

Final:

How do recreational users of OSMP lands define their motivations to recreate and do these meanings vary by recreation activity and geographic locations of recreation sites?

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## *Executive Summary*

The purpose of this study was two-fold. First, to explore how recreational users who recreate on lands managed by the City of Boulder Open Space and Mountain Parks (OSMP) department define three Recreation Experience Preference (REP) categories. Second to examine the relationship between REP motivational definitions, different users' preferred recreation activity, and geographic locations of trailheads (i.e., north, south, east, and west study areas) within a peri-urban and urban parks and protected area (PPA). This two-phase, mixed-methods study utilized an online survey instrument with three open-ended questions asking respondents to define the REP categories "enjoy nature", "physical fitness", and "mental health". Definitions were coded and the top three coded themes for each of the REP categories were expanded to construct definitional terms. The three definitions for the three REP categories obtained from the first phase of the study were used as answers to closed-ended motivational definition questions in an on-site, self-administered paper survey instrument distributed at eight trailheads, two from each of the four geographic study areas.

A total of 38 respondents filled out the online survey, while 349 respondents completed on-site survey instruments. Results from the study showed there was an association between respondents' preferred recreation activity and the REP category definitions of "enjoy nature", with hikers/walkers being less likely to select the "Escaping the built environment" enjoy nature motivational definition. There was an association between both respondents' preferred recreation activity and geographic locations of trailheads with the REP category definitions of "physical fitness". Hikers/walkers and bikers were more likely to select the "Building or maintaining a healthy body" physical fitness motivational definition and respondents who filled out surveys at trailheads located in the west study area were more likely to select the "Challenging my abilities"

physical fitness motivational definition. There were no associations for the “mental health” REP category. Results from this study include:

- Demonstrating the utility of using a mixed-methods research design to study the complex latent concept of recreation motivation.
- The utility in taking traditional REP studies a step further, allowing recreational users to define REP categories gained from established methods, providing a richer understanding of recreation motivations.
- A better understanding of the types of motivations and experiences being sought by different recreation groups recreating at different geographic locations and how the supply of trails within the four study areas are meeting the demand of experiences.
- The idea that recreation for City of Boulder residents may be habitual and routine.

### ***Abstract***

Having a deeper understanding of recreational users’ motivations are important for the successful management of parks and protected areas (PPAs). Motivations can influence recreational users’ behaviors and managers can use motivational studies to gauge whether their lands are providing ample opportunity for recreational users to seek and obtain their preferred recreational experiences. This study expands the understanding of Recreation Experience Preferences (REPs) by allowing recreational users to provide definitions to three REP categories identified as the top responses in a previous REP study that took place on lands managed by the City of Boulder Open Space and Mountain Park (OSMP) department. It took the top three definitions for each of the three REP categories and utilized them to understand if motivational definitions were different between recreational groups or geographic locations where recreational users choose to recreate. An online survey with open-ended questions was used to collect

motivation definitions and a self-administered on-site survey instrument was used to examine the relationship between motivation definitions, recreation activities, and the geographic locations of trailheads where surveys were administered. Chi-square tests of independence showed an association between respondents' preferred recreation activities and definitions for the REP categories of "enjoy nature" and "physical fitness" and that there was an association between geographic locations of trailheads and the REP category of "physical fitness". These results suggest that motivational definitions and their relationship with different recreation activities and geographic settings of recreation sites are complex. Understanding the complexity of motivation can allow managers to predict locations that may witness future increases in use and users' behaviors based on desired recreational outcomes. It also highlights the need for future REP research to more fully understand if recreational users' experiential expectations are being met.

### ***Introduction***

One of the central tenets of recreation management is for parks and protected area (PPA) managers to provide quality recreation-based experiences for visitors while also protecting ecological processes of the natural resource. Understanding visitor motivation is one way that outdoor recreation researchers and managers employ to understand and manage behaviors and potential resource impacts of recreationalists (Manning 2011). Motivational research tends to focus on the psychological perspective of the individual recreational users, seeking to understand what recreational experiences are desired, where visitors go to have these desired experiences, and how these desired experiences are achieved.

Once PPA managers determine recreationalists' motivations, they can determine if the lands they manage offer appropriate settings and management regimes to facilitate the realization of the motivational outcomes that are sought by the recreational user (Driver and Brown 1978).

Having a grasp on recreation motivation can also be important for recreation managers that are facing increasing use that may result in conflict and crowding. This is particularly true in urban and peri-urban recreation areas that witness high levels of recreation use year-round when compared to more rural PPAs because they may represent the only natural areas that are accessible within a proximate distance from large urban areas (Hockett et al. 2017). Urban and peri-urban recreation areas may also offer recreational users a more diverse array of recreational activities and site choices that are easily accessible. Depending on the recreation activity users are participating in and the experiences they are seeking, managers may, for example, be able to point users to other locations where sought experiences may be achieved.

Sisneros and Kidd (2021) point out that there is a lack of research into the importance of understanding recreational users' motivations to recreate on lands managed by urban and peri-urban management agencies. Therefore, this paper seeks to gain a more thorough understanding of recreation motivations in an urban and peri-urban PPA context focusing on lands managed by the City of Boulder's Open Space and Mountain Parks (OSMP) department. In a previous study Arthur et al. (2022) used an online survey instrument and found that the three top motivational Recreational Experience Preference (REP) categories within OSMP managed lands that recreational users selected included "enjoy nature", "physical fitness", and "mental health". A common critique of using quantitative methods to measure REP and underlying motivations is that recreational users are not able to fully express their motives, needs, roles, emotions, and values (Skår et al. 2008). This research seeks to utilize findings from a previous REP study conducted by Arthur et al. (2022) to address some of the critiques about REP research outlined above and the purpose is twofold. First, to use a two-phase mixed-method approach using both qualitative and quantitative data to move a step beyond traditional REP studies allowing

recreational users to provide definitions to the three determinative REP scales and see if these definitions differ by recreation activity or recreation site. Second this research seeks to further the understanding of the motivations of recreational users who choose to recreate on urban and peri-urban recreation areas. Specifically, this research addresses the following questions:

1. How do recreational users define the REP motivational scales “enjoy nature”, “physical fitness”, and “mental health”?
2. Do the definitions of “enjoy nature”, “physical fitness”, and “mental health” differ between recreation groups?
3. Do the definitions of “enjoy nature”, “physical fitness”, and “mental health” differ by the geographic location of recreation sites?

