HIKES & LIKES:

NEW MEDIA AND THE RISE OF RECREATION HIKING IN WASHINGTON STATE

by

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A Thesis
Submitted in partial fulfillment
of the requirements for the degree
Master of Environmental Studies
The Evergreen State College
June 2019

This Thesis for the Master of Environmental Studies Degree

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ABSTRACT

Hikes & Likes: New Media and the Rise of Recreational Hiking in Washington State

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Recreational hiking has always been a popular activity in Washington State. In the past decade however, the number of individuals participating in recreational hiking has increased exponentially. Previously, research projects have identified many possible reasons for this apparent increase such as population growth, increased accessibility, social media and growing affluence to name a few. The work presented here however, focuses on the role of new media and seeks to identify the relationship between new media consumption and the increase in recreational hiking.

This research project utilized two nearly identical surveys: an online survey (delivered via social media) and an intercept survey (delivered in person at various trailheads in the project area), in order to identify hikers' preferences with regard to locating and sharing hiking information on new media sites such as Facebook, Instagram, the WTA, and AllTrails. In total, 443 individuals participated in the surveys. Data from the two surveys were analyzed both individually and jointly using chi squared to test for associations between variables.

Results indicate that new media usage is significantly associated with a number of different variables. In total, four null hypothesis, relating to age, gender, hiking frequency, and importance factors—in relation to their new media usage—were tested. Of the four nulls, two, which were related to gender/age and new media usage, were rejected. Between the two surveys, age and gender were consistently associated with new media usage. Specifically, according to the results, younger individuals (under the age of 30) and women are much more likely to learn about hikes and to share information and photos on new media than older individuals and men. In addition, more than half of participants surveyed indicated that they use some form of new media to learn about hiking trails and opportunities. New media platforms such as Facebook, Instagram, and the Washington Trails Association received the highest number of responses.

The results from this research project has numerous practical applications. The work presented here offers a positive first step to understanding the role of new media in the promulgation of recreational hiking in both Washington State and across the country.

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Acknowledgements

There are several groups and individuals whom I need to acknowledge for their help in completing this project. The first being my (soon-to-be) wife Jayde, for being exceptionally patient and understanding through all of the times when I was gone or up late working on this project. Thank you for being with me from the beginning of this program all the way through the end.

This project would also not have been possible without the direction and guidance of my faculty advisor Shawn Hazboun. Thank you for your consistent (at times persistent) communication throughout the process. I truly do not know where this project would have ended if I didn't have you as my faculty advisor, so thank you for that. Additionally, I also want to thank the entire MES faculty for their help and support. In particular, a major kudos goes to Kathleen Saul for guiding me in the pre-thesis process and always being available if I ever had questions.

There are also several groups and agencies who I would like to thank. Randy Kline from the Washington State Parks and Recreation Commission, Alex Weinberg from the U.S. Forest Service, Kristina Ciari from the Mountaineers, Tim Stapleton from the Department of Natural Resources, and Spencer Wood (and colleagues) from the University of Washington. In addition, I would like to thank the administrators of two Facebook groups: Washington Hikers and Climbers and A Walk on the Wild Side, for allowing me to use their platforms in my survey research.

Finally, a large thank you to all of the individuals who participated in my surveys. This project only has meaning because of all the individuals who took the time to respond to the survey. And to everyone else who has had a hand in this process, thank you very much!

Chapter 1:0 Introduction

Hiking has long since been a recreational endeavor in the United States, however, the level of participation seen today is unlike any other time in American history (Chamberlain, 2015). As of 2017, the number of individuals engaged in recreational hiking, both in Washington State and across the country, was at an all-time high (Statista, 2018). Additionally, a study, conducted in 2018, found that the numbers of recreational hikers in the greater Seattle region has more than doubled in the past decade (Balk, 2018). As the numbers of hikers in Washington State continue to grow, so too does the environmental footprint left behind in many of Washington's forested, alpine and coastal regions; many of which are among its most fragile landscapes.

To properly assess and prepare for the impacts associated with this increase, public land managers must seek to understand the causal factors behind this increase in hiking. Although many of the factors (accessibility, population, etc.) are well known to researchers, the relationship between and influence of each is not well understood. Even before recreational hiking was increasing rapidly across the country, new media usage had become an exceedingly prominent and highly influential force in modern society. However, while much time and effort have been devoted to studying the impact of humans on natural landscapes, little research has been done to effectively link the prevalence of new media to this increase in recreational hiking. The research presented in this work seeks to help ameliorate this problem while adding substantive dialogue and quantifiable data to this topic. It is not intended to deliver a definitive solution, but rather to take the figurative "first step" into the complicated intersection of new media and recreational hiking.

The effect of new media on hiking is an especially important topic to public land managers and conservation groups in particular, as it enhances their understanding of the effectiveness and impact of promoting user-based content platforms. Utilized effectively, this information may lead to increased exposure of less popular public lands, increased visitation, and increased funding for public and non-profit agencies. In addition, academic professionals such as social psychologists, scientists, and others will be able to use this research to enhance the relatively new and growing body of knowledge on the intersection of new media and other segments of society.

New media is a particularly difficult topic to study, in part because its meaning is constantly being redefined (Valkenberg, 2016). This is due to the fact that modern technology, society and the way in which the two interact are always evolving. For simplicity, as well as the purposes of this research, new media is defined as digitally-based content that is created, modified, shared, or otherwise manipulated in some way by a user for use by the same or other users. Popular examples of new media include digital newspapers, blogs, and social media sites such as Facebook and Instagram (Siapera, 2012). The research presented does not focus on a single type of new media entity, but on the influence of new media as a whole on recreational hiking. At times however, particularly during the analysis portion of this research, there is a distinction made between social media (Facebook, Twitter, Snapchat, etc.) and all other types of new media (blogs, trip reports, etc.) when necessary/beneficial.

As for its relationship to recreational hiking, new media appears to play an important role in the dissemination of information across multiple digital platforms. This dissemination of information may enhance the ability and desire of individuals to go

hiking, especially in the more rural areas of the state, where there are fewer informational resources, by providing accurate and up-to-date information that has been historically unavailable. Theoretically however, the relationship between new media and recreational hiking goes further than simple information sharing. The research presented operates under two theoretical frameworks: Self-Determination Theory[1] and Uses and Gratifications Theory[2]. Self-Determination Theory (SDT) is discussed as a broad theoretical framework; however, a sub-theory of SDT, Organismic Integration Theory (OIT), is also discussed in some detail. In addition to these theories, the relationship between an individual's Fear of Missing Out (FOMO) (Abel et al., 2016) and recreational hiking is also examined.

To identify the more popular types of new media being utilized by hikers, along with their impact, two separate survey instruments were utilized, an online and an intercept. The online survey was solicited through public posting on Facebook by three different hiking organizations: Washington Hikers and Climbers, A Walk on the Wild Side, and The Mountaineers. The survey was active for three weeks, from January 11th, 2019 through February 1st, 2019, although it was only actively promoted by these three groups for one week. The intercept survey was conducted over a period of nearly four weeks, from February 17th, 2019 through March 15th, 2019, along six different trailheads[3] located along the I-90 corridor (between Bellevue and Snoqualmie Pass) in Washington

[1] Self-Determination Theory is primarily concerned with understanding the intrinsic and extrinsic motivations behind an individual's choices.
[2] Uses and Gratifications Theory seeks to understand the relationship between media usage and the fulfillment of an individual's needs, latent or otherwise.
[3] Trailheads selected were as follows: Twin Falls, Chirico Trail, Highpoint Trail, Rattlesnake Ledge, Franklin Falls, and Mount Si,

State. The trailheads were selected for their varying levels of difficulty, type of scenery, and accessibility; as well as their jurisdictional authority[4].

The surveys were nearly identical in content, with slight variations in wording to reflect the manner in which they were administered. The questions on both of the surveys had standard demographic questions (age, education level, income, etc.); along with questions specifically designed to gauge the participants' usage of new media, both in relation to recreational hiking and in general. The survey asked questions concerning crowding issues, social media usage, and motivations for hiking; as well as various others. Responses were typically close-ended, however, some questions had an "other" category to allow for some flexibility. Responses from the two surveys were compiled and analyzed comprehensively.

Understanding who is using new media is a critical part of understanding its role in the promulgation of recreational hiking. Although the results of the survey analysis were somewhat inconsistent, some associations were made between recreational hiking and new media. Specifically, the results indicate that there may be an association between new media usage and gender, age, formal affiliation with an outdoor agency, and the importance of some rationales for hiking (specifically exercise/fitness, socialize, and solitude). Variables which were tested that did not reveal significant association in the analysis include household income, race, and three importance of hiking rationales including mental clarity, enjoy nature/be outdoors, and relax/unwind.

[4] Four different public agencies manage the land where each of the six trailheads reside, the responsible agencies are: Washington State Dept. of Natural Resources, Seattle Public Utilities, Washington State Parks, and the US Forest Service.

In addition to the associations between various variables (identified above) and new media usage, the surveys highlighted other important trends. One such trend was the sheer number of people who reported using social and new media sources to share photos and information. Only 10% of respondents (data from both survey types) indicated that they did not share information or pictures on social media sites. In addition, over half of respondents indicated that there primary means of information gathering (prior to a hike) was through a new media source such as the WTA or AllTrails. These and other interesting findings are analyzed further in the Results (4.0) and Discussion (5.0) chapters further on in this thesis.

The research presented in this thesis is important due to the relatively high numbers of hikers who, on any given weekend, occupy many popular trails throughout the Seattle region. It. While only a first step, the data collected for this thesis adds specific and local information to a relatively new and growing body of knowledge. Additionally, the analysis presented has significant implications for hiking groups, conservationists, and public land managers alike.

1.1: Positionality Statement

I came into this research project with a diverse background of experiences and opinions. While I do not believe that any of these experiences or opinions have influenced the review, data, or the results; it is important to be transparent when conducting any research. As such, what follows is a brief positionality statement which

explains my experiences and interests related to the idea of recreational hiking and new media.

My interest in this topic stems, primarily, from my background as an avid hiker and mountain climber. I was exposed to hiking quite early; as a child, my family and I would go on long camping (and hiking) trips to state and national parks. My first foray into mountain climbing came at the age of 13 when I climbed Mount St. Helens with a local church group. Two years later, my dad, brother and I climbed Mount Hood – this marked the beginning of my future alpine experiences.

Over the past decade, my passion for hiking and climbing has grown tremendously. In the past few years, I have found myself increasingly engaging in recreational hiking by myself in the more remote areas of the Olympic Peninsula or North Cascades. Additionally, I am an active member of the Washington Trails Association, as well as several other hiking groups on various social media platforms. I nearly always write trip reports and share information about hikes with anyone who displays interest. This is also partially why I am interested in this research, to see how my beliefs and perceptions compare to that of others.

In addition to my passion for hiking, I am deeply invested in the protection and/or conservation of the natural areas in which I consistently find myself. I chose to study environmental science in graduate school[5] in a desire to better understand the natural environment that consistently finds new ways to impress me. The more I learn the more I recognize how complex and intertwined human society is with the natural environment.

[5] I studied Political Science and Social Studies at Western Washington University for my undergraduate degree.

It is my belief that in order to adequately protect the natural landscapes found in the areas outside where we live, we must begin in the cities and neighborhoods much closer to home.

Beyond my personal background, there are several demographic factors that may influence my positionality – if not in my own mind, then possibly in the minds of others. I am an athletic, 29-year-old, white male; who grew up in a large, moderately low-income and very religious family. I have been told that I "fit the bill" of a stereotypical mountaineer – white, male, and athletic looking. While I have generally taken that as a compliment, I have I also taken it as a cautionary sentiment to be mindful of the way in which I approach people when I was conducting my intercept surveys. In that effort, I believe I have been relatively successful given my high participation rate when conducting the intercept surveys.

In short, I am an avid hiker and climber who is deeply committed to the protection and preservation of Washington's diverse landscape. My interest in this specific topic, new media and recreational hiking, was spurred primarily by my interest in hiking, along with my personal experiences utilizing new media to enhance my hiking outings. In this thesis I am not advocating for a position per se, rather my intent is to educate and inform myself, the general hiking community, land managers, and whomever else may be interested.

Chapter 2: Literature Review

This literature review is organized into 5 distinct sections: an introduction, Sections 1-3, and a concluding summary. The introduction describes the overall research topic broadly and offers data to support the assumptions in the underlying research question. Section one provides a definition for the term 'recreational hiking', briefly outlines the history of recreational hiking in the United States, and highlights the physiological benefits of engaging in recreational hiking. Section two defines the term "new media", provides historical context for new media's prevalence, and addresses the lack of literature on new media's influence on hiking by briefly looking at other disciplines. Section three develops a theoretical framework, employing social psychology concepts to provide foundational understanding on this topic. Finally, the summary brings the discussion full circle by highlighting the key themes presented in this review.

2.1: Introduction & Supporting Data

In the past decade (2007-17), the number of people participating in recreational hiking in the Seattle/Tacoma region in Washington State has more than doubled (Balk, 2018). While part of this increase can be explained by a growing population and continually improving accessibility factors (Romano, 2015), is it also possible that the growing use of new media plays a significant role in driving up the numbers of people engaging in recreational hiking (Balk, 2018; Lepp, 2014; and Valkenburg, 2016)? If so, in what ways? Because new media constantly evolves (Valkenburg, 2016), we need to

better understand its current role in society. To lay the foundation for this understanding, this literature review offers a brief history of hiking in the United States, along with a more detailed examination of new media and its origins. This background is crucial for engaging in a meaningful dialogue about new media and its impacts on recreational hiking.

The topic of new media and its role on society and, particularly, leisure activities, encompasses a variety of disciplines. This review probes the fields of leisure activities (specifically referencing recreational hiking) and new media (particularly user-based, digital content approaches), while also providing theoretical context on the subject. Applications such as Facebook, Instagram, and Snapchat, along with blogs and other user-driven digital sites (such as the Washington Trails Association and Cascade Climbers' trip report forums), represent the forms of new media that will be examined in the course of this research.

Supporting Data

This thesis rests on the premise that there has been an increase in recreational hiking, particularly near major metropolitan areas such as Seattle. There are three ways to validate this assertion: 1) utilize visitation data from individual parks/regions over the past few decades, 2) analyze survey data, and 3) ask the experts (i.e. land managers in and around large metropolitan areas) if they have noticed a significant increase. In the section that follows, I examine each of these avenues and discuss the data presently available.

Visitation data at local, county, and state parks in Washington State is exceptionally limited or not readily accessible to the public. To accurately count visitation and trail use data often requires use of costly and/or time-consuming strategies[6] (Fisher et al, 2018). The one exception to this rule is the National Visitor Use Monitoring (NVUM) Program currently being implemented by the federal government at most national parks and forests. The NVUM was designed to measure visitation, specifically on lands utilized for recreational purposes, through the use of voluntary surveys.

The NVUM utilizes nearly 100,000 surveys each year, taken at locations across the country, to estimate the number of visitors at national parks, forests, and monuments (USFS, 2018). Visitation data from the NVUM shows a steady amount of growth in the number of visitors in national forests since 2005 (USFS, 2018 - Figure 1). Similarly, between 2007 and 2017, the total number of visitors at national parks across the country grew from approximately 438 million in 2007 to just under 503 million in 2017–a 13% increase (NPS, 2018). On a more local scale, data from individual national parks such as Mount Rainier National Park (MRNP) show a similar increase. In 2007, MRNP had an estimated 1,047,685 visitors; by 2017 however, that number had risen to 1,415,867–an increase of 26% (NPS, 2018).

[6] Some examples of these strategies include counting cars at entrance locations, installing motion sensors/lasers at trailheads, and installing cameras and manually counting guests by watching the video. For a review of the costs associated with visitation data collection approaches see Fisher et al, 2018.

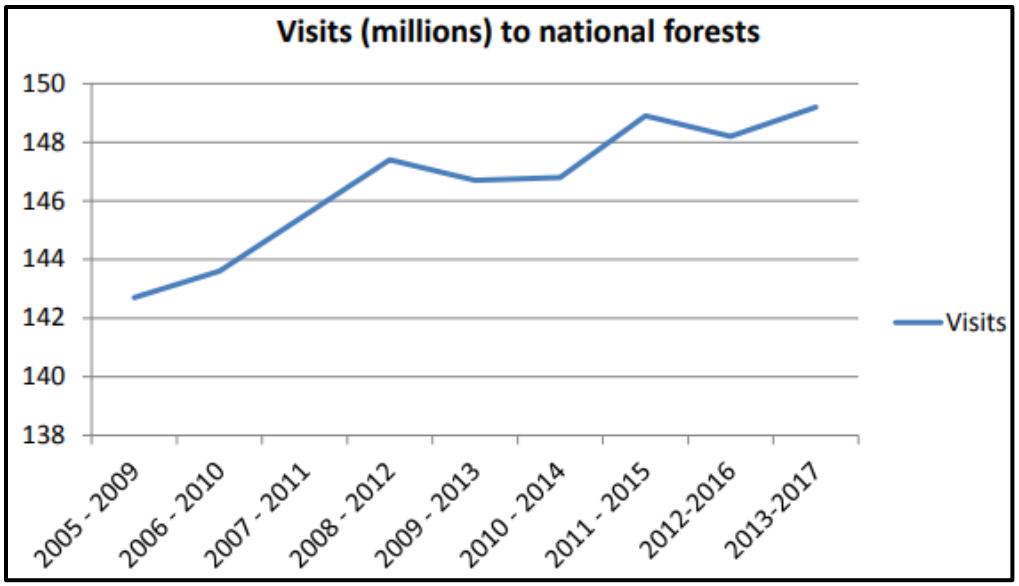

Figure 1: NVUM data on National Forest Visitation (USFS, 2018)

Survey data represents a second method of verifying the increase in recreational hiking. Surveys, the cheapest of the methods reviewed, have been heavily utilized in this field to gain reliable and quantifiable visitation numbers. Three different surveys have been conducted which help to verify the increase: two were done nationally and one locally. The first survey (see Figure 2), was conducted at the national level, utilizing a longitudinal study. In this survey, which took place annually between 2006 and 2017, the surveyors asked participants if they had engaged in recreational hiking that year[7] (Statista, 2018). The results indicate a significant increase in recreational hiking over the same time period as before (2007-17). According to the survey, approximately 30 million (estimated) people participated in hiking in 2007 and nearly 45 million in 2017, an increase of nearly 50% (Statista, 2018).

[7] The survey team asked the same question each year from 2006 to 2017. The survey was administered to a large sample size and participation numbers varied slightly from year to year (Statista, 2018).

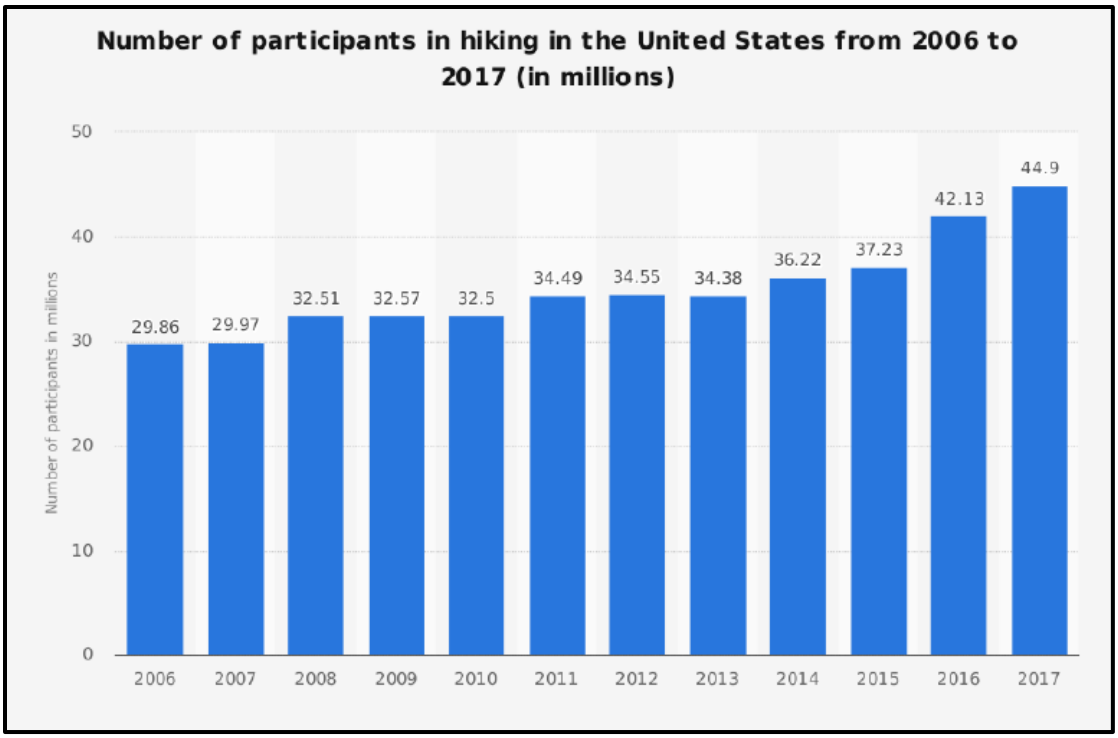

Figure 2: Chart produced by Statista, which shows the results of a nationally distributed, annual survey of over 30,000 participants (age 6 and above). Weighted against national population annually from 2006 – 2017 (Statista, 2018)

The Outdoor Foundation[8] also produced a report on overall outdoor recreation participation in the United States in 2016 (Outdoor Foundation, 2017). This report indicated that "day hiking" had increased by 22.5% nationally from year to year (Outdoor Foundation, 2017). A third survey, administered by Nielsen Scarborough[9], and presented by Seattle Times columnist Gene Balk, showed a similar increase occurring in the greater Seattle region of Washington State during a similar time period. Balk's article states that between the years of 2008-17, the number of individuals residing in the greater Seattle/Tacoma region that engaged in recreational hiking rose from 472,462 (2008) to

[8] "The Outdoor Foundation is a not-for-profit 501(c)3 foundation established by Outdoor Industry Association to inspire and grow future generations of outdoor enthusiasts". See: https://outdoorindustry.org/ for more information.
[9] "Nielsen is a global measurement and data analytics company that provides the most complete and trusted view available of consumers and markets worldwide". For more information see: https://www.nielsen.com/us/en.html

943,333 (2017)–an increase of nearly 50% (Balk, 2018)[10]. This increase of nearly 50% effectively mirrors the results of national survey data discussed previously.

