

Final Evaluation of “Take a Walk in Zion”



A Pilot Intervention to Increase Healthful Recreation/Physical Activity in Zion National Park

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Description of the Park (Introduction):

Numerous studies have demonstrated that physical activity (PA) is a critical component of health¹. Although the health benefits of regular PA have been well documented, the proportion of Americans meeting physical activity standards remains low². In fact, 55% of Americans do not meet the minimum physical activity recommendations for health, and almost 25% are sedentary³.

As part of the increasing focus on improving individual health, the Healthier U.S. Initiative (Executive Order 13266) proposed in 2002 by President Bush was meant to promote the use of public lands to improve individual's personal health, by encouraging the use of these lands for PA. Public lands, such as National Park Service sites, provide a number of important benefits to individuals—but many Americans may not realize the role National Parks can play in their physical health. In order to address this issue, the National Park System Advisory Board Subcommittee on Health & Recreation (2006) noted that, "National Parks are public health assets that are uniquely situated to provide opportunities for outdoor, physically active recreation activities and should be pro-actively communicating the health benefits of such participation." (p. 6). Based upon the recommendations of this Subcommittee, Zion National Park has been chosen to participate in a pilot study (as one of seven NPS sites) to study this link between health benefits and National Parks.

Zion National Park has a storied history and represents one of the great gems of the American West. Originally established as Mukuntuweap National Monument in 1909, the designation was changed to Zion National Park in 1919. The park encompasses some of the most spectacular canyon country in the United States. High plateaus; a maze of narrow, deep, sandstone canyons; and striking rock towers and mesas characterize the park. Known as a hiker's Mecca, the park offers numerous and varied hiking opportunities for all levels of ability. Zion is the most visited national park in Utah and the seventh most visited in the United States.

The most widespread outdoor physical activity is walking, due to its ease, accessibility and acceptability^{4,5}. This component fits well with Zion NP, due to the numerous scenic hiking opportunities. Thus, this pilot project at Zion NP sought to increase visitors' use of the park for healthful recreation/physical activity (e.g., walking). This intervention activity addresses Outcome 2 of the National Park Advisory Board's recommendations to "Increase healthful recreation/physical activity behavior in national parks"⁶. To implement this strategy program planners from Zion NP targeted park visitors to increase their physical activity while on the Pa'rus Trail by utilizing a multi-component informational program using constructs from the Theory of Reasoned Action/Planned Behavior and Social Cognitive Theory.

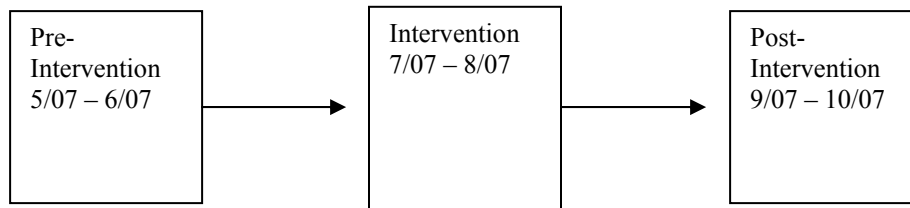
Description and Evaluation of the Intervention (Methods):

Research Design & Timeline

The primary outcome of this pilot project was to “Increase healthful recreation/physical activity behavior in national parks” (Outcome 2)⁶. Thus, this evaluation of a pilot project utilized an interrupted time series research design, in which assessments were measured at multiple time points before, during, and after the intervention. Specific data collected included trail counter frequencies, trail intercept surveys, and focus group data from Zion NP staff (for process evaluation uses). The main outcomes (i.e., dependent variables) were trail counts and active visits (i.e., trail use lasting ≥ 30 minutes).

Data collection for this study was initiated May 1, 2007 and continued through October 31, 2007. Pre-testing of the trail intercept survey and trail counters took place during June 2007. The use of trail intercept surveys and trail counters were continued into the intervention time frame (July – August 2007), and after the intervention was complete (i.e., post-testing; September – October 2007). This time line is depicted in Figure 1.

Figure 1. Study Timeline.



Logic Model

Figure 2 depicts the actual representation of events from the program.

Participants

Participants in this research study were the visitors to Zion National Park between May 2007 and October 2007. Additionally, participants for the process evaluation were a convenience sample of Zion NP staff and employees representing audiences from the park administration (N = 3), park rangers implementing the intervention (N = 8), and shuttle-bus drivers (N = 8).

Description of the Intervention

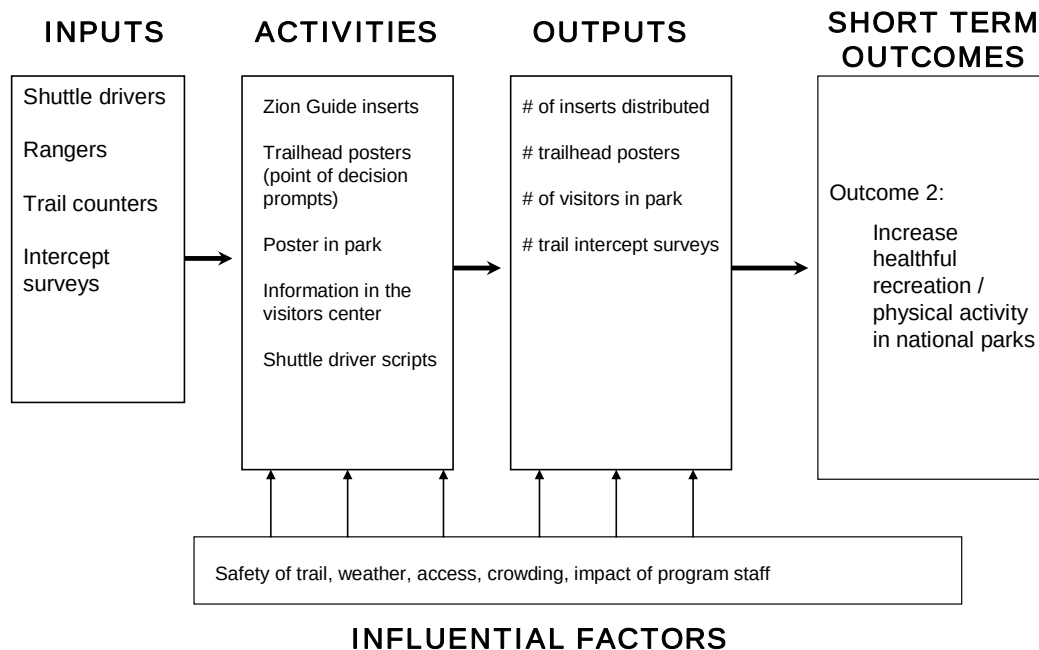
This pilot intervention utilized a communication campaign in both print and verbal channels to raise awareness of potential health benefits gained within the park; namely by using the Pa’rus Trail. The Pa’rus Trail was chosen as the focal point of this intervention because of its proximity to the town of Springdale, the visitor’s center, park museum, and campgrounds, and because of its accessibility and scenery. The trail is a flat, relatively short (~1.7 mi.), and follows the Virgin River through the scenic valley floor.