#### *Recreation Motivation*

Motivations of recreational users are a common way that PPA managers seek to understand recreation behavior and why individuals participate in certain recreational activities at certain sites. Manfredo et al. (1996) point out that motivational studies are a foundational component of understanding recreational users because they help managers determine why people participate in certain recreational behaviors and what impacts to the landscape that these users’ engagements might entail. Motivational study results can be used as the basis for the knowledge that goes into the recreational and environmental management planning processes. An “experiential approach” to studying recreational users was first posited by Driver and Toucher (1970) and suggested that individuals choose and participate in recreational activities to achieve certain goals and to meet psychological outcomes. Motivation acts as an internal force that helps the individual to achieve a certain desired experience or outcome. The experiential approach was the first to link recreational settings and activities to outcomes and suggested that recreation should be

understood as experiences that are undertaken in particular settings with the goal of the recreationalists to obtain pre-determined psychological and/or physical outcomes (Manfredo et al. 1996). It also offered land managers the opportunity to understand if their recreational settings were meeting recreational demands, to develop management objectives sensitive to the needs of the recreational user and the natural resource, to gain a greater understanding of recreation conflicts, and to identify suitable areas that could be used as recreation substitutes (Manfredo et al. 1996).

Driver and Knopf (1977) refined the experiential approach by identifying unique domains of desired experiences of recreationalists by user type, settings, and activities. Domains were quantified using Recreation Experience Preference (REP) scales. The REP scales were developed using motivation theory for measuring desired goals and rely on the “unmet needs” hypothesis where participation in recreational activities helps people satisfy needs not met in their non-recreation activities (Driver et al. 1992). The assumption behind this approach is that recreationalists are motivated, goal-directed actors and that motives, needs, values, and benefits are instrumental in behavioral choices (Ajzen and Driver 1992).

REP scales are commonly used by recreational researchers and managers to measure the extent that certain experiences are desired and expected from recreational activities by using survey instruments that utilize several vetted and empirically tested questions to identify visitor motivations (Manning 2011). Questions include items that respondents select that are related to generalized categories of motivations (e.g., “enjoy nature”, “physical fitness”, and “mental health”). Factor analysis or other multivariate statistical methods are used to confirm and identify latent motivational concepts and place respondents into REP categories. Multiple comparative studies and meta-analyses have found that REP scales offer reasonable validity and reliability for

explaining latent concepts of motivation (see Driver et al. 1992; Manfredo et al. 1996; Manning 1999 for detailed descriptions of the literature).

As alluded to previously, some researchers are starting to critique REP scales and the theoretical underlying assumptions of the method used to identify recreation motivation. Using quantitative methods to place individuals into REP categories misses some of the complexity that underlies a complicated decision-making process tied to expected experiential outcomes that recreational users undertake when deciding where to recreate and which activity to participate in. Concepts and scales focus on one single form of behavior, however recreational users oftentimes can choose between two or more behaviors at any given time or location. Traditional REP studies negate the user's feelings about alternative behaviors that they may take part in (Bright and Tarrant 1999). Contemporary research is beginning to tie recreational motivation to individuals' identity formation, where individuals internalize recreation behaviors to the extent that it represents a significant part of their identity (Lynch and Dibben 2015). An interpersonal process of motivation that is undertaken in identity formation may be hard to quantify using generalized REP scales. Additionally, some have pointed out that motivational research is too empirical, unreflective, and too driven by specific management questions (Skår et al. 2008).

The foundation of this research stems from a previous study conducted by Arthur et al. (2022) that used a survey instrument and common REP questions to identify the top three REP categories as selected by recreational users on OSMP managed lands. Considering the criticisms outlined above, this study seeks to place REP-based research into a wider social and theoretical context, while not discounting the utility that REP scales have in the wider realm of recreation research. Instead of discounting research that uses REP scales to understand recreation motivation outright, this research seeks to take REP-based research a step beyond traditional



studies by using qualitative methods that allow recreational users to provide definitions for the three REP categories previously identified. It takes results from a quantitative study and adds qualitative methods that are useful for exploratory research when little is known about the meaning individual's assign to certain terms (Patterson and Williams 2002). Rubin and Rubin (2011) note that qualitative data collection provides rich data about the meaning that recreational users assign to their experiences.

A richer understanding of how recreational users define REP categories and if these definitions vary by activity and recreation site geography further elucidates the understanding that OSMP managers have about the motivations of their recreational users. Légaré and Haider (2008) suggest that recreationalists with different motivations may respond differently to various management actions. While Frey et al. (2018) note that knowledge of how motivation dictates spatial behavior of recreationalists across multiple destinations within the same system can inform recreation management at various scales including managing behavior at individual access points, particular recreation destinations, and across a regional system. Therefore, it is important for managers to understand these motivations at deeper levels when proposing and implementing management actions.

## ***Methods***

### *Study Area*

Boulder's Open Space and Mountain Parks (OSMP) department is responsible for managing approximately 45,000 acres of land, 155 miles of developed and maintained trails, and 37 trailheads in and around the greater Boulder, Colorado metropolitan area (OSMP 2022). Estimated total recreation visits to OSMP lands on an annual basis is 5.5 million (Leslie 2022).