Experts in the field represent the final validation confirming a significant rise in hiking in the region over the last ten years or so. This validation comes from the likes of public land managers, hiking groups, and hikers themselves. In Washington State, there are two preeminent volunteer organizations on the forefront of recreational hiking: The Washington Trails Association (WTA) and the Mountaineers. Both groups have commented on the popularity of specific trails in Western Washington, particularly those in the North Cascades and the Snoqualmie region (Balk, 2018; and Romano, 2015). Additionally, state agencies such as the Department of Natural Resources have noted the increase of hiking in the Snoqualmie region: "Levels of recreation use on state trust lands and natural areas have increased over time… and (they) are expected to continue to rise" (DNR, 2015). Hikers have also weighed in on the issue, citing their frustration over crowding on blogs and social media platforms (Romano, 2015).

Taken together, these data support the assumption that recreational hiking has increased across the country (Fisher et al., 2018) and in Washington State specifically (Balk, 2018; and Romano, 2015). Though the data presented fails to narrow the geographic scope to a particular region in Washington State, Fisher and colleagues (2018) and Donahue and colleagues (2018) are developing new methods[11] to utilize

[10] This survey included over 4,000 participants from the Seattle/Tacoma area (Balk, 2018).

[11] Fisher and Colleagues are looking to utilize publicly available pictures and "hashtags", found on popular social media sites such as Instagram, Twitter, and Flickr, to estimate visitation counts. This project, being funded by the University of Washington, utilizes specific coding to accurately predict how many individuals visited a particular trailhead. While still in the development and research phase, this program has already made great progress and its results are garnering national attention. See Fisher et al, 2018 for more information.

social media outlets (such as Flickr and the WTA's website) to estimate visitation data at popular trailheads. These methods are still in the developmental phase; however, they have been shown to be fairly accurate in their estimation of park visitation in the areas where they have tested it (Donahue et al., 2018). Additionally, the King County Parks Department and the Washington State Department of Transportation are teaming up to increase monitoring at local and county parks in the region (WSDOT, 2018). Partnerships and research methods such as these will likely only continue to grow as more local (and national) land managers recognize the importance and usefulness of visitation data.

2.2: Recreational Hiking

Hiking has been a leisurely pastime in the United States for over 200 years. While its origins are humble and altogether different than its modern-day presence, many of the underlying motivations for engaging in recreational hiking still exist. It is important to note that there is not a single "accurate" definition of recreational hiking. Indeed the definition seems to change dependent upon which resource you consult. For the purposes of this thesis, recreational hiking is defined as the following:

> A long and/or vigorous walk, typically for pleasure or exercise, in predominantly rural areas. Some examples of hiking include walks in county or state parks, national forests/parks, and/or wilderness areas. Recreational hiking also includes the following activities: trail running, backpacking, and mountain climbing; however, walks through predominantly urban areas and/or walks that are less than an hour do not. [12]

[12] This is the same definition that appeared on both the online and intercept surveys which was used for the data collection of this thesis.

In this section I present an abbreviated version of the history of hiking in the United States, followed by a short discussion of the benefits (perceived or otherwise) associated with hiking in natural landscapes. While not a focal point of this research, understanding the history of and benefits derived from recreational hiking are both important as they represent two factors that influence individuals to engage in recreational hiking. Furthermore, a firm historical background of the nature of hiking in the United States is also important because it helps to show the evolution of the hiking community since its inception.

2.2.1: The History of Recreational Hiking in the United States[13]

Recreational hiking in the United States has changed dramatically over the past two centuries. What began as a "bourgeois" leisure activity gradually evolved into a highly communal and group-based activity, before finally becoming the more individualistic endeavor that it is today[14]. This section seeks to understand that transition and underline some of the causal factors.

To begin, it is worth stating that "hiking"[15] has always been a human activity. From the beginning of human society, humans have had to walk to and from various places for food, shelter, work, etc. However, in this thesis, I examine hiking undertaken

[13] Section 1.1 relies heavily upon Silas Chamberlain's comprehensive book entitled *On the Trail: A History of American Hiking*.

[14] Hiking groups still exist across the United States, however, hiking clubs were once the primary avenue by which individuals engaged in recreational hiking. Today, most hikers engage in hiking outside of formal events put on by hiking clubs.

[15] Hiking is used liberally in this context. For example, at the beginning of the 19th century the earliest "hikers" were simply individuals walking for leisure as opposed to walking out of necessity.

as a leisure activity. In the United States, this began in earnest during the Industrial Revolution in the mid-18th century (Clark, 2014). During this time, the invention of a variety of tools and transportation methods, such as the steam locomotive, caused many Americans to experience a dramatic increase in wealth and free time (Chamberlain, 2015). For some Americans, this translated into a desire to engage in recreational walking/hiking activities (Chamberlain, 2015).

As the century progressed, interest in hiking for leisure grew. This resulted, in part, from the popularity of the writings of prominent individuals such as Ralph Waldo Emerson and Henry David Thoreau, along with the advocacy of John Muir (late 1800's), Gifford Pinchot (early 1900's) and Franklin Roosevelt (1930's)[16] (Kuzmiak, 1991; see also Chamberlain, 2015). These prominent characters romanticized the idea of engaging with nature in both urban and wilderness settings. They encouraged people to engage in "walks in the woods", particularly in areas in "pristine condition" (Cronon, 1995). During this time period, many new outdoor groups formed across the country, older ones became popular, and the general membership of outdoor recreational clubs grew tremendously (Chamberlain, 2015).

In the 20th century, World War I and World War II took their toll on the numbers of individuals engaged in recreational hiking (Kemsley, 2007). This is due to a variety of factors. Chief among them was the draft (which removed many of the young men who were engaging in hiking) and the general shift in American focus to wartime efforts

[16] Chamberlain (2015) goes into some detail highlighting these individuals for their contribution to the world of hiking, however, he also devotes a great deal of time discussing lesser known figures such as Henry Shoemaker (a newspaper columnist who founded the Pennsylvania Alpine Club), Thomas Cole (a painter who painted sublime landscapes and signified the importance of the Hudson River School), and many others.

(Chamberlain, 2015). However, in the time periods between WWI and WWII and after the conclusion of WWII (through the late 1960's), the hiking community grew immensely (Chamberlain, 2015). This new growth came about, in large part, because of WWII (Kemsley, 2007; and Chamberlain, 2015).

The first factors in the hiking resurgence were the "restorative" and "soothing" effects of walking in nature (Shaffer, 1983). Returning WWII veterans had just finished participating in a grueling and shocking military campaign. Many came back with "invisible wounds" such as Post-Traumatic Stress Disorder (PTSD)[17]. These veterans found solace by exploring "wild" areas outside of urban life (Shaffer, 1983; and Chamberlain, 2015). The second factor was the surplus of military backpacking and camping equipment (Shaffer, 1983). Veterans repurposed gear that had been designed and produced for wartime functions, using it for hiking on trails throughout the country (Chamberlain, 2015). For the average citizen, this equipment was relatively cheap and sturdy, revolutionizing the backpacking/hiking world (Chamberlain, 2015).

In the late 1960's, the hiking community experienced a dramatic change, a change that would persist. Chamberlain (2015) describes a "monumental shift in the (hiking) community" where the average hiker transitioned from being a producer of the trails they enjoyed (trail-builder, maintainer, etc.), to that of a consumer (enjoying the trail without contributing to it). This shift from producer to consumer accompanied the diminished role of hiking/outdoor clubs in getting people outside and hiking. As a result, outdoor clubs experienced a declining (or stagnant) membership, despite a dramatic increase in

[17] Post-Traumatic Stress Disorder was not first diagnosed until the 1980's, but it's effect was certainly experienced by soldiers who returned from both WWI and WWII. These soldiers found peace and quiet and purpose in their recreational hiking (Chamberlain, 2015).

the number of recreational hikers (Chamberlain, 2015; see also Fletcher, 1968). At the same time, the federal government began investing heavily in trails and road construction on public lands[18]. This investment worked to shift some of the responsibilities of trail management to the federal government, thus diminishing the role of hiking clubs and the volunteer ethic which had been a focal point of the clubs activities[19] (Chamberlain, 2015).

The values and norms associated with hiking have experienced several changes over time, while its basic role in society has only continued to grow. From its beginnings as a grassroots movement early in the 19th century, to the rise and decline of outdoor clubs in the mid-20th century, to its current-day popularity, the hiking community has continued to evolve[20]. Throughout this history, recreational hiking has had an impact on American society; today however, that impact is being felt more than ever (Romano, 2015). Although trails are being "loved to death" by having more visitors than ever before in American history, the National Park Service is currently facing a near 12-billion-dollar backlog of infrastructure projects (NPS, 2018). The volunteer ethic, which defined the hiking community throughout the 19th and into the 20th century and contributed to trail maintenance and so on, has a greatly diminished role today in protecting these fragile landscapes.

[18] This was not simply for recreational purposes. The federal government, and the Forest Service in particular, had recognized the value of creating new roads and trails for loggers and other economic advantages.

[19] This is not to say that outdoor groups are no longer involved in trail building and upkeep – quite the contrary in fact. However, many Americans no longer feel that it is their responsibility to maintain these trails and that it is the role of the federal government. Thus, a diminishing importance is experienced for outdoor clubs whose relevance may be greater now than ever.

[20] It is important to note that this "popularity" of hiking was not uniformly enjoyed. Many outdoor groups limited membership numbers of both minorities and women. One notable exception was the Alpine Club of Massachusetts whose original membership consisted of nine women and only 3 men (Chamberlain, 2015).

2.2.2: Physiological Benefits of Recreational Hiking

There are many reasons why an individual might choose to engage in recreational hiking. One of the primary reasons is, undoubtedly, the physiological benefits derived from engaging in natural environments via hiking. Although this topic is not directly related to my research per se, it is important to have at least a basic understanding of the physiological benefits (perceived or otherwise) enjoyed by individuals who engage in recreational hiking on at least a semi-regular basis. In this section I briefly explain many of the more commonly associated benefits derived from recreational hiking.

Many studies have systematically examined the positive effects of both passive and active interactions with the natural environment. In these studies, researchers have found that there are several positive physiological impacts derived from engaging with natural landscapes in a variety of ways. While the context of the engagement with nature matters, nearly every study has produced some level of correlation between exposure to natural landscapes and positive mental effects (Ryan et al., 2010). One such study, conducted by Bratman and colleagues (2015), studied the mental benefits derived from walking in an urban city as compared to a city park with more natural features[21]. This study found that participants who walked in the park experienced higher levels of memory capacity, increased positive affect, and an overall decrease in anxiety and rumination (Bratman et al, 2015). These results echo strongly the findings of Ryan and colleagues (2010) who found that individuals who were immersed in natural landscapes had higher levels of vitality, increased mental and physical energy, and overall health.

[21] The study compared a walk in a large city to that of a walk in a city park with an abundant supply of trees.

Several studies have also sought to establish the benefits of viewing natural landscapes in any capacity. For example, Saraglou and colleagues (2008) found that watching videos of different natural landscapes positively affected the viewers' emotional state and contributed to a feeling of "enjoyment and wonder." In this study, participants were merely passive observers of natural landscapes for a short period of time (50 minutes), yet they too experienced positive mental benefits.

The positive effects of natural landscapes may also extend beyond the individual. Mayer & Frantz (2004) found that individuals tended to be more social towards each other after engaging with natural landscapes. They also found that connectedness with nature and overall life satisfaction were significantly associated (Mayer & Frantz, 2004). Additionally, Zhang and colleagues (2014) found that individuals who engage with natural landscapes frequently are likely to be more helpful and have an overall positive affect[22].

The magnitude of the benefits varies considerably from person to person, due to their level of nature connectedness[23] (Berto et al., 2018) and the type of interaction with the natural environment. That being said, across all of the studies examined, regardless of the type of interaction (passive or active) or, the type of natural landscape experienced (city park or wilderness), there are many physiological benefits derived from interacting with nature. Additionally, individuals who interact with natural landscapes more

[22] The positive affect quality of engagement with nature is a re-occurring phenomena within the literature and is listed twice in this review to highlight its importance.

[23] A term coined by Berto et al (2018). Nature connectedness refers to one's desire to be in nature and the gratification they personally receive when they experience natural landscapes. It is possible to engage in natural landscapes, with low levels of connectedness, and have greatly diminished returns. As such, it is important that the individual feel personally connected to the environment in which they engage.

frequently tend to enhance the magnitude to which they experience the positive results from the aforementioned mental and physical benefits (Ryan et al., 2010).

While not a focal point of this research, the benefits mentioned above are nevertheless important to be familiar with as they represent a primary motivation for many individuals who engage in recreational hiking[24]. In the following section I provide a definition and brief history of new media, along with a discussion of its ability to encourage individuals to recreate outdoors through several very influential digital platform(s).

2.3: New Media

The term "new media" is a broad field that takes on new meaning as new technologies are developed. Today, new media can be loosely identified as digital and user-based content. New media, however, are not without controversy (Siapera, 2012), nor confusion (Neese, 2016). The primary source of this controversy/confusion lies in the differentiation between media being defined as "old" or "new" (Logan, 2010; and Neese, 2016). In his book *Understanding New Media: Extending Marshall McLuhan*, Logan (2010) offers one definition of new media: "digital media that are interactive, incorporate two-way communication and involve some form of computing… (it is) very easily processed, stored, transformed, retrieved, hyperlinked and, perhaps most radical of all, easily searched for and accessed" (pg. 8). This definition, however, does not fully

[24] An important distinction to address is that minimal amounts of interaction with nature can have these benefits (Ryan et al, 2010) in much the same way as engaging in extended recreational hiking activities.

encompass the term "new media" because new media are not stagnant; rather, they are a constantly evolving (at times rather quickly) as technology develops.

What is "new media" today will inevitably be "old media" at some point in the future (Logan, 2010). For the purposes of this thesis, the definition I will be working with (when referring to new media) is the following:

> New Media: Digitally-based content that is created, modified, shared, or otherwise manipulated in some way for use by the user or others.

Some of the more common examples of new media include: Facebook, Twitter, Instagram, blogs, websites with user-based content (AllTrails, Washington Trails Association, Wikipedia, etc.), and online news media outlets (Neese, 2016; Siapera, 2012; see also Manovich, 2003).

On many new media websites, 'users' are able to interact with each other in a variety of ways. On Facebook and Instagram for example, a user may see the posting by another user and choose to "like", "comment", or "share" the post. While comments and sharing of the post are relatively self-explanatory[25], the likes appear to have additional meaning. When an individual posts something (a picture, words, video, etc.) on Facebook or Instagram, other users are able to see said post. These other users are able to "like" a post by simply pushing a button. The number of likes that a post receives is generally indicative of the response, either positive or negative, from the originator who may have been seeking feedback or positive affirmation in the first place[26]. Each new

[25] A "comment" is a direct statement made from one user to the originator, whereas a "share" would include the copying of the status (in its original form) and sharing it via a message or post.

[26] I.e. A post with a low number of likes may make the originator believe that the post wasn't valued, conversely, a high number of likes may encourage the originator to produce more posts of a similar nature.

media site has its own form of user interactions, while the previously mentioned platforms focus on likes, comments, and shares; other websites such as the WTA each have their own means of interaction.

The rest of this section is divided into two parts. In the first, I give a very brief historical context of new media. The second part deals with the influential capacity of new media by reviewing several studies which highlight new media's ability to influence societal trends, such as the rise in recreational hiking.

2.3.1: Historical Context of New Media

The origins of new media date back to the early nineteenth century (Manovich, 2002). Louis Daguerre's invention of the daguerreotype and Charles Babbage's ideas about the "analytical machine" jointly represent the beginning of the era of new media (Manovich, 2002). Over the years, technological advancements aided in the reproduction of different types of media (journals, magazines, newspapers, etc.), with each advancement taking its place along a lengthy history of new media[27] (Manovich, 2002). While these advancements, and others before the age of modern computers/cell phones, may not seem connected to new media, they are. Marshall McLuhan (1964) understood and was the first to support this idea. In his book, Understanding Media: The Extensions of Man, McLuhan (1964) states that "the medium is the message… it is the medium that shapes and controls the scale and form of human association and action." In proclaiming

[27] See Manovich, 2002 for an extended historical background of new media from the 1800's onward.

that "the medium is the message," McLuhan furthered the idea that the type of communication mattered, not just the ideas that were being communicated.

The more modern forms of new media (i.e. personal computer, internet, etc.) are constantly being developed and transformed. The first digital computer was invented in 1942; the first personal computer (the Altair 8800) appeared in kit form in 1975 (Pew Research Center, 2014). Sir Tim Berners-Lee revealed his plans for the internet (the World Wide Web) in 1989 (Pew Research Center, 2014). Since that time, the way in which individuals interact with PC's and the internet has changed dramatically. An example of this is the modern cell phone, which has computing and processing capabilities that far exceed what was possible for personal computers back in the early 1990s. Cell phones are also incredibly mobile, fitting in the palm of our hands as opposed to necessitating space on a desk. Today, nearly 95% of American adults own a cellphone (Pew, 2018)[28]. Consequently, we as a society, have an unending supply of individualized new media (Valkenburg, 2016), just one click away.

2.3.2: The Influence Capacity of New Media

The research concerning the effects of new media on specific societal functions (i.e. voter activism, leisure activities, etc.) is still in its infancy (Lepp, 2014). However, several recent studies have exhibited the effectiveness of new media in engaging individuals with the outdoors. In this section I utilize some modern examples to

[28] According to the Pew Research Center (2018), nearly 95% of American adults own a cellphone of some kind and approximately 77% of Americans own a smart phone. This number is up dramatically from 2011, where just 35% of Americans owned a smart phone.

demonstrate the influential capacity of new media in a given society. I then review several recent studies which have examined the role of new media in enhancing (or diminishing) recreational experiences and activities in natural landscapes.

To begin, we must recognize that new media is, by nature, difficult to study. Valkenburg and colleagues (2016) describe the study of new media and its impacts on society as a "moving target," due to the constantly changing world of technology and new media's role in it (Valkenburg et al., 2016). As previously discussed, defining new media is a task that is constantly evolving as technology changes. Thus, the study of its uses tends to change somewhat frequently, which complicates the ability to study the impacts associated with it.

The influence of new media on society has also been documented in many disciplines. Perhaps the most prominent example of new media's influence lies in the distribution of national and international news. Consider, for example, the phenomena known as the Arab Spring[29]. During the Arab Spring, political groups in the Middle East utilized new media to help organize and disseminate information in order to overthrow oppressive regimes (Brown et al., 2012; see also Howard & Hussain, 2011). In so doing, they changed the very fabric of the societies in which they lived.

Similarly, new media has fundamentally altered the way in which people in the U.S. absorb and disseminate local, national, and international news by providing a type of social gratification through news sharing (Siapera, 2012; and Lee & Ma, 2011). In modernized societies around the world, individuals have (for several years now) been

[29] See Brown et al., 2012 for more information about the Arab Spring movement.

sharing news and information in order to receive the gratification (a form of positive emotional reinforcement) from their peers that they have shared something interesting, funny, useful, etc. Lee & Ma (2011) explore the concept of social gratification, derived from new media sources, in depth by focusing on sharing news via new media platforms:

> …socializing gratification was the other salient factor motivating users to share news. This indicates that users may feel that they are connected to the virtual community through sharing news stories, and is consistent with the notion of ‘‘anticipatory socialization’’ where people derive social gratifications from sharing views and news with others (pg. 7).

The social gratification received from news sharing may extend to recreational hiking also. Sharing trip reports and information about trails, especially less popular ones, is one way an individual can connect to the hiking community digitally. As such, it is conceivable that an individual would receive the same type of gratification sharing information (or "news") about a given trail, especially if the information is well-received or utilized by the general public (whether on social media or blog posts, etc.). The topic of social gratification received through new media will be revisited in section three of this review, which deals with theoretical frameworks.

New media has extended its influence to nearly every portion of modern-day life in the U.S. (Siapera, 2012). It has transformed the market economy by changing consumer, seller, and marketing habits; through the proliferation of targeted advertising, individualized consumption, and instant gratification (Siapera, 2012; and Aydin & Arslan, 2016). New media is making things more personal and relevant to the user than ever before (Rapp et al., 2013). It has increased civic engagement (Loader et al., 2014),

and, as we have seen with the Arab Spring Movement, the capital of activist, minority, and nonprofit groups and their ability to affect social change (Guo & Saxton, 2014).

Many studies have shown a positive association between new media and its ability to encourage individuals to participate in outdoors activities. One such study, conducted by Mackenzie and colleagues (2017), found that utilizing social media as a medium for information about different natural areas effectively increases the participation of young people in outdoor activities. Additionally, Pinkerton and colleagues (2016) found that individuals who post details (text, photos, etc.) about their activities on social media platforms received "'encouragement or support either through comments or 'likes' to their physical activity related posts[30]'". These 'likes', serve as a reinforcing motivation to continue both the action (physical activity) and the reflection (post on social media) in the minds of these individuals. In the same study, participants who post on social media also felt more socially integrated, experienced higher levels of self-worth, and viewed themselves as inspiring to others (Pinkerton et al., 2016). Thus, use of new media appears to encourage some individuals to partake in physical activities through a social reward mechanism.