Additionally, the trail can be used by cyclists, baby strollers, wheelchairs, etc. All of these reasons made the Pa’rus Trail an obvious choice for an intervention site.

The intervention message was based on social cognitive theory constructs (self-control and emotional arousal) and was developed to be a message that was witty and one with which most visitors could identify. The actual message dealt with energy balance (amount of trail walking to offset ½ cup of ice cream). Print materials in this intervention consisted of posters that were located inside the park at the Zion Lodge, visitor’s center and museum, and at the campgrounds. Posters were also located outside the park in local businesses including restaurants and lodges in the town of Springdale. In addition to posters, every visitor that entered through the gates of Zion NP was provided an insert into the Zion Map and Guide with the intervention message (similar to the posters) included. Further, posters were placed inside shuttle busses. The intervention message was also delivered through verbal channels by interpretive staff and shuttle drivers. Specific texts for these messages are listed in the Appendices. Both interpretive staff and shuttle drivers were provided with classroom education about how to deliver the message. Additionally, interpretive staff were given onsite training for the first time that the intervention message was delivered.

Figure 2. Logic model for the intervention.

Increasing Physical Activity in Zion NP



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Instruments

Trail counters were used to assess the frequency of trail use. Trail counters were installed on the Pa'rus trail in two different locations in June 2006, and have been collecting data since that time. The trail counters are located on the southern and northern ends of the trail. The trail counters were calibrated to capture movements that pass by their location, and register a “count” for each movement at a time interval of 1.8 s per count.

The trail intercept survey was designed to assess reasons for trail use and demographic information. The intercept survey uses multiple questions from different instruments to assess the reasons for using the trail. Where possible, items on the trail intercept survey originate from existing surveys that have undergone psychometric testing.^{7, 8} The survey has been reviewed by a broad group of individuals from academia (parks and recreation, public health, social science) and parks and recreation staff (interpretive staff, administrative, resource specialists) from the parks and universities involved in each of the pilot programs.

Focus groups were used for process evaluation. Qualitative methods such as focus groups have been used to interpret and explain changes in the outcome variables, and interpret how well interventions have been implemented.⁹ Information obtained through focus groups can provide a rich understanding of the participant's experiences and beliefs. Focus groups are structured, directed, expressive, cost effective, and can require fewer resources and fewer subjects than other types of research interventions.^{10, 11}

Procedures

Trail counter data were continuously collected during the previous year by Zion NP staff (beginning June 2006). These data were collected until November 1, 2007, and routinely downloaded by Zion NP staff and forwarded to researchers.

Trail intercept surveys were interviewer-administered to trail users at a central part of the Pa'rus Trail. Trained facilitators were stationed in a tent equipped with water, water for dogs, and shade. The tent was identified by a sign that gave visitors information about the survey, and that it was sponsored by the National Park Service and the University of Utah. A sampling strategy was developed in which facilitators would randomly select trail users and ask them if they were willing to participate in the survey. After ensuring that the potential participant was at least 18 years of age, interviewers conducted the intercept survey. Survey participants were provided with water and coupon for a poster from the Zion NP visitor's center. Surveys took approximately 10 minutes to complete.

During the implementation phase of the project, researchers from the University of Utah conducted focus groups to complete a process evaluation. Three groups were held with distinct groups (park administrators, park rangers, and shuttle drivers). At each group participants were welcomed and asked to complete an informed consent and short demographic questionnaire. As part of this step, participant chose a pseudonym to maintain confidentiality. After this was complete, the group facilitator and co-moderator

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asked a series of questions designed to ascertain how well the intervention was being implemented. While specific questions varied, the content was similar for all groups (See Table 1). All responses were recorded using a digital audio recorder. At the completion of each group participants were thanked for their responses and the group was concluded.

Table 1. Focus Group Questions.

For Interpretive Staff

1. What's your opinion about the park encouraging more use of the Pa'rus trail?
 2. Describe your experience with the trail intercept survey procedure you've been using.
 3. If you were personally in charge of this project, how would you have conducted the trail intercept survey procedure?
 4. How would you describe the reaction to the survey from trail users?
 5. How would you describe the effects of the park's media campaign to encourage more use of the Pa'rus trail?
 6. On any given work shift, about how often did you speak to park visitors about the Pa'rus trail promotion program?
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For Shuttle Drivers

1. What's your opinion about the park encouraging more use of the Pa'rus trail?
 2. Describe your experience with the shuttle bus script procedure that you've been using.
 3. If you were personally in charge of this project, how would you have conducted the shuttle bus script procedure?
 4. How would you describe the reaction to the script from shuttle passengers?
 5. How would you describe the effects of the park's media campaign to encourage more use of the Pa'rus trail?
 6. On what percentage of your shuttle bus rides down the canyon did you complete the entire script?
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For Administrators

1. What's your opinion about the park encouraging more use of the Pa'rus trail?
 2. How do you and your employees feel about the script and survey procedures that you've been using?
 3. Are there any things you and your employees would change about the script and survey procedures, and why or why not?
 4. How would you describe the reaction to the script & survey from shuttle passengers and trail users?
 5. How would you describe the effects of the park's media campaign to encourage more use of the Pa'rus trail?
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Data Reduction and Analysis

Trail Counter Data

Trail counter were downloaded on a regular basis and stored in an electronic database as hourly, daily, weekly, and monthly counts for each of the individual trail counters. Files were merged into a SAS (Cary, NC) data file to be used for analyses. Descriptive statistics were calculated for daily and monthly trail usage for all months of the study

(i.e., May 2007 – October 2007). Since there were two trail counters being used and registered counts did not appear to be similar, a dependent t-test was utilized to examine whether daily counts from the trail counters were significantly different. Results of this test indicated that there was not a significant difference between trail counters in the amount of daily traffic that was recorded ($t[184] = 0.12, p = 0.90$). Thus, mean daily counts were computed from the trail counters as the primary dependent variable.

