



MSU Graduate Theses

Spring 2021


Exploring the Influence of Self-Efficacy and Autonomy on Outdoor Recreation Behaviors during the Covid-19 Pandemic

Katheryn E. Carpenter

Missouri State University, Katheryn102@live.missouristate.edu

As with any intellectual project, the content and views expressed in this thesis may be considered objectionable by some readers. However, this student-scholar's work has been judged to have academic value by the student's thesis committee members trained in the discipline. The content and views expressed in this thesis are those of the student-scholar and are not endorsed by Missouri State University, its Graduate College, or its employees.

Follow this and additional works at: <https://bearworks.missouristate.edu/theses>

 Part of the [Health and Medical Administration Commons](#), [Mental and Social Health Commons](#), [Public Health Commons](#), [Social and Behavioral Sciences Commons](#), and the [Sports Sciences Commons](#)

Recommended Citation

Carpenter, Katheryn E., "Exploring the Influence of Self-Efficacy and Autonomy on Outdoor Recreation Behaviors during the Covid-19 Pandemic" (2021). *MSU Graduate Theses*. 3600.

<https://bearworks.missouristate.edu/theses/3600>

This article or document was made available through BearWorks, the institutional repository of Missouri State University. The work contained in it may be protected by copyright and require permission of the copyright holder for reuse or redistribution.

For more information, please contact bearworks@missouristate.edu.

**EXPLORING THE INFLUENCE OF SELF-EFFICACY AND AUTONOMY
ON OUTDOOR RECREATION BEHAVIORS DURING
THE COVID-19 PANDEMIC**

A Master's Thesis

Presented to

The Graduate College of

Missouri State University

In Partial Fulfillment

Of the Requirements for the Degree

Master of Science, Health Promotion and Wellness Management

By

Katheryn Elizabeth Carpenter

May 2021

Copyright 2021 by Katheryn Elizabeth Carpenter

EXPLORING THE INFLUENCE OF SELF-EFFICACY AND AUTONOMY ON OUTDOOR RECREATION BEHAVIORS DURING THE COVID-19 PANDEMIC

Public Health and Sports Medicine

Missouri State University, May 2021

Master of Science, Health Promotion and Wellness Management

Katheryn Elizabeth Carpenter

ABSTRACT

Outdoor Recreation (OR) provides the benefits of physical activity and traditional leisure along with the addition of the benefits associated with an outdoor environment. Self Determination Theory (SDT) and Social Cognitive Theory (SCT) state that self-efficacy (SE) and autonomy can increase depending on the physical and social environment. The purpose of this study was to explore the relationship between self-efficacy and autonomy on OR behaviors during the COVID-19 pandemic. It was hypothesized there would be a correlation between individuals who participate in OR activities and self-efficacy as well as autonomy. The research also explored barriers and facilitators to OR via qualitative data. Participant data was collected via a voluntary survey distributed nationwide using Qualtrics. Survey measures included demographics, OR behavior identification, COVID-19 Activity Survey, the Recreation Experience Preference Scale (REPV2), and the Outdoor Recreation Self-Efficacy Scale (ORSE). A statistically significant positive correlation existed between autonomy and self-efficacy ($r = 0.138, p < 0.01$), as well as between self-efficacy and pre/post pandemic OR behaviors 2020 ($r = 0.158, p < 0.01$), ($r = 0.129, p < 0.01$). respectively. Reported levels of autonomy and self-efficacy were high among participants at 9.85 ± 2.92 (out of 15 possible points) and 144.81 ± 25.37 (out of 190 points) respectively. Qualitative data implied barriers and facilitators to OR to be in four main categories: social, mental health, increased OR or physical activity, and activity change or identification. Implications from this research indicate a strong relationship between autonomy, self-efficacy, and OR.

KEYWORDS: Outdoor recreation, self-efficacy, autonomy, leisure, COVID-19, pandemic

**EXPLORING THE INFLUENCE OF SELF-EFFICACY
AND AUTONOMY ON OUTDOOR RECREATION BEHAVIORS
DURING THE COVID-19 PANDEMIC**

By

Katheryn Elizabeth Carpenter

A Master's Thesis
Submitted to the Graduate College
Of Missouri State University
In Partial Fulfillment of the Requirements
For the Degree of Master of Science, Health Promotion and Wellness Management

May 2021

Approved:

Sara Powell, Ph.D., Thesis Committee Chair

Melinda Novik, Ph.D., Committee Member

Hugh Gibson, Ed.D., Committee Member

Julie Masterson, Ph.D., Dean of the Graduate College

In the interest of academic freedom and the principle of free speech, approval of this thesis indicates the format is acceptable and meets the academic criteria for the discipline as determined by the faculty that constitute the thesis committee. The content and views expressed in this thesis are those of the student-scholar and are not endorsed by Missouri State University, its Graduate College, or its employees.