New media (social media in particular) has also been shown by Zeng and Gerritsen (2014) to impact tourists' recreational choices. Zeng and Gerritsen (2014) demonstrate that tourists' choices, such as where to visit and what to do, are heavily influenced by new media because it offers individuals to access information (via the

[30] Pinkerton et al, 2016, Pg. 6

internet) in ways hitherto unimagined. This influence extends beyond tourism and recreation and is corroborated by multiple other studies[31].

Wilderness has long been thought of as "the domain of men"; however, new media may be working to deconstruct that notion. Weatherby & Vidon (2018) argue that new media (specifically social media) is working to reshape the historically masculine identity of "wilderness" in the United States through the sharing of female experiences in wilderness settings. This sharing of information works to dismantle the idea that women are unable or unwilling to experience wilderness (Weatherby & Vidon, 2018). It also begins to uncover the narrative of women hikers who have been present but (mostly) overlooked throughout American history (Chamberlanin, 2015).

Finally, Stavrositu & Sundar (2012) conducted two studies testing whether "blogging" could be a potential source of empowerment for women and found a strong correlation between women who blog about their activities and feelings of female empowerment. They explain this finding as a byproduct of increased sense of personal agency and a feeling of community gained from blogging (Stavrositu & Sundar, 2012). Additionally, Chen (2015) found that women who participated in outdoor activities were much more likely than their peers to engage in information sharing (via new media) after their outdoor activities. This sharing of information by women hikers may very well encourage other women, who have previously felt that hiking was inaccessible (for one reason or another) to them, to engage in said activity. These findings, along with those

[31] See Aydin & Arslan, 2016 for additional studies.

made by Weatherby & Vidon (2018), work in tandem to show the potential influence that new media can have on empowering women to engage in recreational hiking.

The influence of new media is prevalent throughout modern society. From its humble origins, to its modern-day prowess, the role of new media is constantly evolving. As we continue to learn more about new media and its impacts, we move one step closer to utilizing its influential capacity. The research presented in this body of work will offer new data in an emerging field with broad implications for land managers and hikers alike.

2.4: Theoretical Frameworks

This section highlights two broad theoretical approaches which seek to lay the groundwork for discussion in later sections of this thesis. As was previously mentioned, the two theories discussed are: Self-Determination Theory (Deci & Ryan, 1985) and Uses and Gratifications Theory (Katz, Blumler, & Gurevitch, 1973). In addition to these two overarching theories, a sub-theory of Self-Determination Theory, Organismic Integration Theory, is also discussed at length. These theories provide compelling rationale detailing the ways in which new media may be influencing the recent surge in hiking. Both theories discussed offer a unique look at the varying motivations for each individual who chooses to venture into natural landscapes, but specifically how new media can play a role[32].

[32] Additionally, Appendix 6.4 offers a brief overview of three theories which detail why humans are physiologically and psychologically drawn to ourdoor settings.

2.4.1: Self-Determination Theory

Self-Determination Theory (SDT) is an overarching theoretical framework for understanding the underlying characteristics of human motivation (Ryan & Deci, 2008). It identifies three universal "intrinsic needs" --autonomy, competence, and relatedness-- as being necessary for good psychological health. SDT also seeks to explain, among other things, "the impact of social environments on motivation, affect, behavior, and well-being" (Ryan & Deci, 2008). To do this effectively, SDT distinguishes between two distinct types of human motivation: autonomous (intrinsic) and controlled (extrinsic) motivation (Deci & Ryan, 1985).

Autonomous (intrinsic) motivation is the form of motivation whereby an individual is energized by internal values and/or self-worth about the activity to be performed. Examples of intrinsic motivations include morals, personal interests, etc. Intrinsic motivations are often shaped by personal experiences, however, they can also be formulated through controlled (extrinsic) motivations. At times, the individual may not be aware that their internal motivations are being constructed by external forces (influences from family and friends, interactions with different forms of media, etc.) (Ackerman & Tran, 2019). In this thesis, the intrinsic motivation side of the Self-Determination Theoretical spectrum (see Figure 3 below) is only analyzed in its relation to external motivators.

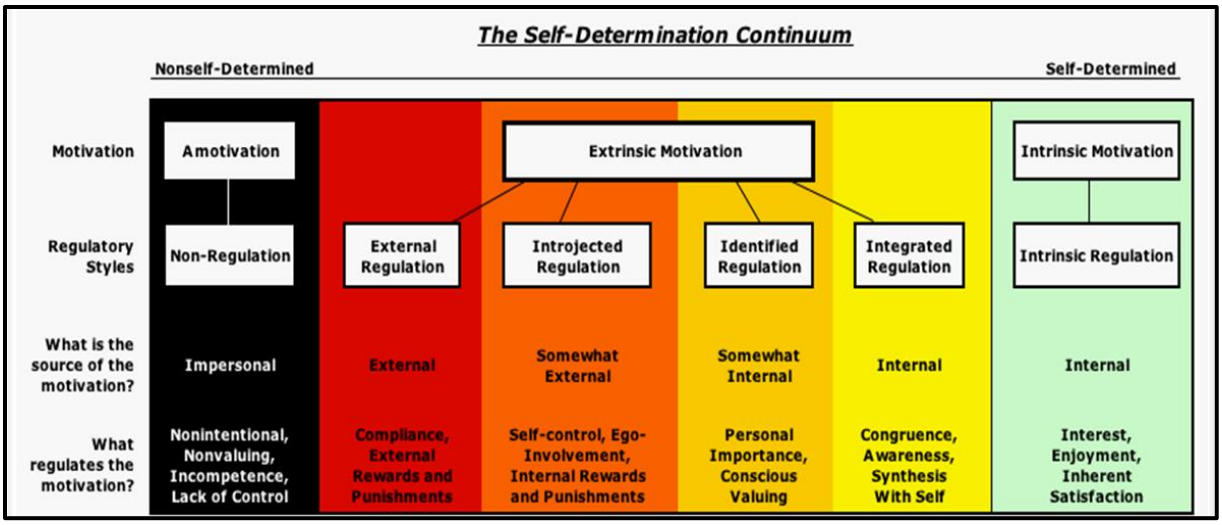

Figure: 3: Chart produced by Ackerman, C. & Tran, N. (2019). Based on Ryan and Deci (2008). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being.

Controlled (extrinsic) motivation is energized by perceptions and expectations from others; or, as summarized by Ryan and Deci (2008), "controlled motivation … is energized by factors such as an approval motive, avoidance of shame, contingent self-esteem, and ego-involvements." Controlled motivation is based on an individual's perception of themselves in regards to others' behaviors and actions. Essentially, when an individual is motivated to action by external factors, they feel an urge to satisfy the expectations, perceived or otherwise, of others (Ackerman & Tran, 2019; see also Ryan & Deci, 2008). Thus, an individual's motivation is "controlled" externally and their actions are likely to conform and be impacted by the norms of the community to which they belong or are seeking to belong.

With regard to Self-Determination Theory, the research presented in this thesis focuses on the ability (or inability) of new media to produce specific actions (i.e. engage in recreational hiking) through extrinsic motivations (i.e. new media). This research specifically looks at two sub-theories of SDT to account for the various ways in which an

individual can be extrinsically motivated. The two sub-theories discussed are Organismic Integration Theory (OIT) and the Fear of Missing Out (FOMO)[33].

2.4.2: Organismic Integration Theory

Organismic Integration Theory (OIT) posits that the motivating ability of an extrinsic motivator is dependent entirely upon its ability to become internalized in an individual (James, Wallace, & Deane, 2019). Additionally, the degree to which the individual internalizes and values any action (integration of the behavior), is predictive of the likelihood that said individual will repeat said action in the future (Ryan & Deci, 2008). An example of this process is provided by Ackerman and Tran (2019):

> …school assignments are an externally regulated activity. Internalization in this situation can be understood as the child seeing the value and importance of the assignment while integration in this situation would be the degree to which he perceives performing the assignment as his own choice (np).

As the individual integrates the behavior, by assigning or ascribing value to it, they increase the likelihood by which an external activity will occur and become internalized.

Organismic Integration Theory fills a gap in SDT by accounting for motivations that lie somewhere in-between the intrinsic (fully autonomous) and extrinsic (entirely dependent) extremes of SDT (James, Wallace, & Deane, 2019; see also Ryan & Deci, 2009). OIT maintains that certain motivations can be at least partially intrinsic, regardless of whether or not the motivations originated internally (Ryan & Deci, 2009).

[33] There are other sub-theories within Self-Determination Theory which also account for extrinsic motivation; however, OIT and FOMO were specifically analyzed in this research due to their ability to properly account for new media interactions.

This is possible when, as stated by James, Wallace, and Deane (2019), "the stimulus is extrinsic but the individual starts to want to perform the activity to some degree rather than simply complying with the outside force." In the previous example of the school child, the school assignment is the external motivator. As the school child began to recognize and internalize the value associated with completing the assignment, he began internalizing the extrinsic motivation and it became (at least partially) an internal motivator. The extent to which the child values the reward earned from completing the assignment (internalization) and perceives the assignment as being a personal choice (integration), is indicative of the level of autonomy utilized when completing this extrinsic action.

In sum, OIT posits that even if an activity is extrinsically-based, the motivation behind the completion of the activity is not necessarily entirely extrinsic. There are theoretical "gray areas" where an action/behavior is not entirely extrinsic or intrinsic. In these circumstances, the ability and/or desire of an individual to internalize and integrate the action/behavior is indicative of the level of autonomy that the individual will experience in relation to that activity or behavior. When applied to recreational hiking, it is possible to see how the extrinsic rewards (social recognition and accomplishment) could help motivate an individual to engage in hiking. Additionally, these individuals may not recognize that they are extrinsically motivated to participate in hiking, due to the internalization of the rewards (whether psychological or physical) to be gained from said activity. As such, Organismic Integration Theory adequately accounts for both of these possibilities and is a fundamental piece of this research.

2.4.3: The Fear of Missing Out (FOMO)

The concept of "Fear of Missing Out" or "FOMO" has experienced a resurgence amongst social psychologists (Abel, Buff, & Burr, 2016). FOMO can be loosely characterized as an individual being highly sensitive to what other individuals are doing, or are in possession of, in relation to their own actions, possessions, and self-worth (Abel, Buff, & Burr, 2016). FOMO has been shown to be especially influential in individuals who have higher levels of irritability, anxiety, and/or inadequacy (Abel, Buff, & Burr, 2016; see also Hertz et al, 2015). Additionally, FOMO has been shown to increase when individuals engage with social media (Wortham, 2011; see also Abel, Buff, & Burr, 2016); this is because people are social creatures who care about what other people and groups are doing and what they may think of what we are doing (Abel, Buff, & Burr, 2016). The impact of FOMO on each individual varies considerably depending on their connectedness to a community, feeling of self-worth, and dependency on the approval of others (Abel, Buff, & Burr, 2016).

FOMO aligns well within the boundaries of Self-Determination Theory. As mentioned previously, there are two types of motivation put forward by SDT, autonomous (intrinsic) and controlled (extrinsic). FOMO conforms to idea of controlled motivations whereby social media encourages participation and/or action on the part of the individual – regardless of whether the individual has any intrinsic motivation to perform the action (Abel, Buff, and Burr, 2016; see also Ryan & Deci, 2008). This phenomena could be (and has been) described as the Instagram Effect (Balk, 2018). The general premise of the Instagram Effect, at least in regards to hiking, is that people are drawn to environmentally spectacular areas –not for the scenery per se, but for the

pictures. These pictures are then subsequently shared on social media sites; which then entices others to engage in the same activity, less they "miss out" on this "great thing" that the other person has enjoyed.

When analyzed jointly, FOMO and OIT effectively cover the spectrum of controlled motivation and its ability to influence an individual. Organismic Integration Theory emphasizes the autonomous side of controlled motivation (yellow/orange section in Figure 3), by focusing on the degree to which an individual internalizes an activity and how that internalization is perceived as being an autonomous decision (James, Wallace, & Deane, 2019). Conversely, Fear of Missing Out emphasizes the ability of outside forces to control an individual's actions (red section of Figure 3) by positing that individuals are likely to model their behavior after certain actions that they believe will enhance their sense of belonging (Abel, Buff, and Burr, 2016). For this thesis, both sub-theories of Self-Determination Theory (OIT & FOMO) are in play. However, the influential capacity of new media to encourage participation in a particular activity (recreational hiking for example) for a given individual relies entirely on the individual themselves.

2.4.4: Uses and Gratifications Theory

Uses and Gratifications Theory (UGT) is primarily concerned with understanding how varying types of media (particularly new media) are used to satisfy the needs of the user[34] who utilizes said media (Sundar and Limperos, 2013). Originally developed by

[34] User is underlined to signify the shift in the User and Gratification Theoretical framework. Prior to the prevalence of digital media, individuals were believed to be more passive in reaction to media, as opposed to active participants (Sundar and Limperos, 2013).

Katz, Blumler, & Gurevitch (1973), UGT posits that there are certain basic 'needs' which are universal and that new media is one way in which individuals meet those needs. This theory builds and expands upon the work of Abraham Maslow and his "Hierarchy of Needs" (Maslow, 1943).

Maslow's Hierarchy of Needs is exceptionally prevalent in the field of social psychology and is worth briefly discussing here in relation to UGT. Maslow's original Hierarchy of Needs is a five-tiered[35] pyramid model of 'needs' that every individual needs to achieve their full potential. These five tiers, beginning at the base of the pyramid, include the following: physiological needs, safety needs, belongingness and love needs, esteem needs, and self-actualization, (Maslow, 1987). While each need represents a necessary step, they do not need to be realized fully before a new need is realized and/or met (Maslow, 1987). For example, it is entirely possible to fulfill esteem needs before belongingness and love needs are met. However, the needs do build upon each other and the two basic needs (safety and physiological) will generally be met, at least in some capacity, before the others can be completely realized. Maslow's need hierarchy is a foundational piece of Katz's Uses and Gratifications Theory.

In Uses and Gratification Theory, Katz argues that the level of satisfaction for each specific need (i.e. belongingness, esteem, etc.) of an individual are unique (Katz, Blumler, Gurevitch, 1973). Each individual's dependency on a specific need, fuels their consumption of the type of new media which is able to meet that need (Katz, Blumler & Gurevitch, 1973; see also Rubin, 2009). Over the past decade, new media is increasingly

[35] The original Hierarchy of Needs model was only five tiers (physiological, safety, belonging, esteem, and self-actualization), however, Maslow's hierarchy was refined in the 1970's to include three other needs (cognitive, aesthetic, and transcendence) (Mcleod, 2018).

the medium through which needs are being met (Sundar and Limperos, 2013); however, it may also be an avenue by which previously unrealized/unfulfilled needs are met. As indicated by Sundar and Limperos (2013):

> It is clear that newer media have ushered in new rituals and new instrumental activities. Furthermore, new features offered by each new medium (new media) can themselves provide process gratifications… such gratifications may reflect latent needs that were hitherto unfulfilled, but their realization is clearly driven by the new possibilities offered by the technology of the medium (pg. 511).

In essence, new media and subsequent technological advances are either creating or revealing new needs for the individual (Sundar and Limperos, 2013). In order to satisfy those needs, users are becoming increasingly active and deterministic when it comes to their choice of media consumption (Rubin, 2009).

The intersection between UGT and new media comes about because of exposure. Due to the prevalence of new media, collaboration (in the form of trip reports, conditions, and general advice) within the hiking community has grown tremendously (Haugen-Goodman, 2015). Additionally, new media has made the hiking community more accessible than ever before, particularly to individuals on the periphery, or outside the community altogether. The increased collaboration and external visibility of the hiking community has created/revealed a new avenue by which the need for belongingness and love (and possibly esteem) can be achieved by hikers, whether they previously identified with the community or not.

Originally, Uses and Gratifications Theory highlighted the importance of social interaction on a basic level (Katz, Blumler & Gurevitch, 1973). More recent

interpretations have applied this theoretical framework to explore the role of new media in creating and/or revealing additional social interaction needs (Sundar and Limperos, 2013; see also Rubin, 2009). As individuals, both within and outside of the hiking community, continue to connect to each other using new media, they are increasingly exposed to this new need and are seeking ways in which to fulfill it. While there are several ways to fulfill the need, many individuals are turning to recreational hiking and are sharing photos and/or details of their experiences in order to satisfy this need. Thus, UGT is helpful in understanding, at least in part, why there has been such an increase in recreational hiking–both in Washington State and across the country.

The ideas offered by both Self-Determination Theory and Uses and Gratification Theory offer a unique perspective on the motivations behind new media usage and its impact on recreational hiking. There are however, countless other relevant theories and theoretical frameworks which exist in social psychology–to adequately explore them all would be a thesis in and of itself. The variety and degree of applicability of each of these theories, in regards to new media and its impacts on recreational hiking, is exceptionally diverse. The theories discussed in this section are the frameworks on which the discussion section of this thesis is built and are key to understanding some of the internal motivations for engaging in recreational hiking.

Conclusion

In summary, the increase of recreational activities (most notably recreational hiking) across the United States has been dramatic. There are few reliable estimates of visitation counts at the local level; however, local land managers are working on new and

innovative strategies to bridge this knowledge gap (Fisher et al., 2018; and Donahue et al, 2018). Conversely, federal lands such as national parks, forests, and monuments have continued to gather data[36] that supports this narrative over the past several decades (NPS, 2018; and USFS, 2018). Additionally, new methods are continually being tested and developed by agencies in Washington State to more accurately estimate user visitation data (WSDOT, 2018).

The idea of recreational hiking in the U.S. has changed dramatically from its origin (Waterman & Waterman, 1989). What was once almost entirely a social club/group activity, filled with trailblazers and volunteers (producer-based), has transformed into more of an individualistic (consumer-based) one, with membership in hiking/outdoors groups at one of the lowest levels of all time (Chamberlain, 2015). Despite this transition, the hiking community in the U.S. is remarkably vibrant and is currently experiencing a dramatic increase in recreational hiking.

The physiological benefits associated with recreational hiking are numerous (Howell et al., 2011; Ryan et al., 2010; and Zhang et al., 2014). Additionally, the greater the connection between the individual and natural landscape, the greater the individual benefit they receive (Berto et al., 2017). The degree to which new media applications (Facebook, Instagram, blogs, etc.) are impacting recreational hiking remains to be seen. However, new media (as previously shown) has had a tremendous impact on almost every facet of society (Siapera, 2012)–including recreational hiking (Mackenzie et al, 2017; Pinkerton, 2016; and Aydin & Arslan, 2016).

[36] The data collected by the federal government is only an estimate, generated via the National Visitor Use Monitoring (NVUM) Program.

Numerous theoretical frameworks attempt to effectively link new media and leisure activities. In this review we focused on two theories, Self-Determination Theory (Joye & Dewitte, 2018) (including FOMO and Organismal Integration Theory) and Uses and Gratification Theory (Katz, Blumler & Gurevitch, 1973) (the satisfying of intrinsic needs through recreational hiking and new media usage). These theories paint a partial picture of the complicated relationship between humans and nature, as well as new media's influential capacity in the field of recreational hiking. The theories chosen should not be considered exhaustive, as the field of social psychology is extensive.

Although I have laid a broad framework in this literature review, it is important to understand that the research presented here is a small piece of the bigger puzzle. Recreational hiking touches on many facets of American society such as economics, tourism, politics, environmentalism, and ecology, as well as countless others. The purpose of this literature review is not for the reader to become an expert in recreational hiking or new media, but rather to properly orient the reader to the specific piece that I am examining, the role of new media in recreational hiking. In the next section, we look at the study design and methods employed for both surveys in the data collection procedure.

Chapter 3: Methods

This research project utilized two surveys, an online and an intercept, that were nearly identical in content[37]. The online survey was administered via a social media platform (Facebook), while the intercept surveys were conducted in-person by myself and (at times) a colleague at specified trailheads. I utilized both survey instruments in an attempt to balance the strengths[38], and weaknesses[39] of each of the surveys. This chapter details these survey methods and also discusses measurement and analytical strategy. The results and discussion of the analysis are discussed in the proceeding chapter.

3.1: Survey Methodology

3.1.1: Online Survey

The online survey was distributed by three different hiking organizations via their Facebook pages: Washington Hikers and Climbers, A Walk on the Wild Side, and The Mountaineers[40]. Additional groups and entities were contacted, but were either unable or unwilling to distribute the survey via their online platform(s) for varying reasons. An invitation to participate in the online survey was posted once on each organization's Facebook page. Responses were solicited for the first two groups using my personal

[37] The online survey had an additional question to ensure consistency and some minor wording changes for context.
[38] The strength of the online survey for this research is that it had the ability to reach a diverse audience, was easily distributed, and was administered directly to a target audience. The strength of the intercept survey is that the audience was very specific – this allowed me to utilize the intercept survey as a case study of a geographic area and provided a distinction between the two surveys.
[39] The weakness of the online survey was that it was non-specific. Although the survey was administered in targeted groups, there are no requirements to join said groups and thus, the population of the groups is diverse. The drawback of the intercept survey was twofold: difficulty in accessing trails (due to weather conditions and timing issues) and difficulty in engaging willing participants (people avoided the area in which I set up my booth).
[40] The Mountaineers were founded in 1906 and are a volunteer-based outdoor recreation group based in the Pacific Northwest.

account (Ex: Figure 4), while the Mountaineers posted the invitation themselves. The post in each was also "shareable", individual users had the ability to share the post with other members or on their own Facebook pages – the survey was only shared on Facebook, no other social media sites were utilized. Participation in each of the three locations was voluntary, no forms of compensation or external reward were offered.

