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A Benefits-Based Study of Appalachian Trail Users: Validation and Application of the Benefits of Hiking Scale

Étude des bienfaits pour les randonneurs du Sentier des Appalaches : Validation et application de l'échelle de bienfaits

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Lack of exercise has been linked to poor health issues (e.g., obesity) in American society. National (e.g., Appalachian Trail) and local trails are a potential resource for championing physical activity. To challenge sedentary lifestyle choices and promote more active ones, an understanding of the benefits perceived to be associated with physical and outdoor activities is needed. A total of 454 Appalachian Trail user surveys were collected. Validity analyses and reliability analyses showed the Benefits of Hiking Scale to be an accurate and consistent measure of the dimensions of recreation benefits. Within the improved condition dimension of Benefits, significant differences were found to exist between day hikers and section hikers (p=0.02), day hikers and thru-hikers (p=0.03), and multi-use and thru-hikers (p=0.04). By increasing participation in physical activities such as hiking on the AT, recreation professionals may aid in the effort to reduce health concerns directly correlated with sedentary lifestyle choices.

Le manque d'exercice a engendré toute une série de problèmes de santé (p. ex., l'obésité) au sein de la société américaine. Les sentiers nationaux (comme celui des Appalaches) et locaux offrent de bonnes occasions de célébrer et promouvoir l'activité physique. Pour lutter contre des modes de vie sédentaires et favoriser les loisirs actifs, il importe de connaître les bienfaits associés à l'activité physique et aux activités de plein air. Cette étude se fonde sur un sondage mené auprès de 454 usagers du Sentier des Appalaches. Les analyses de validité et les analyses de fiabilité ont démontré que l'échelle des bienfaits de la randonnée

pédestre donne une mesure précise et cohérente de l'ampleur des bienfaits associés aux activités récréatives actives. À l'intérieur du créneau des bienfaits découlant d'un meilleur état physique, on a observé des écarts significatifs entre les personnes qui font une randonnée pédestre d'un jour et celles qui ne parcourent qu'une portion du sentier (p=0,02), entre les personnes qui font une randonnée pédestre d'un jour et celles qui parcourent le sentier en entier (p=0,03), ainsi qu'entre les personnes qui explorent le sentier à diverses fins et celles qui parcourent le sentier en entier (p=0,04). En aidant à accroître le taux de participation à des activités physiques comme la randonnée pédestre sur le Sentier des Appalaches, les professionnels des loisirs participent aux efforts engagés pour contrer les problèmes de santé directement associés à des modes de vie sédentaires.

Introduction

Chronic diseases (e.g., cardiovascular disease, some forms of diabetes, and some cancer types) are acknowledged as leading causes of death and disability in the United States. Annually, 1.7 million Americans have deaths attributed to chronic diseases. Additionally, due to a chronic disease, 10% of all Americans experience a major limitation in activities of daily living. A substantial amount of the burden of chronic diseases is avoidable; hence, millions of Americans needlessly suffer a decrease in quality of life (Centers for Disease Control [CDC], 2009).

Physical inactivity contributes to many of these life threatening chronic diseases and is associated with weight gain and obesity (CDC, 2009; U.S. Department of Health and Human Services [HHS], 2001). Being overweight or obese is often linked to conditions such as arthritis, heart disease, stroke, certain cancer types, type 2 diabetes, certain breathing problems, and psychological disorders like depression (HHS, 2001). An estimated 300,000 deaths each year is attributed to obesity alone (HHS, 2001).

The number of individuals in the U.S. that are either overweight or obese has increased dramatically since the mid-seventies of the twentieth century (CDC, 2009). In the U.S., all ages, racial and ethnic groups, and genders have increased in numbers of individuals who are overweight and obese (HHS, 2001). This increase is of concern because of its link to premature death, disability, and decrease in quality of life.

Literature Review

The Role of Parks and Recreation in Addressing Health Concerns

Physical activity may be used to contest overweight conditions (President's Council on Physical Fitness and Sports, 2007). Yet, during leisure time, 24% of American adults are inactive (CDC, 2009). In 1997, 15% of the population was found to engage in the recommended amount of physical activity (*Healthy People 2010*, 2000). Because physical activity helps control weight, and excessive weight is linked to premature death, disability, and decreased quality of life, physical activity tops the list of Leading Health Indicators in *Healthy People 2010*. The National Recreation and Park Association (NRPA) and U.S. Department of Health and Human Services (HHS) have joined forces to utilize parks as places of health, exercise, and general well-being (*Healthy People 2010*, 2002).

Secretary of the Interior, Dirk Kempthorne, acknowledged the role National Parks should play in health and fitness. In *The Future of America's National Parks* (2007), it was noted that "[national] parks restore minds, hearts, and souls. Many Americans, especially children, are increasingly disconnected from the great outdoors. National parks will be part of the solution to reduce obesity, chronic illness, and adult-onset diabetes" (p. 12). The lack of connection Americans have with the outdoors was noted in House Resolution 3036, also known as the No Child Left Inside Act of 2007 (Chesapeake Bay Foundation [CBF], n.d.). This Act proposed learning in the outdoors could positively impact a child's life (e.g., self-esteem). The No Child Left Inside Coalition boasts 200 member groups representing tens of millions of Americans (CBF, n.d.); thus, iterating the current, widespread notion of using the outdoors to address societal concerns such as personal health. Likewise, Louv's *Last Child in the Woods: Saving Our Children from Nature-Deficit Disorder* (2005) considers the implications of research indicating that nature and interaction with nature are positively linked to the "physical, emotional and spiritual health" of children and adults (p. 3).

