. Overall, I feel that hiking the AT improves self-awareness.	5.74	1.45	0.84	
6. Overall, I feel that hiking the AT increases feelings of satisfaction.	6.25	1.05	0.76	
7. Overall, I feel that hiking the AT improves self-reliance.	6.02	1.23	0.81	
8. Overall, I feel that hiking the AT improves self-fulfillment.	5.96	1.34	0.79	
9. Overall, I feel that the benefits of hiking the AT are applicable to other areas of life.	6.11	1.94	0.71	
<i>Consequences (CONSEQ, α = 0.77)</i>				
10. I hike the AT because I feel hiking is spiritual. ^d	4.81	2.00		
11. I hike the AT because I feel hiking is a physical challenge.	6.10	1.14	0.74	
12. I hike the AT because hiking gives me peaceful feelings. ^d	6.00	1.27		
13. I hike the AT because hiking is relaxing. ^d	5.91	1.30		
14. I hike the AT because hiking increases my personal awareness. ^d	5.59	1.52		
15. I hike the AT because hiking increases my social awareness.	4.45	1.67	0.83	
16. I hike the AT because hiking increases my environmental awareness. ^c	5.59	1.46		
17. I hike the AT because hiking is exercise.	5.91	1.41	0.91	
18. I hike the AT because hiking is good for my health.	5.86	1.42	0.81	
19. I hike the AT because hiking is social and leads to social bonding.	4.46	1.72	0.88	
<i>Attributes (ATTRIB, α = 0.75)</i>				
20. One of the main reasons I hike the AT is because of the scenic beauty of the trail.	6.12	1.09	0.73	
21. One of the main reasons I hike the AT is because I can use and develop survival skills. ^c	4.47	1.74		
22. One of the main reasons I hike the AT is because hiking leads to social interactions that I enjoy. ^c	4.60	1.65		
23. One of the main reasons I hike the AT is because I enjoy being outdoors.	6.69	0.69	0.67	
24. One of the main reasons I hike the AT is simply because I enjoy the act of hiking.	6.43	0.89	0.71	
25. One of the main reasons I hike the AT is because I enjoy the characteristics of that trail.	6.13	1.05	0.76	

^a- items underlined were not used in the measure of BENE construct

^b- factor loadings were only presented for items included in the measure

^c-item did not have the necessary factor loading during the internal validity check

(*h* > 0.6)

^d-item did not have the necessary factor loading during the external validity check

(*h* > 0.6)

Table 2.
ANOVA for Means-end Theory Components and User Types

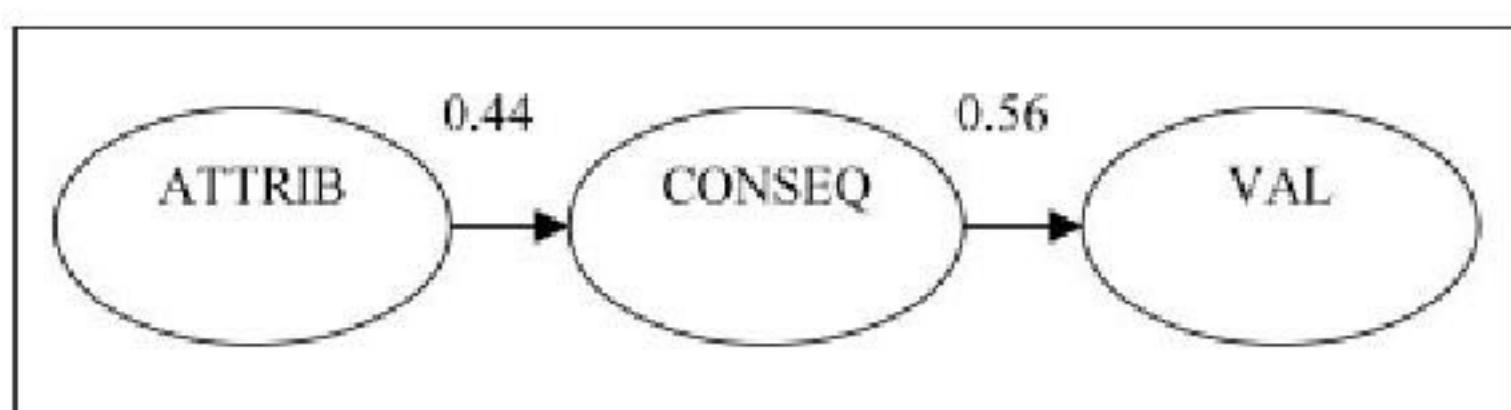
Source	df	F	η^2	p
Between groups				
Attributes	4	1.15		0.33
Consequences	4	2.25		0.06
Values	4	2.26		0.06
Within groups				
Attributes	419			
Consequences	420			
Values	421			