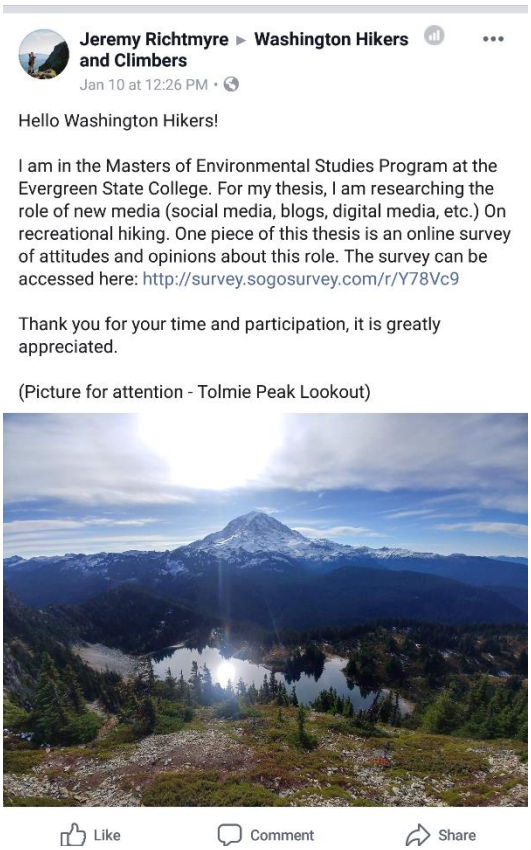

Figure 4: Social media post for online survey in Washington Hikers and Climbers Facebook group.

The online survey consisted of 17 hiking and new media-related questions and 6 demographic questions, all of which were in multiple-choice format[41]. The online survey was active for a three week period beginning January 10th, 2019 and ending January 31st, 2019. In total, 348 individuals participated in the survey; of which none were excluded due to age or other factors[42]. The full survey instrument for both the online and the intercept survey can be found in Appendix 6.1.

[41] There were a few questions with an open-ended "other" option, however, all questions were multiple choice (with the exception of the "what is your age?" question).
[42] Individuals were to be excluded if they were under the age of 18 as of March 1st, 2019. The age of the individuals are self-identified on the online survey and were assessed by the researcher during the intercept survey process. No individuals were determined to be under the age of 18, with the youngest participant being 18 years old.

3.1.2: Intercept Survey

The intercept surveys were administered in person by myself and (in two instances) a research assistant at six different trailheads. Prior authorization from the appropriate managing jurisdiction was requested and given before the research was conducted. Only one of the sites, Twin Falls (State Parks), required an official permit application and authorization prior to the conducting of research – this permit was obtained nearly a month in advance. At each of the locations, a "survey station", complete with a table, camping chairs, posters, and a pop-up canopy (when weather dictated), was set up. There were two posters that utilized. The first had the words "Graduate Research" and "Masters of Environmental Studies" in large print, along with the college logo and the researcher's contact information. The second poster had additional details concerning the research topic; it gave a general overview, along with the impetus for the research[43].

Responses were solicited from individuals as they approached the trailhead[44]. The surveys were conducted in the winter, in the late-morning through mid-afternoon, under (at-times) less-than-ideal conditions[45]. This in turn had an overall negative effect on the trail conditions, number of hikers, and level of participation experienced at each of the trails. In total, 171 individuals were approached; of which 81 individuals participated

[43] These posters were only used when visiting Rattlesnake Ledge, Highpoint Trail, and Franklin Falls. No posters were used at Twin Falls or at the Chirico Trail.

[44] The first attempts to gain participation were negatively perceived as individuals appeared to deliberately avoid the research area. The presumption is that these individuals were under the impression that I was attempting to sell something or they were otherwise deterred by my presence in some way. After my first two visits, I attempted to address this problem by creating a poster stating the purpose of my presence at the trailheads. Participation improved after this modification.

[45] A particularly unusual weather pattern moved into the region at the time when I was to complete the intercept surveys. Record cold temperatures and high levels of snow accumulation impeded my ability to get to trailheads and limited the number of individuals participating in the activity during that time period.

in the survey at the trailhead. Additionally, some individuals opted to take a copy of the survey home, with a self-addressed envelope, to mail back upon completion. There were 29 surveys handed out in this manner, 14 of which were returned by the cutoff date (March 16th, 2019). In total, 95 participants completed the intercept survey out of a possible 171; putting the overall response rate at approximately 56%.

The region in which the intercept surveys took place was in the I-90 corridor in Washington State, between Bellevue and Snoqualmie Pass. This region is located within the North Cascades mountain range and many of the trails in the region are snow-covered and/or avalanche prone. To account for these and other dangers/limiting factors, the six sites were purposefully selected and are as follows: Twin Falls, the Chirico Trail, Rattlesnake Ledge, Highpoint Trail, Mount Si, and Franklin Falls. The trails selected had the advantage of being located near the highway (guaranteeing year-round access for most vehicles), and are generally popular year-round. Additionally, each of these hikes varies greatly in the types of natural features (waterfalls, summits, lakes, etc.), terrain (generally flat, moderate inclines, etc.), and levels of accessibility (amount of gear required, experience necessary, etc.). Lastly, the trailheads selected were all located on public lands and had a variable range of regulatory oversight[46].

The intercept survey consisted of 16 hiking and new media-related questions and 6 demographic questions, for a total of 22 questions. The first intercept survey was conducted at the Twin Falls trailhead on February 16th, 2019; the final intercept survey was conducted at the Mount Si trailhead on Friday, March 15th, 2019. The sites were

[46] Twin Falls (WA State Parks); Mt Si and Highpoint Trail (WA State DNR); Rattlesnake Ledge (Seattle Public Utilities); Franklin Falls (U.S. Forest Service); and Chirico Trail (King County & WA State DNR – trailhead starts on King County property but quickly leads onto DNR-managed land).

surveyed according to the researcher's availability to get to the trailhead (generally on weekends when there were more hikers), as weather conditions allowed. The following table contains a summary of the intercept survey data, for a detailed log of trailheads, dates, weather, etc.; see Appendix 6.2.

Table 3.1: Summary of intercept survey distribution and response rates

Total Time Spent Surveying	Individuals Approached	Surveys Completed at Trail	Mail-in Surveys Distributed	Mail-in Surveys Returned	Mail-in Response Rate	Cumulative Response Rate	Total Responses
17 Hours & 30 Minutes	171	81	29	14	48%	56%	95

3.1.3: Suggestions for Methodological Improvement

In general, the surveying process ran rather smoothly; there are however, some lessons to be learned in hindsight. With regards to the online survey, the sample field was limited to a few groups within Facebook's platform. Future studies should expand the outreach to other new media sites, including online forums, blogs, etc. While efforts were made to do so with this survey (certain sites/groups declined to participate), an emphasis should be placed on this point as many digital media users, particularly younger users, are migrating away from Facebook. Additionally, solicitation for the online survey needs to be persistent. The online survey was active for three weeks and was actively promoted (initial post, re-posted, etc.) a total of three times. Each time the survey was actively promoted, participation grew briefly (for 1-2 days). This study was operating under specific constraints and was unable to continuously solicit responses; however,

survey promotion and participation in this study were highly correlated and daily active promotion should be considered necessary for future online surveys that utilize social media sites.

There are also several lessons to be learned from the intercept survey. Perhaps the biggest lesson is effective advertising. During my first two visits to trailheads, I found that hikers actively avoided my table despite it being located immediately adjacent (as much as possible) to the trailhead. Upon conversation with some of the hikers, I determined that they thought that I was either a) selling or soliciting a product (Girl Scout cookies were mentioned several times), or b) an agency employee there for some ulterior reason (checking permits, answering questions, etc.). To account for this, I created a poster which indicated who I was and the reason why I was at the trail. After implementing this poster, the level of participation increased moderately and fewer hikers avoided my booth—in fact, many of them went out of their way to ask questions about my research.

Another lesson from this research is that the number of researchers seems to have an impact on participation. For two of the trips (Chirico Trail & Rattlesnake Ledge), I had a research assistant with me at the trails. The presence of a second individual seemed, in general, to increase avoidance and lower participation. At the Chirico Trail, my assistant and I were present at the trailhead continuously. Surprisingly, we experienced the lowest amount of participation with the highest level of avoidance of all six visits. The second time my assistant came with me[47], we decided to test our theory of diminished participation. To do this, my assistant and I took turns operating the table

[47] My assistant only joined me on two of the six visits – Chirico Trail and Rattlesnake Ledge.

while the other left the vicinity. Nearly every time the second researcher left the area, regardless of whether it was the assistant or myself, participation increased and avoidance decreased. While hardly scientific, it is interesting to consider that having a second researcher in the same vicinity may create an intimidation factor for potential participants and may negatively impact participation and avoidance rates.

The time of year and method by which the survey is administered is also likely to have a dramatic impact on the results. This study was conducted in winter (February/March), on the tail end of a near record-breaking cold weather pattern in the region[48]. This contributed to both a smaller pool of potential participants, as well as a much lower participation rate (individuals didn't want to stay and chat in the cold weather). Future studies should be conducted in the spring or summer if possible, when the weather is a little more forgiving in western Washington. Additionally, the method by which the survey was administered may have limited participation somewhat. Several individuals picked up the paper survey, only to put it back down a few moments later. Electronic methods (IPad, tablet, etc.) of completing the survey have the potential to save time for survey participants and are more efficient for the data analysis portion of future studies.

3.2: Measurement

The questions selected analysis in this research project were purposefully designed to challenge four distinct null hypotheses. They are as follows: 1) neither

[48] February average temperature for the Seattle area was 36.6 degrees Fahrenheit, just one degree higher than the record of 35.6 degrees Fahrenheit which was set in 1956. Additionally, it was officially the snowiest February on record, if the blizzard of 1916 (where 21.5 inches of snow fell in one day) is excluded.

gender nor age is associated with an individual's likelihood to share information/photos on new media; 2) the frequency to which an individual engages in recreational hiking is not associated with their propensity to share information/photos on new media; 3) individuals who place a higher importance on certain benefits of hiking (solitude, mental clarity, etc.) are just as likely to share information/photos as those who place a lower importance on the same benefits; and 4) there is no association between an individual's age or gender and their likelihood to learn about hikes from new media.

3.2.1: New Media Variables

Variables of interest with regard to new media include: 1) the frequency to which individuals share photos and information on social media (question 7); 2) the frequency to which individuals share photos and information on other types of new media (question 8); and 3) the source through which an individual learns about a particular hike (question 11). The surveys were not designed to measure the increase in recreational hiking, but rather to study the impact of new media on hiking in Washington State. That being said, the research presented in earlier portions of this project has demonstrated the measurable increase in the number of hikers along the study area (the I-90 corridor between Bellevue and Snoqualmie Pass) in Washington State.

The first two new media variables, the frequency of information sharing via social and other new media, were assessed through two nearly identical questions which asked respondents to identify the frequency to which they share photos or trail information in each category. Respondents were provided a six-point Likert response scale to identify their sharing frequency. The choices included never, occasionally, sometimes,

frequently, nearly always, and always. In order to simplify the analysis, as well as to attempt to meet Pearson's chi squared analytical requirements[49], responses were collapsed into four categories (never, seldom, often, and always) for the first round of analysis, then three (never/rarely, occasionally, and frequently/always) for the second round.

The third variable was information source. This variable was determined by asking survey respondents to identify the way in which they typically first learn about a hike[50]. Responses for this category included the following: social media post, online hiking/trails forum, book, print article, online article, online blog, friend or acquaintance, and other. As was the case with the previous variables, the responses were collapsed for analytical and simplicity purposes. The first round of analysis had three categories (new media, friend/acquaintance, and other), while the second round only had two (new media and all other sources).

3.2.2: Hiking Related Variables

This research is interested in analyzing the role of new media in promulgating recreational hiking. To accomplish this, a variety of variables were analyzed. The variables selected for analysis in this study include the following: general demographics, affiliation with an outdoor agency/group, hiking frequency, and several questions about

[49] Pearson's Chi Squared Test requires that each cell in the contingency table of a statistical analysis have a value equal to or greater than five.

[50] The intercept survey asked specifically about the specific hike that they were on that day, instead of asking the question in a general manner as was on the survey.

the reasons/importance of different hiking benefits. Individuals were asked to answer these questions in a close-ended question format.

Three other hiking variables (hiking frequency, formal affiliation, and reasons/importance of hiking) were also assessed. Hiking frequency was determined by a close-ended, four-response option in which respondents self-identified their own hiking tendencies[51]. As identified in a previous section[52], formal affiliation with a public or private outdoor group or agency has historically been associated with an increase in hiking activity. This association was analyzed as participants were asked (via a "yes" or "no" response) if they were formally affiliated with an outdoor agency or group. The reasons behind and/or importance of different hiking benefits was identified through a grouped series of questions. Participants were asked to assign a value (1-5 scale) to each of the following reasons for engaging in recreational hiking: exercise and fitness, mental clarity, enjoy nature and be outdoors, socialize with friends/family, relax and unwind, and solitude. The results of each category were totaled independently and then averaged by the total number of responses.

3.2.3: Demographic Variables

The demographics analyzed in this research include age, gender, race, education level, and annual household income. Respondent's age was identified by birth year and was then sorted into three categories (18-30, 31-45, and 46+). Three options were present for gender: male, female, and non-binary/other. The "non-binary/other" response

[51] Options included the following: less than once a month, 1-2 times/month, once a week, and several days a week
[52] See Section 2.2.1 – The history of recreational hiking in the United States.

is excluded from the analysis as only four (0.9%) individuals selected this option[53]. For race, respondents were able to select all of the categories[54] which applied to them, as such the total of responses for this category exceed the total number of responses. Unfortunately, due to a small sample size, the race variable was necessarily collapsed into just two responses for the analysis—white and non-white; however, tables which were not used in the analysis still maintain their categorical integrity. Education level was assessed across a spectrum of five incremental categories ranging from high school/GED to professional/doctorate degree; these categories were collapsed further into three categories[55] for the analysis. Finally, income level represents the total gross income of the household in which the respondent is a member. Eight categories were present on the surveys, ranging from $0 to over $200,000; however, for the analysis the categories are collapsed into four brackets[56].

3.2.4: Other Variables Measured

There are a variety of other variables, not analyzed in this research, that are worthy of further research. Three questions on the surveys ask respondents to identify their beliefs about crowding on trails. These questions asked participants whether or not they believed certain areas were more crowded than others and whether or not crowding

[53] The sample size of non-binary/other responses (n=4) out of a cumulative total of (n=443) responses makes this data set too small to analyze effectively.
[54] Categories included: Black or African American, Asian or Pacific Islander, American Indian or Alaskan Native, White or Caucasian, and other.
[55] The three categories include: no college degree, AA/tech/bachelor's Degree, and post-graduate degree.
[56] The analysis separated income in increments of $50,000 ($0-$49,999, $50,000-$99,999, $100,000-$149,999, and over $150,000).

was an issue in general. The results, although not specifically applicable to new media usage, are very notable and should be investigated further[57].

Other variables dealt with the types of new media platforms that are most frequently used, while others have basic hiking habits and beliefs. The usefulness of these questions lies in the relationship between the types of hikers and their primary sources of new media usage. Although these variables lie outside the scope of this research and are not specifically analyzed, these variables are worthy of further investigation by researchers, land managers, and hikers alike.

3.3: Analytical Methods

Survey data was first assessed descriptively, then cross-tabulated through contingency tables, and finally tested for association using Pearson's chi squared (chi squared was used because all variables were categorical). In total, nine contingency tables were produced. The contingency tables were used to identify and group general frequencies and tendencies between the variables in question. Of the nine contingency tables, three were created for each of the two data sets (online and intercept) and three more were created for the combined data set. Pearson's chi squared test was used to determine the pairwise statistical associations between the different sets of variables. Findings were deemed to be statistically significant when the (*p)* value of Pearson's chi squared test was less than 0.05 ($p = < 0.05$). Results that did not meet the 0.05 threshold

[57] 74% of respondents indicated that an increase in hikers would have an overall negative impact on trails in the area. Additionally, nearly 55% of respondents feel that the trails in the study area are too crowded.

but that seemed practically significant and had p values of less than 0.10 are also reported.

The survey questions analyzed were consistent in both the online and intercept survey results. The frequency to which social/new media is shared (questions 7 & 8) and the avenue by which individuals learn about hikes (question 11) were tested against a series of differing variables. The variables analyzed against new media frequency were all categorical and included the following: age, gender, race[58], education level, income, formal affiliation, hiking frequency, and importance factors. The variables analyzed against where individuals learn about hikes were age, gender, and hiking frequency.

[58] Question 20, Ethnicity--Hispanic or non-Hispanic, was not assessed due to the low number of "Hispanic" responses (n=14) versus "not Hispanic" (n=424).

Chapter 4: Results

This chapter is organized into two distinct sections. The first presents the summarized descriptive results, of both the intercept and online surveys. To do this effectively, each of questions used in the analysis were separated into three distinct classifications and reported as such. The classifications are as follows: 1) respondent profiles, 2) hiking and crowding preferences, and 3) new media usage. The second section reports on the analytical methods, as described in chapter three, by examining the association(s) between selected variables and all data sets. Two analyses were run on the selected variables, the statistical results of each are briefly summarized in this section.

4.1: Descriptive Statistics

4.1.1: Respondent Profiles

Six demographic questions were utilized to identify the profile of respondents from both surveys, as well as one question about formal affiliation with an environmental agency or group. A total of 443 individuals participated in the study between the two survey instruments. Overall, the two surveys types (online and intercept) had some similar demographics, but there were some differences found for several of the variables (see Table 4.1 and Section 4.2.2). For example, with regards to the formal affiliation variable, 52% of online respondents indicated that they were formally affiliated with an environmental group or agency, compared to only 20% of intercept survey participants. The results of the demographic variables can be found in Table 4.1 below.

Table 4.1: Descriptive statistics of demographic variables for both the online and intercept surveys

		Survey Type					
Variables		Online		Intercept		Aggregate	
		N	**%**	**N**	**%**	**N**	**%**
*Q17. Age (18+)**	(Range 18-66)	342	(m) = 40*	94	(m) = 43*	436	(m) = 41*
	18-30 years	83	24.3%	21	22.3%	104	23.9%
	31-45 years	130	38.0%	34	36.2%	164	37.6%
	46 & over	129	37.7%	39	41.5%	168	38.5%
Q18. Gender	Male	92	26.5%	45	47.9%	137	31.1%
	Female	251	72.3%	49	52.1%	300	68.0%
	Non-Binary	4	1.2%	0	0.0%	4	0.9%
*Q19. Race**	Black or African American	2	0.6%	3	3.2%	5	1.1%
	Asian / Pacific Islander	20	5.8%	12	12.8%	32	7.2%
	American Indian / Alaskan Native	3	0.9%	3	3.2%	6	1.4%
	Caucasian / White	322	93.3%	81	86.2%	403	91.0%
	Other	12	3.5%	0	0.0%	12	2.7%
Q20. Ethnicity	Hispanic	9	2.6%	5	5.3%	14	3.2%
	Not Hispanic	335	97.4%	89	94.7%	424	96.8%
Q21. Education Level	High School / GED	12	3.5%	3	3.2%	15	3.4%
	Some College	39	11.2%	8	8.6%	47	10.7%
	Associates / Technical Degree	39	11.2%	7	7.5%	46	10.5%
	Bachelor's Degree	138	39.8%	39	41.9%	177	40.2%
	Post-Graduate (M.A., Ph.D, etc.)	119	34.3%	36	38.7%	155	35.2%
Q22. Household Income	$0-$49,999	61	18.6%	12	13.5%	73	17.5%
	$50,000-$99,999	127	38.7%	30	33.7%	157	37.6%
	$100,000-$149,999	73	22.3%	24	27.0%	97	23.3%
	Over $150,000	67	20.4%	23	25.8%	90	21.6%
Q6. Affiliation	Yes	181	52.0%	19	20.0%	200	45.1%
	No	167	48.0%	76	80.0%	243	54.9%

* Indicates the mean for the variable. The mean was calculated for age by subtracting the current year (2019) from the respondents birth year

The average age of participants was 41 years old, with female respondents (68%) outnumbering males (31%) by a greater than a two-to-one ratio. Participants were asked to identify their race and were given the option to select all categories which applied. In total, the racial distribution of participants consisted primarily of two groups: White/Caucasian (91%) and Asian/Pacific Islanders (7.2%); with the remaining groups--Black/African American (1.1%), American Indian/Alaskan Native (1.4%), and other (2.7%)--each receiving less than (3%) of the overall total. The education level of respondents was relatively high, with the majority (75.4%) holding at least a bachelor's degree. Despite the relatively high education levels, income levels appear to be more modest with the majority of households (55.1%) earning less than $100,000 annually.

4.1.2: Hiking and Crowding Questions

The surveys prompted users to identify a variety of their habits in relation to hiking, along with their attitudes concerning overcrowding on trails. Answers relating to hiking habits were fairly consistent between the two surveys. A strong majority of respondents (roughly 77%) indicated that they engage in recreational hiking between one and four times monthly, and (58%) typically spend between two-to-five hours on each hiking endeavor. In terms of reasons for hiking, mental clarity (4.2) and enjoyment of nature/spending time outdoors (4.7) received the highest ratings; while, ironically, socializing with friends/family (2.8) and solitude (3.4) received the lowest ratings[59].

[59] Relax/Unwind and Exercise/Fitness were the other two categories, they received middling, identical scores (3.9).

Fulfillment from hiking areas was also assessed, with national parks and forests receiving high scores (4.8 overall)[60] and city/county parks having the lowest score (2.8).

Attitudes concerning crowding issues were addressed in three separate questions. The first question asked respondents whether they believed that the trails were overcrowded. The majority (55%) of respondents responded with a "yes" response of some type, while 11% responded with a "no"[61]. In addition, a strong majority of respondents (74%) indicated that an increase in the number of hikers would have an overall negative impact on their hiking experience, with roughly 3% indicating that an increase would have a positive impact. The table (Table 4.2) on the next page summarizes several of the hiking and crowding variables. A complete table of all hiking and crowding variables can be found in Appendix 6.3

[60] Wording issues between the intercept and online surveys resulted in two slightly different categories. The intercept survey separated national parks and forests into two categories while the online survey did not. The 4.8 score is a result of combining answers from both surveys.