The Appalachian Trail

The Appalachian Trail, colloquially referred to as the AT, is an ideal example of a National Park entity to showcase the idea of using parks for health restoration. *Healthy People 2010* (2000) stated the major barriers for increasing levels of physical activity were lack of time, lack of convenient facilities, and lack of a safe environment. In contrast to the suggestion that lack of time is a constraint, O'Sullivan (2006) estimated more than one-third of a person's life may be discretionary time; a sentiment noted earlier by Chubb and Chubb (1981) who wrote, "On the average, people spend about one-third of their time on some form of recreation" (p. 50-51). If this is the case, what are people doing with their discretionary time?

The average person is projected to spend 1,555 hours watching television, 91 hours watching videos, 12 hours watching movies in the theater, 195 hours using the internet, 86 hours playing video games, and 26 hours using interactive television and/or wireless content a year (U.S. Census Bureau, 2006). Thus, the average person is projected to spend 1,965 hours using media a year; 1,965 hours equals nearly 82 full twenty-four hour periods. This exemplifies Americans' current choice to participate in non-physical activities. Choosing sedentary activities, such as the above, is in direct opposition to choosing physical ones and, therefore, in conflict with the prevention, treatment, and decrease of chronic health diseases

Mackaye initiated the formation of the AT with the explicit purpose of combating the "machine influence," a facet many commonly acknowledge as a prime contributor to Americans' sedentary lifestyle choices. Mackaye wrote:

> … the Appalachian Trail was started—to become "acquainted with" scenery; to absorb the landscape and its influence as revealed in the earth and primeval life … Such is the first long step in the longer pursuit of becoming harmonized with scenery—and the primeval influence … primeval influence is the opposite of machine influence. It is the antidote for over-rapid mechanization. (1932, p. 330)

Thus, the U.S.A.'s first National Scenic Trail was formed with the intent of getting individuals away from the "machine influence," a factor the media usage statistics show is currently affecting leisure activity choice. For this reason, campaigning for physical activity by advocating the use of this trail is fitting.

In addition to lack of time, lack of convenient facilities was listed as a major barrier to increasing physical activity (*Healthy People 2010,* 2000). The AT presents millions of Americans with the opportunity to engage in an assortment of physical activities of varying levels (National Park Service [NPS], 2007); activities range from a short walk or run to a complete "thru-hike" of the entire trail. The AT spans fourteen states and consists of approximately 2,175 miles of connected footpath (NPS, 2007). The AT is often referred to as the "People's Path" because nearly two-thirds of the entire American population is within a day's drive of it (NPS, 2007). In 2006, over 299 million people were estimated to live in the U.S. (U.S. Census Bureau). The NPS estimates the AT receives four million visitors annually; this is equivalent to two percent of the population relatively close to the footpath (NPS, 2007).

The last major barrier to physical activity participation listed in *Healthy People 2010* (2000) was lack of a safe environment. Burns, Lee, and Graefe (1999) piloted a survey instrument to measure perceptions of safety and security among AT users. They reported that 76% of AT users surveyed felt very safe while 24% felt reasonably safe. Of particular note, not a single AT user surveyed reported feeling either somewhat unsafe or very unsafe. Manning et al. (2001) surveyed nearly 2,000 AT visitors and reported less than 5% indicated encountering a security problem on or off the AT in the last twelve months. More than 96% of respondents in this study indicated feeling reasonably or very secure on the trail (Manning et al., 2001).

In sum, the AT is a NPS entity and recreation resource that has the potential to target all three major barriers to increasing physical activity. For this reason, the AT makes an excellent model with respect to the use of parks to advocate increased physical activity and improved health. Programming to use parks for the purpose of increasing physical activity is a currently much discussed topic. Thus, research demonstrating the usefulness and effectiveness of park usage in providing the desired benefits is needed to market this campaign and to further justify funding for parks and park programs.

The Benefits Movement

In order to best provide quality service to the public and continually justify the existence and maintenance of recreation facilities, evidence of tangible outcomes continues to be an ever-growing demand of the populace (Allen & Cooper, 2003; Moore & Driver, 2005). This need to justify recreation and leisure experiences led to the Benefits Movement; the Benefits Movement refers to the "ongoing process of leisure service providers to identify desirable individual, social, economic and environmental benefits derived from recreational experiences" (Allen & Cooper, 2003, p. 30). The process includes the assignment of resources to address and promote these benefits; additionally, the process requires the documentation and promotion of the outcomes (Allen & Cooper, 2003). Prior to the National Recreation and Parks Association (NRPA) promoting the Benefits Movement, this was happening at the international level. In 1997, the Canadian Parks and Recreation Association (CPRA) published *The*

Benefits Catalogue. This resource provided evidence-based research on the numerous benefits of incorporating recreation into one's lifestyle. The document also highlighted the specific areas (e.g., environmental) of which recreation and parks can be beneficial. These four areas were in parallel as NRPA began the U.S.A.'s campaign on the Benefits Movement. In 2001, CPRA further explored the demand of recreation in youth, identifying the multiple ways in which recreation can be highly beneficial in families of lower socio-economic status (*CPRA, 2001).* More recently, at the international level on recreation and benefits, Driver (2009) published *Managing to Optimize the Beneficial Outcomes of Recreation*. In this text, an entire chapter was dedicated to Canada highlighting it as an example to demonstrate effective ways to use parks to promote benefits and its outcome-focused approach to management.