ACKNOWLEDGEMENTS

I would like to thank the following people for their support during the course of my graduate studies.

A special thank you to Dr. Sara Powell, the completion of this study could not have been possible without your help. I am sincerely grateful for your guidance and support throughout this process. I express gratitude for Dr. Hugh Gibson as he guided and fostered my interest in outdoor recreation throughout the course of my undergraduate studies, without which I would not be in this position today. Thank you as well to Dr. Melinda Novik for serving as a member of this committee.

Thank you to my close friends and relatives who have been understanding during this busy time and showed me patience and support. Lastly, to my immediate family members, parents Lisa and Matthew Carpenter as well as my brother Mark Carpenter. You each play a vital role in shaping the woman I am today.

TABLE OF CONTENTS

Introduction	Page 1
Purpose and Research Questions	Page 5
Hypotheses	Page 5
Delimitations	Page 6
Assumptions	Page 6
Definitions	Page 6
Significance	Page 7
Literature Review	Page 8
Recreation	Page 8
Outdoor Recreation	Page 11
Methods	Page 19
Participants	Page 19
Sampling Procedures	Page 19
Measures	Page 20
Data Collection	Page 22
Data Analysis	Page 22
Results	Page 24
Open-Ended Responses	Page 26
Discussion	Page 37
Data Limitations	Page 41
Recommendations for Future Research	Page 41
References	Page 44
Appendices	Page 49
Appendix A: IRB Approval	Page 49
Appendix B: Recruitment, Informed Consent, OR Behaviors	Page 50
Appendix C: Measures	Page 51
Appendix D: Additional Datasets	Page 63

LIST OF TABLES

Table 1. Travel for Outdoor Recreation Activities	Page 29
Table 2. Training Preferences for Outdoor Recreation	Page 29
Table 3. Intensity for Outdoor Recreation	Page 30
Table 4. Perceived Benefits of Outdoor Recreation	Page 30
Table 5. Effects of COVID-19 on Outdoor Recreation	Page 31
Table 6. Recreation Experience Preference Scale	Page 31
Table 7. Outdoor Recreation Self-Efficacy Scale	Page 32
Table 8. Descriptive Statistics and Correlations for Study Variables	Page 34
Table 9. Other Impacts of COVID-19 (open-ended response)	Page 35

LIST OF FIGURES

Figure 1: Change in Outdoor Activity Due to COVID-19

Page 36

INTRODUCTION

COVID-19, caused by the virus SARs-CoV-2, is a novel coronavirus that spreads from person to person via small respiratory droplets when an infected individual sneezes, coughs, or talks (CDC, 2020 August). Symptoms are usually flu-like but can progress to a severe viral pneumonia (CDC, 2020 August). The main practice used to slow the spread of the virus is social distancing and city or state-wide shut-downs (CDC, 2020 August). While social distancing can be used to slow the spread of infection rates, this practice has been found to negatively impact physical and mental health (Figuroa & Aguilera, 2020). Restrictions on an individual's daily activities, recreation/leisure, physical activity, and exercise are negatively impacting those in areas affected by COVID-19 (Hossain et al., 2020). The pandemic has also taken a toll on the mental health for many, with 78% of American adults reporting that the pandemic is causing "major psychological stress" (Healthday News, 2020). According to previous research, increased overall wellbeing has been identified as a benefit of physical activity (Lotan et al., 2005) and recreation time spent outside (Weng & Chiang, 2014).

The benefits of recreation and physical activity have been well researched and explored (CDC, 2020 October; Fallahpour et al., 2016; Paggi et al., 2016). These benefits include but are not limited to: weight management, decreased risk of cardiovascular disease, decreased risk of cancer, decreased risk of falling (CDC, 2020 October), and deceleration of cognitive decline as an individual ages (Fallahpour et al., 2016). In current times, there is a shift in focus to explore the psychological and physical benefits of leisure (Paggi et al., 2016). Cognitive and physical leisure time has been found to have a positive impact on an individual's state of mind, as well as how successfully they age (Depp & Jeste, 2006). Physical benefits of leisure include improved bodily functioning, with substantial cardiovascular improvements (CDC, 2020 October).