[61] The survey identified two "yes" and two "no" type responses, each with a varying sentiment. The final options were "other" and "unsure/don't know", they received 34% of all responses.

Table 4.2: Results of hiking and crowding variables for both the online and intercept surveys

Variables		Survey Type					
		Online		Intercept		Aggregate	
		N	**%**	**N**	**%**	**N**	**%**
Q2. Frequency	Less than once a month	45	12.9%	9	9.7%	54	12.2%
	1-2 times/month	152	43.7%	43	46.2%	195	44.2%
	Once a week	114	32.8%	29	31.2%	143	32.4%
	Several days a week	37	10.6%	12	12.9%	49	11.1%
Q3. Time Spent	Less than 2 hours	17	4.9%	14	15.1%	31	7.0%
	2-5 hours	193	55.5%	64	68.8%	257	58.3%
	6-9 hours	114	32.8%	14	15.1%	128	29.0%
	10-24 hours	15	4.3%	1	1.1%	16	3.6%
	More than 24 hours	9	2.6%	0	0.0%	9	2.0%
*Q5. Importance**	Exercise/fitness	346	3.8	93	4.3	439	3.9
	Mental clarity	345	4.2	92	4.1	437	4.2
	Enjoy nature/be outdoors	346	4.7	93	4.6	439	4.7
	Socialize	343	2.7	89	3.2	432	2.8
	Relax/unwind	346	3.9	90	4	436	3.9
	Solitude	345	3.4	89	3.1	434	3.4
*Q16. Fulfillment**	City/County Parks	342	2.8	90	2.9	432	2.8
	State Parks/Forests	345	4.2	90	4.3	435	4.2
	National Parks/Forests**	345	4.8	N/A	N/A	**	**
	National Parks**	N/A	N/A	92	4.7	528	4.8
	National Forests**	N/A	N/A	91	4.6	**	**
Q13. Too Crowded	No - the more the merrier	6	1.7%	10	10.9%	16	3.6%
	No - but we are reaching capacity	28	8.1%	5	5.4%	33	7.5%
	Unsure/Other	125	36.0%	25	27.2%	150	34.2%
	Yes - good problem to have	102	29.4%	37	40.2%	139	31.7%
	Yes - something must be done	86	24.8%	15	16.3%	101	23.0%
Q14. Increase in Hikers	Positive impact	6	1.7%	6	6.5%	12	2.7%
	No impact / unsure	77	22.1%	24	25.8%	101	22.9%
	Negative impact	265	76.2%	63	67.7%	328	74.4%

** Q5 & Q16: Not a required answer so (n) varies.*
*** Due to wording differences between the two surveys, Q16 has differing responses*

4.1.3: New Media Variables

The prevalence of new media use was measured through six questions[62]. The first two questions asked users to identify how often they use new media, making a distinction between social media and all other forms of new media. For social media usage, the intercept and online surveys had a moderate level of variance. Intercept survey participants, as a whole, indicated that they were less likely to share information/pictures on social media than the online survey respondents. For example, 24% of intercept survey respondents indicated that they never share information/photos on social media, as opposed to just under 6% of online survey takers. Likewise, 49% of online survey takers either "frequently" or "nearly always" share information, as opposed to 29% of intercept survey respondents. With regards to the sharing of information via other forms of new media, respondents of both surveys indicated that they share information less frequently than on social media (see Table 4.3 next page).

[62] There were two questions about the frequency of new media usage, two questions on the specific platforms used, and two questions about how people respond for hikes.

Table 4.3: Results of new media variables for both the online and intercept surveys

		Survey Type						
Variables		Online		Intercept		Aggregate		
		N	%	N	%	N	%	
Q7. Social Media Sharing	Never	20	5.6%	23	24.2%	43	9.7%	
	Occasionally	61	17.5%	20	21.1%	81	18.3%	
	Sometimes	69	19.8%	14	14.7%	83	18.7%	
	Frequently	81	23.3%	16	16.8%	97	21.9%	
	Nearly Always	89	25.6%	12	12.6%	101	22.8%	
	Always	28	8.1%	10	10.5%	38	8.6%	
Q8. New Media Sharing	Never	157	45.1%	54	56.8%	211	47.6%	
	Occasionally	95	27.3%	25	26.3%	120	27.1%	
	Sometimes	45	12.9%	8	8.4%	53	12.0%	
	Frequently	27	7.8%	4	4.2%	31	7.0%	
	Nearly Always	17	4.9%	2	2.1%	19	4.3%	
	Always	7	2.0%	2	2.1%	9	2.0%	
*Q9. Social Media Platforms**	Facebook	293	84.2%	51	54.8%	344	77.6%	
	Flick'r	3	0.9%	1	1.1%	4	0.9%	
	Instagram	205	58.9%	41	44.1%	246	55.5%	
	Snapchat	55	15.8%	15	16.1%	70	15.8%	
	Twitter	8	2.3%	5	5.4%	13	2.9%	
	I do not share info	27	7.8%	18	19.4%	45	10.2%	
	Other	22	6.3%	10	10.8%	32	7.2%	
*Q10. New Media Platforms**	AllTrails	37	10.8%	7	7.5%	44	9.9%	
	Cascade Climbers	4	1.2%	1	1.1%	5	1.1%	
	NW Hikers	19	5.6%	3	3.2%	22	5.0%	
	Strava	14	4.1%	3	3.2%	17	3.8%	
	WTA	131	38.3%	29	30.9%	160	36.1%	
	I do not share info	168	49.1%	58	61.7%	226	51.0%	
	Other	25	7.3%	5	5.3%	30	6.8%	
Q11. Learn about Hikes	Social media post	51	14.7%	2	2.2%	53	12.1%	
	Online hiking forums	168	48.3%	18	20.0%	186	42.5%	
	Book	42	12.1%	10	11.1%	52	11.9%	
	Print article	4	1.2%	0	0.0%	4	0.9%	
	Digital article	4	1.2%	3	3.3%	7	1.6%	
	Online blog	2	0.6%	0	0.0%	2	0.5%	
	Friend/acquaintance	50	14.4%	51	56.7%	101	23.1%	
	Other	27	7.8%	6	6.7%	33	7.5%	

Table 4.3 -- Continued									
*Q12. Preparation for Hikes**	Social media post	113	32.5%		8	8.7%		121	27.3%
	Online hiking forums	322	92.5%		54	58.7%		376	84.8%
	Book	142	40.8%		9	9.8%		151	34.1%
	Print article	29	8.3%		1	1.1%		30	6.8%
	Digital article	70	20.1%		3	3.3%		73	16.5%
	Online blog	56	16.1%		4	4.4%		60	13.5%
	Friend/acquaintance	177	50.9%		31	33.7%		208	47.0%
	No other info used	8	2.3%		14	15.2%		22	5.0%
	Other	34	9.8%		6	6.5%		40	9.0%
Q10 and Q12: Respondents could select all that apply, response percentages are based on total participants (online survey N = 348, intercept survey N = 95, Aggregate Total N = *443).*									

The next two questions (Table 4.3) asked users to indicate the new media platforms that they often use. Again, this category divided new media into two distinct categories, social media and all other types of digital media usage. Responses were generally consistent across both survey types for both questions. For social media sites, survey respondents indicated that they share information and/or photos on platforms such as Facebook (78%), Instagram (56%), and Snapchat (16%) the majority of the time. While other social media platforms such as Twitter (3%) and Flick'r (1%) rarely see usage. With regards to new media usage beyond social media, the results are a bit different. Although a solid proportion of individuals indicated that they share info/photos on sites such as the Washington Trails Association (36%) and AllTrails (10%), the most common response, across both survey instruments, was "I do not share information" (51%).

The final two new media questions (Q11 and Q12) asked users to a) identify where they first learned about a hike, and b) what sources they use to prepare for hikes. There is a moderate amount of variation between the proportions of responses found

when comparing the online and intercept surveys, specifically with regards to where participants indicated that they learn about hikes (Table 4.3 above). Respondents of the online survey indicated four primary sources of information: online hiking/trails forums (48%), social media (15%), friend/acquaintance (14%), and books (12%). Similarly, the top four sources of information for intercept survey participants were friend/acquaintance (57%), online hiking/trails forum (20%), books (11%), and "other" (7%). Overall, the sources of information used to find hikes is similar between the two survey instruments, however the percentages associated with both vary considerably. Beyond the primary sources of information listed above, less than 4% of all respondents indicated that they learned about a hike through an online blog (0.5%), print (1%) or digital (2%) articles.

The primary sources of information used to prepare for a hike are more closely related between the two surveys. Overall, a strong majority of respondents indicated that they supplemented their knowledge of a hike by utilizing online hiking/trails forums (85%)[63]. Other responses which garnered strong support amongst respondents included friend/acquaintance (47%), books (34%), and social media posts (27%). An interesting distinction between the two surveys is that, although both surveys agree with the primary sources of information that are most commonly used, their proportions are noticeably different. For example, roughly 93% of individuals who took the online survey indicated that they use online hiking/trail forums as a supplemental source of information, conversely, 59% of intercept survey respondents indicated that they did. More interestingly, and perhaps expectedly, the results indicate that participants of the online

[63] Online hiking / Trails forums include sites such as AllTrails and the WTA for example.

survey use, in general, more sources of information than those who participated in the intercept survey[64].

In general, the descriptive data from the two survey instruments align reasonably well with each other. Over the last few paragraphs I have briefly explored each of the variables and have sought to point out some notable exceptions to this rule. In the next section, specific variables are examined in order to better inform the discussion which explores the complex relationship between hiking and new media prevalence.

4.2: Statistical Analysis

4.2.1: Contingency Tables

Contingency tables for the three new media variables[65] were created as part of the analysis in order to accompany the statistical tests of association. The new media variables were analyzed for association with the hiking and demographic variables[66] for the three data sets (online, intercept, and combined). In total, nine contingency tables were produced. This section highlights and briefly summarizes a few of the more outstanding results found in each of the combined (intercept and online) data set tables. All nine of the contingency tables can be viewed in their entirety in Appendix 6.5.

[64] Question twelve is a "choose all that apply" response. Participants in the online survey (n = 348) selected a total of 951 responses, for an average of 2.7 responses (sources utilized) per participant. Participants in the intercept surveys (n = 95) selected a total of 130 responses, for an average of 1.4 responses (sources utilized) per participant.
[65] Social media sharing, new media sharing, and learn about hikes.
[66] Age, race, gender, education level, income, formal affiliation, hiking frequency, and importance factors.

Share on Social Media

A number of interesting results emerged from the social media contingency tables. The first was that the percentage of individuals who "never" share information or photos on social media coincided with an overall low percentage of hiking frequency across the board. Another was the frequency to which individuals share information on social media (see Table 4.4 below). Generally speaking, individuals whose age falls between 31 and 45 were the most likely to share information. In total, 7.4% of respondents between the ages of 31 and 45 indicated that they never share information on social media; while 54.8% fell into the "often" and "always" categories. Conversely, 18-30 years old had response rates of 8.8% and 52.7%, while individuals 46 and older had 13% and 52.5% respectively.

Table 4.4: Age and sharing variables cross-tabulated with social media variables from the combined data set

	Share on Social Media				
Age	Never	Seldom	Often	Always	% of Whole
18-30	2.1%	9.2%	10.1%	2.5%	23.9%
31-45	2.8%	14.2%	18.3%	2.3%	37.6%
46+	5.0%	13.3%	16.3%	3.9%	38.5%
Grand Total	9.9%	36.7%	44.7%	8.7%	100.0%

*Results from Pearson's chi squared test showed no statistically significant associations between these two variables in the original analysis. Test statistic (6.421) and *p*-value (0.3778).

In terms of the importance variables, a few interesting anomalies are present in the social media tables (4.5 & 4.6, next page). Before addressing those anomalies however, a quick caveat. In both of the following tables (4.5 & 4.6), the means of each importance variable are presented, as opposed to proportions, because the mean offers the

simplest way to graphically present the data for ordinal variables. It is also important to note that, when the chi squared statistical tests were computed for these variables, they were analyzed as categorical variables.

The first anomaly present in these two tables is that the mean of the solitude variable decreases as the use of social media increases. Conversely, the means of both the mental clarity and relax/unwind variables rise as social media use increases[67]. Unfortunately, the "seldom" and "often" categories of the sharing on social media variable contain the vast majority of responses, while "always" and "never" are typically quite small. This makes finding interesting and relevant information more difficult because the data sets for the other categories are quite small and cannot offer much in the form of statistical (or practical) significance.

Table 4.5: Importance variables cross-tabulated with share on social media variable from the combined data set.

	Share on Social Media				
Importance	Never	Seldom	Often	Always	Average
Exercise/Fitness	4.3	3.9	3.8	4.3	3.9
Mental Clarity	4.0	4.1	4.2	4.4	4.2
Enjoy Nature/Be Outdoors	4.8	4.6	4.8	4.8	4.7
Socialize Family/Friends	2.8	2.7	2.9	2.9	2.8
Relax/Unwind	3.6	3.9	3.9	4.4	3.9
Solitude	3.6	3.4	3.3	3.2	3.4

*The means of each importance variable are reported in this table, as opposed to proportions. The means are presented as they reflect the difference between the columns for each of the variables in the simplest and most coherent way. See Appendix 6.8 for proportions by column.

**Results from Pearson's chi squared test showed no statistically significant associations between the above variables in the original analysis with one exception: exercise and fitness. Test statistic (24.234) and *p*-value (0.0189).

[67] Other variables (Exercise/Fitness, Enjoy Nature/Be Outdoors, and Socialize with Family/Friends) in this set produced inconsistent results.

Share on New Media

In each of the data sets (combined, intercept, and online), new media sharing was unpopular. Although it is one of the variables selected for analysis in this research, and the results are theoretically relevant, the results of the contingency tables are somewhat less useful than both the statistical analysis and the descriptive statistics. That said, the results of the contingency tables for new media sharing are consistent—more than 80% of all respondents fall into the categories of never and seldom for each variable assessed (with the exception of importance which is a measurement of the mean, not a percentage). Due to the large number of responses in the first two categories, the percentages from each of the columns (never, seldom, often, and always) are +/- 2% of each other across the board.

Table 4.6: Contingency table of importance and sharing on new media variables from the combined data set.

	Share on New Media				
Importance	**Never**	**Seldom**	**Often**	**Always**	**Average**
Exercise/Fitness	3.9	4.0	3.8	4.4	3.9
Mental Clarity	4.1	4.1	4.4	4.7	4.2
Enjoy Nature/Be Outdoors	4.7	4.8	4.8	4.6	4.7
Socialize Family/Friends	2.9	2.8	2.5	2.9	2.8
Relax/Unwind	3.9	3.9	4.1	4.6	3.9
Solitude	3.3	3.4	3.5	3.7	3.4

*The means of each importance variable are reported in this table, as opposed to proportions. The means are presented as they reflect the difference between the columns for each of the variables in the simplest and most coherent way. See Appendix 6.8 for proportions by column.

**Results from Pearson's chi squared test showed no statistically significant associations between the above variables in the original analysis with one exception: Solitude. Test statistic (25.035) and *p*-value (0.0147).

The variables in the importance category from new media sharing align well with two of the highlighted variables from the social media sharing table. There is however, a

notable difference between the two. In the new media table, solitude increases in importance as an individual shares information, while the inverse is true in the social media table (see Tables 4.5 & 4.6).

Learn about Hikes

As seen previously in the survey descriptive tables, individuals seem to learn about hikes by using new media sources much more often than from other sources. This reliance on new media remained true regardless of which descriptive variable (age, sex, hiking frequency, etc.) was analyzed in the contingency tables. The contingency table analysis found two variables, age and gender, to be most strongly related to new media usage when analyzed jointly. In general, younger participants (18-30 and 31-45 years old) indicated that they use new media as a source at a higher rate than did the oldest group (46+ years old).

Table 4.7: Contingency table of information source and age from the combined data set

	Information Source			
Age	New Media	Friend / Acquaintance	Other	% Used New Media to Learn about a Hike
18-30	14.2%	5.6%	4.0%	59.9%
31-45	24.0%	7.4%	6.3%	63.7%
46+	18.6%	10.2%	9.8%	48.2%
Column Total	56.7%	23.3%	20.0%	-

*Results from Pearson's chi squared test showed a nearly statistically significant association between these two variables in the original analysis. Test statistic (9.053) and *p*-value (0.0598).

With regards to gender, respondents who identified as a woman tended to utilize new media as a source for hikes more at a higher rate than did men. Almost 60% of

women surveyed indicated that they use new media as their information source for learning about a hike, compared to 52.7% of men.

Table 4.8: Contingency table of information source and gender from the combined data set.

	Information Source			
Gender	New Media	Friend / Acquaintance	Other	% Used New Media to Learn about a Hike
Female	40.8%	15.1%	12.8%	59.4%
Male	16.5%	7.7%	7.2%	52.7%
Column Total	57.3%	22.7%	20.0%	-

*Results from Pearson's chi squared test showed no statistically significant associations between these two variables in the original analysis. Test statistic (1.907) and *p*-value (0.3854).

Finally, the frequency to which an individual goes hiking also seems to be associated with an increase in new media usage. Responses from each of the four categories were: less than once a month (50.8%), once or twice a month (56.5%), once a week (56.2%), and several days a week (67%). In other categories, results did not appear to conform to a trend. Additionally, in contrast from the previous contingency tables, every importance variable was inconsistent across the board for the information source variable.

Table 4.9: Contingency table of information source and hiking frequency from the combined data set.

	Information Source			
Hiking Frequency	New Media	Friend / Acquaintance	Other	% Used New Media to Learn about a Hike
Less than once a month	6.2%	4.4%	1.6%	50.8%
Once or twice a month	25.3%	10.8%	8.7%	56.5%
Once a week	18.2%	6.0%	8.3%	56.2%
Several days a week	7.1%	1.8%	1.6%	67%
Grand Total	56.8%	23.0%	20.2%	-

*Results from Pearson's chi squared test showed a nearly statistically significant association between these two variables in the original analysis. Test statistic (10.939) and *p*-value (0.0903).

4.2.2: Statistically Significant Associations

Testing for associations between several variables was conducted using Pearson's chi squared. Prior to this testing however, the data sets (intercept and online) were tested for statistical differences in the samples. This was accomplished by creating a new categorical variable, survey type (intercept or online), and using chi squared to find if survey type was associated with responses, as shown in Table 4.10 (below).

Variables that were statistically different between the two survey types included: gender, race, formal affiliation with an environmental group/agency, the importance of exercise/fitness and socializing, information sharing on social media, and learning about hikes. The differences for each of these variables are briefly discussed here. Gender had a significantly higher response rate for females in the online survey than the intercept. For race, we found that the intercept survey actually had statistically higher levels of racial diversity than did the online. However, for formal affiliation, the reverse was true; response rates were much lower for the intercept survey than the online.

Table 4.10: Statistical differences between surveys as determined using chi squared

Online and Intercept Data Sets	*Statistically Different?*		*Online and Intercept Data Sets*	*Statistically Different?*
Age			Importance: Mental Clarity	
Gender	Yes (**p < 0.0001**)		Importance: Enjoy Nature/Outdoors	(†)
Race	Yes (**p = 0.0285**)		Importance: Socialize	Yes (**p = 0.0070**)
Education Level			Importance: Relax/Unwind	
Household Income			Importance: Solitude	
Affiliation	Yes (**p = < 0.0001**)		Share on Social Media	Yes (**p = 0.0001**)
Hiking Frequency			Share on New Media	
Importance: Exercise/Fitness	Yes (**p = 0.0021**)		Learn about Hikes	Yes (**p < 0.0001**)

(†) indicates a value of less than 5 in at least one cell for that variable

The importance questions (exercise/fitness and socialize) were statistically significant; with both questions scoring significantly higher on the intercept survey. For two of the variables, sharing on social media and learning about hikes, the differences were quite stark. The online data set typically learned about hikes through social media and nearly all of the respondents shared info on Facebook. For the intercept data set, the majority of individuals learned about a hike through a friend, while just over half of them reported that they shared information on Facebook.

Due to the statistical differences between the survey types for some variables, each survey type was analyzed separately. Statistical analysis was also performed on the combined data set, although some sampling bias (in favor of online responses) are likely present in some of the results. In addition, during the analysis process, several of the tests did not meet the assumptions of chi squared (with some cell values not high enough) (see Table 4.11). In order to alleviate the warning for as many of the individual tests as possible, the three variables were recoded and collapsed with fewer response options. This achieved the desired effect, however, many of the statistically significant results were lost as a result of the further collapsing of the three variables. There are things to be learned from both analyses, as such, they are both presented here in an effort to provide both transparency as well as an accurate picture of the analytical results. It must be restated however, that the original analysis violated the assumptions of chi squared so its statistical significance is useful only in the sense that it provides transparency and a more complete picture of the analysis.

Original and Secondary Analysis

The statistically significant associations found, in both the original and secondary analyses, paint a picture of association between several of the variables. When we look at the original analysis for example (Table 4.11—page 72), we find that every variable (except for four of the importance variables) were statistically significant[68] in at least one data set, for at least one of the categories. Four variables in specific--age, gender, affiliation, and hiking frequency—were consistently significant as each had at least three significant test results amongst the different data sets. This is important because it offers clues into the internal motivators of recreational hikers, as well as which groups might be more prone to utilize new media in the context of recreational hiking; a topic revisited in later sections of this work.

As noted previously, the original analysis violates the assumptions of the chi squared test, so we must take caution and be sure to not place too much stock in the results. However, a few of the variables in specific did show strong levels of association. In the original analysis, gender was the only variable which had at least one significant test result in each of the three columns (share on social/new media and learn about hikes). The original analysis showed that gender (females specifically) is associated with an individual's propensity to share information/photos, on both social media sites and new media sites in general. This association, according to the original analysis, is strong as five out of six cells found statistically significant results.