The Benefits Movement implores recreation professionals to not assume that recreation is inherently rewarding but instead to identify and measure the beneficial consequences (Allen & Cooper, 2003; Driver, Brown, & Peterson, 1991). A benefit of leisure, as defined by Driver (1998a), is an outcome that causes (a) a change resulting in a more desirable condition than the preexisting state, (b) the continuance of a desired condition in order to prevent an undesired condition from occurring, or (c) the realization of a satisfying experience with regards to recreation. The improved condition, described as a change in a condition to a more desirable one, includes improvements to human, natural or economic factors. An example of this type of leisure benefit includes increased familial bonding (Canadian Parks & Recreation Association, 1997; Hill, Gomez, & Jeppesen, 2007). The prevention of a worse condition is described as avoidance of deterioration in a human, natural, or economic condition such as level of life satisfaction (Canadian Parks & Recreation Association, 1997; Moore & Driver, 2005; O'Sullivan, 2001). The realization of a psychological experience is a category of leisure benefits defined as the selection of a recreational activity because of the intrinsic value of the experience (e.g., relaxation and spirituality). By identifying benefits associated with the recreational experience, recreation professionals and recreationists may reap the rewards of better recreation management, programming, and awareness (Moore & Driver, 2005; O'Sullivan, 2006).

Benefits Based Management. In addition to managers providing evidence of benefits, managers should align the structure of the organization so benefits gained are integrated into the internal administrative functioning and agency philosophy (Allen & Cooper, 2003). Benefits Based Management (BBM) is a recreation resource management and planning system. This system is used by managers and collaborating partners to assure an array of benefit opportunities while targeting and facilitating the realization of one or more specific types of benefits desired (Moore & Driver, 2005). In other words, BBM is a method that permits managers to directly measure and facilitate benefits associated with recreation (Allen, 1996; Allen & Cooper, 2003; Allen & McGovern, 1997; Hurtes & Allen, 2001).

Benefits Based Awareness. Benefits Based Awareness (BBA) is a marketing technique used to effectively increase internal and external appreciation and understanding of recreation benefits in relationship to quality of life determinants (Allen & Cooper, 2003). The guiding premise of BBA is that promotional efforts should be intentionally designed to augment both internal and external

consciousness of the "benefits" of parks and recreation experiences that have an influence on quality of life (e.g., improved health and wellness) (Allen & Cooper, 2003). The effort to push this type of awareness was originally known as the National Recreation and Park Association's "Parks and Recreation: The Benefits are Endless" campaign (Allen & Cooper, 2003).

Benefits Based Programming. The *Statistical Abstract of the United States* (U.S. Census Bureau, 2007) recorded that exercise walking, with an estimated 84.7 million participants, was the number one Series I Recreational Sport Activity (i.e., top twenty sport activities) in the U.S. in 2004. Camping, ranked second, had an estimated 55.2 million participants. Hiking, eleventh on the list, had an estimated 28.3 million participants. Backpacking, ranked seventeenth, had 17.3 million participants. Backpacking, hiking, camping, and exercise walking are all activities which are done on the AT. Therefore, three items should be considered. First, backpacking, hiking, camping, and exercise walking are still popular (U.S. Census Bureau, 2006). Second, American society is currently concerned with physical inactivity (CDC, 2009; *Healthy People 2010*, 2000; HHS, 2001). Third, the primary goal of the recreation professional is to address individual and community development needs (Allen & Cooper, 2003). Thus, it is feasible to suggest that Benefits Based Programming (BBP) provides a framework within which use of trails can be programmatically geared toward increasing physical activity and, subsequently, address health and wellness concerns.

Appalachian Trail Research

In order to manage, build awareness, and program for hiking on trails with a focus on addressing active living and the health conditions correlated with physical inactivity, knowledge of the physical benefits was needed. Research concerning physical benefits of hiking in the natural setting was previously limited by the cumbersome nature of equipment; thus, research was conducted mostly in laboratory settings (Devoe, 2000; Durnin, 1955). Recent research in the natural setting indicated that the highest heart rates occur on the uphill portions of the hike and that increased difficulty in terrain significantly increased heart rate (Devoe, 2000; 2001). Devoe (2001) found hiking to be a moderate intensity exercise appropriate for cardiovascular fitness training, and determined that the average rate of estimated caloric cost ranged from 408 kcal-hr to 636 kcal-hr.

Hill, Swain, and Hill (2008) conducted a study evaluating energy expenditure during an AT backpacking trip. The participants walked for an average of nine hours for each of the first four days and roughly seven hours on the fifth day; results showed that participants expended approximately 5,000 kcal per day. Additionally, the participants in the study did not consume enough calories to maintain original body mass; over the duration of five days of hiking the participants lost 1.7 ± 0.6 kg (Hill et al., 2008).

While the aforementioned studies were limited by the small number of participants in each, the data supported the notion that hiking has significant impacts on physical health and, thereby, is useful in addressing current societal concerns with health conditions directly related to physical inactivity and excess weight. Hiking and backpacking is useful in encouraging individuals to meet physical activity requirements while also contributing to weight loss or weight maintenance. By better understanding the perceived and actual physical benefits,

hikers and non-hikers alike are encouraged to increase hiking amounts and, thereby, improve health and wellness.