City of Boulder's OSMP lands offer a unique opportunity for this exploratory study for several reasons. First, as previously pointed out, researchers have recently completed a motivational study using REP scales and results from this study identified the top three REP categories as identified by recreational users on OSMP lands that will be used to understand how recreational users define these REP categories. Second, access to OSMP lands exist in both an urban and peri-urban context, which generally results in higher visitation levels than more rural areas. Finally, sampled trailheads where surveys were distributed are geographically situated around the four cardinal directions from the City of Boulder, and each represents unique landscapes and opportunities for recreation experiences that may be distinct from one another.

#### *Data Collection*

Data collection took place between June and October of 2022 and was divided into two phases. Phase one took place between June and August and consisted of an online survey. Participants for the online survey were recruited via signs placed at a total of 18 trailheads selected by staff at OSMP. Signs included a quick response (QR) code, shortened survey URL link, and an attached box containing business cards that included the same material as the sign that users could take home with them if a mobile device was not accessible at the trailhead, or they preferred to complete the questionnaire at home. The online survey consisted of demographic questions that aligned with previous OSMP research. Motivation definitions were obtained using three deliberately broad open-ended questions that asked respondents to define what "enjoy nature", "physical fitness", and "mental health" meant to them as a motivation to recreate or visit OSMP lands. Open-ended questions allow for a richer dataset than may be obtained from other research methods when it comes to recreation users defining their motivations in their own words. It should be noted that the original intent of the first phase was

to conduct open-ended interviews, however there was a lack of participation in the original recruitment of interviewees. In consultation with managers from OSMP the decision was made to change to an online survey with open-ended questions that would still allow participants to define the REP scales in their own words.

Phase two took place in September and October 2022 and consisted of self-administered on-site paper survey instruments distributed at eight OSMP trailheads, two from each of the four geographic study areas. Trailheads and sampling days and times were selected based on OSMP managers' sampling design. On-site surveying took place during three shifts during each day (9-11 am, 12-2 pm, and 3-5 pm). Each trailhead was visited three times, two times during the week and once during the weekend, for a total 24 surveying sessions. Survey instruments consisted of demographic questions consistent with other OSMP studies and questions related to recreational habits including the number of years respondents have been recreating on OSMP lands and how many times a month, on average, respondents recreate on or visit OSMP lands. The survey instrument concluded with three closed-ended questions that asked respondents to choose the one definition that best represented their definition of the REP categories enjoy nature, physical fitness, and mental health. Definitional answers for this question were obtained from the open-ended questions used in phase one of the project.

### *Data Analysis*

Open-ended question responses for each of the REP scales were downloaded and analyzed using two coding cycles as outlined by Miles et al. (2018) where the first cycle of coding includes broad categories, and the second cycle of coding refines these broad first-level coding categories into more specific coding themes relying not on the responses but the codes themselves. During the first cycle of coding, broad descriptive codes were assigned to each of

the definitions for the three REP categories. A second cycle coding process further refined and collapsed the codes into more specific categories. The top three coded categories were expanded into definitions by revisiting the text from the respondent's open-ended answers and used as the three closed-ended answers for the self-administered on-site survey distributed at the eight sampled trailheads.

On-site, self-administered paper survey instruments were individually imported into Esri Survey123 online survey software by the researcher. Twelve surveys were removed from the analysis because of incompleteness or not being filled out correctly. Data were exported from Survey123 into RStudio for statistical analysis. Descriptive statistics (frequency, mean, and standard deviation) were run on demographic data. Before running descriptive statistics on the number of years visiting OSMP lands question, the answers "First time" and "Less than one year" were recoded into numeric variables and were given values of 0.25 and 0.75 respectively. Similarly, for the average number of times visiting OSMP lands per month, the answer "This is my first visit" was recoded to a numeric value of 0.083.

Before running statistical analysis four surveys where respondents selected their genders as being transgender woman, transgender man, genderqueer/gender non-conforming, and different identity were dropped due to their low response rates ( $n = 1$  for each gender group) and the researcher not wanting to collapse the categories out of respect for gender differences. The preferred recreation activity category "Climbing/bouldering" ( $n = 13$ ) was combined with the preferred recreation activity category "Other" ( $n = 4$ ) into a single "Other" category ( $n = 17$ ) due to their small individual sample sizes. For simplification of analysis and to prevent dropping additional surveys with low sample sizes the primary residence question was changed from a categorical variable with 11 categories to a categorical variable with three categories, City of

Boulder residents (those that indicated they lived within the City of Boulder limits), Boulder County residents (those that indicated they lived in Boulder County or a city located in Boulder County) and Outside Boulder County residents (those that indicated they lived someplace other than within the City of Boulder or Boulder County limits). Individual trailhead locations were recoded into the factors north, south, east, or west, representing the geographic cardinal direction which the trailhead was located in. Finally, each of the three definition questions' answers were truncated into their original single-worded coding themes.

Statistical tests were used to compare results of the on-site survey between the four geographic study areas. The categorical variables of gender, residence, and preferred recreation activity frequencies were analyzed using Pearson's chi-square tests. The continuous variables of age, the number of years visiting, and times visited per month were analyzed with analysis of variance (ANOVA). To determine whether the three motivation definitions for the top three REP scales were different amongst recreation groups and the geographic locations of trailheads, Pearson's chi-square tests were applied. If there was a statistically significant result for any of the relationship analysis, a post-hoc test was performed.