[68] Statistical significance is established with a *p* value of 0.05. Unless otherwise stated, and for the purposes of this section, nearly significant results are also included when "statistically significant results" are mentioned.

4.11: Statistical associations using chi squared--original analysis									
	New Media Variables								
	Share on Social Media			Share on New Media			Learn about Hikes		
Other Variables	Intercept	Online	Combined	Intercept	Online	Combined	Intercept	Online	Combined
Age				**p = 0.0649**				**p = 0.0347**	**p = 0.0598**
Gender	**p = 0.0163**	**p = 0.0094**	**p < 0.0001**		**p = 0.0138**	**p = 0.0102**		**p = 0.0940**	
Race							**p = 0.0327**		**p = 0.0184**
Education Level			**p = 0.0737**	**p = 0.0037**					
Household Income								**p = 0.0583**	**p = 0.0898**
Affiliation				**p = 0.0331**	**p = 0.0346**	**p = 0.0026**		**p = 0.0129**	**p = 0.0001**
Hiking Frequency					**p = 0.0006**	**p = 0.0028**		**p = 0.0053**	**p = 0.0903**
Importance: Exercise/ Fitness			**p = 0.0189**						
Importance: Mental Clarity									
Importance: Enjoy Nature/ Outdoors								**p = 0.0769**	**p = 0.0854**
Importance: Socialize									
Importance: Relax/Unwind									
Importance: Solitude					**p = 0.0238**	**p = 0.0147**			

Affiliation was strongly associated with new media information/photo sharing. Each of the three data sets returned positive association between an individual's affiliation with an environmental agency or organization and their likelihood to share information on new media. Directionality was established by through a cross-tabulation analysis which identified proportions of respondents who indicated they were likely to share information versus those who were not, based on formal affiliation. Affiliation was also associated positively with the "learn about hikes" variable. This association

however, was only present in the online and combined data sets. The intercept data set returned a statistical error for this same variable. Hiking frequency was strongly associated with both the new media and where individuals learn about hikes variables. Once again however, the association was limited to the online and combined data sets.

Interestingly, the majority of statistically significant associations, found in Table 4.11, seems to come primarily from the online data source. In the original analysis, only five statistically significant test results came from the intercept surveys. Conversely, eleven significant results were generated from the online data and thirteen were generated when the data sets were combined. In addition, the vast majority of tests ran on intercept survey data came back with the statistical warning previously mentioned, whereas the online had slightly fewer and the combined data set had the fewest statistical errors.

As was previously discussed, a secondary analysis was conducted due to the frequency of statistical errors encountered in the original analysis. This new analysis (Table 4.12) collapsed the three variables into smaller categories in an attempt to limit the statistical errors. In this endeavor the analysis was generally successful, however, it also removed many of the statistically significant findings from the first analysis. The original analysis returned twenty-nine statistically significant results, while the secondary analysis returned just eleven. Additionally, only two of the eleven statistically significant results from the original remained in the second analysis, while nine new significant results were recorded.

The results of the secondary analysis were evenly distributed among the different data sets (three for intercept and four each for online and combined). Also, no variables in the secondary analysis achieved more than three statistically significant results. The

significant variables include: age (3 results), gender (2 results), race and education level (one each) and the importance of exercise/fitness and socialization (two each).

Table 4.12: Statistical associations using chi squared--secondary analysis

	New Media Variables								
	Share on Social Media			Share on New Media			Learn about Hikes		
Other Variables	Intercept	Online	Combined	Intercept	Online	Combined	Intercept	Online	Combined
Age		**p = 0.0337**	**p = 0.0063**					**p = 0.0590**	
Gender							**p = 0.0186**	**p = 0.0997**	
Race				**p = 0.0487**					
Education Level									**p = 0.0539**
Household Income									
Affiliation									
Hiking Frequency									
Importance: Exercise/ Fitness								**p = 0.0724**	**p = 0.0035**
Importance: Mental Clarity									
Importance: Enjoy Nature/ Outdoors									
Importance: Socialize	**p = 0.0118**		**p = 0.0649**						
Importance: Relax/Unwind									
Importance: Solitude									

The results of the secondary analysis indicate that age is negatively associated with social media sharing, although this finding was not consistent with the intercept data. Inferences about directionality were made by analyzing variables jointly in a cross-tabulated table and identifying proportionalities where they existed. In some cases, no clear trend was present and, as a result, directionality could not be established.

Interestingly, gender was associated with where an individual learns about hikes from both data sets, however, the association went in opposite directions with the two data sets. The intercept data associated males more strongly with new media usage, while the online data associated females with new media usage more strongly than males. The combined data set found no significance between the two.

Other statistically significant results (race and education level), beyond the importance variables whose values are mean-based, are difficult to assess. The race category was collapsed down to two categories--white and non-white—and education level down to three—no college, AA/tech/bachelor's, post-graduate. As a result, there is little, if any, practical significance with regards to the race and education level variables, despite the significant test results.

In all, the results found that there are a number of statistically significant associations, both between the variables analyzed and the data sets themselves. The table below provides a summary of the statistically significant associations found between the two analyses. The red asterisk indicates that significance was found in the first analysis, while a blue asterisk indicates that there was significance found in the secondary.

Table 4.13: Summary of significance tables – both analyses

	New Media Variables								
	Share on Social Media			Share on New Media			Learn about Hikes		
Other Variables	Intercept	Online	Combined	Intercept	Online	Combined	Intercept	Online	Combined
Age		*	*	*				**	*
Gender	*	*	*		*	*	*	**	
Race				*			*		*
Education Level			*	*					*
Household Income								*	*
Affiliation				*	*	*		*	*
Hiking Frequency					*	*		*	*
Importance: Exercise/Fitness			*					*	*
Importance: Mental Clarity									
Importance: Enjoy Nature/Outdoors								*	*
Importance: Socialize	*		*						
Importance: Relax/Unwind									
Importance: Solitude					*	*			

** denotes significant (p value of less than 0.05), or nearly significant (p value of less than 0.10), associations between each of the variables presented.*

Chapter 5.0: Discussion & Conclusion

This section is divided into four sections. The first is the discussion section which examines and interprets the significance of the results and ties it back to the theoretical frameworks found in Chapter 2. The second section addresses some of the limitations of this study and offers strategies to avoid duplication of those limitations. The third section discusses the steps that can be taken to build upon the research presented in this work and the final section offers a few brief concluding remarks.

5.1 Discussion

The work presented in this research was intended to test four different null hypotheses[69] (see Chapter 3.2). In that venture the project was generally successful, although the level of success is not complete. Each of the null hypothesis were rejected at least once by the chi squared analysis due to the level of statistical significance for each hypothesis.

The strongest, or most consistently significant, factors typically involved gender and age. Over the two analyses (the original and secondary), gender had the highest numbers of statistical significance test results (8 out of 9 significant results), with age being a close second (6 out of 9 significant results). These two variables are also the only ones to earn statistical significance in at least one category in both analyses. Additionally,

[69] The null hypothesis, as detailed in Chapter 3.2. 1) neither gender nor age is associated with an individual's likelihood to share information/photos on new media; 2) the frequency to which an individual engages in recreational hiking is not associated with their propensity to share information/photos on new media; 3) individuals who place a higher importance on certain reasons for hiking are equally likely to share information/photos as those who place a lower importance on the same benefits; and 4) there is no association between an individual's age or gender and their likelihood to learn about hikes from new media

the statistical tests from these two variables, across both analyses, revealed the fewest statistical errors.

The murkiness and inconsistency between the two analyses is important to recognize. While the original analysis offers more useful practical information, it is fraught with numerous statistical errors and is therefore statistically unreliable. As such, I have chosen to rely on the secondary analysis when deciding whether to accept or reject the null hypothesis. To this end, the results of the secondary analysis dictate that I must reject the null hypothesis in two instances, and fail to reject the null for the other two.

The two null hypothesis that must be rejected are: (#1) age and gender are not associated with new media sharing, and (#4) age and gender are not associated with an individual's likelihood to learn about a hike from new media. This is because there is simply too much raw data in the descriptive tables and too many positive statistically significant results to fail to reject these two hypotheses. The remaining nulls: (#2) the frequency to which an individual engages in recreational hiking is not associated with their propensity to share information/photos on new media; and (#3) individuals who place a higher importance on certain benefits of hiking are just as likely to share information/photos as those who place a lower importance on the same benefits; are highly inconsistent. Additionally, the descriptive and contingency tables offer no clear trend, therefore, I fail to reject both of these null hypotheses.

While statistical significance is often what causes excitement for researchers the practical (but non-statistical) significance of this study must also be considered. As the previous paragraphs alluded too, the analysis revealed mixed results; however, the raw data and descriptive information provided more (seemingly) conclusive results. For

instance, the online survey had a total of 348 responses, 251 of which identified as female.

The data contained in the descriptive tables contains a wealth of useful information and begs a series of questions. Why is it that 72% of the people who took the online survey were females? What drove them to be involved in the hiking groups in the first place? Why are they so overly represented in the online sample as opposed to the intercept, which had a near 50-50 distribution between males and females. And why did the online survey reveal a significantly higher number of social media users than did the intercept—was it sample bias, or is there something more in play? Unfortunately, these questions cannot be answered by the analysis done here, but the data collected still serves its purpose by prompting the questions which will (hopefully) lead to additional studies. Each of which will paint a new brush stroke in a much larger picture.

Although not directly addressed in this thesis, the crowding variables which were present on the survey are potentially significant and warrant a brief discussion. These questions, which asked questions on people's perceptions about trails being crowded, hit at the heart of this increase in hiking in the areas near urban city centers. In total, nearly 55% of respondents indicated that trails were too crowded, while 34% said they were unsure and just over 11% said they were not. Additionally, nearly 75% of respondent indicated that a continued increase in the number of hikers would have an overall negative impact on their experiences while hiking.

The crowding numbers are strikingly high given the fact that this survey was distributed in an exceptionally large hiking group that actively promotes hiking and is always acquiring new members. The significance of the crowding responses is that they

indicate a general negative feeling about individuals getting outdoors. Even still, the number of hikers continue to rise and the recreational hiking community continues to expand all across the state and throughout the country.

This increase in the recreational hiking community may be a positive thing for society. Consider, for example, the many benefits of hiking previously discussed[70]. Then examine the survey data and look for the most important reasons for getting outside (question 5), as self-reported by the survey participants. The highest response, for both survey types, was to "enjoy nature and be outdoors", with "mental clarity" being the next highest response. If engaging in recreational hiking can fulfill these two needs, whether that fulfillment is perceived or otherwise, then an increase in recreational hiking should (theoretically) be beneficial to any society.

When individuals are connected to a community, they begin to instill value and worth from actions taken to benefit both others and themselves in the group. In much the same way, users in the various hiking groups who participated in the survey must have felt some value in participating in the group-based survey, regardless of the fact that there was no external reward. Perhaps fulfilling a need that aren't aware that they have, or simply due to curiosity and not wanting to miss out on being a part of some potentially interesting research.

The value derived by those participating in the survey extends the line of thinking behind Self-Determination Theory (SDT) broadly, and Organismic Integration Theory—a sub-theory of SDT--(OIT) specifically. SDT deals with the extrinsic and intrinsic

[70] Some of these benefits were mentioned in Chapter 2, others are present in Appendix 6.4.

motivations of the actions that an individual makes. In this instance, OIT extends the SDT framework by adequately addressing the possible motivations behind an individual's decision to participate in either the online or intercept surveys. In response to the situation presented in the previous paragraph, OIT argues that individuals who are part of, or are longing to be part of, the hiking community would be more likely to participate in the research as they are likely to internalize the behavior as inherently valuable. The high response rate (56%) of the intercept surveys is evidence of the notion that individuals valued their own participation in the surveys, despite the fact that there was no external reward mechanism in place to encourage participation. Thus extending the OIT and SDT framework(s).

In the survey, questions 7 & 8 asked users about sharing information on social and new media. Overwhelmingly, respondents indicated that they shared information on social media much more often than on other types of new media. The divergent relationship between social media and all other types of new media suggests that individuals are sharing information not simply to be helpful, but to fulfill an otherwise latent need. If the idea were to simply inform others, then the usage of new media outlets (such as the WTA, blogs, articles, etc.) should be roughly comparable to the level of social media usage—but it isn't. Nearly 78% of respondents indicated that they use Facebook and 56% said that they use Instagram. Conversely however, the highest response from any of the new media categories is "I do not share information" at 51%, with the WTA coming in at a distant second with 36%. No new media platform, with the exception of the WTA, had a response rate of more than 10%.

Whatever the mechanism or rationale, it is clear that individuals are sharing information about hiking on social media at a much higher rate than other new media platforms. There are countless possible explanations for this phenomenon, yet it seems likely that there is at least one of two things at play, each of which extends one of the theories previously discussed in the literature review.

The first is that an individual's connection to social media and its inherent value to that person drives up the value of interactions on social media. If this explanation were to hold true, it would again extend the thinking behind OIT. As an individual integrates a particular behavior or action into their life/routine, the individual begins to add value to it. For social media, the degree to which an individual internalizes and values each of the reward mechanisms associated with each platform will necessarily impact that individual's desire to share on social media. Conversely, other types of new media (blogs, forums, etc.), are much less visible with a (conceivably) much weaker reward system. This disparity accounts for why individuals valuate social media at a much higher level and why it is used at a higher rate than other new media outlets.

Second, the desire to be perceived by others as exceptional, or at the very least to not be left out, solicits a desire to engage with social media at a much higher rate than other less "gratifying" media platforms--particularly when surrounded with groups that have like-minded interests (such as recreational hiking). If we examine both the Uses and Gratification Theory (UGT), as well as the Fear of Missing Out (FOMO), this explanation seems plausible. UGT would argue that individuals share on social media more often because of the reward mechanism inherent in social media, as opposed to other new media sources. When you receive a "like" or a positive "comment" on

something that you have posted, it is (generally) an exceptionally gratifying experience. To know (or at least think) that your peers admire the things that you say/share.

The explanation offered by FOMO is equally convincing. FOMO argues that people are inherently social and want to know what others are doing, even if only to validate their own actions. FOMO would posit that people post on social media more often because they want others to perceive them (or their actions) as desirable/enviable and/or to show that they aren't "missing out" on said activity. In a highly interconnected society, an individual's perceived social standing may be inexplicably tied to their social media account(s). In this way, FOMO accounts for the high usage of social media, as opposed to other, less visible forms of new media.

5.2 Limitations of this Study

This study faced several limiting factors, both with the process of implementing the surveys as well as the data collected from the surveys themselves, some of which have previously been discussed. First of all, the research employed a nonprobability sampling design drawing on two convenience sampling procedures – thus, the results are not generalizable to the larger population of Washington State. Second, the seasonal timing of the survey was not conducive towards the goal of a high level of participation for intercept survey participation. Third, the study was constrained by a narrow time frame and limited funding, both of which limited the amount of respondents that could be reached.

The survey questions themselves presented this research with some limitations. Although the questions asked were designed specifically to address the research question, the wording on a few of them could have been clearer. In an attempt to allow respondents more latitude with their answers, I choose to err on the side of more classifications instead of fewer, a decision which at times complicated (or nullified) the analysis which was being performed. Additionally, significance testing was limited to chi squared due to the categorical nature of most measures. Future studies should consider the value of employing more Likert-style questions on the survey that can be more easily and flexibly analyzed.

Finally, the mixed-methods approach of conducting both an online as well as an intercept survey were well-intentioned, but failed to truly produce the results desired for two reasons. First, the online survey utilized a different sample of respondents than did the intercept surveys. Although the online survey was posted in hiking organizations that were based in Washington State, membership of those groups in entirely obligation-free and anyone can technically be a member – thus, while the intercept survey had a very specific and targeted audience, the online survey was broad and minimal controls were in place to constrain the sample.

Second, the size of the two data sets were heavily skewed in favor of the online survey. While not a problem when analyzing the data sets separately, this skew became a problem when the joint analysis was conducted; this is because the combined results are heavily biased in favor of the online data. Future studies should attempt to correct this error by either: a) choosing one method and focusing on it exclusively, or, b) putting controls in place to ensure that participation between the two surveys can be managed

effectively and efficiently. This research project could've used a weighted sampling method to effectively manage the data from the two data sets; ultimately however, scoping and time constraints removed this as a feasible option for this research project.

5.3 Next Steps

Future studies should continue to focus on the role of new media, by focusing on specific aspects of the field. Facebook, Instagram and the WTA website appear to be the primary means of information sharing, at least for the two data sets this work collected. Researchers can build upon this data by focusing their efforts on these three new media platforms by studying their influential and motivational capacity in encouraging individuals to participate in outdoor hiking.

This study produced a number of different findings. One such finding was that there is an association between gender and the sharing of information on social media, with females having a higher propensity to do so. Future studies should expand upon this finding, as there have been similar findings in many other studies—some of which were identified previously in Chapter 2—in other activities. In addition to gender, it may be useful for researchers to consider age. Specifically focusing on two factors: whether younger women are more likely to engage in recreational hiking than previous generations of women and whether or not the same women are likely to engage in solo hiking trips.

Another finding of this study is that new media is heavily utilized. This finding was true both in regards to the sharing of information, as well as to where individuals

indicated that they learn about new hikes. The significance of this finding, while at least partially expected, cannot be under-emphasized. Future studies can build upon this research by adding data to support this finding, as well as asking new questions. What factors are enabling new media to be such a potent force with regards to recreational hiking? What implications are there for the hiking community and for the trails which they use? Should public land managers be utilizing this technology universally or selectively? Each of these questions warrant analysis, particularly because there is very little literature on the subject.

Finally, future studies should explore the intersection of different hiking factors and new media. The research presented here asked some basic questions about hiking preferences, but did delve deeply into the topic. It is possible (likely even) that individuals are more or less likely to share information based on the type of hiker that they are (day-hiker, rock-climber, trail-runner, etc.). Future studies can help illuminate these differences by assessing the differences between hikers and their use of new media.

5.4 Conclusion

The impact of new media on recreational activities such as hiking is a relatively new field. The research presented in this work looked at a number of different factors that may be associated with an increase in recreational hiking. Although the analysis didn't serve to illuminate the research question directly, it did link several positive associations with new media. In addition, the raw data and the descriptive tables associated with them provided useful inferential data that may prove very useful to various public entities and researchers.

The methods employed in this thesis revealed many associations between new media and a variety of other variables. Variables such as age, gender, formal affiliation, etc. all revealed statistically significant associations in at least one of the different analysis. Some associations, such as gender, appear to be quite strong; while others, such as race and education level, appear to be less so. The four null hypotheses discussed in Section 3.2 highlight these associations quite well. Of the four nulls, there was significant statistical evidence to reject two (#1 and #4), while the other two (#2 and #3) failed to be rejected[71]. The two nulls which were rejected both involved the intersection between age and gender demographics and their association with new media usage. The two nulls which could not be rejected were related to the motivations and frequency of recreational hiking and their association to new media usage.

The findings of this research project have also worked to extend the theoretical framework presented in Section 2.4. Two situations were discussed in relation to the theoretical frameworks. The first was the internal motivations which drive an individual to participate in survey research of this type. This situation was discussed through the lens of Organismic Integration Theory which posited that as person is integrated into a group (hikers for example), that individual is more likely to participate in group-like functions. Secondly, the propensity for an individual to use social media, as opposed to other new media outlets, is adequately explained by each of the theories discussed in Section 2.4 (Uses and Gratifications Theory, Organismic Integrations Theory, and the Fear of Missing Out). In essence, each of these theories argue that there is a greater value

[71] See Section 3.2 for a list of the four null hypotheses.

associated with social media, and that explains its level of usage as compared to other new media platforms.

The stated topic of this study was to research the role of new media in promulgating recreational hiking. To that end, the study was successful as it was able to quantifiably measure the extent to which new media (and social media in specific) is being utilized. On the survey, more than 90% of respondents indicated that they share information about hikes on social media at least occasionally; over 53% stated that they share information frequently to always. In addition to establishing the prevalence of information sharing via social media, this study also found that nearly 57% of individuals learn about hikes using a new media source, with a similar percentage using new media to supplement their knowledge of a hike. These results highlight the potential effect and influential capacity of new media in the realm of recreational hiking (and other activities as well!).

The findings of this research reveal the need for additional attention in the field of new media from academics and researchers alike. As discussed in previous sections, new media has been demonstrated to have a powerful influence in a number of different areas in society (for a review see Section 2.3). The work presented here is yet one more example of this influence. Future studies should endeavor to build upon the findings presented in this study to help us to further understand the role of new media, both in recreational hiking as well as in other aspects of society. In so doing, public land managers, environmentalists, and recreationalists alike will be able to effectively leverage these studies to better inform both themselves and the general public. And we, as a

society will move one step closer to understanding the profound role that new media is playing, both in our everyday lives as well as in our leisure activities.

Chapter 6.0: Appendixes

6.1: Survey Questions (Online and Intercept)

The intercept and online surveys utilized the same questions, with slight wording variations on three questions. Of the three variations, two (Q11 & Q12) were purely contextual and one (Q16) had a slightly different response option. Additionally, the online survey had two questions which were not present on the intercept survey, for readability purposes, they are listed at the bottom of this appendix. In this appendix, blue lettering is utilized to denote the difference(s) between the two surveys.