* $p < .005$

**reported if found to be significant

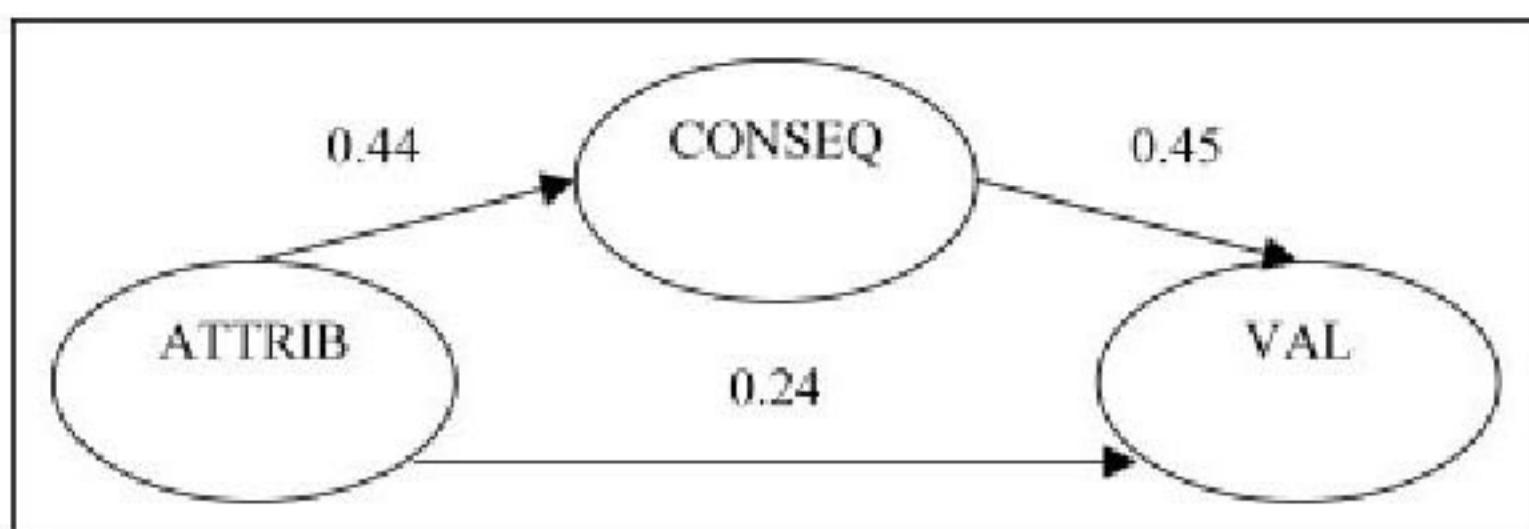
To determine the nature of the relationship between the means-end dimensions (ATTRIB, CONSEQ, and VAL), a two-tailed Pearson correlation analysis was conducted ($N = 424$) to investigate the relationships between the three factors. Because statistically significant correlations were found ($p < 0.01$) between attributes and consequences, attributes and outcomes, and consequences and outcomes, regression analyses were performed. In the one-predictor case a correlation is equivalent to the beta weight. In the first conceptual model (ATTRIB → CONSEQ → VAL), the correlation (r value) between ATTRIB and CONSEQ was equal to 0.44 and the relationship between CONSEQ and VAL yielded an r value of 0.56 (see Figure 4). Thus, the data indicated that CONSEQ may be better estimated 44% of the time when a product, service or experience's appreciated attribute is known, in comparison to not knowing which attribute is appreciated. Similarly, VAL may be better estimated 56% of the time when the consequence perceived is known, in comparison to when it is not known.