## ***Results***

### *Phase One: Online Surveying*

A total of 38 respondents fully completed the online survey. Online survey respondents were more likely to be women, primarily reside within Boulder city limits, identified hiking or walking as the preferred recreation activity, and had an average age of 56.1 (Table 1). Motivation definition answers for the top three REP categories were solicited using three open-ended questions that asked respondents to respond to the prompt "When recreating or visiting OSMP

lands, what does (“enjoy nature”, “physical fitness”, and “mental health”) mean to you as a motivation to recreate or visit OSMP lands?”.

Coding for the enjoy nature REP category was more diffuse than the other three, with definitions spanning a wider array of coding themes. The top coded theme was observation (Table 2). One respondent stated that they defined enjoy nature as being “Viewing wildflowers, cactus, trees....”, while another defined it as “Beautiful views, fresh clean air, interesting vegetation, and possible encounters with wildlife”. The second enjoy nature definition coded theme was escapism with respondent stating that enjoy nature was an “... opportunity to get away from concrete and people...”. The third definition coded theme for enjoy nature, learning, was succinctly summed up by one respondent as being able to “Study the animals, plants, and geology”.

There was the most consensus in respondents’ definitions in the physical fitness REP categories, resulting in more similarity in the number of coded themes for the top two definitions (Table 2). The top coded theme was activity with one respondent defining physical fitness as “Having an area to walk, run, hike, and bike....”. The second highest coded theme was health with one respondent defining physical fitness as “Exercise is vital to improve/maintain both physical and mental health”. The final coded theme, challenge, stated that “Boulder has some strenuous trails to hike”.

Much like the REP category codes for enjoy nature, the mental health coded themes were more varied than the codes for the physical fitness REP category (Table 2). The top coded theme, wellness, was defined by one respondent as “Dopamine and serotonin releases that come from being outside”. The second coded theme, disconnection, may appear to be like the coded theme of escapism used for the enjoy nature REP scale, however the distinguishing factor is that

escapism is an escape from the built environment whereas disconnection has to do with disconnecting from technology or other life pressures. As an example, one respondent stated that mental health meant “Just time away from devices with friends or loved ones.” The third coded theme, relaxation, was summed up in a one-word definition of enjoy nature by one respondent as “Relax”.

### *Phase Two: On-site Surveying*

A total of 349 on-site self-administered paper surveys were collected across all sampling locations. Respondent’s demographic characteristics were like the respondent demographic characteristics of the online survey used in phase one and were more likely to be women, primarily reside within Boulder city limits, identified hiking or walking as the preferred recreation activity, and had an average age of 53.3 (Table 3). The response rate for the on-site surveys was 59.3%. Non-response bias checks were conducted relative to recreation activity type for recreational users who declined to participate when solicited at trailheads. Non-respondents tended to be more often than respondents for hiking/walking (64% for non-respondents compared to 58.5% for respondents) and running (15.5% for non-respondents compared to 14.9% for respondents). While respondents tended to be more often than non-respondents for biking (21.8% for respondents compared to 20.1% for non-respondents). These non-response bias checks revealed that there was no uniform nonresponse by any of the recreational groups during on-site survey sampling.

To understand if the frequency of responses and if the mean values were different by geographic locations of trailheads, a chi-square test of independence was performed on the categorical variables (gender, residence, preferred recreation activity) and a one-way ANOVA was performed on the numerical variables (age, years visiting, and average times per month

visiting) (Table 4). The residence ( $\chi^2_{(6)} = 83.07, p < .001$ ) and preferred recreation activity ( $\chi^2_{(9)} = 18.11, p < .05$ ) variables were significantly associated. Post hoc comparisons of survey respondent's residence and preferred recreation activity by geographic locations of trailheads revealed that lower amounts of residents from Boulder city limits filled out surveys and that hikers/walkers made up a larger percentage of respondents in the southern study area.

There was a statistically significant difference in age  $F(3, 341) = 8.89, p < .001$ , years visiting  $F(3, 341) = 5.98, p < .001$ , and average times per month visiting  $F(3, 341) = 6.69, p < .001$  between the four geographic study areas. A Tukey's HSD Test determined that the mean values of the age of survey respondents were significantly different between the southern and eastern study areas ( $p < .01, 95\% \text{ C.I} = -15.03, -2.48$ ), western and eastern study areas ( $p < .05, 95\% \text{ C.I} = -11.57, -0.50$ ), southern and northern study areas ( $p < .001, 95\% \text{ C.I} = -16.37, -4.12$ ), and western and northern study areas ( $p < .01, 95\% \text{ C.I} = -15.03, -2.48$ ). Mean values of the number of years respondents have been visiting OSMP lands were significantly different between southern and eastern study areas ( $p < .01, 95\% \text{ C.I} = -14.79, -1.77$ ), southern and northern study areas ( $p < .001, 95\% \text{ C.I} = -15.93, -3.21$ ), and southern and western study areas ( $p < .01, 95\% \text{ C.I} = 7.17, 1.48$ ). Finally, mean values of the average number of times respondents visit OSMP lands per month were significantly different between southern and eastern study areas ( $p < .001, 95\% \text{ C.I} = -10.29, -2.53$ ), southern and northern study areas ( $p < .01, 95\% \text{ C.I} = -8.54, -0.97$ ), and southern and western study areas ( $p < .01, 95\% \text{ C.I} = 0.85, 7.63$ ).

#### *REP Scale Motivational Definitions*

A chi-square test of independence examined the individual relationships between the preferred recreation activity of survey respondents (hiking/walking, biking, running, other) and



geographic locations trailheads where surveys were collected (north, south, east, west) on the three REP category motivation definitions.