Because park use increases at the time of the intervention (i.e., summer) there was some concern that trail use may be artificially inflated due to an increase in overall park use. To correct for such error, Zion staff collected data on the amount of individuals entering the gates of Zion National Park. These data were used to standardize the trail counter data by dividing the number of mean trail count frequencies by the number of visitors entering into the park. After this was completed, the resulting coefficient was utilized in repeated-measures ANOVA models to investigate the data by day of the week and month to examine for significant differences at the time of the intervention. Additionally, to control for the effect of excessive temperature on trail use, three-factor general linear models were developed in which high temperature was included in the model.

Trail Intercept Survey

Data from the Trail Intercept Survey was entered into a password protected database for analysis. Four variables were recoded for analyses; 1) proportion of trail users who identified physical health as an important, or very important reason for using the trail, 2) a summary variable for the physical health questions, 3) proportion of trail users that had an active visit on the trail (i.e., ≥ 30 min. on trail), and 4) a variable to assess where trail users learned about the trail. This variable was designed to assess whether any of the intervention components were useful in determining trail use.

All of the quantitative data was analyzed using SAS (Cary, NC). Descriptive statistics were calculated for all variables of interest. Differences in the four outcome variables listed above were examined by chi-square (#'s 1, 3, & 4) and a one-way ANOVA (# 2) to examine if there was a difference during the three time points in the monitoring time frame (i.e., pre-intervention, during intervention, and post-intervention). Level of significance was set at 0.05 for all analyses.

Focus Groups

Each focus group was recorded using a digital audio recorder. Researchers then transcribed the recordings verbatim. Each transcript was then analyzed using the qualitative data analysis program QSR NUD*IST® version N6¹². A two-step process was used to code the data. For the first step, open coding was used in which two independent study investigators grouped data similar in theme together into a category and assigned a label capturing its theme. A third investigator then reviewed the categories and labels that have been created. Any suggested changes in either the composition of the categories or the labels were discussed among investigators. When agreement between the investigators in the composition and label of each category was reached, the next step in the coding process was taken. For this step, axial coding was conducted. This process consists of relating categories to the central phenomena of interest¹³. For this process

evaluation, this step involved relating the categories created during open coding to how well the intervention was implemented. As part of this step, relationships among categories were assessed, and categories found to be similar were combined.

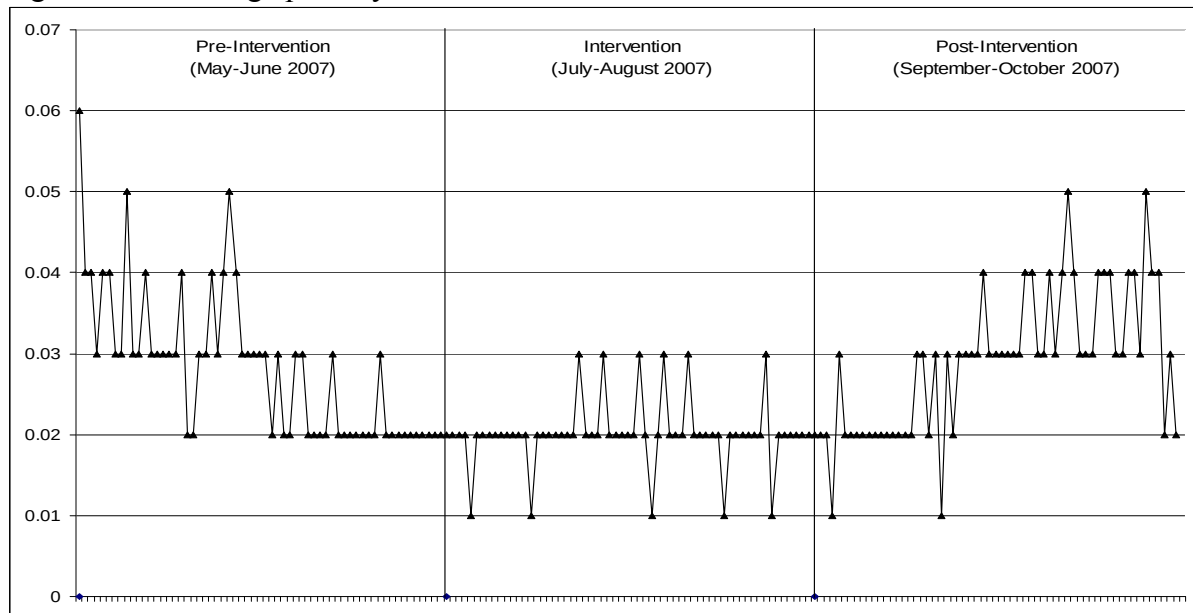
Findings from Intervention (Results):

Summary Results from the Trail Counters

When examining the raw counts from the trail counting system, there did appear to be differences between both daily and monthly trail usage patterns. However, when standardized for park visitors, these discrepancies were not evident (Table 2). Further, when high temperature was added to the model, there was not a difference in raw counts in daily and monthly trail usage.

When data from the trail counters was standardized for park visitors, there was not a significant difference in usage of the Pa'rus Trail at any time during the monitoring time frame by day ($F = 1.45$, $df = 1832, 1,464$, $p > 0.26$; Figure 3) or by month ($F = 3.05$, $df = 5, 35$, $p > 0.12$; Figure 4). Further, when examined by pre-intervention, during intervention, and post-intervention there was still no difference observed in usage of the Pa'rus Trail ($F = 1.05$, $df = 2, 5$, $p > 0.45$). Specifically when examining the effect of high temperatures on trail use there was no significant difference in trail use even after accounting for high temperature in the model ($F = 0.19$, $df = 176, 177$, $p > 0.89$). When examining pre-, during, and post-intervention with high temperature in the model, there was still no significant effect on trail usage ($F = 1.85$, $df = 4, 177$, $p > 0.12$).

Figure 3. Trail Usage per Day.