Figure 4. Impact Analysis of Traditional Means-end Theory Conceptualization



To test the second conceptual model (ATTRIB→CONSEQ, CONSEQ→VAL, and ATTRIB →VAL), a multiple regression analysis was performed. As this was a two-predictor case, beta weights (β) were used. The relationship between ATTRIB and CONSEQ was significant at the $p < 0.001$ with a β of 0.44. The relationship between CONSEQ and VAL was significant at the $p < 0.001$ with a β of 0.45. The multiple r was 0.60, and the r^2 was 0.35 ($p = 0.0001$). The relationship between ATTRIB and VAL was found to have a β of 0.24 (see Figure 5). Thus, the data illustrated that knowledge of consequences, when compared to not knowing the consequences, improves the likelihood of predicting VAL by 45%. In contrast, knowledge of attributes, when compared to not knowing attributes, was shown to improve the likelihood of predicting VAL by 24%. The data confirmed that by understanding the attributes and consequences associated with a product, service or experience, outcomes desired may be better predicted. More specifically, the data supported that knowledge of CONSEQ was more powerful in estimating outcomes than knowledge of ATTRIB.

Figure 5. Impact Analysis of Alternative Means-end Theory Conceptualization



Discussion and Summary

In the present study, the dimensions of means-end demonstrated statistical validity and reliability. The data supported prior research's conclusions that knowledge of means-end components ATTRIB (see Table 1, Items 20, 23, 24, and 25) and CONSEQ (see Table 1, Items 11, 15, 17, 18 and 19) increase the estimation of VAL (see Table 1, Items 3-9) in comparison to not knowing the attributes appreciated and consequences desired. While a significant, direct relationship was shown to exist between ATTRIB and VAL, in comparison to the alternative con-

ceptual model of the means-end theory (Figure 5), the use of the traditional conceptual model of means-end theory using laddering (Figure 4) was shown to increase the ability to predict VAL by 11% when CONSEQ are known. The beta weight for the relationship between CONSEQ and VAL for Figure 5 (alternative model) was 45% while the beta weight for the relationship between CONSEQ and VAL for Figure 4 (traditional model) was 56%. The alternative conceptual model illustrates that the CONSEQ→VAL impact/relationship is somewhat attenuated according to whether one conceptualizes the relationship of ATTRIB to VAL as either spurious (Figure 4) or direct (Figure 5). Additionally, the data supported that the scale was a valid and reliable measure of means-end. Therefore, this may be interpreted as support for the use of the means-end concept in recreational settings, thus, providing support for prior means-end recreation research (Goldenberg et al., 2000, 2002, 2005, 2008; Klenosky et al., 1998).

Attributes were correlated with consequences and consequences were, in turn, correlated with values. Additionally, attributes were found to have a direct relationship with values. Yet, CONSEQ was found to be the strongest component, and a better predictor of VAL than ATTRIB was. This result may be interpreted as support for the use of the laddering technique (Reynolds & Gutman, 1988), or a modified version of such (Goldenberg et al., 2000, 2002), for determining associations between product/service/experience attributes and an individual's desired outcome. Likewise, the results may be interpreted as support for a quantitative scale for measurement of each sub-component of the means-end chain.

Because no statistically significant differences among AT user types and attributes were found to exist in the ANOVA, "positioning" of each of the four measures of AT attributes should be successful for each AT hiker type. Similarly, no statistically significant differences were found to exist between AT hiker type and consequences perceived. These consequences may be assumed to be factors driving all AT user types to participate (or consume) recreation experience (i.e., hiking) and, thus, may be useful in improving marketing and advertising efforts for the consumption of a recreation experience (Gutman, 1982). Lastly, no statistically significant differences were found to exist between AT hiker types and values desired. Based on the assumption that all consumers are goal-oriented and motivated to perform behaviors that lead to specific desirable outcomes (Costa, Dekker, & Jogen, 2004), the data may be interpreted as evidence supporting that AT hiker types were motivated to hike on the AT for similar reasons. Because no statistically significant differences were found between attributes, consequences, or values for any hiker type, the consumer process of product/service opinion development and how the process leads to an in-

tended outcome may be assumed to be similar for each hiker type (Gutman, 1982).