Numerous cognitive benefits have also been noted, such as slower cognitive decline (Fallahpour et al., 2016) and a decrease in overall stress levels (Parr & Lashua, 2004). While traditional forms of leisure have been well-researched, one component of leisure and physical activity that remains relatively untapped is that of outdoor recreation.

Outdoor Recreation (OR) combines the traditional idea of recreation or leisure time in an outdoor, or simulated outdoor, environment (Phipps, 1990). Activities that encompass OR range from birdwatching, hiking, camping, and paddling to simulated experiences such as indoor rock climbing. In research and academics, the terms “outdoor recreation” and “outdoor leisure” are occasionally used interchangeably with each other (Phipps, 1990). However for the purpose of this study, the focus will be on outdoor recreation. There is also a need for open-air recreation and leisure, which Outdoor Recreation provides (Godbey, 2009). While traditional leisure provides a sense of freedom, satisfaction, social engagement, and physical activity (Fallahpour et al., 2016; Stebbins, 2005), OR combines these benefits with the benefits of an outdoor environment (Weng & Chiang, 2014). Due to the vast number of benefits as well as the methods in which one can participate in Outdoor Recreation, there has been an increase in public participation in recent years.

Outdoor recreation participation is a vast and growing industry. According to a 2018 census, 49% of the United States population participated in outdoor recreation at least once per year (Outdoor Foundation, 2018). The number of OR participants has increased yearly by a rate of 1% per year between 2015 and 2018 (Outdoor Foundation, 2018). These data were collected from all age groups. Outdoor Recreation participation is also increasing across diversity demographics as well with the Hispanic and Asian populations in the United states also reporting a 1% increase in participation between the years of 2015 and 2018 (Outdoor Foundation, 2018).

It is clear that participation in outdoor recreation is on an upward trend, but the underlying reasons remain unknown.

Outdoor recreation participation has also been shown to be a growing practice over the course of the COVID-19 pandemic (Kim et al., 2020). According to this recent study, individuals identify outdoor recreation activities, such as hiking, to have a lower risk of infection than indoor recreation activities (Kim et al., 2020). A recent study found a significant increase in adoption of preventative health behaviors during the COVID-19 pandemic, specifically stating outdoor recreation and leisure being used more frequently by both men and women in the study (Kim et al., 2020). Though there is limited research available exploring the relationship between outdoor recreation and COVID-19, these preliminary findings suggest a relationship is possible between these two factors.

One potential predictor of participation in OR stems from the psychological benefits. Outdoor recreation provides an immersion in a natural environment which leads to a decrease in stress (Weng & Chiang, 2004). The added element of the natural environment and its benefits has also been linked to an evolutionary need to be immersed in nature due to human history as hunter-gatherers (Nesse & Williams, 1996). According to Social Cognitive Theory (SCT) (Bandura, 2004) the environment an individual is in plays a key role in their educational experience as well as their self-efficacy. Self-efficacy is defined as, “an individual's belief in his or her capacity to execute behaviors necessary to produce specific performance attainments” (Bandura, 1977). Though the concepts of SCT and self-efficacy lead the researcher to believe that OR would provide an ideal environment for positive outcomes, there remains a gap in literature exploring the potential relationship between these two areas.

Previous research has identified a clear correlation between physical activity, leisure, and self-efficacy (Sweet et al., 2012). Recreation and leisure behaviors stem from an intrinsic

motivation to do the said behavior (Stebbins, 2005). Intrinsic motivation is defined as engaging in an activity because it is “inherently desirable” while extrinsic motivation is when an individual is motivated because the action leads to a desirable outcome (Deci & Ryan, 2000). It has also been discussed that due to Self-Determination Theory (SDT) (Deci & Ryan, 2000), an individual’s overall sense of competence and self-efficacy (Bandura, 1977) is increased when intrinsic motivation facilitates task completion (Deci & Ryan, 2000).