Yet, while exercise walking, hiking, and backpacking were acknowledged as popular activities, a study exploring the population of AT users reported a fairly homogeneous population. Manning and colleagues (2000) surveyed 2,000 hikers of the AT and found that 69% of users were male, nearly 97% were white, and hikers' average age was in the mid-to-upper thirties. Because health conditions related overweight and obesity are concerns for all races, ethnicities, age groups, genders, and income levels, one of the challenges for use of this trail as a representative of how parks contribute to healthy living is to use BBM, BBA, and BBP in attracting a more diverse group of trail users.

Chronan, Shinew, and Stodolska (2008) emphasized, "encouraging more walking and promoting the use of existing environments for walking may be one way to help promote healthier lifestyles and decrease the prevalence of obesity and related health complications within the Latino population" (p. 64). Specifically, this study attempted to understand motivations, preferences and constraints to Latinos' usage of trail and greenway space; this was done to obtain information useful in managing recreation space in a way so as to better deliver health benefits to minority populations (Chronan et al., 2008). Studies such as the one aforementioned intimate the desire to use recreation and recreation amenities for the purpose of increasing leisure time physical activity to combat chronic disease. In addition, these studies indicated that to best encourage participation in physical activity by members of all subgroups of the general population, a better understanding of the benefits sought and motivations for participation by each subgroup is needed.

As evidenced by the 24% of Americans engaging in no leisure time physical activity, promotion of the physical benefits alone may not be enough to encourage participation by all the individuals who could benefit from the activity. Business theorists suggested that "positioning" the product (which in this case is an experience/activity) in the minds of potential consumers increases the likelihood of the purchase of that product (or participation in the activity) (Gutman, 1982). For this reason, BBM, BBP, and BBA efforts should focus on the benefits motivating participation.

One study, employing qualitative research using the means-end theory's laddering technique, examined the motivations of AT hikers (Hill, Goldenberg, & Freidt, 2009). Hill et al. (2009) gathered data from a convenience sample of 43 AT hikers. These hikers were asked a series of questions geared toward identifying the components of the AT experience that were the most meaningful to them and how those components were linked to benefits desired. Using LadderMap, a Hierarchical Value Map (see Figure 1) was created in order to visually depict connections respondents made between attributes of the trail, consequences (benefits) resulting from the trail's attributes, and the higher order consequences referred to as personal values. The Hierarchical Value Map illustrates the strength of relationships between attributes, consequences and personal values found to be related to hiking on the AT. Attributes were listed in un-shaded circles, consequences were depicted in semi-shaded circles, and values were listed in completely shaded circles. The strength of the relationship between two items was depicted by the thickness of the line. Also, the size of the response for each item was indicated by the size of the circle; therefore, the larger the

circle the larger the number of respondents indicating the item was of importance to them.

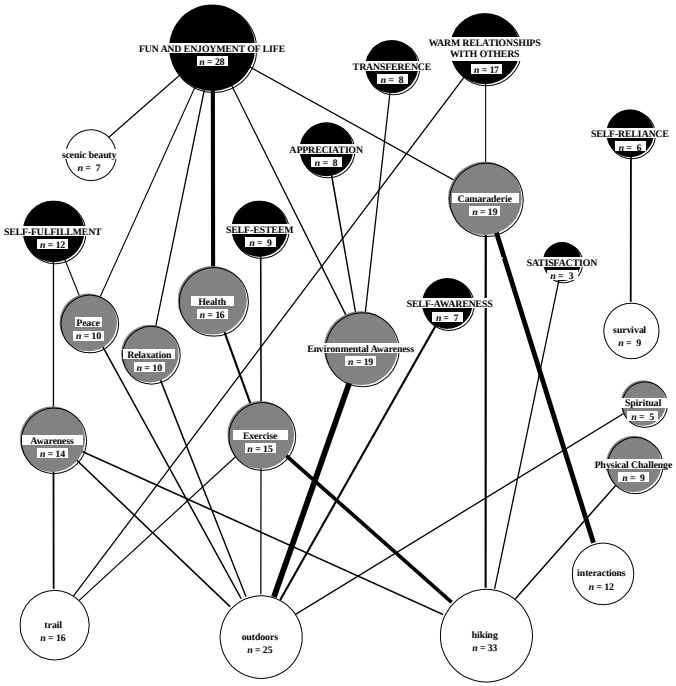

*Figure 1.*Appalachian Trail Hiker Means-end Theory Hierarchical Value Map

As indicated by the Hierarchical Value Map, themes in what hikers of the AT reported to be beneficial to them were discovered; consequences which surfaced during this study included: health, physical challenge, exercise, and relaxation (Hill et al., 2009). Respondents linked those consequences (also known as benefits) with higher-order benefits; these values included: self-fulfillment, self-reliance, fun and enjoyment of life, and warm relationships with others. In this study, strong links between hiking and exercise, exercise and health, and health, fun and enjoyment of life existed. The results from this study indicated use of the trail was motivated by physical challenge, exercise, and health among other motives. This research supported programming use of trails as a means of increasing leisure time physical activity. This research also provided data useful to trail managers. However, future research validating the study's findings was warranted because a convenience sample was used.

The major contribution of this current study was to provide the development and validation of a quantitative scale exploring the benefits associated with hiking. With the development of such a scale, populations using other trails could be better understood and, subsequently further encouraged to use the trail to engage in physical activities like hiking.

Given the aforementioned literature, and need for increased physical activity, we sought to answer two research questions. First, is there empirical evidence that the three dimensions of benefits exist (for hikers) as defined by Driver (1997) (i.e., improved condition, prevention of a worse condition, and realization of a psychological state)? Second, if these three dimensions are found to be reliable and valid, do differences exist between the types of user (i.e., day, overnight, thru, section, or multi-use hikers) and their perception of these three types of benefits?