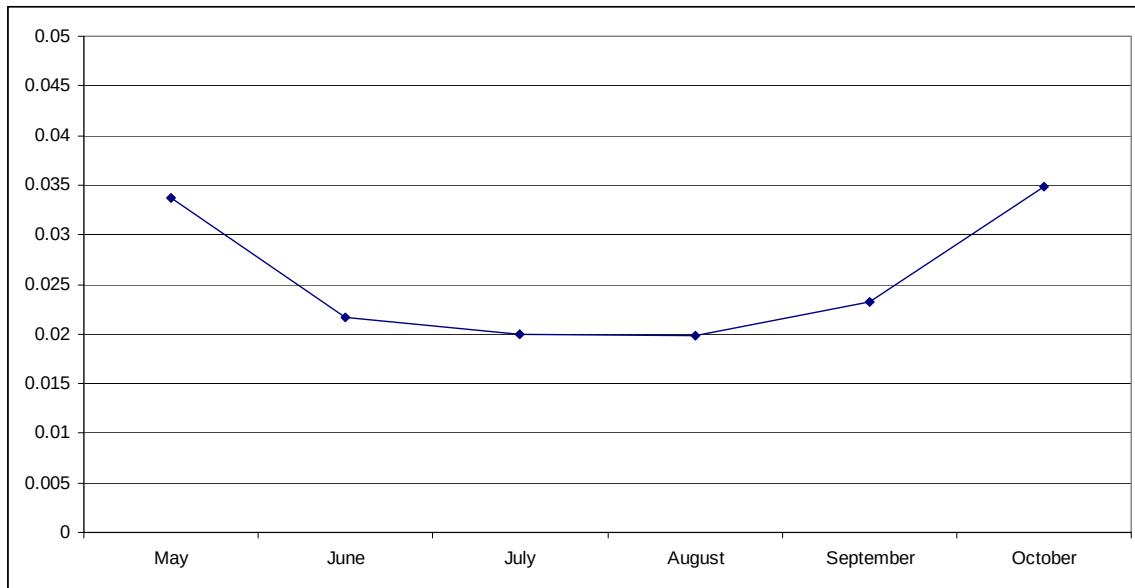


($F = 1.45$, $df = 1832, 1,464$, $p > 0.26$)

Table 2. Summary Statistics for Trail Usage, Park Visitors, and Trail Usage Standardized for Park Visitors.

Variable	Mean $\pm$ SD	Min	Max	95% CI
Raw Trail Usage				
Users/day	190.51 $\pm$ 47.18	80	378.5	183.65 - 197.37
Users/month	5,842.45 $\pm$ 836.4	5,104	7,048	4,964.5 – 6,720
Users pre-intervention	6,381.5 $\pm$ 943.99	5,713	7,048	-2,100.89 – 14,861.89
Users during intervention	5,110.25 $\pm$ 8.83	5,104	5116.5	5,030.84 – 5,189.66
Users post-intervention	6,036 $\pm$ 938.33	5,372.5	6,699.5	-2,394.57 – 14,466.57
Park Visitors				
Visitors/day	7,661.6 $\pm$ 1,372.03	3,204	10,043	7,461.75 – 7,861.98
Visitors/month	77,797.67 $\pm$ 15,030.15	58,366	93,422	62,024.49 – 93,570.84
Visitors pre-intervention	236,267.5 $\pm$ 38,414.99	209,104	263,431	-108,877.49 – 581,412.49
Visitors during intervention	256,746.5 $\pm$ 2,720.24	245,823	258,670	232,306.12 – 281,186.88
Visitors post-intervention	211,572 $\pm$ 27,547.47	192,093	231,051	-35,932.16 – 459,076.16
Standardized Trail Usage				
% Users/day	0.026 $\pm$ 0.0008	0.01	0.06	0.025 – 0.027
% Users/month	0.026 $\pm$ 0.007	0.02	0.035	0.18 – 0.033
% Users pre-intervention	0.028 $\pm$ 0.008	0.02	0.03	-0.049 – 0.10
% Users during intervention	0.019 $\pm$ 0.0002	0.019	0.02	0.018 – 0.021
% Users post-intervention	0.029 $\pm$ 0.008	0.023	0.035	-0.045 – 0.010

Figure 4. Trail Usage per Month.



($F = 3.05$, $df = 5,35$, $p > 0.12$)

Trail Intercept Surveys

Overall, researchers were able to interview 656 respondents with trail intercept surveys. Three-hundred individuals were interviewed pre-intervention, 317 responded during the intervention, and 48 surveys were administered post-intervention. A demographic breakdown of these respondents is located in Table 3.

Respondents to the trail intercept surveys had many reasons for using the Pa'rus Trail. Most respondents felt that their physical health was an important reason (87.07%). Additionally, many cited the mental health benefits of walking the trail, along with social reasons. The majority (62.1%) expected to be on the trail for one hour or less, while 80% said that they would be on the trail for 30 or more minutes. Among trail users interviewed the vast majority (73.83%) responded that they have been regularly physically active for more than six months, that they are aware they need to be physically active (91.27%) and that they had “high” knowledge about physical activity (83.26%).

Although Zion National Park was not immediately vested in Outcome 1: Increase awareness of health benefits by park visitors, still, the majority of visitors (87.07%) stated their physical health was an important reason for using the Pa'rus Trail. When this importance was calculated across pre-intervention, intervention, and post-intervention, the responses remained similar with no differences dependent upon time of the intervention (Table 4). Further, when this concept was examined as a summary score, no significant differences were observed ($F = 1.22$, $df = 2,664$, $p > 0.30$).

Table 3. Demographic characteristics of survey respondents.

Variable	Total	Pre- Intervention	During Intervention	Post- Intervention
Age	46.27 ± 13.54	45.93 ± 13.58	46.06 ± 13.15	49.66 ± 15.53
Race*				
White/Caucasian	537(86.17)	257(85.67)	281(88.64)	35(72.92)
Black/African-American	6(0.90)	4(1.33)	2(0.63)	-
Asian	19(2.86)	7(2.33)	9(2.84)	3(6.25)
Other	23(0.04)	13(3.73)	13(3.15)	-
Hispanic Origin	19(3.0)	8(2.79)	9(2.95)	2(4.88)
Educational** Attainment				
Less than HS	11(1.65)	10(3.33)	-	1(2.08)
HS Graduate	37(5.56)	14(4.67)	18(5.68)	5(10.42)
Some College	125(18.80)	56(18.67)	60(18.93)	9(18.75)
College Graduate	248(37.29)	110(36.67)	120(37.85)	18(37.50)
Some graduate school or advanced degree	237(35.64)	10(3.33)	115(36.27)	15(31.25)

Note: All variables are n(%) except age = M ± SD, **44 missing cases, **7 missing cases

Outcome 2: Increase healthful recreation by park visitors, was the primary objective for Zion National Park. As earlier alluded to, the majority of trail users (80.0%) expected to use the trail for ≥ 30 minutes, indicating trail use that results in physical health benefits. However, when examined in a time-series fashion it was evident that this motivation for an active visit did not differ during the intervention time frame (Table 4). Thus, it would appear that the intervention activities were not conducive to increased usage of the trail.