Self-Determination Theory also identified autonomy as a key factor when predicting behaviors (Deci & Ryan, 2000). Self-efficacy must be accompanied by autonomy to influence an individual to participate in an activity (Sweet et al., 2012) such as OR. An individual’s autonomy has been shown to significantly increase after an outdoor experience (Sibthorp et al., 2008). There seems to be a positive correlation between an individual’s participation in OR and their autonomy and self-efficacy, however there is a lack of literature available. This gap in research makes any definitive conclusions about the correlations between these two areas elusive.

Outdoor recreation and physical activity have been shown to be associated with a decrease in stress and an improvement in mental state, as well as overall well-being (Fallahpour et al. 2016). The previously researched relationships between self-efficacy, autonomy and outdoor recreation (Sibthorp et al., 2008) as well as the relationships observed between self-efficacy, autonomy, physical activity and overall wellness (Sweet et al., 2012; Weng & Chiang 2014) may indicate that there could be an existing relationship between these items during the current pandemic. Therefore, the purpose of the present study was to explore the relationship between outdoor recreation and an individual’s level of self-efficacy and autonomy during the novel COVID-19 pandemic, as well as the perceived benefits of outdoor recreation an individual has.

Purpose and Research Questions

The purpose of the study was to answer the following questions:

1. Is there an association between an individual's level of autonomy and their participation in outdoor recreation behaviors during the COVID-19 pandemic?
2. Is there an association between an individual's level of self-efficacy and their participation in outdoor recreation behaviors during the COVID-19 pandemic?
3. What are the specific barriers and facilitators of outdoor recreation behaviors that individuals identify during the COVID-19 pandemic?

Hypotheses

1. What is the relationship between an individual's autonomy and their outdoor recreation behaviors during the COVID-19 pandemic?

Directional Hypothesis: An individual's autonomy will be positively correlated with their Outdoor Recreation behaviors during the COVID-19 pandemic.

Non-Directional Hypothesis: There will be an association between an individual's level of autonomy and their outdoor recreation behaviors during the COVID-19 pandemic.

Null Hypothesis: An individual's autonomy and their Outdoor Recreation behaviors have no correlation.

2. What is the relationship between an individual's self-efficacy and their outdoor recreation behaviors during the COVID-19 pandemic?

Directional Hypothesis: An individual's self-efficacy will be positively correlated with their outdoor recreation behaviors during the COVID-19 pandemic.

Non-Directional Hypothesis: An individual's self-efficacy will be correlated with their Outdoor Recreation behaviors during the COVID-19 pandemic.

Null Hypothesis: An individual's self-efficacy and their outdoor recreation behaviors have no correlation.

3. What are the specific barriers and facilitators of outdoor recreation behaviors that individuals identify during the COVID-19 pandemic?

Delimitations

The study participants were limited to those that currently engaged in Outdoor Recreation habits. The study was open to any adult over the age of 18, ethnicity or cultural background. The data were gathered nationwide.

Assumptions

It was assumed that all self-reported survey answers are completed honestly and that survey answers will not be discussed between participants. It was assumed that those that completed the surveys are involved in outdoor recreation as it is defined in this thesis. It was assumed that each individual will not complete more than one survey.

Definitions

Leisure: An uncoerced activity or state of mind that takes place during free time, provides a sense of freedom, mental stimulation, and is satisfying. It can provide a source of social engagement and physical activity. Leisure can be physical or cognitive (Stebbins, 2005).

Outdoor Recreation/Recreation: The pre-defined classification of Leisure with the added component of taking place in an outdoor, or simulated outdoor environment.

Self-Efficacy: “An individual's belief in his or her capacity to execute behaviors necessary to produce specific performance attainments” (Bandura, 1977).

Autonomy: “One’s perception of his or her social environment to the extent to which it provides choices and options, acknowledges one’s opinion, and provides rationale when suggesting choice” (Sweet et al., 2012).

Self-Determination Theory: The theory that different goals require different types of motivation. This theory also states that the environment plays a key role in an individual's self-efficacy and competence (Deci & Ryan, 2004).

Motivation: Being moved or compelled to complete an action and is described by both the level, or amount of motivation, as well as the orientation, or reason behind the motivation (Deci & Ryan, 2000).

Significance

There is a significant lack of literature pertaining to the personal effects that outdoor recreation has on the individual. There is also a lack of literature exploring how these traits have been affected during the COVID-19 pandemic. This study served to provide an understanding of the relationship between self-efficacy, autonomy, and outdoor recreation behaviors, as well as examining whether these characteristics are affected by participation in outdoor recreation during the COVID-19 pandemic. Understanding these aspects can aid leisure professionals in creating marketing and policy, as well as provide programming opportunities for health and wellness professionals in relation to self-efficacy and autonomy.