Conclusions

The application of means-end theory in outdoor recreation research has been limited. Studies have suggested the need to further explore the uses of means-end in leisure research and uncover benefits and outcomes associated with outdoor and other recreation experiences. However, only a limited number of studies have done so (Goldenberg et al., 2008, 2002, 2000, 2005; Klenosky et al., 1993). Similarly, studies have indicated a need to compare data collected using different methods of collecting means-end data (Goldenberg et al., 2002). Studies have also indicated a need to use means-end data to explore outdoor adventure participant subgroups (Goldenberg et al., 2005). The present study attempts to provide a deeper understanding of the relationship between attributes, consequences, and values, with respect to outdoor recreation and, more specifically, hiking on the AT. Additionally, the current study examined sub-groups of users of the AT.

The data revealed that a significant relationship between attributes, consequences, and values exists with respect to hiking on the AT. No significant relationship between hiker type and AT hiking attributes existed. No significant relationship between hiker type and AT hiking consequences existed. No significant relationship between hiker type and AT hiking values existed.

Attributes

Attributes were shown to have a significant relationship with values. However, more strongly related to values were consequences. Of the six attributes identified in Hill and colleague's (2009) study, four attributes held. Survival skills and social interactions were deleted for not meeting the internal validity criterion. One possible explanation for the fact that the survival skill development item did not meet the criterion is that survival skills may have been interpreted as a personal benefit rather than an attribute of the trail. Similarly, an explanation for why social interactions did not hold as an attribute of the trail is that this component may be highly variable as social interactions imply a human component to the trail and this human component may vary from section to section and from time to time.

Consequences

During internal validity analyses, the environmental awareness consequence did not hold. This may be attributed to society's current focus on environmentalism. Hikers may already view themselves as environmentally aware. During external validity the following consequences were deleted because each did not meet the criterion: personal awareness, peaceful feelings, the spiritual nature and relaxing associated with hiking. One speculation for the deletion of these items is that each of these items may be considered rather abstract. By deleting the repeated questioning of "Why was _____ important to you?" respondents may not have progressed to that level of abstraction, to which the aforementioned laddering technique is meant to help lead a respondent. This may indicate a limitation in the use of a quantitative scale for measuring means-end components.

Values

Values items that were deleted included "fun and enjoyment of life" and the creation of "warm relationships with others." Both of these values were found to be of high importance in Hill and colleague's (2009) study. The deletion of warm relationships with others may be due to the fact that most other outcomes focused on the "self." It is possible that respondents were focused on outcomes that did not depend on external factors such as other hikers.

Implications

Foremost, an understanding of the attributes, consequences, and values associated with hiking on the AT may be useful in arguing for funding for the conservation and preservation of the footpath and its surrounding corridor lands. Use of the identified consequences and values (i.e., exercise, good health, physical challenge, social bonding, social awareness, self-awareness, self-reliance, self-fulfillment, self-esteem, satisfaction, appreciation of life, and transference of all of the aforementioned to other aspects of a hiker's life) in promotion and advertising materials in order to "position" the AT hiking experience in the minds' of potential donors to the ATC or trail maintaining clubs may aid in acquiring funding. By relating the hiking experience to the consequences desired, lack of undesired consequences or desired outcomes, land managers may increase donations to conservation and preservation efforts.

Secondly, land managers and trail club leaders may use the newly found information regarding desired values (i.e., self-awareness, self-reliance, self-fulfillment, self-esteem, satisfaction, appreciation of life, and transference of all of the aforementioned to other aspects of a hiker's life) to promote the wise-use of the trail. Similarly, aligning the hiking experience in advertising and promotional material for less frequented areas of the footpath with consequences and outcomes now known, wise-use of the trail may increase. By offering a "substitution" for an overpopulated area that will afford hikers the same consequences and values sought by hiking in the overloaded area, use of overpopulated areas may decrease, thus, aiding in conservation and preservation of the overused section of trail and that section's ecosystem. Additionally, knowledge of consequences and values desired may be used by trip leaders (e.g., Boy Scouts, Outward Bound, Boys & Girls Clubs, and trail club trip leaders) to better program for attainments of these consequences and values. For example, Eckerd Youth Alternatives' Outdoor Therapeutic programs may choose to target adjudicated youth for distance hiking trips on the AT knowing that self-reliance, self-esteem and appreciation of life are outcomes intrinsic in the activity. Programming to concentrate on these outcomes/values may improve delivery of said outcomes, thus, improving the success of the trip. In the same way, a diabetes camp may use hiking on the AT to promote exercise, physical challenge, good health and self-esteem—all of which are frequently targeted in such camps.