Table 4. Select summary scores pre-, during, and post-intervention.

Variable	N (%)	χ^2	df	p
Frequency that reported engaging in an active visit				
Pre-Intervention	228 (76)	5.62	2	0.06
During Intervention	263 (82.97)			
Post- Intervention	41 (85.42)			
Frequency that mentioned physical activity as an important reason for trail use				
Pre-Intervention	260 (86.67)	0.08	2	0.96
During Intervention	277 (87.38)			
Post- Intervention	42 (87.50)			
Frequency responded that trail information was from intervention activities				
Pre-Intervention	217 (72.33)	6.12	2	0.04
During Intervention	256 (80.76)			
Post- Intervention	37 (77.08)			

Data regarding “where” park visitors had learned about the Pa’Rus Trail were examined pre-, during, and post-intervention (Table 5). Those responses that were directly related to the intervention activities were recoded to form one variable indicating whether the visitors had heard about the trail from intervention activities. Conversely to the results regarding an active visit, results indicated that there was a significant effect during the intervention for “where” the respondents had heard about the Pa’rus Trail (Table 4). This may indicate that the intervention activities had “reach”, yet failed to lead to behavior change.

Table 5. Sources of information that made visitors aware of the Pa'rus Trail.

Source of Information	Pre-Intervention	Intervention	Post-Intervention
Word of mouth	19 (7.42)	20 (7.14)	4 (9.30)
Saw trail	34 (13.28)	37 (13.21)	12 (27.91)
Roadside signage	17 (6.64)	12 (4.29)	3 (6.98)
Bike shop	2 (0.78)	5 (1.79)	-
Workplace	2 (0.78)	-	2 (4.65)
Park ranger*	22 (8.59)	26 (9.29)	3 (6.98)
Internet web site*	12 (4.69)	9 (3.21)	1 (2.33)
Posters*	66 (25.78)	50 (17.86)	4 (9.30)
Park map*	-	12 (4.29)	-
Tourist weekly article	63 (24.61)	79 (28.21)	12 (27.91)
E-mail	19 (7.42)	30 (10.71)	2 (4.65)
Location of Information			
Driving	8 (3.79)	4 (1.56)	-
Park shuttle/bus*	57 (27.01)	35 (13.67)	9 (21.95)
Trailhead*	29 (13.74)	51 (19.92)	9 (21.95)
Bike shop	6 (2.84)	7 (2.73)	-
Store	-	1 (0.39)	-
Online	15 (7.11)	10 (3.91)	-
Hotel	6 (2.84)	7 (2.73)	2 (4.88)
Workplace	4 (1.90)	3 (1.17)	2 (4.88)
Visitor center*	86 (40.76)	138 (53.91)	19 (46.34)

Note: All variables listed as n (%); *Variables that were recoded into one variable to indicate exposure to intervention activities.

Process Evaluation

Two dominant themes emerged from participants' responses: 1) employee and visitor resistance to the existing intervention protocol, and 2) suggestions for improvement. Each had four sub-factors, as described in Figure 5.

Resistance to Existing Protocol

Resistance to the protocol focused on four main areas, including preexisting differences between physically fit visitors and sedentary visitors, local environmental / climate factors, the varying demographics of visitors riding different types of buses within the park, and the content of the media messages themselves.

Physical fitness vs. physical activity

All three groups brought up differences between physically fit visitors and sedentary visitors, including considerable confusion about which type of visitors were being targeted. Initially, confusion over the intervention's target population was one of the first

topics to come up, as park employees were typically unable to distinguish if the intervention messages were targeted toward visitors who were sedentary or already active. Additionally, terms like “fitness,” “physical activity,” and “exercise” were swapped, often indiscriminately, echoing a common trend in the lay population for whom those terms have little, if any difference, and indicating the intervention hadn’t clearly distinguished a specific target population and/or a well-defined intensity of physical activity. Examples regarding confusion about the target audience are as follows:

“I keep having a question mark in my mind as to why we keep pushing fitness with visitors that are on vacation and the ones who are most likely, that I see, the most likely to do any kind of walking at any level are the ones that have already gone out and done lots of trails already much more strenuous.”