### *Enjoy Nature*

The “enjoy nature” definition most frequently selected by survey respondents was “Observing plants, animals, scenery, and/or other things on the natural landscape” (Table 5). The preferred recreation activity variable ( $\chi^2_{(6)} = 14.04, p < .05$ ) was significantly associated while the geographic locations of trailheads variable ( $\chi^2_{(6)} = 9.45, p = .15$ ) was not statistically associated with the enjoy nature definitions. Post hoc comparisons of respondents’ preferred recreation activity revealed that hikers/walkers were less likely to choose the “Escaping the built environment” enjoy nature definition.

### *Physical Fitness*

There was more consensus on the “physical fitness” definition amongst the survey respondents. Overwhelmingly the definition most frequently selected was “Building or maintaining a healthy body” (Table 6). Both the preferred recreation activity variable ( $\chi^2_{(6)} = 22.81, p < .001$ ) and the geographic locations of trailheads variable ( $\chi^2_{(6)} = 19.03, p < .01$ ) were significantly associated with the physical fitness definitions. Post hoc comparisons of respondents’ preferred recreation activity revealed that hikers/walkers and bikers were more likely to choose the physical fitness definition of “Building or maintaining a healthy body”. Additionally, post hoc comparisons of the geographic locations of trailheads revealed that respondents that visited trailheads located in the western study area were more likely to define physical fitness as “Challenging my abilities”.

### *Mental Health*

The frequency of “mental health” definitions selected by survey respondents was more evenly distributed than the other two REP scale definitions with “Developing a positive mental state” being the definition most frequently selected (Table 7). There was no statistically significant association between the preferred recreation activity variable ( $\chi^2_{(6)} = 7.55, p = .27$ ) or the geographic locations of the trailheads variable ( $\chi^2_{(6)} = 1.61, p = .95$ ) with the mental health definitions.

### ***Discussion***

This study used a two-phase mixed-method design to explore the relationship of recreation activity and trailhead geographic location with definitions of three Recreation Experience Preference (REP) categories identified in a previous study conducted on OSMP lands. Traditional REP studies arose from the experiential approach and attempt to measure psychological goal states desired by recreational users and to determine the motivations for participating in recreational activities through the utilization of a set of empirically tested questions that identify potential motivations (Manfredo et al. 1996). REP research tends to rely on survey questions with dozens of items that are related to general motivation categories and researchers categorize individuals’ motivations based on scales that are selected. In recognition that motivation is a complex and interpersonal psychological process that may not be captured through a standard suite of questions, the research began with an expanded perspective of REP research that gave more voice to the recreational users. Traditional REP research was taken one step further in the first phase, allowing recreational users to provide definitions to the three REP categories. Findings from the first, qualitative phase of the study allow managers at OSMP to see beyond traditional REP scales and categories to understand the deeper nature of recreational users’ desired experiences and the motivations to recreate providing the underpinnings of the

second phase of the research. The second phase of the research sought to understand if there was an association between recreation activity and geographic location of the trailheads and the top three definitions for each of the REP categories from phase-one. Traditional REP research suggests that motivations of recreation groups are different from one another (Cordell 2012) and that there are not significant differences in spatial decisions made by recreational users based on different motivations and recreation activity types (Becco et al. 2013).

Unlike previous research that seeks to understand the relationship between motivations, recreation activity, and the spatial decisions of recreational users, this study explored the relationship between motivation category definitions and preferred recreation activity and geographic locations of trailheads across four specific geographic urban and peri-urban trailhead geographies in Boulder, Colorado. This research suggests that motivational definition differences may not be clearly related to recreation type and the geography of the trailheads where users choose to recreate for the two of the three REP scales, revealing that there is more nuance in how different recreation groups that recreate in different geographic areas choose motivational definitions.

#### *REP category definitions*

Giddens (2020) stated that people can provide the interpretations and reasons for their intentions, purposes, goals, needs, and behaviors if they are asked. For the first phase of this project, recreational users were asked to provide definitions for three REP categories that serve as proxies for motivations to recreate on lands managed by OSMP. For the enjoy nature REP category, the coded theme with the greatest frequency was observation (Table 2). Most of the definitions provided by respondents that fell under this coded theme referenced either the views that were afforded by recreating on OSMP lands or the ability to see wild flora and fauna on a

natural landscape. The fact that OSMP lands forms a natural buffer around the city, protecting the natural environment from development, may facilitate the observational motivation of the enjoy nature REP category for recreational users. The top coded theme frequency for the physical fitness REP category was activity (Table 2). Most of the respondents' definitions that were coded as activity either specifically referenced a recreation activity (i.e., hiking or running) or referenced both a recreation activity and a location to participate in that activity (i.e., trails to run or bike on). Manfredi et al. (1996) noted that motivational studies are a way for recreation managers to ensure that their recreational settings were meeting recreational demands. With people defining physical fitness on OSMP lands as being either a specific recreation activity or a place to participate in that recreational activity, the implication may mean that OSMP settings are meeting recreational users' demands. Finally, the coded theme with the greatest frequency for the REP category mental health was wellness (Table 2). Respondents' definitions that were coded as wellness either contained the word wellness itself or were related to the benefits that recreating on OSMP lands had on their health (i.e., release of serotonin or dopamine). There are many studies linking outdoor recreation and wellness (see Godbey 2009 for a comprehensive review) and the fact that recreational users are seeking out OSMP lands for wellness may represent a health benefit that OSMP lands are providing to those that recreate on them.