LITERATURE REVIEW

The review of literature will provide a background of the current research done in the areas of recreation, and outdoor recreation as it relates specifically to self-efficacy, autonomy, and the COVID-19 pandemic. Much of the current research has focused on the physical benefits of Outdoor Recreation, focusing on intrinsic benefits such as autonomy, self-efficacy, and personal image may help leisure professionals better market programming for existing and prospective Outdoor Recreation participants. For organizational purposes, this literature review has been broken down into the following sections; Recreation, Outdoor Recreation, and Motivations to Outdoor Recreation.

Recreation

Background. The parameters that define “recreation” are continuously being adapted by recreation and leisure professionals. When exploring the field of choice and experiential recreation and leisure, Stebbins comes to the following definition of, “uncoerced activity undertaken during free time where such activity is something people want to do and, at a personally satisfying level using their abilities and resources, they succeed in doing” (Stebbins, 2005). While determining the interaction of recreation and aging, recreation was described as “activities that provide mental stimulation, social engagement, and physical activity” (Fallahpour et al., 2016).

Much of the literature focuses on physical recreation, however there is also a field of cognitive recreation. Cognitive recreation includes activities that stimulate the mind such as reading books or working on logic puzzles and these practices of recreation are common in older

adults (Lee & Chi, 2015). Cognitive forms of recreation have been shown to aid in social and intellectual development in all ages, as well as promote successful aging (Särkämö, 2017) Risk of dementia, Alzheimer's disease, and social isolation late in life have been shown to decrease across all racial demographics with cognitive recreation throughout life (Särkämö, 2017).

Throughout all definitions of recreation and leisure practices, three concepts have remained consistent: "free time", "activity", and "state of mind" (Parr & Lashua, 2004). The experience of recreation and leisure is highly subjective to the individual. Though the previously mentioned three aspects are highly repeated in recreation and leisure studies as defining characteristics of recreation, defining an objective, concrete, and universally agreed upon framework for recreation has yet to be completed (Gunter & Gunter, 1980). Each type of recreation, physical or cognitive, provides numerous benefits for the individual participant.

Physical Benefits of Recreation. It is known that there are numerous benefits of remaining physically active throughout life. Active recreation is involvement of movement or exercise in free time recreation activities (Laidley & Conley, 2018). A cross examination of recreation activities, well-being, and physical health found that each of these aspects was positively correlated to each other (Paggi et al., 2016). This study also found that engaging in physically active recreation and leisure activities throughout every stage in life was a key component to successful aging. Physical benefits of active recreation go hand in hand with the known benefits of physical activity. The Center for Disease Control (CDC) states numerous health benefits resulting from physical activity and recreation including: weight management, decreased risk of cardiovascular disease, decreased risk of cancer, decreased risk of falling, greater bone density, decreased risk and intensity of arthritis and rheumatic conditions, and an increased longevity (CDC, 2020 October). The cognitive benefits of recreation described later in this literature review also tie into the physical benefits and aid in the areas described above.

Cognitive Benefits of Recreation. The participation in recreation activities has been shown to have a variety of benefits. One of these benefits is the deceleration of cognitive decline as an individual ages (Fallahpour et al., 2016). In a systematic review examining 52 cognitive recreation and leisure studies, it was found that in 90.4% of the studies, recreation activities showed a significant inverse correlation between recreation involvement throughout life and cognitive decline in older adult years (Fallahpour et al., 2016). The same study also showed links between recreation involvement and a decrease in instances of dementia. Recreation was also used as a social outlet and led to an increased sense of community and companionship among those who participated in the studies (Fallahpour et al., 2016). In a study by Lee and Chi (2015) that explored the relation between cognitive recreation and dementia, it was found that cognitive recreation activities such as reading and discussion had a significant effect on decreasing the likelihood of developing dementia later on in life. They also found that having current dementia patients engage in cognitive recreation helped slow the disease progress (Lee & Chi, 2015).