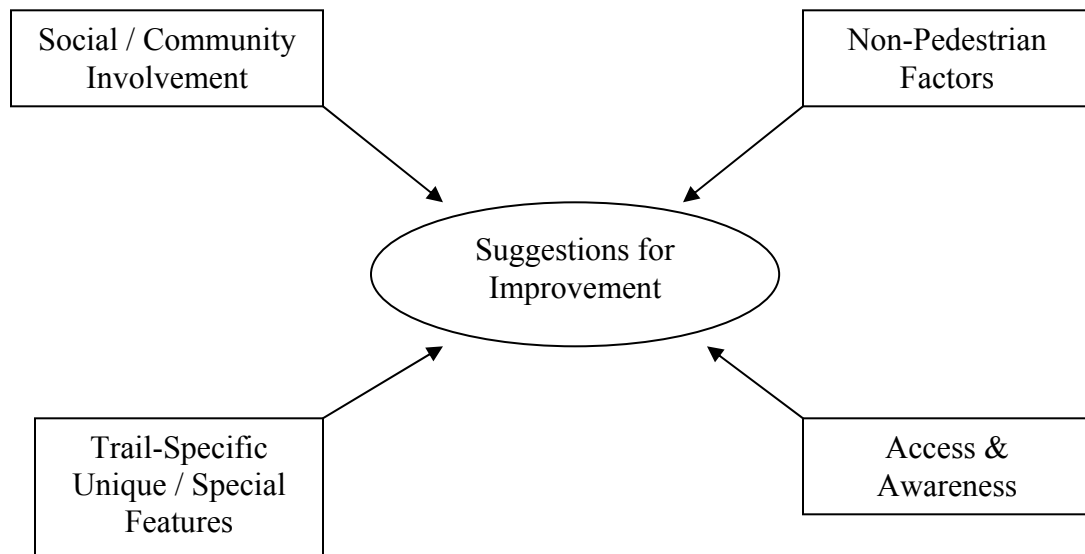
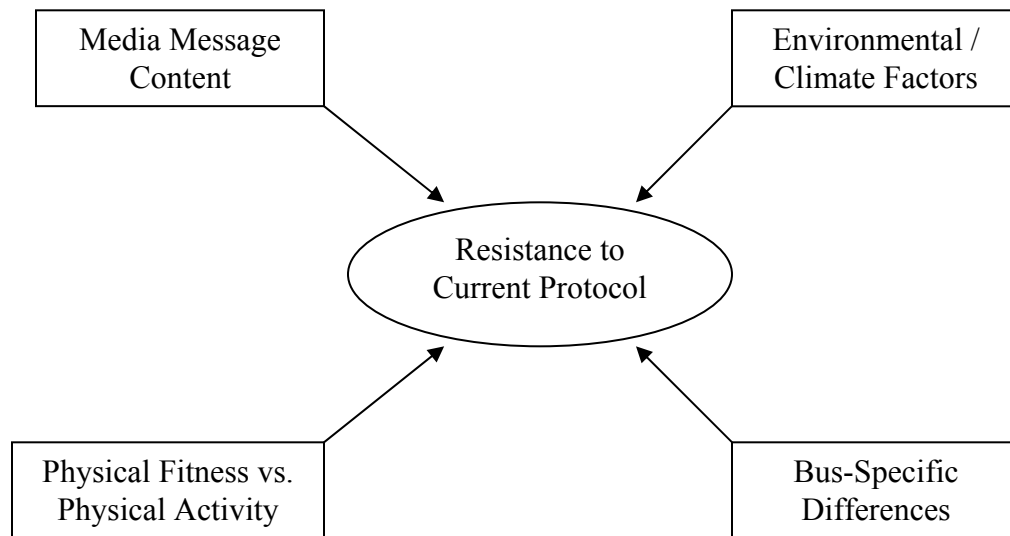
“I think it's already been said, but most of the people that use the trail are already very highly motivated to exercise whether it is walking, biking, whatever it is, running. I didn't see a lot of people on the trail at all that looked like they needed the exercise. It was the ones that already exercise. ...So if we were trying to target the folks that eat the ice cream, they weren't even coming on the trail that I could see.”

Local environment / climate

Another dominant topic within the theme of resisting the current intervention protocol was the weather; particularly the heat. Zion NP is located in the high desert environment of southern Utah, and with the pilot study occurring in mid-summer, the atmosphere was a challenging one in which to encourage physical activity. Even the administrators, who were generally more in favor than the shuttle drivers or rangers for promoting the sun-drenched Pa’rus trail, felt the timing of the intervention wasn’t ideal for this particular trail. The heat of the summer was therefore reflected in comments from all three of the focus groups. An examples of these comments::

“...when they launched this campaign it was the first of July when we went into 110 degree weather. How many days in a row did we have exceedingly hot weather that they had rangers on the Pa'rus questioning those few straggling crazy people who got lost on the Pa'rus saying 'what are you doing here?' I mean it was a horrible time to encourage people to go out. You do not get active in the middle of the day. You will kill yourself...”

Figure 5. Representation of main themes from process evaluation.



Differences in bus passengers

Another topic brought to light by the park's drivers centered on the differences between visitors heading "up-canyon" versus "down-canyon," and also the differences between shuttle bus passengers and tour bus passengers. This was an insight for which these shuttle drivers seemed to have a uniquely helpful viewpoint:

"I'm going to say as a bus driver, if you look at visitors, not locals, when they first get on the bus the first thing they want to do is go up canyon. So telling them that they could get off the bus right there and walk the first trail before, or the first walk back, before they have even gone up the canyon, that just doesn't happen. And then usually if they go up canyon, particularly in July and August, by the time they are coming back, the Pa'rus trail doesn't sound appealing to them because they are ready to go to eat or go back to town or something like that. So either way as a bus driver it makes it more difficult."

"The problem I see on that is that most of those tour groups, they've got about, it seems like two to two and a half hours...I found the tour groups where the tour guide has told them that they could do the whole loop and then told them to take the down canyon shuttle is actually short changing most people because then they don't have the time to do the up canyon thing and do maybe weeping rock or the riverside walk and to tell them to go down canyon to do just the Pa'rus trail. I mean we're...I agree that there's got to be a way to kind of expand that but the limits that those people have on their time here are incredible."

Content of media messages

Prior to the intervention's launch, administrators at Zion NP remarked on how challenging it was to develop catchy slogans promoting physical activity, because even though there were a lot of good media campaign examples from other health promotion areas (e.g., nutrition, anti-tobacco, etc.), there seemed to be fewer cutting-edge messages available for physical activity interventions. As a result, the messages used for this intervention focused on a traditional calorie-reduction emphasis, and employee reaction to that was noticeably negative.

"Yeah, it sounds a little corny as we're coming down canyon to tell people, in my opinion, to get off because you can burn the ice cream that you ate last night or something like that. It just sounds corny and so I honestly don't say it all the time. I say it once in a while and I don't say it all the time because I feel like I am being laughed at and I am. I still announce the trail. I still tell them how long it is. I still say it's a beautiful trail but I usually don't add that little ice cream, 150 calorie thing because it's corny."

Suggestions for Improvement

Despite all of the resistance to the current protocol, focus group participants were equally vocal in their recommendations for improvement. Specifically, they suggested an intervention protocol that took the focus away from calories and directed it toward social and community involvement, trail access and awareness issues, non-pedestrian activities, and other unique/special features and benefits of the trail and its surroundings that had nothing to do with weight control, body image, or even physical health.

Social and community involvement

Focus group participants suggested community partnerships of all kinds for future interventions, in order to promote self-sustaining, long-term programs for visitors and locals alike.

“one of the things that we could think about is forming some kind of a relationship with different town groups where you get locals to go out. I know that there's a lot of locals that will do it once in a while. They do an early morning walk or an evening walk but if you went to the community center, the Lions club, the oh I don't know, the yoga group and stuff like that and said, what we're trying to do is set up maybe a once a week, 7:30 in the morning walk where we can walk and all chat together on it and stuff like that. Once you get that energy going, where you have got something going, then being able to introduce that to visitors too and saying, you know here's a walk with locals that know the park. It's going to occur with a ranger at 7:30 in the morning or 7:30 at night or something like that. We could do it every Wednesday or something like that. Then you start getting some energy toward it I think and I think it can have an impact on both visitors as well as locals...”