Understanding of consequences desired may be useful to trail maintainers in determining how best to cultivate the trail with respect to the desires of the users. For example, by knowing that social bonding and social awareness are important to hikers, trail maintainers may determine that shelters accommodating large groups may improve AT hiker satisfaction. Likewise, trail maintaining clubs may use knowledge of consequences and values to enlist maintenance service project attendees. Instead of focusing on the camp food or the environmental consequences—which did not emerge as motivators—trail maintaining clubs may increase service project participation by programming maintenance trips that can advertise and deliver the consequences and values desired (i.e., exercise, good health, physical challenge, social bonding, social awareness, self-awareness, self-reliance, self-fulfillment, self-esteem, satisfaction, appreciation of life, and transference of all of the aforementioned to other aspects of a hiker's life). In doing so, the means-end theory asserts that service project attendance will increase. On a different note, service projects may be able to better service hikers of the AT by understanding and planning projects based upon knowledge of the attributes of the AT appreciated by hikers (i.e., the AT itself, the scenic beauty, the act of hiking, and the outdoors). This knowledge may allow

trail maintainers to focus service projects on those that will improve the “positioning” of that section of the trail (i.e., make the appreciated attribute more noticeable, observable, and discernable) while also using the attributes of their section of trail to market use of that section.

The development and validation of a quantitative scale measuring means-end for AT hiking may be useful to leisure service professionals interested in studying other trails. The BHS may be adapted to do so. Likewise, validation of the applicability of means-end theory to outdoor recreation experiences may encourage leisure professionals to use this theory in other recreation research. Most importantly, the validation of the use of a quantitative scale, rather than the outdated MS DOS program used for laddering, may encourage further use of the means-end theory in recreation and leisure research. This type of research lends itself to the use of academic research to promote and articulate recreation consequences and values to the public, to government agencies, and to public and private service providers while also forming partnerships between academia and recreation agencies—both of which are acknowledged needs of the profession (Driver, 1998; Hill et al., 2009).

Future Studies

As the current study was delimited to users of the AT, future studies may adapt the scale for use on other trails. In particular, an examination of our nation’s other National Scenic Trail, the Pacific Crest Trail may be of interest. Local trails may also use the BHS questionnaire to examine the benefits and outcomes desired by users. Comparing the desires of users of longer and shorter trails may provide data for planning and development of future trails while helping local trail managers to determine how best to promote local trail use. Comparison of findings from the current study and future studies may be of note to the hiking community and hiking service providers. Information gathered may be useful in justification of funding to preserve wilderness or pathways on which to hike, in justification of funding for new hiking trails, in programming group hikes, in promotion of trail usage and in increasing in trail usage.

In order to further validate the findings of the current study with respect to perceived health benefits and the findings of Hill, Swain, and Hill’s (2008) study which explored the actual health benefits of three, high-fit AT hikers, future studies should explore via field testing the actual health benefits (e.g., weight maintenance or loss from caloric expenditure during hikes and improvements in aerobic capacity). Of particular interest may be studies of the actual health benefits for indi-

viduals currently needing to maintain or lose weight to increase quality of life. The combination of perceived and actual health benefits may be used to strengthen arguments for participation in the activity and, thus, address current health concerns related to lack of physical activity.

Studies should also examine the consequences and values for differing demographic populations (e.g., male v. female, ethnic and racial subgroups, etc.). As this study was delimited to adult users of the AT, future studies should be conducted to examine consequences and values for youth. The No Child Left Inside Act of 2007 (Chesapeake Bay Foundation, 2008) and Louv's Last Child in the Woods (2005) reveal society's current concern with the health of this population, research on this subpopulation may be of interest to Benefits Based managers, recreation specialists and the general populace.

Future studies should also be conducted to further validate the use of a quantitative scale to measure means-end. These studies may be used to expound upon the use of means-end in the recreation setting. Future studies may also use branching (an on-line survey option linking subsequent questions to answers choices for previous questions). Advanced statistics, such as hierachal linear modeling analyses could also be used to quantitatively simulate the means-end theory's qualitative laddering technique. A comparison between differing quantitative means-end data collection methods may help recreation and leisure professionals better analyze the construct.

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