#### *Associations between motivation definitions, recreation activity, and trailhead geography*

Chi-square tests of independence were used to identify associations between the three definitions for each of the three individual REP categories, respondents' preferred recreation activity, and the geographic location of the trailhead where the survey was filled out. For the enjoy nature REP category definitions there was a statistical association between the recreation activity variables and the three definitions (Table 5). Those that selected hiking/walking as their

preferred recreation activity were less likely to define their enjoy nature motivation as being “Escaping the built environment”. Instead, hikers/walkers were more likely to choose the definitions “Observing plants, animals, and/or other things on the natural landscape” or “Learning about the natural world around me”. This may arise from the fact that hikers are traveling at a slower pace than other recreational groups and are able to observe what is around them and not necessarily what is immediately in front of them, as a recreational user that is traveling at a faster pace may be forced to do. Furthermore, by taking in the surroundings and being able to observe things at a slower pace may offer more opportunities to learn about the natural world, which may be accomplished using guidebooks or mobile applications that users traveling at faster paces would not be able to employ as readily.

The three physical fitness REP category definitions were statistically associated with the preferred recreation activity variable and the geographic locations of trailheads variable (Table 6). Both hikers/walkers and bikers were more likely to select the physical fitness motivation definition of “Building or maintaining a healthy body”. Hiking and walking may normally be associated with maintaining health. However, it is interesting for bikers, who many perceive to be a challenge seeking recreational activity that requires more skills than other forms of recreation chose the “Building or maintaining a healthy body” over “Challenging my abilities” or “Participating in and developing recreational activity skills”. Respondents in the western study area were more likely to choose the “Challenging my abilities” physical fitness REP category definition. Based on the physical characteristics of the sampled trailheads located within the western study area this intuitively makes sense. Both Sanitas Valley Trailhead and Chapman Drive Trailheads offer recreational users access to two challenging trails with steep climbs, varied terrain, and noteworthy elevational gain (Sanitas Mountain and Chapman Drive), possibly

making those that choose to visit these areas being motivated by the challenge that these trails offer, over building health or acquiring skills.

There were no statistically significant associations between the three mental health REP category definitions and the preferred recreation activity variable and the geographic locations of trailheads variable (Table 7). This, however, does not negate the need for further investigation. During the on-site survey administration, the researcher noted that respondents had a hard time selecting only one of the mental health REP category definitions with many noting that they were having a hard time selecting just one of the definitions. Unlike the other REP categories, the mental health category may be more complex and multidimensional and therefore does not lend itself to three pre-determined definitions.

#### *Management implications*

The first implication for management emanates from the relationship of onsite survey respondents by geographic locations of trailheads (Table 4). Statistical tests revealed that respondents who took surveys at trailheads located in the southern study area (Flatirons Vista and South Mesa) were likely to reside outside the city of Boulder and had lower mean values for respondents' age, number of years visiting OSMP lands, and average number of times visiting OSMP lands per month. Managers from OSMP can use this to understand that visitors to trailheads in the southern study area may be more likely to be from communities outside of Boulder city limits and be classified as lower frequency users, when compared to the other study areas. Characteristics of the recreational users who were sampled at the southern study area may point to the need of a management strategy that is different than the other study areas, including greater educational outreach about parking protocols and proper etiquette when recreating on lands managed by OSMP.

Other implications for management surface from the second phase of the study exploring the association between the three definitions for the three REP category definitions, preferred recreation activity, and geographic locations of trailheads where surveying occurred. The most frequent definition chosen for the REP category enjoy nature was “Observing plants, animals, scenery, and/or other things on the natural landscape”. What is important for OSMP managers is that this enjoy nature motivation definition is related to natural landscapes. When thinking about acquiring additional lands or expanding recreational opportunities through the development of additional trailheads or recreation trails, managers should be aware that recreational users are motivated by natural lands to recreate on. The physical fitness REP category definitions were the only ones to show a statistical association with the geographic locations of trailheads. Those recreating on the trailheads located in the western study area were more likely to be motivated by the challenges that the trails from these trailheads offered, choosing the “Challenging my abilities” definition over the other definitions. While respondents that were sampled at the southern study area trailheads may visit OSMP trails less frequently compared to the other study areas, respondents that were sampled at the western study area trailheads may also have different motivations and visitation patterns that require different management strategies. Additionally, managers may need to provide more challenging opportunities for recreational users alleviating potential overcrowding issues that may occur at these locations because they offer the only opportunity for some recreational users to be challenged. There were no statistical associations for the mental health REP category definitions, though the frequency of responses for each of the definitions was more evenly distributed than the two other REP categories’ definitions between the preferred recreation activity and geographic locations of trailheads variables. Managers at

OSMP can use this finding to recognize that mental health motivations can be realized by all types of recreational users within all four of the geographic study areas.

A final implication for managers that arose from this study, is that managers who manage parks and protected areas that are adjacent to urban and peri-urban areas may need to understand that recreational use is not a one-of experience that recreational users may have in more rural parks and protected areas that they visit less frequently. City of Boulder residents in the sample reported that their average number of days visiting OSMP lands in the past twelve months was 14.7 days per month. Traditional frameworks such as REP based scales that seek to understand recreational experience and motivation may be asking recreationalists to ascribe meanings to everyday activities that are performed without much reflexive individual deliberation. Neal et al. (2006) noted that habits and routines are actions that individuals automatically perform with a high degree of frequency and are triggered by external environmental stimuli. Additionally, Verplanken and Aarts (1999) defined habits and routines as behaviors that were once driven by conscious and reflexive decisions but have become automatic responses to the attainment of specific goals and end states. Managers at OSMP can therefore understand that recreating on OSMP lands for those that reside within City of Boulder limits may be a recurrent practice of everyday life that is non-reflexive. Management actions, if taken, may interrupt stable practices and change specific cues that trigger habitual and routine actions and lead to negative attitudes toward such actions because recreationalists will have to reassess their goals and values of their recreational activities.

Ultimately, knowledge of recreational users' motivations can better inform OSMP managers in providing desired experiences. A deeper understanding of experiences offered to recreational users at different geographic locations gives OSMP managers the opportunity to



better describe and communicate experiences offered to users at different trailheads and recreation trails. It can also be used to provide amenities or trail designs that will help recreational users achieve their desired outcomes from their experiences when they recreate on lands managed by OSMP and develop management plans that recognize that for some recreational user's recreation has become habitual and routine.