Methods

Sample

The target population for this study was all users of the AT. The National Park Service (NPS) estimates four million users visit the AT each year. However, the accessible population sample for this study consisted of individuals over the age of 18 years with internet access who were members of AT maintaining clubs (e.g., the Tidewater Appalachian Trail Club) or viewers of websites of organizations associated with the AT (e.g., Whiteblaze.net). The Appalachian Trail Conservancy (ATC) reported having 42,000 members in 2006. According to the ATC's website (n.d.), currently 30 trail maintenance clubs are partnered with the ATC. Via electronic mail, all 30 of the trail maintaining clubs were asked to encourage member participation. Additionally, a popular hiker website volunteered to post the link to the survey and allowed a description of the study to be posted on the general forum portion of the website.

The number of members exposed to the survey from all clubs and websites combined was approximately 37,600. However, it should be noted that the 37,600 members exposed does not necessarily mean that all 37,600 were AT hikers. Members of clubs and subscribers to websites may be hikers of trails other than the AT. Similarly, members of trail maintaining clubs may choose to do AT trail maintenance activities, but not to hike the AT. These groups were specifically targeted to ask about motivations for, and benefits derived from, hiking on the AT, so as to better inform decision makers on where to focus future marketing efforts for non-users of the AT.

Instrumentation

The 63-item benefits version of the Benefits of Hiking Scale (BHS) is a quantitative, online survey instrument created using Inquisite version 8.0. The benefits component of the scale explored the typologies of benefits sought by AT users; the typologies measured in this study were those identified by Driver (1998a; 1998b)—the improved condition (IMP), prevention of a worse condition (PREV), and realization of a psychological state (PSYC). The benefits section was measured using 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. A total of 30 items were used to measure Driver's typologies of recreation benefits with respect to hiking on the AT, and 33 items were used to measure demographics (e.g., age, gender, household income, etc.) and use patterns (e.g., hiker type, time spent on trail, volunteerism, etc.).

Data Collection Procedures

After field-testing the instrument five weeks prior to posting the final online survey, a description of the study was sent via electronic mail to each of the 30 ATC-partnering trail maintaining clubs and the ATC. The initial letter, electronically mailed, outlined the study's intent, introduced the researchers, 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 desiring to participate in the study were sent the survey link, a paragraph to use when discussing the survey, and a request for confirmation of both dissemination methodology and membership number.

After four weeks, clubs and agencies not responding to the initial participation request were sent another request to participate. This request included all the information in the initial letter plus an update as to the club response rate and survey response rate. Several clubs participating forwarded contact information for other clubs and other agencies (e.g., Whiteblaze.net) interested in participating in the study. These clubs and agencies were extended the opportunity to participate. After another four weeks, a final participation request to non-responsive ATC-partnering clubs was sent. At the end of the data collection period, a thank you letter was sent electronically to each of the participating organizations.

Results

The data collected were analyzed using the Statistical Package for the Social Sciences (SPSS 15.0). A total of 454 usable surveys were collected. Descriptive statistics were performed in order to get an overview of perceptions and demographic information from the respondents. Confirmatory Factor Analyses (CFAs) were performed to establish the internal and external validity of the hypothesized constructs of recreation benefits, and Chronbach's Alpha was used for the reliability analysis. 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 recreation benefits (i.e., the improved condition [IMP], the prevention of a worse condition [PREV] and realization of a psychological experience [PSYC]). The *p*-value of 0.05 was used as the criterion determining statistical significance among the variables for all analyses.

Descriptive Statistics

Fourteen of the 30 ATC partnering clubs participated in the current study in one or more of the following manners: announcing information about the survey during trail club meetings, emailing club members, or posting a link to the survey on the club website. Thus, the club response rate was 46.6%. Members of a website frequented by AT hikers, www.whiteblaze.net, participated in the study. Two outdoor equipment providers posted fliers about the survey as well. The number of members exposed to the survey from all clubs and the Whiteblaze website combined equaled approximately 37,600 individuals. A sample size of 380 was needed for a population of 40,000 (Guadagnoli & Velicer, 1988). Even assuming that all members of clubs and all website viewers were hikers of the AT

(approximately 37,600 members and viewers), the current study had a useable sample size larger than required (N=454).

Out of 454 respondents surveyed 422 provided demographic information. Males constituted 70.1% of study participants. Nearly 63% of respondents ranged between 41 and 65 years of age. The racial and ethnic background of the respondents consisted mostly of Caucasians (94.3%). The vast majority held a baccalaureate degree or higher (72.8%). In terms of marital status, married people (59.5%) represented the largest group. A majority of respondents (N=394) reported household incomes; 18% reported household incomes of less than $40,000, 36.8% earned between $40,001 and $80,000, 25.4% earned between $80,001 and $120,000 and 14.2% indicated earning more than $120,000. Out of 454 hikers, 34.6% identified themselves as section hikers, 26.2% as day hikers, 16.5% as multi-use hikers, 13.0% as thru-hikers, and 9.7% as overnight hikers.

Inferential Statistics

Because no prior literature on Driver's typologies of benefits with respect to hiking on the AT was found to exist, the BHS was created using benefits (consequences and values) identified in Hill et al.'s study (2009). The questions for perceived benefits involved items related to prevention (with respect to health, fitness, and stress), the improved condition (health, fitness, social bonding, and awareness), and the realization of a psychological state (social bonding, self-reliance, quality of life, health and transference of hiking benefits to other aspects of one's life). Thus, the initial conceptual model (see Figure 2) consisted of the BENE (Driver's typologies of benefits) construct, which was composed of the dimensions IMP (Improved condition), PREV (Prevention of a worse condition), and PSYC (Realization of a psychological state).