Non-pedestrian factors

Building on the social, non-fitness aspects mentioned in the preceding section, another key aspect debated for the Pa'rus trail was its status as the only trail in the park allowing bicycles and dogs.

“I have done the first trail both biking and walking a lot and most of the people that I see are coming out of the campground with their dog or you know an evening walk or something like that. That's a whole different ball game you know because the trail is right there, it's right next to the south campground and it's a wonderful walk there. I think that you get a lot of flow out of there.”

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Trail access and awareness

The debate over dogs and bikes carried over into more general aspects of the trail's accessibility, with this feature already being a popular reason to advocate the Pa'rus trail, within certain limitations.

"...it's user friendly in some ways in that it is accessible, it is wide, it's comfortable and all that."

Promoting the trail's unique / special benefits

One of the most important messages from park employees was that they remained primarily enthusiastic about promoting the Pa'rus trail, although for distinctly different reasons than caloric expenditure and ice cream consumption, which the program was based upon.

"...it's got marked river access paths to really cool swimming holes..."

"To me, the kind of standard line I will put out there is that it's I think the best trail in the park for sunrise, sunset, and late at night and that it's across five beautiful bridges along the way. Then I'll throw in the...like for example this last week, the night thing was the Perseid meteor shower and I will talk about that or whether it is a new or full moon. If it is a full moon you are probably not going to need a flashlight on it. Something that ties it in with this moment that says if you do the trail today it's special and unique. If it doesn't have any star type stuff going on then maybe giving the times of the sunset or the best times in the morning; meaning the sun's coming up from the east side and it's going to light up the streaked (?) wall at a certain time, you know stuff like that."

Conclusions & Lessons Learned:

The purpose of this pilot project was to assess the feasibility of a program to increase healthful recreation/physical activity behavior in Zion National Park⁶ (Outcome 2). Results indicated that while although this program did lead to increased awareness of the intervention message (i.e., reach), the intervention did not result in a change in healthful/physical activity behavior (i.e., efficacy). This evaluation has identified a number of different reasons for this seemingly incongruent discrepancy.

Benefits Gained from the Pilot Project

The most obvious benefit to the park was the inclusion of technology in monitoring trail use. The park acquired trail counters for the Pa-rus Trail and gathered over one year of data regarding trail use. These data did not exist prior to the pilot project. Further, the area medical community was actively engaged in the in the process, and as a result there have been a number of offers to engage Zion NP in fitness promotion efforts within the

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community. Additionally, park staff developed quality graphics that can be utilized for other interventions and shared with other parks. Finally, and perhaps most importantly, lessons were learned on how to engage employees in the intervention process and motivate them to implement change effectively.

Specific Challenges Encountered

Although there were many benefits derived from this project, there were also challenges that were encountered. First and foremost, program planners found it difficult to identify a suitable message relating to the health benefit of walking on the Pa'rus Trail. Because of this difficulty and pressing time constraints, the intervention message was developed at last minute and did not have the impact to lead to behavior change. Compounding this issue was that of quality control. Shuttle drivers and Zion staff were not successful in having a consistent intervention message provided to shuttle passengers. Unfortunately, shuttle drivers routinely announced the Pa'rus trail and encouraged visitors to take it on the way back to the parking areas *before* the beginning of the intervention, possibly contaminating results for the pre-intervention period. Additionally, most did not alter their message, which may have significantly diminished the intervention effects.

With regards to the trail, many of the trail users were repeat users and some became agitated when they were stopped more than once. Additionally, the Pa'rus Trail is not conducive to increased use in the heat of the day because of its exposure to the sun and intense heat. The timing of the intervention was prescribed by direction from the national leads and our inability to gain pre-intervention data from trail counters early enough to start a spring effort. The weather definitely affected the intervention and lead to decreased use of the trail.

Specific Lessons Learned

1. Trail use in Zion Canyon is very high during much of the year. However, the Pa'rus Trail is one of the least used. This trail was chosen as the intervention site for its easy terrain and the fact that it could handle an increase in users. The results clearly demonstrate that the raw number of users decreased in the hottest summer months, which should not be a surprise to anyone due to the exposure of this trail and the extreme heat of summer. Future efforts to promote the use of this trail, or other trails in Zion NP, should focus on the off season and/or shoulder seasons in which the heat is not as much of a concern.
2. Feedback from local stakeholders (i.e., medical community, businesses, etc.) prior to the intervention is necessary. This feedback will aid to develop site-specific messages and interventions that are ideal for Zion NP and the types of individuals that visit the park. Additionally, this increased involvement will lead to reciprocating partnerships in which to promote better health in the local community.
3. Along with feedback and input from local stakeholders, feedback and input from those delivering the intervention message is necessary. This should take many forms including 1) involvement from staff early in the planning process, 2)

- increased training for those individuals implementing the intervention to ensure that the intervention message is consistent, and 3) closer supervision of the drivers and NPS staff to assure the message is being delivered in a consistent and precise manner.
4. Messages that are developed do not necessarily need to be focused on health benefits. Many traditional health promotion messages have *reach*, but are not *efficacious* (i.e., knowledge does not always infer behavior change). Thus was the effect of the intervention message in this pilot project. However, “guerilla marketing” (i.e., getting people to adopt health-promoting behaviors for non-health reasons) could be a great strategy for indirectly increasing physical activity in the park. Our analysis indicated that while most trail users valued their physical health, many were using the trail for reasons other than physical health benefits. This reasoning should be exploited for intervention messages in the future.

Sustainability of the Pilot Project

Advertising the Pa’rus Trail as a less strenuous alternative to the more popular trails in the park will continue. Due to the issues identified in this report, the specific message or reason for using the Pa’rus Trail will need to be modified.