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1. In general, do you typically hike alone, with a partner, or in a group? (Select one option)
    a. Alone
    b. Partner
    c. Group
2. On average, how many days per month do you go hiking for fun or exercise? (Select one option)
    a. Less than once a month
    b. Once or twice a month
    c. Once a week
    d. Several days a week
3. On average, about how much time do you typically spend on each hike or hiking trip? (Select one option)
    a. Less than 2 Hours
    b. 2 – 5 Hours
    c. 6 – 9 Hours
    d. 10 – 24 Hours
    e. More than 24 Hours
4. On average, about how far (in miles) do you travel to go hiking (i.e., to get to the trailhead)? (Select one option)
    a. Less than 20 Miles
    b. 20 – 39 Miles
    c. 40 – 59 Miles
    d. 60 – 79 Miles
    e. More than 80 Miles

5. How important are each of the following reasons for going hiking today? (Each response is its own sub-question, measured on a 1-5 Likert Scale)
    a. Exercise and Fitness
    b. Mental Clarity
    c. Enjoy Nature and Be Outdoors
    d. Socialize with Family/Friends
    e. Relax and Unwind
    f. Solitude
6. Are you formally affiliated (member, employee, etc.) with an environmental or hiking focused organization or agency (such as a state or federal agency, the Washington Trails Association (WTA), The Mountaineers, etc.)? (Select one option)
    a. Yes
    b. No
7. After finishing (or during) a hike, how often do you share pictures online using social media platforms, such as Facebook, Instagram, Snapchat, Twitter, or other application? (Select one option)
    a. Never
    b. Occasionally
    c. Sometimes
    d. Frequently
    e. Nearly Always
    f. Always
8. How often do you write and share details about your hiking trip using trip report websites or other new media platforms (i.e, WTA, Cascade Climbers, AllTrails, or an online forum or blog)? (Select one option)
    a. Never
    b. Occasionally
    c. Sometimes
    d. Frequently
    e. Nearly Always
    f. Always
9. Which social media platform(s) do you frequently use to share your photos and/or details about your experiences on hikes? (Check all that apply)
    a. Facebook

b. Instagram
c. Snapchat
d. Flickr
e. Twitter
f. I do not share photos/details via social media
g. Other (Please specify) _____

10. Which new media platform(s) do you frequently use to share your photos and/or details about your experiences on hikes? (Check all that apply)
    a. Washington Trails Association
    b. Cascade Climbers
    c. Strava
    d. AllTrails
    e. NW Hikers
    f. I do not share photos/details on other media outlets
    g. Other (Please specify) _____
11. (Intercept Survey): How did you first learn about this hike? (Select one option)
    (Online Survey): Where do you typically first learn about hikes you want to complete? (Select one option)
    a. Social media post (Facebook, Instagram, etc.)
    b. Online hiking/trails forum (WTA, AllTrails, etc.)
    c. Book
    d. Print article (newspaper, magazine, or other publication)
    e. Online article (digital newspaper, magazine, or other publication)
    f. Online blog
    g. Friend or acquaintance
    h. Other (Please specify) _____
12. (Intercept Survey): What forms of information supplemented your knowledge of this hike? (Check all that apply)
    (Online Survey): When preparing for a hike, which of the following resources do you typically utilize? (Check all that apply)
    a. Social media post (Facebook, Instagram, etc.)
    b. Online hiking/trails forum (WTA, AllTrails, etc.)
    c. Book
    d. Print article (newspaper, magazine, or other publication)

e. Online article (such as a newspaper, magazine, or other publication)
f. Online blog
g. Friend or acquaintance
h. No other information sources were used
i. Other (Please specify) _____

13. Do you feel that the hiking trails along the I-90 corridor, between Bellevue and Ellensburg, are too crowded? (Select one option)
    a. No – The more the merrier
    b. No – But we are beginning to reach capacity
    c. Unsure
    d. Yes – But I believe it's an overall good problem to have
    e. Yes – Something needs to be done
    f. Other (Please specify) _____
14. Hypothetically, would an increase in the number of hikers on your favorite trail have an impact on your overall hiking experience? (Select one option)
    a. Positive impact
    b. No impact
    c. Negative impact
    d. Unsure
15. Which, if any, of the following types of hiking areas along the I-90 corridor do you feel are too crowded? (Check all that apply)
    a. City parks
    b. County parks
    c. State parks or state forests
    d. National forests
    e. None of the above
16. How fulfilling is hiking in each of these different types of areas for you personally?[72] (Each response is its own sub-question, measured on a 1-5 Likert Scale)
    a. City and county parks
    b. State parks and forests
    c. National parks
    d. National forests

[72] In the online survey – National Parks and Forests are one category, the intercept survey separates them into two categories.

17. In what year were you born (i.e. 2000)?
    a. (Fill-in-the-blank response)
18. What is your sex? (Select one option)
    a. Male
    b. Female
    c. Non-Binary/Other
19. What is your race? (Check all that apply)
    a. Black or African American
    b. Asian / Pacific Islander
    c. American Indian / Alaskan Native
    d. Caucasian / White
    e. Other (please specify) _____
20. What is your ethnicity? (Select one option)
    a. Hispanic
    b. Non-Hispanic
21. What is the highest level of education you have completed? (Select one option)
    a. High School / GED
    b. Some College
    c. Associates / Technical Degree
    d. Bachelor's Degree (B.A., B.S., Etc.)
    e. Master's Degree (M.A., M.S., etc.)
    f. Professional or Doctorate Degree
22. What is your household's annual gross income? (Select one option)
    a. $0-$24,999
    b. $25,000-$49,999
    c. $50,000-$74,999
    d. $75,000-$99,999
    e. $100,000-$124,999
    f. $125,000-$149,999
    g. $150,000-$199,999
    h. $200,00 or more

Online Only Questions

I. Did you engage in recreational hiking along the I-90 corridor, between Bellevue and Ellensburg, at any point in 2018?
    a. Yes
    b. No

II. Please use this space to provide comments, if you have any, on the role and/or impact of new media on recreational hiking (fill-in-the-blank response).

6.2: Intercept Survey Response Log

Intercept Survey Log Book							
	Twin Falls	**Chirico Trail**	**Highpoint Trail**	**Rattlesnake Ledge**	**Franklin Falls**	**Mount Si**	**Totals**
Date	2/17/2019	2/18/2019	2/21/2019	3/3/2019	3/10/2019	3/15/2019	
Time Spent Surveying	3H, 40M	3H	2H, 40M	2H, 25M	2H, 30M	3H, 15M	17H, 30M
Weather Conditions	Mostly Cloudy (33-38 deg.)	Clouds & Rain (34-38 deg.)	Clouds & Rain (34-38 deg.)	Mostly Cloudly (36-42 deg.)	Mostly Sunny (34-38 deg.)	Mostly Sunny (49-56 deg.)	
Individuals Approached	35	18	33	42	21	22	171
Surveys Completed at Trailhead	20	9	12	16	12	12	81
Mailed Surveys Distributed	2	3	10	14	N/A	N/A	29
Mailed Surveys Returned	2	0	7	5	N/A	N/A	14

Intercept Survey Summary Table							
Total Time Spent Surveying	**Individuals Approached**	**Surveys Completed at Trail**	**Mail-in Surveys Distributed**	**Mail-in Surveys Returned**	**Mail-in Response Rate**	**Cumulative Response Rate**	**Total Responses**
17 Hours & 30 Minutes	171	81	29	14	48%	56%	95

6.3: Survey Response Tables

Table 1: Demographic Variables

Variable	Categories or Range	Online		Intercept		Aggregate	
		N	% or Mean	N	% or Mean	N	% or Mean
*Q17. Age (18+)**	(Range 18-66)	342	(m) = 40*	94	(m) = 43*	436	(m) = 41*
	18-30 years	83	24.3%	21	22.3%	104	23.9%
	31-45 years	130	38.0%	34	36.2%	164	37.6%
	46 & over	129	37.7%	39	41.5%	168	38.5%
Q18. Gender	Male	92	26.5%	45	47.9%	137	31.1%
	Female	251	72.3%	49	52.1%	300	68.0%
	Non-Binary	4	1.2%	0	0.0%	4	0.9%
*Q19. Race**	Black or African American	2	0.6%	3	3.2%	5	1.1%
	Asian / Pacific Islander	20	5.8%	12	12.8%	32	7.2%
	American Indian / Alaskan Native	3	0.9%	3	3.2%	6	1.4%
	Caucasian / White	322	93.3%	81	86.2%	403	91.0%
	Other	12	3.5%	0	0.0%	12	2.7%
Q20. Ethnicity	Hispanic	9	2.6%	5	5.3%	14	3.2%
	Not Hispanic	335	97.4%	89	94.7%	424	96.8%
Q21. Education Level	High School / GED	12	3.5%	3	3.2%	15	3.4%
	Some College	39	11.2%	8	8.6%	47	10.7%
	Associates / Technical Degree	39	11.2%	7	7.5%	46	10.5%
	Bachelor's Degree	138	39.8%	39	41.9%	177	40.2%
	Post-Graduate (M.A., Ph.D, etc.)	119	34.3%	36	38.7%	155	35.2%
Q22. Household Income	$0-$49,999	61	18.6%	12	13.5%	73	17.5%
	$50,000-$99,999	127	38.7%	30	33.7%	157	37.6%
	$100,000-$149,999	73	22.3%	24	27.0%	97	23.3%
	Over $150,000	67	20.4%	23	25.8%	90	21.6%
Q6. Affiliation	Yes	181	52.0%	19	20.0%	200	45.1%
	No	167	48.0%	76	80.0%	243	54.9%

Age* = (m = median age) Participants were asked to identify their age by year of birth. Ages are assumed based on end of year birth age and may be +/- 1 year of actual age (categories: 1989-2001, 1974-1988, & __-1973). Mean is calculated to nearest whole number.

Race* = Percentage totals exceed 100% as participants were able to select all that apply.

Table 2a: Hiking Variables

		Online		Intercept		Aggregate	
Variable	**Categories or Range**	**N**	**% or Mean**	**N**	**% or Mean**	**N**	**% or Mean**
Q1. Hiking Style	Alone	87	25.0%	18	19.8%	105	23.9%
	Partner	203	58.3%	58	63.7%	261	59.5%
	Group	58	16.7%	15	16.5%	73	16.6%
Q2. Frequency	Less than once a month	45	12.9%	9	9.7%	54	12.2%
	1-2 times/month	152	43.7%	43	46.2%	195	44.2%
	Once a week	114	32.8%	29	31.2%	143	32.4%
	Several days a week	37	10.6%	12	12.9%	49	11.1%
Q3. Time Spent	Less than 2 hours	17	4.9%	14	15.1%	31	7.0%
	2-5 hours	193	55.5%	64	68.8%	257	58.3%
	6-9 hours	114	32.8%	14	15.1%	128	29.0%
	10-24 hours	15	4.3%	1	1.1%	16	3.6%
	More than 24 hours	9	2.6%	0	0.0%	9	2.0%
Q4. Distance Traveled	Less than 20 miles	86	24.8%	33	35.9%	119	27.1%
	20-39 miles	68	19.6%	26	28.3%	94	21.4%
	40-59 miles	82	23.6%	20	21.7%	102	23.2%
	60-79 miles	81	23.3%	10	10.9%	91	20.7%
	More than 80 miles	30	8.7%	3	3.3%	33	7.5%
(online only) Hike I-90	Yes	258	74.1%	N/A	N/A	258	74.1%
	No	90	25.9%	N/A	N/A	90	25.9%
*Q5. Importance**	Exercise/fitness	346	3.8	93	4.3	439	3.9
	Mental clarity	345	4.2	92	4.1	437	4.2
	Enjoy nature/be outdoors	346	4.7	93	4.6	439	4.7
	Socialize	343	2.7	89	3.2	432	2.8
	Relax/unwind	346	3.9	90	4	436	3.9
	Solitude	345	3.4	89	3.1	434	3.4
*Q16. Fulfillment**	City/County Parks	342	2.8	90	2.9	432	2.8
	State Parks/Forests	345	4.2	90	4.3	435	4.2
	National Parks/Forests**	345	4.8	N/A	N/A	**	**
	National Parks**	N/A	N/A	92	4.7	528	4.8
	National Forests**	N/A	N/A	91	4.6	**	**

Importance* = Measured on a scale from 1-5, 1 being not important at all and 5 being very important. Not a required answer, so (n) varies answer to answer.

Fulfillment* = Measured on a scale from 1-5; 1 being not fulfilling at all and 5 being very fulfilling. Not a required answer, so (n) varies answer to answer. **The intercept survey separated the National Parks and Forests categories. Fulfillment score obtained from combining groups and dividing by the total number of responses.

Table 2b: Crowding Variables

		Online		Intercept		Aggregate	
Variable	**Categories or Range**	**N**	**% or Mean**	**N**	**% or Mean**	**N**	**% or Mean**
Q13. Too Crowded	No - the more the merrier	6	1.7%	10	10.9%	16	3.6%
	No - but we are reaching capacit	28	8.1%	5	5.4%	33	7.5%
	Unsure/Other	125	36.0%	25	27.2%	150	34.2%
	Yes - good problem to have	102	29.4%	37	40.2%	139	31.7%
	Yes - something must be done	86	24.8%	15	16.3%	101	23.0%
Q14. Increase in Hikers	Positive impact	6	1.7%	6	6.5%	12	2.7%
	No impact / unsure	77	22.1%	24	25.8%	101	22.9%
	Negative impact	265	76.2%	63	67.7%	328	74.4%
*Q15. Crowded Areas**	City parks	32	9.2%	11	11.6%	43	9.7%
	County parks	55	15.8%	16	16.8%	71	16.0%
	State parks/forests	198	56.9%	48	50.5%	246	55.5%
	National forests	180	51.7%	37	38.9%	217	49.0%
	None of the above	55	15.8%	26	27.4%	81	18.3%

Crowded Areas* = *Participants could select all that apply, percentage is based on total number of participants or (n), (total of n = 348 + 95 = 443).*

Table 3: New Media Variables

		Online		Intercept		Aggregate	
Variable	**Categories or Range**	**N**	**% or Mean**	**N**	**% or Mean**	**N**	**% or Mean**
Q7. Social Media Sharing	Never	20	5.6%	23	24.2%	43	9.7%
	Occasionally	61	17.5%	20	21.1%	81	18.3%
	Sometimes	69	19.8%	14	14.7%	83	18.7%
	Frequently	81	23.3%	16	16.8%	97	21.9%
	Nearly Always	89	25.6%	12	12.6%	101	22.8%
	Always	28	8.1%	10	10.5%	38	8.6%
Q8. New Media Sharing	Never	157	45.1%	54	56.8%	211	47.6%
	Occasionally	95	27.3%	25	26.3%	120	27.1%
	Sometimes	45	12.9%	8	8.4%	53	12.0%
	Frequently	27	7.8%	4	4.2%	31	7.0%
	Nearly Always	17	4.9%	2	2.1%	19	4.3%
	Always	7	2.0%	2	2.1%	9	2.0%
*Q9. Social Media Platforms**	Facebook	293	84.2%	51	54.8%	344	77.6%
	Flick'r	3	0.9%	1	1.1%	4	0.9%
	Instagram	205	58.9%	41	44.1%	246	55.5%
	Snapchat	55	15.8%	15	16.1%	70	15.8%
	Twitter	8	2.3%	5	5.4%	13	2.9%
	I do not share info	27	7.8%	18	19.4%	45	10.2%
	Other	22	6.3%	10	10.8%	32	7.2%
*Q10. New Media Platforms**	AllTrails	37	10.8%	7	7.5%	44	9.9%
	Cascade Climbers	4	1.2%	1	1.1%	5	1.1%
	NW Hikers	19	5.6%	3	3.2%	22	5.0%
	Strava	14	4.1%	3	3.2%	17	3.8%
	WTA	131	38.3%	29	30.9%	160	36.1%
	I do not share info	168	49.1%	58	61.7%	226	51.0%
	Other	25	7.3%	5	5.3%	30	6.8%

Q9, Q10, & Q12 = Respondents were able to select multiple answers. Percentages are based on total of participants or (n), (total of n = 348 + 95 = 443).*

Table continues on next page…

Table 3: New Media Variables - Continued

		Online		Intercept		Aggregate	
Variable	**Categories or Range**	**N**	**% or Mean**	**N**	**% or Mean**	**N**	**% or Mean**
Q11. Learn about Hikes	Social media post	51	14.7%	2	2.2%	53	12.1%
	Online hiking/trails forum	168	48.3%	18	20.0%	186	42.5%
	Book	42	12.1%	10	11.1%	52	11.9%
	Print article	4	1.2%	0	0.0%	4	0.9%
	Digital article	4	1.2%	3	3.3%	7	1.6%
	Online blog	2	0.6%	0	0.0%	2	0.5%
	Friend/acquaintance	50	14.4%	51	56.7%	101	23.1%
	Other	27	7.8%	6	6.7%	33	7.5%
*Q12. Preparation for Hikes**	Social media post	113	32.5%	8	8.7%	121	27.3%
	Online hiking/trails forum	322	92.5%	54	58.7%	376	84.8%
	Book	142	40.8%	9	9.8%	151	34.1%
	Print article	29	8.3%	1	1.1%	30	6.8%
	Digital article	70	20.1%	3	3.3%	73	16.5%
	Online blog	56	16.1%	4	4.4%	60	13.5%
	Friend/acquaintance	177	50.9%	31	33.7%	208	47.0%
	No other info was used	8	2.3%	14	15.2%	22	5.0%
	Other	34	9.8%	6	6.5%	40	9.0%

Q9, Q10, & Q12 = Respondents were able to select multiple answers. Percentages are based on total of participants or (n), (total of n = 348 + 95 = 443).*

6.4a: Combined Data Contingency Tables: Share on Social Media

		Share on Social Media				
		Never	Seldom	Often	Always	
Age	18-30	2.1%	9.2%	10.1%	2.5%	23.9%
	31-45	2.8%	14.2%	18.3%	2.3%	37.6%
	46+	5.0%	13.3%	16.3%	3.9%	38.5%
	Grand Total	9.9%	36.7%	44.7%	8.7%	100.0%
Sex	Female	4.3%	24.3%	31.8%	8.2%	68.6%
	Male	5.5%	12.8%	12.6%	0.5%	31.4%
	Grand Total	9.8%	37.1%	44.4%	8.7%	100.0%
Race	Black/African American	0.0%	0.7%	0.4%	0.0%	1.1%
	Asian/Pacific Islander	0.9%	2.4%	2.0%	1.7%	7.0%
	American Indian/Alaskan Native	0.0%	0.2%	0.9%	0.2%	1.3%
	White/Caucasian	8.7%	31.7%	40.4%	7.2%	88.0%
	Other	0.0%	1.7%	0.7%	0.2%	2.6%
	Grand Total	9.6%	36.7%	44.3%	9.4%	100.0%
Education	High School/GED	0.2%	0.7%	1.8%	0.7%	3.4%
	Some College	0.9%	3.2%	4.8%	1.8%	10.7%
	Associates/Technical Degree	1.1%	3.2%	4.8%	1.4%	10.5%
	Bachelor's Degree	3.0%	16.8%	18.0%	2.5%	40.2%
	Master's Degree	3.6%	8.6%	12.0%	2.3%	26.6%
	Professional/Doctorate Degree	0.9%	4.5%	3.2%	0.0%	8.6%
	Grand Total	9.8%	37.0%	44.5%	8.6%	100.0%
Income	$0-$49,999	1.7%	5.0%	8.4%	2.4%	17.5%
	$50,000-$99,999	4.1%	12.0%	18.2%	3.4%	37.6%
	$100,000-$149,999	2.4%	9.8%	9.8%	1.2%	23.3%
	Over $150,000	1.7%	9.1%	9.4%	1.4%	21.6%
	Grand Total	9.8%	36.0%	45.8%	8.4%	100.0%
Affiliation	No	7.0%	19.2%	23.7%	5.0%	54.9%
	Yes	2.7%	17.8%	21.0%	3.6%	45.1%
	Grand Total	9.7%	37.0%	44.7%	8.6%	100.0%
Hiking Frequency	Less than once a month	1.8%	5.4%	3.9%	1.1%	12.2%
	Once or twice a month	3.6%	16.1%	21.8%	2.7%	44.2%
	Once a week	3.2%	11.8%	13.2%	4.3%	32.4%
	Several days a week	1.1%	3.6%	5.9%	0.5%	11.1%
	Grand Total	9.8%	37.0%	44.7%	8.6%	100.0%
Importance	Exercise/Fitness	4.3	3.9	3.8	4.3	3.9
	Mental Clarity	4.0	4.1	4.2	4.4	4.2
	Enjoy Nature/Be Outdoors	4.8	4.6	4.8	4.8	4.7
	Socialize Family/Friends	2.8	2.7	2.9	2.9	2.8
	Relax/Unwind	3.6	3.9	3.9	4.4	3.9
	Solitude	3.6	3.4	3.3	3.2	3.4