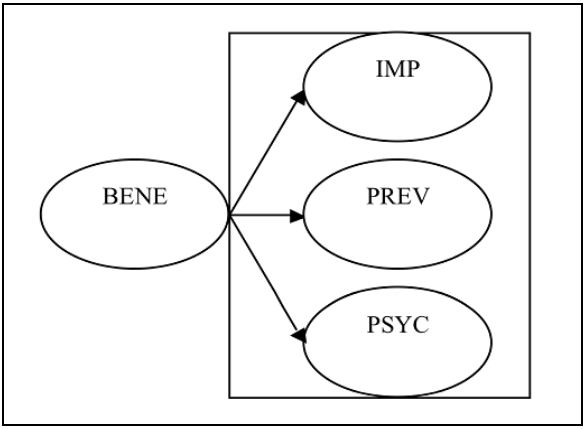

Figure 2. Conceptual Model of Driver's Typologies of Recreation Benefits

Confirmatory Factor Analysis (CFAs) using Varimax Rotation was conducted to determine if the variables within the BENE construct were valid measures of the underlying construct. Sampling adequacy was confirmed using the KMO (> 0.60) and BTS ($p < 0.05$) standard criteria on the IMP, PREV, and

PSYC subscales; the subscales met both the KMO and BTS criteria. Using Guadagnoli and Velicer's (1988) factor loadings criterion (> 0.60), the subscales were assessed for internal and external validity (factor analysis); Chronbach's alpha was used to determine reliability. Items were omitted from further analyses if factor loadings were lower than 0.60 (see Table 1 for accepted items). [1]

Because internal validity was confirmed, the next step was to see if the subscales of IMP, PREV, and PSYC held together to form BENE, thus, confirming external validity. The BENE construct held (KMO 0.90; BTS $p < 0.001$). Any scale items not meeting the external validity check (see criteria above) were omitted from the second factor analysis of the BENE subscales (IMP, PREV, PSYC). Seven additional items were omitted from further analyses based on external CFA results. Table 1 displays all BENE items and denotes which items passed both internal and external validity checks as well as reliability checks. Thus, the BENE subscales passed all validity (factor analysis) and reliability (Chronbach's alpha) tests.[2]

Using the items confirmed during CFA, a one-way between-subjects ANOVA was conducted to investigate the differences between user types (i.e., day hiker, overnight hiker, section hiker, thru-hiker or multi-use hiker) and the type of benefit sought (i.e., IMP, PREV and PSYC). No statistically significant differences were found between the means among user types with respect to the PREV and PSYC subscales (see Table 2). For subscale PREV and user types, the ANOVA analyses revealed an F (4, 434) = 1.71, p = 0.15. For subscale PSYC user types, ANOVA analyses revealed an F (4, 425) = 1.76, p = 0.14. However, Tamhane's test showed statistically significant differences between day hikers and section hikers, day hikers and thru-hikers, and multi-use hikers and thru-hikers on their respective mean scores for the IMP subscale. For subscale IMP, ANOVA analyses revealed an F (4, 431) = 4.73, p = 0.001. This manipulation accounted for 0.04 of the variance in scores (using η^2).

Table 1

Items used to Measure Driver's Typologies of Recreation Benefits

Items[a]	M	SD	*h*[b]
Prevention of a worse condition (PREV, α= 0.91)			
1. I hike because I feel hiking reduces stress. [c]	5.82	1.61	
2. I hike because I feel hiking reduces my chances of developing diabetes.	3.10	2.06	0.82
3. I hike because I feel hiking reduces my chances of having a heart attack.	4.09	2.11	0.85
4. I hike because I feel hiking reduces my chances of weight gain.	4.78	2.00	0.61
5. I hike because I feel hiking reduces my chances of premature death.	4.06	2.14	0.83
6. I hike because I feel hiking reduces my number of illnesses.	4.06	2.05	0.82
7. I hike because I feel hiking reduces feelings of alienation. [c]	3.07	2.03	
8. I hike because I feel hiking reduces the amount of unhealthy foods I eat. [c]	2.93	1.77	
9. I hike because I feel hiking reduces the amount of time I am sedentary. [d]	5.35	1.94	
10. I hike because I feel hiking prevents negative health conditions.	4.96	1.94	

Improved condition (IMP, α=0.90,)

11. I hike because I feel that hiking improves my likelihood of living longer. [d]	4.79	1.95	
12. I hike because I feel that hiking improves my overall fitness.	5.91	1.55	0.85
13. I hike because I feel that hiking improves my overall health.	5.80	1.55	0.82
14. I hike because I feel that hiking improves my productivity at work. [c]	3.70	2.03	
15. I hike because I feel that hiking improves my social life. [c]	3.75	1.95	
16. I hike because I feel hiking improves muscle strength.	5.28	1.72	0.82
17. I hike because I feel hiking improves my physical flexibility.	4.84	1.83	0.74
18. I hike because I feel hiking improves my ability to adapt. [d]	4.81	1.98	
19. I hike because I feel hiking improves my ability to use all of my senses. [d]	5.37	1.81	
20. I hike because I feel hiking improves my environmental awareness.	5.66	1.67	

Recognition of a psychological experience (PSYC, α=0.90)