Connecting Youth to Nature

Zion NP does seek to expand and refine Zion’s Junior Ranger Program to better serve a diversity of ages. This can be accomplished through state of the art techniques using technology that incorporate the following:

1. Initiation of a multi-day youth (early teen) program, “Zion Rock Stars” or other appropriate title, through the Zion Canyon Field Institute to educate youth about the purposes of national parks, park resources including an geology, park resources, archeology, and park management programs and challenges.
2. Expand educational outreach program to reach more classrooms, increase awareness of leave no trace and resource education issues, and encourage and accommodate on-site educational field trips by school classes. More outreach efforts will be targeted at specific youth groups such as the Boy Scouts.
3. Create partnerships and provide opportunities for youth and adult volunteers. Identify projects which would fit the ability of the volunteer group (e.g., school, club, Eagle Scout project). Emphasize the role of the new Volunteer Coordinator in working with community organizations in creating long-term partnerships with the Park.
4. Increase biking opportunities within/adjacent to the Park such as the work now being done with Springdale and other partners in creating the Zion Canyon Trail. Identify the potential to link with other trails (e.g., roads on the south side of the Virgin River, JEM Trail, Gooseberry Mesa, etc.) and work more extensively and effectively with youth groups such as the Boy Scouts of

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America to provide an educational experience to strengthen their stewardship ethic.

5. Junior Ranger Program – Emphasize the long history of Zion’s Junior Ranger Program and build upon it. Create high expectations and build a first-class program. Gear the presentations for various age groups and emphasize hands-on learning and exploration.
6. Youth Backcountry Program (patterned after Yosemite Institute Wild) in association with ZNHA Field Institute. One- or two-week backcountry program covering wilderness ethics, environmental education, survival . . . Include involvement of non-profit organizations to assist in supporting underprivileged youth.

Potential for Replication

Much has been learned by the pilot project. The tools are available for encouraging visitors to use trails in the park (e.g., posters, news clips, etc.). Further, trail counters can be used to monitor trail use, and trail intercept surveys can be modified to gain visitors’ perspectives for trail use. With modifications to the intervention message, this intervention could easily be replicated in a variety of settings.

With respect to cost, rough estimates of costs involved with this pilot project are listed below:

Budgetary Item	Per unit cost	Total
Zion NP Personnel		
Jock Whitworth	~30 hrs @ 45 hr	1,350
Ron Terry	~30 hrs @ 40 hr	1,200
Tom Haraden	~20 hrs @ 35 hr	700
Supervisors	~20 hrs @ 25 hr	500
Rangers	~5 hrs/d X ~100 d @ 16 hr	8,000
Materials		
Posters	95 @ 2.50 ea.	237.50
Map & guide inserts	~180,883 @ 0.03 ea.	5,426.49
Contract Costs		
University of Utah contract	Tim Behrens, PhD & Dave Chong, MS	29,692
Incentives		
Posters for survey participants	656 @ 2.50 ea.	1,640
Total		\$48,745.99

Limitations

This evaluation is not without its limitations. The research design did not include a control group because there was no other trail in the park that was comparable for matching. Therefore, the cause and effect relationship is somewhat unclear. However, we attempted to resolve as many threats to internal validity as possible with a rigorous quasi-

experimental design (i.e., interrupted time-series design). Further, we were unable to attain our goals for the amount of post-intervention trail intercept surveys. Thus, findings from the surveys regarding active visits may be underpowered. Additionally, there may have been error with the trail counters because of the signaling frequency and the opportunity of the counters to collect non-activity data (e.g., animals, debris, double-counting of an individual, etc.). However, trail counters were calibrated and standardized before monitoring for this evaluation, and we did obtain full data from the trail counters, weather, and number of visitors entering the park. Thus, we are confident in our findings regarding the primary outcome variable.

Summary

Based on our evaluation of this pilot project, our findings do not demonstrate conclusive evidence that the intervention was efficacious. Insufficient sample size on post-intervention surveys tainted statistical power and did not allow for a conclusive finding regarding an active visit. However, trail data and clearly did not indicate a change in physical activity behavior. Based on these inconsistencies, there is insufficient evidence to support, or refute, the efficacy of this evaluation.

Support for NPS Program Outcomes:

Goal 1: Increase awareness of health benefits by park visitors derived from participation in recreation in National Parks.

This was not a goal addressed at Zion NP. However, analysis of trail intercept surveys indicated that there was not a change in awareness of health benefits pre-, during, or post-intervention.

Goal 2: Increase healthful recreation/physical activity behavior in National Parks.

This was the primary goal on Zion NP. Data indicated that there was inconclusive evidence to support, or refute, the program effect on recreation/physical activity behavior while in the park.

Goal 3: Increase healthful recreation/physical activity behavior as a lifestyle at home.

This was not a goal addressed at Zion NP, and no data were collected regarding this outcome.

References

1. U.S. Department of Health and Human Services. Physical Activity and Health: A Report of the Surgeon General. US Department of Health and Human Services 1996.
2. Schiller JS, Coriaty-Nelson Z, Barnes P. Early release of selected estimates based on data from the 2003 National Health Interview Survey Available:
<http://www.cdc.gov/nchs/nhis.htm>. Accessed June, 2004.
3. Pate RR, Pratt M, Blair SN, et al. Physical activity and public health: A recommendation from the Centers for Disease Control and Prevention and the American College of Sports Medicine. *Journal of the American Medical Association*. 1995;273(5):402-407.
4. Brownson RC, Baker EA, Boyd RL, et al. A community based approach to promoting walking in rural areas. *American Journal of Preventive Medicine*. 2004;27(1):28-32.
5. Siegel P, Brackbill R, Heath G. The epidemiology of walking for exercise: Implications for promoting activity among sedentary groups. *American Journal of Public Health*. 1995;85:706-710.
6. National Park System Advisory Board. Health, Recreation, and our National Parks: Addressing the role of National Parks to promote and provide healthful recreation activities - an outcome-based approach. In Department of the Interior, (Ed). Washington D.C. 2006.
7. Active Living Research. Tools and Measures Available:
http://www.activelivingresearch.org/index.php/Tools_and_Measures/312. Accessed March 8, 2007.

8. Davenport M, Borrie W, Freimund W, et al. Assessing the Relationship Between Desired Experiences and Support for Management Actions at Yellowstone National Park Using Multiple Methods. *Journal of Park and Recreation Administration*. 2002;20(3):51-64.
9. Steckler A, McLeroy KR, Goodman RM, et al. Toward integrating qualitative and quantitative methods: An introduction. *Health Education Quarterly*. 1992;19:1-8.
10. Krueger RA. Moderating focus groups. Thousand Oaks, CA: Sage Publications 1998.
11. Morgan DL. Planning Focus Groups. Thousand Oaks: Sage Publications 1998.
12. NUD*IST. NUD*IST. Victoria, Australia: QSR International Pty Ltd 2002.
13. Strauss A, Corbin J. Basics of Qualitative Research: Grounded theory procedures and techniques. Newbury Park, CA: Sage Publications 1990.