6.4b: Combined Data Contingency Tables: Information Source

		Share on New Media				
		Never	Seldom	Often	Always	
Age	18-30	13.3%	8.3%	1.6%	0.7%	23.9%
	31-45	17.0%	14.4%	5.7%	0.5%	37.6%
	46+	17.0%	16.5%	4.1%	0.9%	38.5%
	Grand Total	47.2%	39.2%	11.5%	2.1%	100.0%
Sex	Female	32.3%	24.7%	9.6%	2.1%	68.6%
	Male	15.8%	13.7%	1.8%	0.0%	31.4%
	Grand Total	48.1%	38.4%	11.4%	2.1%	100.0%
Race	Black/African American	0.4%	0.7%	0.0%	0.0%	1.1%
	Asian/Pacific Islander	3.1%	3.3%	0.4%	0.2%	7.0%
	American Indian/Alaskan Native	0.7%	0.7%	0.0%	0.0%	1.3%
	White/Caucasian	42.1%	34.1%	10.0%	1.7%	88.0%
	Other	1.3%	1.1%	0.2%	0.0%	2.6%
	Grand Total	47.6%	39.7%	10.7%	2.0%	100.0%
Education	High School/GED	1.6%	0.7%	0.7%	0.5%	3.4%
	Some College	5.5%	4.8%	0.5%	0.0%	10.7%
	Associates/Technical Degree	3.6%	5.2%	1.4%	0.2%	10.5%
	Bachelor's Degree	20.0%	16.1%	3.2%	0.9%	40.2%
	Master's Degree	12.7%	9.5%	3.9%	0.5%	26.6%
	Professional/Doctorate Degree	4.3%	2.7%	1.6%	0.0%	8.6%
	Grand Total	47.7%	39.1%	11.1%	2.0%	100.0%
Income	$0-$49,999	8.2%	7.2%	1.4%	0.7%	17.5%
	$50,000-$99,999	17.7%	13.4%	5.8%	0.7%	37.6%
	$100,000-$149,999	10.8%	10.6%	1.4%	0.5%	23.3%
	Over $150,000	11.3%	7.0%	3.1%	0.2%	21.6%
	Grand Total	48.0%	38.1%	11.8%	2.2%	100.0%
Affiliation	No	30.5%	18.5%	5.2%	0.7%	54.9%
	Yes	17.2%	20.5%	6.1%	1.4%	45.1%
	Grand Total	47.6%	39.1%	11.3%	2.0%	100.0%
Hiking Frequency	Less than once a month	8.4%	3.9%	0.0%	0.0%	12.2%
	Once or twice a month	22.2%	17.0%	4.5%	0.5%	44.2%
	Once a week	12.7%	14.1%	4.8%	0.9%	32.4%
	Several days a week	4.3%	4.3%	1.8%	0.7%	11.1%
	Grand Total	47.6%	39.2%	11.1%	2.0%	100.0%
Importance	Exercise/Fitness	3.9	4.0	3.8	4.4	3.9
	Mental Clarity	4.1	4.1	4.4	4.7	4.2
	Enjoy Nature/Be Outdoors	4.7	4.8	4.8	4.6	4.7
	Socialize Family/Friends	2.9	2.8	2.5	2.9	2.8
	Relax/Unwind	3.9	3.9	4.1	4.6	3.9
	Solitude	3.3	3.4	3.5	3.7	3.4

6.4c: Combined Data Contingency Tables: Information Source

		Information Source (Learn about Hikes)			
		New Media	Friend/Acquaintance	Other	
Age	18-30	14.2%	5.6%	4.0%	23.7%
	31-45	24.0%	7.4%	6.3%	37.7%
	46+	18.6%	10.2%	9.8%	38.6%
	Grand Total	56.7%	23.3%	20.0%	100.0%
Sex	Female	40.8%	15.1%	12.8%	68.7%
	Male	16.5%	7.7%	7.2%	31.3%
	Grand Total	57.3%	22.7%	20.0%	100.0%
Race	Black/African American	0.0%	0.7%	0.2%	0.9%
	Asian/Pacific Islander	2.7%	2.9%	1.3%	6.9%
	American Indian/Alaskan Native	0.2%	0.7%	0.4%	1.3%
	White/Caucasian	51.8%	19.0%	17.5%	88.3%
	Other	2.0%	0.2%	0.4%	2.7%
	Grand Total	56.6%	23.5%	19.9%	100.0%
Education	High School/GED	1.4%	0.5%	1.4%	3.2%
	Some College	5.8%	2.3%	2.8%	10.8%
	Associates/Technical Degree	6.5%	2.5%	1.6%	10.6%
	Bachelor's Degree	23.0%	10.4%	6.9%	40.3%
	Master's Degree	16.1%	5.3%	5.3%	26.7%
	Professional/Doctorate Degree	4.4%	1.8%	2.1%	8.3%
	Grand Total	57.1%	22.8%	20.0%	100.0%
Income	$0-$49,999	10.2%	5.3%	2.2%	17.7%
	$50,000-$99,999	22.3%	7.5%	7.5%	37.4%
	$100,000-$149,999	10.7%	6.1%	6.3%	23.1%
	Over $150,000	13.8%	4.4%	3.6%	21.8%
	Grand Total	57.0%	23.3%	19.7%	100.0%
Affiliation	No	30.0%	16.2%	8.0%	54.2%
	Yes	26.8%	6.9%	12.1%	45.8%
	Grand Total	56.8%	23.1%	20.1%	100.0%
Hiking Frequency	Less than once a month	6.2%	4.4%	1.6%	12.2%
	Once or twice a month	25.3%	10.8%	8.7%	44.8%
	Once a week	18.2%	6.0%	8.3%	32.4%
	Several days a week	7.1%	1.8%	1.6%	10.6%
	Grand Total	56.8%	23.0%	20.2%	100.0%
Importance	Exercise/Fitness	3.9	4.0	4.0	3.9
	Mental Clarity	4.2	4.0	4.2	4.2
	Enjoy Nature/Be Outdoors	4.8	4.6	4.7	4.7
	Socialize Family/Friends	2.7	3.1	2.7	2.8
	Relax/Unwind	4.0	3.8	4.0	3.9
	Solitude	3.3	3.2	3.7	3.4

6.5a: Online Data Contingency Tables: Share on Social Media

		Share on Social Media				
		Never	Seldom	Often	Always	% of Column
Age	18-30	1.8%	9.1%	11.1%	2.3%	24.3%
	31-45	1.8%	14.3%	19.9%	2.0%	38.0%
	46+	2.3%	13.5%	18.1%	3.8%	37.7%
	Grand Total	5.8%	36.8%	49.1%	8.2%	100.0%
Sex	Female	3.5%	25.4%	36.4%	7.9%	73.2%
	Male	2.3%	12.0%	12.2%	0.3%	26.8%
	Grand Total	5.8%	37.3%	48.7%	8.2%	100.0%
Race	White/Caucasian	5.0%	33.1%	45.1%	7.0%	90.2%
	Not White/Caucasian	0.6%	4.5%	3.1%	1.7%	9.9%
	Grand Total					357
Education	No College Degree	2.0%	20.7%	24.8%	3.5%	51.0%
	AA/Tech/Bachelors Degree	1.2%	3.7%	7.5%	2.3%	14.7%
	Post-Graduate Degree	2.6%	12.7%	16.7%	2.3%	34.3%
	Grand Total	5.8%	37.2%	49.0%	8.1%	100.0%
Income	$0-$49,999	0.9%	5.5%	9.5%	2.7%	18.6%
	$50,000-$99,999	2.4%	12.8%	20.1%	3.4%	38.7%
	$100,000-$149,999	1.5%	8.5%	11.3%	0.9%	22.3%
	Over $150,000	0.9%	8.8%	9.8%	0.9%	20.4%
	Grand Total	5.8%	35.7%	50.6%	7.9%	100.0%
Affiliation	No	2.6%	17.5%	23.6%	4.3%	48.0%
	Yes	3.2%	19.8%	25.3%	3.7%	52.0%
	Grand Total	5.7%	37.4%	48.9%	8.0%	100.0%
Hiking Frequency	Less than once a month	0.5%	2.5%	1.8%	0.6%	5.4%
	Once or twice a month	2.1%	12.9%	19.1%	2.1%	36.2%
	Once a week	2.1%	15.7%	18.6%	4.3%	40.8%
	Several days a week	0.5%	5.2%	11.0%	1.0%	17.6%
	Grand Total	5.2%	36.4%	50.4%	8.0%	100.0%
Importance	Exercise/Fitness	3.9	3.9	3.7	4.1	3.8
	Mental Clarity	4.1	4.1	4.2	4.3	4.2
	Enjoy Nature/Be Outdoors	5.0	4.6	4.8	4.9	4.7
	Socialize Family/Friends	2.3	2.6	2.9	2.6	2.7
	Relax/Unwind	3.6	3.9	3.9	4.4	3.9
	Solitude	3.5	3.5	3.4	3.3	3.4

6.5b: Online Data Contingency Tables: Share on New Media

		Share on New Media				
		Never	Seldom	Often	Always	% of Column
Age	18-30	12.9%	9.4%	1.8%	0.3%	24.3%
	31-45	16.4%	14.9%	6.1%	0.6%	38.0%
	46+	15.2%	16.4%	5.0%	1.2%	37.7%
	Grand Total	44.4%	40.6%	12.9%	2.0%	100.0%
Sex	Female	33.2%	26.5%	11.4%	2.0%	73.2%
	Male	12.2%	13.1%	1.5%	0.0%	26.8%
	Grand Total	45.5%	39.7%	12.8%	2.0%	100.0%
Race	White/Caucasian	41.2%	35.9%	11.5%	1.7%	90.2%
	Not White/Caucasian	3.6%	5.3%	0.6%	0.3%	9.8%
	Grand Total					357
Education	No College Degree	6.3%	6.3%	1.4%	0.6%	14.7%
	AA/Tech/Bachelors Degree	23.9%	20.2%	5.8%	1.2%	51.0%
	Post-Graduate Degree	14.7%	13.8%	5.5%	0.3%	34.3%
	Grand Total	45.0%	40.3%	12.7%	2.0%	100.0%
Income	$0-$49,999	7.6%	8.2%	1.8%	0.9%	18.6%
	$50,000-$99,999	18.0%	14.0%	6.1%	0.6%	38.7%
	$100,000-$149,999	10.1%	9.8%	1.8%	0.6%	22.3%
	Over $150,000	9.5%	7.6%	3.4%	0.0%	20.4%
	Grand Total	45.1%	39.6%	13.1%	2.1%	100.0%
Affiliation	No	25.0%	17.5%	5.2%	0.3%	48.0%
	Yes	20.1%	22.7%	7.5%	1.7%	52.0%
	Grand Total	45.1%	40.2%	12.6%	2.0%	100.0%
Hiking Frequency	Less than once a month	3.7%	1.7%	0.0%	0.0%	5.4%
	Once or twice a month	17.6%	14.1%	4.1%	0.5%	36.2%
	Once a week	14.7%	18.2%	7.2%	0.7%	40.8%
	Several days a week	5.2%	7.6%	3.3%	1.4%	17.6%
	Grand Total	41.2%	41.6%	14.5%	2.6%	100.0%
Importance	Exercise/Fitness	3.8	3.8	3.8	4.3	3.8
	Mental Clarity	4.1	4.1	4.4	4.9	4.2
	Enjoy Nature/Be Outdoors	4.7	4.8	4.8	4.6	4.7
	Socialize Family/Friends	2.7	2.8	2.5	2.9	2.7
	Relax/Unwind	3.9	3.9	4.1	4.6	3.9
	Solitude	3.4	3.5	3.5	3.7	3.4

6.5c: Online Data Contingency Tables: Information Source

		Information Source (Learn about Hikes)			
		New Media	Friend/Acquaintance	Other	% of Column
Age	18-30	16.4%	4.1%	3.8%	24.3%
	31-45	27.2%	3.2%	7.6%	38.0%
	46+	21.1%	7.3%	9.4%	37.7%
	Grand Total	64.6%	14.6%	20.8%	100.0%
Sex	Female	49.0%	11.1%	13.1%	73.2%
	Male	16.3%	2.9%	7.6%	26.8%
	Grand Total	65.3%	14.0%	20.7%	100.0%
Race	White/Caucasian	59.4%	12.9%	17.9%	90.2%
	Not White/Caucasian	5.3%	1.7%	2.8%	9.8%
	Grand Total				357
Education	No College Degree	8.4%	2.3%	4.0%	14.7%
	AA/Tech/Bachelors Degree	33.4%	8.6%	8.9%	51.0%
	Post-Graduate Degree	23.1%	3.5%	7.8%	34.3%
	Grand Total	64.8%	14.4%	20.7%	100.0%
Income	$0-$49,999	11.9%	4.0%	2.7%	18.6%
	$50,000-$99,999	26.2%	4.3%	8.2%	38.7%
	$100,000-$149,999	11.6%	4.0%	6.7%	22.3%
	Over $150,000	14.9%	2.7%	2.7%	20.4%
	Grand Total	64.6%	14.9%	20.4%	100.0%
Affiliation	No	32.2%	8.6%	7.2%	48.0%
	Yes	32.5%	5.7%	13.8%	52.0%
	Grand Total	64.7%	14.4%	21.0%	100.0%
Hiking Frequency	Less than once a month	2.9%	1.8%	0.7%	5.4%
	Once or twice a month	24.3%	4.3%	7.6%	36.2%
	Once a week	25.7%	4.3%	10.7%	40.8%
	Several days a week	12.9%	2.4%	2.4%	17.6%
	Grand Total	65.8%	12.8%	21.5%	100.0%
Importance	Exercise/Fitness	3.8	3.7	3.9	3.8
	Mental Clarity	4.2	3.8	4.2	4.2
	Enjoy Nature/Be Outdoors	4.8	4.5	4.8	4.7
	Socialize Family/Friends	2.7	2.9	2.6	2.7
	Relax/Unwind	4.0	3.6	4.0	3.9
	Solitude	3.4	3.3	3.8	3.4

6.6a: Intercept Data Contingency Tables: Share on Social Media

		Share on Social Media				
		Never	Seldom	Often	Always	% of Column
Age	18-30	3.2%	9.6%	6.4%	3.2%	22.3%
	31-45	6.4%	13.8%	12.8%	3.2%	36.2%
	46+	14.9%	12.8%	9.6%	4.3%	41.5%
	Grand Total	24.5%	36.2%	28.7%	10.6%	100.0%
Sex	Female	7.4%	20.2%	14.9%	9.6%	52.1%
	Male	17.0%	16.0%	13.8%	1.1%	47.9%
	Grand Total	24.5%	36.2%	28.7%	10.6%	100.0%
Race	White/Caucasian	22.2%	27.3%	24.2%	8.1%	81.8%
	Not White/Caucasian	2.0%	7.1%	5.1%	4.0%	18.2%
	Grand Total					99
Education	No College Degree	11.8%	17.2%	15.1%	5.4%	49.5%
	AA/Tech/Bachelors Degree	1.1%	4.3%	3.2%	3.2%	11.8%
	Post-Graduate Degree	11.8%	15.1%	9.7%	2.2%	38.7%
	Grand Total	24.7%	36.6%	28.0%	10.8%	100.0%
Income	$0-$49,999	4.5%	3.4%	4.5%	1.1%	13.5%
	$50,000-$99,999	10.1%	9.0%	11.2%	3.4%	33.7%
	$100,000-$149,999	5.6%	14.6%	4.5%	2.2%	27.0%
	Over $150,000	4.5%	10.1%	7.9%	3.4%	25.8%
	Grand Total	24.7%	37.1%	28.1%	10.1%	100.0%
Affiliation	No	23.2%	25.3%	24.2%	7.4%	80.0%
	Yes	1.1%	10.5%	5.3%	3.2%	20.0%
	Grand Total	24.2%	35.8%	29.5%	10.5%	100.0%
Hiking Frequency	Less than once a month	4.3%	3.2%	2.2%	0.0%	9.7%
	Once or twice a month	7.5%	18.3%	17.2%	3.2%	46.2%
	Once a week	8.6%	8.6%	6.5%	7.5%	31.2%
	Several days a week	4.3%	5.4%	3.2%	0.0%	12.9%
	Grand Total	24.7%	35.5%	29.0%	10.8%	100.0%
Importance	Exercise/Fitness	4.5	4.1	4.1	4.7	4.3
	Mental Clarity	4.0	4.2	4.0	4.5	4.1
	Enjoy Nature/Be Outdoors	4.6	4.6	4.5	4.8	4.6
	Socialize Family/Friends	3.2	2.9	3.4	3.7	3.2
	Relax/Unwind	3.6	4.1	3.9	4.4	4.0
	Solitude	3.6	3.0	2.8	3.2	3.1

6.6b: Intercept Data Contingency Tables: Share on New Media

		Share on New Media				
		Never	Seldom	Often	Always	% of Column
Age	18-30	14.9%	4.3%	1.1%	2.1%	22.3%
	31-45	19.1%	12.8%	4.3%	0.0%	36.2%
	46+	23.4%	17.0%	1.1%	0.0%	41.5%
	Grand Total	57.4%	34.0%	6.4%	2.1%	100.0%
Sex	Female	28.7%	18.1%	3.2%	2.1%	52.1%
	Male	28.7%	16.0%	3.2%	0.0%	47.9%
	Grand Total	57.4%	34.0%	6.4%	2.1%	100.0%
Race	White/Caucasian	46.5%	28.3%	5.1%	2.0%	81.9%
	Not White/Caucasian	11.1%	6.1%	1.0%	0.0%	18.2%
	Grand Total					99
Education	No College Degree	22.6%	25.8%	0.0%	1.1%	49.5%
	AA/Tech/Bachelors Degree	9.7%	2.2%	0.0%	0.0%	11.8%
	Post-Graduate Degree	25.8%	6.5%	5.4%	1.1%	38.7%
	Grand Total	58.1%	34.4%	5.4%	2.2%	100.0%
Income	$0-$49,999	10.1%	3.4%	0.0%	0.0%	13.5%
	$50,000-$99,999	16.9%	11.2%	4.5%	1.1%	33.7%
	$100,000-$149,999	13.5%	13.5%	0.0%	0.0%	27.0%
	Over $150,000	18.0%	4.5%	2.2%	1.1%	25.8%
	Grand Total	58.4%	32.6%	6.7%	2.2%	100.0%
Affiliation	No	50.5%	22.1%	5.3%	2.1%	80.0%
	Yes	6.3%	12.6%	1.1%	0.0%	20.0%
	Grand Total	56.8%	34.7%	6.3%	2.1%	100.0%
Hiking Frequency	Less than once a month	6.5%	3.2%	0.0%	0.0%	9.7%
	Once or twice a month	25.8%	17.2%	3.2%	0.0%	46.2%
	Once a week	16.1%	11.8%	1.1%	2.2%	31.2%
	Several days a week	8.6%	3.2%	1.1%	0.0%	12.9%
	Grand Total	57.0%	35.5%	5.4%	2.2%	100.0%
Importance	Exercise/Fitness	4.1	4.5	4.4	5.0	4.3
	Mental Clarity	4.0	4.3	4.4	4.0	4.1
	Enjoy Nature/Be Outdoors	4.5	4.7	4.6	4.5	4.6
	Socialize Family/Friends	3.2	3.3	2.6	3.0	3.2
	Relax/Unwind	4.0	4.0	3.6	4.5	4.0
	Solitude	3.1	3.0	3.4	3.5	3.1

6.6c: Intercept Data Contingency Tables: Information Source

		Information Source (Learn about Hikes)			
		New Media	Friend/Acquaintance	Other	% of Column
Age	18-30	5.7%	11.4%	4.5%	21.6%
	31-45	11.4%	23.9%	1.1%	36.4%
	46+	9.1%	21.6%	11.4%	42.0%
	Grand Total	26.1%	56.8%	17.0%	100.0%
Sex	Female	9.1%	30.7%	11.4%	51.1%
	Male	17.0%	26.1%	5.7%	48.9%
	Grand Total	26.1%	56.8%	17.0%	100.0%
Race	White/Caucasian	23.7%	43.0%	16.1%	82.8%
	Not White/Caucasian	2.2%	14.0%	1.0%	17.2%
	Grand Total				93
Education	No College Degree	13.8%	29.9%	6.9%	50.6%
	AA/Tech/Bachelors Degree	2.3%	4.6%	4.6%	11.5%
	Post-Graduate Degree	10.3%	21.8%	5.7%	37.9%
	Grand Total	26.4%	56.3%	17.2%	100.0%
Income	$0-$49,999	3.6%	10.7%	0.0%	14.3%
	$50,000-$99,999	7.1%	20.2%	4.8%	32.1%
	$100,000-$149,999	7.1%	14.3%	4.8%	26.2%
	Over $150,000	9.5%	10.7%	7.1%	27.4%
	Grand Total	27.4%	56.0%	16.7%	100.0%
Affiliation	No	21.3%	46.1%	11.2%	78.7%
	Yes	4.5%	11.2%	5.6%	21.3%
	Grand Total	25.8%	57.3%	16.9%	100.0%
Hiking Frequency	Less than once a month	3.4%	4.6%	1.1%	9.2%
	Once or twice a month	9.2%	33.3%	6.9%	49.4%
	Once a week	8.0%	16.1%	6.9%	31.0%
	Several days a week	4.6%	3.4%	2.3%	10.3%
	Grand Total	25.3%	57.5%	17.2%	100.0%
Importance	Exercise/Fitness	4.1	4.3	4.3	4.3
	Mental Clarity	4.0	4.1	4.3	4.1
	Enjoy Nature/Be Outdoors	4.6	4.6	4.3	4.6
	Socialize Family/Friends	3.2	3.2	3.0	3.2
	Relax/Unwind	4.0	4.0	4.1	4.0
	Solitude	3.0	3.1	3.3	3.1

6.7: Alternative Format for Table(s) 4.5 & 4.6

Table 4.5--Alternative: Contingency table of importance and sharing on social media variables from the combined data set.

	Share on New Media				
Importance	**Never**	**Seldom**	**Often**	**Always**	**Average**
Exercise/Fitness	83.3%	63.0%	61.9%	78.9%	65.8%
Mental Clarity	69.0%	75.2%	76.0%	78.9%	75.3%
Enjoy Nature/Be Outdoors	95.2%	92.0%	94.9%	100.0%	94.3%
Socialize Family/Friends	30.8%	21.4%	31.1%	31.6%	27.5%
Relax/Unwind	61.0%	67.9%	66.8%	83.8%	68.1%
Solitude	51.2%	47.2%	46.7%	32.4%	46.1%

Table 4.6--Alternative: Contingency table of importance and sharing on new media variables from the combined data set.

	Share on New Media				
Importance	**Never**	**Seldom**	**Often**	**Always**	**Average**
Exercise/Fitness	61.5%	71.1%	63.3%	77.8%	65.8%
Mental Clarity	72.5%	74.4%	87.8%	88.9%	75.3%
Enjoy Nature/Be Outdoors	92.3%	95.4%	100.0%	88.9%	94.3%
Socialize Family/Friends	29.2%	29.1%	14.3%	33.3%	27.5%
Relax/Unwind	67.6%	64.3%	79.6%	88.9%	68.1%
Solitude	44.7%	47.6%	44.9%	55.6%	46.1%

Chapter 7.0: Bibliography

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