21. I hike because I recognize that it is spiritual. [d]	4.91	2.04	
22. I hike because I recognize that hiking creates bonds with others. [d]	4.83	1.79	
23. I hike because I recognize that hiking gives me a sense of self-reliance.	5.90	1.42	0.73
24. I hike because I recognize that hiking gives me a sense of higher self-esteem.	5.28	1.83	0.73
25. I hike because I recognize that hiking causes me to appreciate life more.	6.14	1.23	0.86
26. I hike because I recognize that hiking causes me to be more satisfied with my life.	6.00	1.42	0.85
27. I hike because I recognize that hiking makes me more aware of whom I am.	5.43	1.79	0.78
28. I hike because I recognize that hiking causes me to enjoy life more.	6.20	1.26	0.80
29. I hike because I recognize that hiking is connected to other positive aspects of my ife.	5.87	1.41	0.75
30. I hike because I recognize that hiking makes me feel healthier. [c]	6.02	1.39	

[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 Driver's Typologies of Recreation Benefits and User Types

Source	df	F	η^{2**}	p
		Between groups		
Improved condition	4	4.73	0.04	0.001*
Prevention of a worse condition	4	1.71		0.15
Realization of a psychological state	4	1.76		0.14
		Within groups		
Improved condition	431			
Prevention of a worse condition	434			
Realization of a psychological state	425			

*$p < 0.05$

**reported if found to be significant

Discussion and Summary

The identified dimensions of BENE (i.e., IMP, PREV and PSYC) in the current study demonstrated statistical validity and reliability. The data supported prior researcher's assumptions of the typologies of recreation benefits identified by Driver (1997). In their initial testing of the Benefits Approach to Leisure, Driver, Brown, and Peterson (1991) found that their definition of a recreation benefit was insufficient, as they felt the benefits were multidimensional, rather than unidimensional. Therefore, Driver (1997) redefined a recreation benefit as an improved condition, prevention of a worse condition and realization of a psychological state; the current study's data support these dimensions of BENE, with respect to hiking on the AT. The present study offers confirmation of Driver's three typologies of recreation benefits (i.e., PREV, IMP, and PSYC).

One-way ANOVA analyses revealed that no statistically significant differences between hiker type and the BENE sub-component prevention of a worse condition existed. Thus, the current data provide information necessary for BBM, BBP, and BBA; using these data the benefits sought may now be targeted and facilitated through Benefits Based management, programming and advertising efforts. With respect to the BENE sub-component, PREV, the data support that a BBM design need not differentiate based upon user type. Likewise, the current study provides information about PREV benefits currently desired by AT hikers. Next, the data may be interpreted as indicating that BBP [which requires that leisure professionals identify the desired outcomes to be assessed prior to program development in order to connect the program to the individual participants' life (Allen & Cooper, 2003)] need not differentiate between hiker types when targeting PREV benefits. BBA suggests that promotional efforts should be purposely engineered to amplify internal and external awareness of the "benefits" of parks and recreation experiences with respect to quality of life determinants (Allen & Cooper, 2003). The current study's PREV benefit data may be interpreted as supporting no need to differentiate between hiker types when creating promotional, marketing, and advertising items focusing on PREV benefits of hiking on the AT.

Similarly, one-way ANOVA analyses revealed no statistically significant differences between AT hiker types and the BENE sub-component realization of

a psychological state (PSYC). Therefore, results support that Benefits Based Management, Programming and Awareness techniques focusing on this sub-component of benefits need not differentiate based upon AT hiker type.

Conversely, one-way ANOVA analyses revealed statistically significant differences among user type for the improved condition (IMP) subcomponent of BENE. Statistically significant differences existed between IMP benefits for day hikers and section hikers, day hikers and thru-hikers, and multi-use hikers and thru-hikers. The current findings may be interpreted as support for differentiating programming, management, and awareness plans based upon AT hiker type with respect to the IMP dimension of benefits.

Leisure and recreation professionals have acknowledged the need to research benefits of recreation experiences (Goldenberg, Klenosky, O'Leary & Templin, 2000; Driver, 1998b) as benefits research is obligatory in the Benefits Approach to Leisure (Driver, 1998b; Driver, Brown & Peterson, 1991). The current study provided support for Driver's dimensions of recreation benefits while also providing a greater understanding of the benefits associated with hiking on the AT. Knowledge of the benefits sought may help better deliver those benefits to participants. Additionally, assessment and promotion of the successful delivery of benefits could encourage use of trails, and participation in programming conducted in conjunction with trail usage. By increasing participation in physical activities such as hiking on trails, recreation professionals could aid in the effort to reduce health concerns directly correlated with sedentary lifestyle choices.

Of particular interest to recreation professionals advocating parks, trails and other recreation amenities for the purposes of addressing society's current health concerns may be that the IMP subscale items that held were those that dealt specifically with fitness and health. This would seem to indicate that BBM, BBP and BBA efforts advocating physical activity might profit from focusing on IMP benefits.

The perceived benefits of hiking supported in the current study may be useful for hikers to encouraging others to hike. While AT hikers may understand what motives were important to them with respect to hiking, they may have friends or family that would be better encouraged to join trips by aligning or "positioning" the experience with other now known benefits. This could include PREV: reducing the chances of developing diabetes or having a heart attack; IMP: improving overall health, physical fitness, muscle strength, and physical flexibility; PSYC: providing self-reliance, self-esteem, and an appreciation of life.