### *Limitations and future research*

The primary limitation of this study was utilizing open-ended survey questions in lieu of semi-structured interviews to understand how recreational users define the three REP categories. Some of the open-ended responses contained single terms or brief statements. Conducting interviews would have allowed the researcher to ask probing questions that would press respondents for further elucidation of these brief definitions. It would have also allowed the researcher to recognize when responses were meeting the point of saturation more quickly than through the utilization of an online survey that required more checking-in with responses. However, an online open-ended survey was employed due to the logistical convenience of allowing respondents to fill out the survey at their convenience, negating the need to coordinate times and modes of interviews which proved challenging.

While the researcher recognizes the validity and reliability of traditional REP-based research and its importance to understanding recreation motivation, there also should be a recognition in the recreation management and research fields that goal-directed models of understanding behavior may be limited in their construction of recreational decisions. The REP scale framework assumes that the best way to understand behavior is through individual volition that is stagnant and not dynamic. What a linear goal-directed model misses are that individual behavior may be influenced by social structures surrounding recreational activities, forces of

individual's identity that changes as they recreate, a complex postmodern world that confronts the recreational user, and a fluidity in experience sought and gained over time through recreational pursuits. This model also assumes that recreation users whose recreational activities have become a habit or routine can be reflective about their behaviors, experiences, and motivations. Future research in the realm of motivation could utilize longitudinal studies, qualitative methods, and other interpretive methods of data collection and analysis to give more agency to the recreational user to form and share their own narrative around motivations. Additionally, to capture the habitual and routine nature of recreational users, particularly those in urban or semi-urban parks and protected areas, a more robust conceptual framework that seeks to better understand habits and routines should be developed, drawing upon the literature in the field of social psychology.

Finally, REP research categorizes recreational users' desired experiences and motivations based on responses to what is oftentimes a list of terms or phrases on a survey instrument. Managers use results of these studies to understand if recreational settings are providing sites where recreational users can realize their desired experiences, without asking respondents this question directly. Future REP scale-based research should continue to utilize the empirically tested questions and scales to understand experiences, however it should also give the recreation users the ability to identify if the lands managed by the agency where the research is taking place does indeed fulfill their experiential expectations. Or, alternatively, if there is much thought put into experiential outcomes being sought by recreational users every time they participate in a recreation activity.

### ***Conclusion***

Recreational users' motivations to recreate is a complex phenomenon and requires data collection methods that provide managers a deeper understanding of this phenomena. Results from a previous study of recreation motivation using REP categories conducted on OSMP lands were used in this two-phase, mixed methods study. What is unique about this study is that it took REP research a step further than traditional methods by allowing recreational users to provide definitions about REP categories and then to test if these definitions were associated with different recreation activities or different geographic locations. The findings in this study indicate that recreation activity was associated with two of the three REP categories' definitions and that geographic location was associated with one of the three REP categories' definitions suggesting that motivational definitions are complex, and that future research may require additional social, ecological, physical, and managerial variables to more fully understand this phenomenon.

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**Table 1.** Characteristics of online open-ended survey respondents (n = 38).

	n	%
Gender		
Woman	20	53.6
Man	18	47.4
Primary Residence		
Boulder (within city limits)	18	43.4
Metro Denver	5	13.2
Unincorporated Boulder County	4	10.5
Louisville	3	7.9
Superior	3	7.9
Other State	2	5.3
Other area in Colorado	1	2.6
Lafayette	1	2.6
Longmont	1	2.6
Preferred Recreation Activity		
Hiking/Walking	26	68.4
Biking	5	13.2
Running	4	10.5
Other	2	5.3
Horse riding	1	2.63
	M	SD
Age	56.1	13.9

**Table 2.** Thematic coding of online open-ended survey motivation definition responses.

Coding Theme	Example online survey response	n	Definitions used for onsite survey.
<b>Enjoy Nature</b>			
Observation	Observe nature: the habitat, birds, occasional mammals.	11	Observing plants, animals, scenery, and/or other things on the natural landscape.
Escapism	Getting away from an urban environment and concrete with a certain amount of solitude.	8	Escaping the built environment
Learning	To learn, observe and listening to my surroundings.	7	Learning about the natural world around me.
<b>Physical Fitness</b>			
Activity	I like walking and it's an activity that I don't enjoy doing at the gym so open space is better.	15	Participating in and developing recreational activity skills.
Health	Exertion to improve cardio conditioning.	14	Building or maintaining a healthy body.
Challenge	Challenging trails that can be combined for longer distances.	6	Challenging my abilities
<b>Mental Health</b>			
Wellness	Dopamine and serotonin releases that come from being outside.	11	Developing a positive mental state.
Disconnection	Disconnect to experience your world and your own thoughts and the happiness it brings.	10	Disconnecting from the demands of the modern world.
Relaxation	Breathing in and relaxing into the environment.	8	Relaxing my mind from distractions.

Note: Respondents were asked the following:

Enjoy Nature

When recreating or visiting OSMP lands, what does "enjoy nature" mean to you as a motivation to recreate or visit OSMP lands?

Physical Fitness

When recreating or visiting OSMP lands, what does "physical fitness" mean to you as a motivation to recreate or visit OSMP lands?

Mental Health

When recreating or visiting OSMP lands, what does "mental health" mean to you as a motivation to recreate or visit OSMP lands?