Group hike leaders could better program and promote hiking trips by using knowledge of benefits desired. For example, knowing that hikers desire improved physical fitness, muscle strength, physical flexibility and overall health, group hike leaders may deem it wise to purchase and use heart rate monitors and healthy camp food. Additionally, group leaders could hold contests or offer rewards to those who maintain their target heart rate or burn the most calories during the hike. Along the same lines, the trip can be advertised as one focusing and targeting desired fitness benefits. Group hike leaders may link society's current health concerns with the physical benefits of trip participation in order to encourage trip participation and, thus, use recreation programming to address the need for physical activity during leisure time.

The ATC and trail maintaining clubs could use information about benefits perceived to be obtained while hiking on the AT in acquiring new funding for conservation and preservation of the footpath and its surrounding corridor lands. While the current emphasis is on using recreation and recreation amenities to promote physical activity, the ATC and trail maintaining clubs could build a stronger case for funding conservation and preservation efforts by using statistical data about the benefits perceived to be obtained by AT hikers. As noted in the benefits literature, the general population is responsive to justification of how monies given are allocated (Allen & Cooper, 2003); the current study's data, for example, could be used to that end. Using data indicating both the actual and perceived physical benefits derived from hiking along the AT, monetary or in kind giving from institutions or persons seeking to address society's current concern with physical activity is often sought for sound decision-making. On a similar note, in response to the desire to use parks and recreation amenities to address chronic diseases linked with sedentary lifestyle choices, funding for maintenance and programming along the AT may be allocated in a manner supporting conservation and preservation while also supporting the physical benefits desired by users. Hikers may be further encouraged to hike knowing that they may burn 5,000 kcal per day doing so (Hill et al., 2008). Likewise, by experiencing the natural environment, hikers may be further encouraged to aid in conservation and preservation efforts.

Lastly, the validation of Driver's typologies of recreation benefits may be useful in further encouraging others to research benefits perceived to be gained from recreational activities using Driver's definitions. Consistency in definitions and scale design may allow for comparison of benefits derived from alternate recreation activities. Additionally, consistency amongst researchers in definition may strengthen the profession's argument that the benefits of recreation participation are endless and concurrently improve the ability to publicize recreation benefits.

Future Studies

As the current study was delimited to users of the AT, future studies should adapt the scale for use on other trails (e.g., national, local trails, greenways, etc.). In particular, an examination of the U.S.A.'s other National Scenic Trail, the Pacific Crest Trail, may prove not only interesting but also useful in championing the movement to increase leisure time physical activity through hiking for the population in the western states. Yet, perhaps more influential will be studies exploring local trails. By adapting the BHS questionnaire to examine the benefits and outcomes desired by users of local trails, local trail managers may utilize BBM, BBP and BBA to increase use and, thus, physical activity. Comparing the desires of users of longer and shorter trails may provide data for planning and development of future trails while concurrently helping managers of existing local trails to determine how best to promote and program for local trail use. Information gathered might also be useful in justification of funding to preserve wilderness areas containing footpaths and other designated pathways on which to hike. This data could also be used in justification of funding for new hiking trails. Finally, the data might be used in justification of monies spent for programming and implementation of group hikes, in promotion of trail usage by new users and in increasing trail usage by current users.

Similarly, studies should examine the benefits perceived for differing demographic populations (e.g., racial subgroups) and countries. For each respective population, studies, such as Chronan et al.'s 2008 study that explored the motivations of the trail using Latino population, may aid in the efficiency of efforts targeting increases in physicality during leisure time. As this study was delimited to adult users of the AT, future studies should be conducted to examine benefits for youth. The No Child Left Inside Act of 2008 (CBF, n.d.) and Louv's *Last Child in the Woods: Saving Our Children from Nature Deficit Disorder* (2005) reveal society's widespread current concern for the health of this population. Thus, research with respect to this population may be of particular interest to Benefits Based Managers, recreation specialists and the general populace. This research is not only recommended and helpful for trails within the U.S.A. (e.g., Pacific Crest Trail), but it is encouraged to explore benefits of trails on a global level. Although many countries view trails and wilderness different than the U.S.A., there are still many similarities. For example, in 2003, the International Trails Day was created. Through this movement, people all over the world joined in to create awareness of trails (in 2009, International Trails Day was held on June 6). The Canadian Parks and Recreation Association has identified numerous benefits (e.g., reduction of health care costs), on how using parks is helpful to everyone. This furthered provides global evidence of how trails users and recreational professionals alike see the health benefits of hiking on trails.

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 study (2008) with respect to actual health benefits, future studies should explore via field testing the actual health benefits of hiking (e.g., weight maintenance or loss from caloric expenditure and improvements in aerobic capacity during both short and long distance hiking). Of particular interest may be studies looking at the actual health benefits of hiking for individuals 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, increase activity levels and address current health concerns compounded by sedentary lifestyle choices.

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Endnotes

[1] Two items were excluded from IMP subscale resulting in a KMO of 0.85, a BTS less than 0.05, and a Cronbach's alpha of 0.89. In the PREV subscale, three items were omitted because factor loadings were not higher than 0.60; once these items were deleted, the subscale KMO was 0.90, the BTS was less than 0.05, and Cronbach's alpha was 0.92. The PSYC subscale lost one item due to the factor-loading criterion. The resulting KMO for the PSYC subscale was 0.91, the BTS was less than 0.05, and Cronbach's alpha was 0.90.

[2] The final IMP subscale's KMO was 0.74, and Chronbach's alpha was 0.90. The PREV subscale had a KMO = 0.87 and a Chronbach's alpha = 0.91. The PSYC subscale's KMO was 0.90 and a Chronbach's alpha was 0.90.