**Table 3.** Characteristics of onsite survey respondents (n = 349).

	n	%
<b>Gender</b>		
Woman	200	57.3
Man	145	41.5
Transgender Woman	1	0.3
Transgender Man	1	0.3
Genderqueer/Gender non-conforming	1	0.3
Different Identity	1	0.3
<b>Primary Residence</b>		
Boulder (within city limits)	191	54.7
Unincorporated Boulder County	34	9.7
Out of State	21	6
Other areas in Colorado	19	5.4
Lafayette	17	4.9
Metro Denver	16	4.6
Longmont	15	4.3
Louisville	15	4.3
Other City in Boulder County	13	3.7
Superior	6	1.7
Other Country	2	0.6
<b>Preferred Recreation Activity</b>		
Hiking/Walking	204	58.5
Biking	76	21.8
Running	52	14.9
Climbing/Bouldering	13	3.7
Other	4	1.1
	M	SD
Age	53.3	14.9
Number of years visiting*	19.3	15.2
Times visited per month**	12	9.1

\*If respondents selected "Less than one year" or "First time" they were given a value of 0.25 and 0.75 respectively.

\*\* If respondents selected "This is my first visit" they were given a value of 0.083, representing 1 visit divided by 12 months.

**Table 4.** Relationship of onsite survey respondents by geographic study areas.

	West (n = 130)		North (n = 78)		South (n = 72)		East (n = 69)		$\chi^2$ or F
	n	%	n	%	n	%	n	%	
Gender									2.003
Woman	69	53.5	48	63.2	42	59.2	41	59.4	
Man	60	46.5	28	36.8	29	40.8	28	40.6	
Residence									83.09***
City of Boulder	89	69	47	61.8	17	23.9	36	52.2	
Boulder County	21	16.3	26	34.2	22	31	31	44.9	
Outside Boulder County	19	14.7	3	3.9	32	45.1	2	2.9	
Recreation									18.11**
Hiking/Walking	67	51.9	46	60.5	54	76.1	35	50.7	
Biking	32	24.8	17	22.4	10	14.1	16	23.2	
Running	20	15.5	10	13.2	6	8.5	16	23.2	
Other	10	7.8	3	3.9	1	1.4	2	2.9	
	M	SD	M	SD	M	SD	M	SD	
Age	51.2	13.7	58.7	15.2	48.4	15.1	57.2	14	8.89**
Number of years visiting	20.2	15.4	22.6	16.3	12.9	12.8	21.3	14.4	5.98**
Times visited per month	12.4	8.9	12.9	8.3	8.1	8.7	14.5	9.5	6.69***

Statistical significance markers: \* p<0.1; \*\* p<0.05; \*\*\* p<0.01



**Table 5.** Relationship of recreation activity and survey site geography by enjoy nature experience themes.

	Observing (n = 196)		Escaping (n = 135)		Learning (n = 14)		$\chi^2$
	n	%	n	%	n	%	
Recreation							14.04**
Hiking/Walking	125	63.8	66	48.9	11	78.6	
Biking	38	19.4	37	27.4	0	0	
Running	28	14.3	22	16.3	2	14.3	
Other	5	2.6	10	7.4	1	7.1	
Study Area							9.45
West	65	33.2	57	42.2	7	50	
North	45	23	31	23	0	0	
South	41	20.9	25	18.5	5	35.7	
East	45	23	22	16.3	2	14.3	

Statistical significance markers: \* p<0.1; \*\* p<0.05; \*\*\* p<0.01

Respondents were asked to respond to the question “When recreating or visiting OSMP lands, “enjoy nature” means:”. Answers, with codes, included, “Escaping the built environment (Escaping)”, “Observing plants, animals, scenery, and/or other things on the natural landscape (Observing)”, and “Learning about the natural world around me (Learning)”.

**Table 6.** Relationship of recreation activity and survey site geography by physical fitness experience themes.

	Building (n = 261)		Challenging (n = 48)		Participating (n = 36)		$\chi^2$
	n	%	n	%	n	%	
Recreation							22.81***
Hiking/Walking	167	64	19	39.6	16	44.4	
Biking	44	16.9	18	37.5	13	36.1	
Running	41	15.7	8	16.7	3	8.3	
Other	9	3.4	3	6.2	4	11.1	
Study Area							19.03***
West	90	34.5	30	62.5	9	25	
North	65	24.9	3	6.2	8	22.2	
South	54	20.7	7	14.6	10	27.8	
East	52	19.9	8	16.7	9	25	

Statistical significance markers: \* p<0.1; \*\* p<0.05; \*\*\* p<0.01

Respondents were asked to respond to the question “When recreating or visiting OSMP lands, “physical fitness” means:”. Answers, with codes, included, “Building or maintaining a healthy body (Building)”, “Participating in and developing recreational activity skills (Participating)”, and “Challenging my abilities (Challenging)”.

**Table 7.** Relationship of recreation activity and survey site geography by mental health experience themes.

	Developing (n = 137)		Relaxing (n = 124)		Disconnecting (n = 84)		$\chi^2$
	n	%	n	%	n	%	
Recreation							7.55
Hiking/Walking	81	59.1	72	58.1	49	58.3	
Biking	25	18.2	34	27.4	16	19	
Running	26	19	13	10.5	13	10.5	
Other	5	3.6	5	4	6	7.1	
Study Area							1.61
West	52	38	46	37.1	31	36.9	
North	22	24.1	27	21.8	16	19	
South	27	19.7	27	21.8	17	20.2	
East	25	18.2	24	19.4	20	23.8	

Statistical significance markers: \* p<0.1; \*\* p<0.05; \*\*\* p<0.01

Respondents were asked to respond to the question “When recreating or visiting OSMP lands, “mental health” means:”.

Answers, with codes, included, “Disconnecting from the demands of the modern world (Disconnecting)”, “Relaxing my mind from distractions (Relaxing)”and “Developing a positive mental state (Developing)”.