Parr and Lashua (2004) described recreation as a “state of mind” while O’Dell (2010) states that recreation involves a “perceived sense of freedom.” This state of mind induced by recreation creates a sense of positive detachment from daily life, this detachment in turn creates an environment conducive to reducing daily stressors and the potential for treatment of certain psychological disorders (i.e. addiction). Cognitive benefits of recreation have been used as a treatment modality for addiction. When studying relapse prevention, it was found that the introduction of recreation activities that patients once enjoyed decreased the likelihood of addiction relapse (Hodgson & Lloyd, 2002). One reason for this is that recreation as a state of mind results in a detachment from daily stressors. A 2012 study found that psychological detachment from work and stressors through recreation resulted in increased overall wellness,

social interaction in family, and stress levels (Sonnetag, 2012). Physical and cognitive benefits of general recreation practices are also observed in the areas of Outdoor Recreation.

Outdoor Recreation

Criteria for Outdoor Recreation. Maurice Phipps defines Outdoor Recreation as, “activities that occur outdoors in an urban and man-made environment as well as those activities traditionally associated with the natural environment” (Phipps, 1990). The characteristics of recreation as described by Fallahpour and colleagues (2016) include mental stimulation, social engagement, and physical activity. Additionally, Outdoor Recreation may be defined by the characteristic of “free time” as described by Stebbins (2005). Outdoor Recreation adds the concept of engaging in these practices in an outdoor or simulated outdoor environment (Stebbins, 2005). Examples of this include but are not limited to rock climbing gyms, hiking, paddling, outdoor sports, or any recreation time spent in an outdoor environment (Weng & Chiang, 2014). Being an area that combines the cognitive and physical effects of recreation in addition to the added element of the outdoors, Outdoor Recreation activities have numerous benefits.

Benefits of Outdoor Recreation. The health benefits of Outdoor Recreation activities have been focused on in recent years to help agencies secure public land for parks and nature reserves (Godbey, 2009). It is argued that the many benefits of Outdoor Recreation have links to our history as hunter-gatherer people, our bodies have not had time to adjust to a life spent primarily indoors so being outside has many health benefits (Nesse & Williams, 1996). Spending time outside has also been linked to a decrease in stress (Weng & Chiang, 2014), according to the American Institute of Stress (2017), an estimated 75% of general practitioner visits by American adults have to do with health factors caused by stress. Stress has been linked to the

following conditions: common cold, heart attack, and cancer, obesity, high systolic blood pressure, elevated heart rates, decreased blood flow to the heart, circulation, and coronary heart disease (Godbey, 2009). Outdoor Recreation provides an individual with the “state of mind” (Parr & Lashua, 2004) and “perceived sense of freedom” (O’Dell, 2010) discussed earlier as key components to stress reduction in leisure, as well as a physical change to one’s environment to create a greater separation between themselves and daily stressors (Godbey, 2009).

Being engaged in active Outdoor Recreation also provides the benefits found in the involvement of general physical recreation as outlined previously. Outdoor Recreation has also been shown to benefit families, families that engage in group Outdoor Recreation report more physical activity, and increase in family time, an increase in personal development, and memory making that increased overall family bonding in both traditional and non-traditional families (Pomfret & Varley, 2019). The specific physical and mental health benefits of being outdoors combined with the benefits of recreation and physical make Outdoor Recreation a possible significant factor to a healthy and balanced life (Weng & Chiang, 2014). It is essential to understand what motivates individuals to participate in Outdoor Recreation, as well as understand what the perceived constraints to Outdoor Recreation are to increase involvement in this beneficial practice throughout all demographics and age groups.

COVID-19 and Outdoor Recreation. COVID-19, caused by the virus SARs-CoV-2, is a novel coronavirus that spreads from person to person via small respiratory droplets when an infected individual sneezes, coughs, or talks (CDC, 2020 August). Symptoms are usually flu-like but can progress to a severe viral pneumonia (CDC, 2020 August). The virus was first identified in the United States on January 21st of 2021 and as of November 12, 2020 had caused 10 million infections and 241,000 deaths in the United States (CDC, 2020 August). One of the main ways to

prevent spread of the virus has been the use of city shut-downs and social distancing or maintaining a minimum distance of 6-feet between individuals (CDC, 2020 August).

When it comes to mental health, 78% of American adults reported that the pandemic is causing them “major psychological stress” (Healthday News, 2020). Much of this stress has been reported as relating back to the loneliness that the public is experiencing from isolation, as well as the overall stress and anxiety surrounding the potential of the self or loved ones catching the virus (Healthday News, 2020). Though overall mental health seems to be declining, one study found that spending time outside during the pandemic is increasing overall happiness levels (Otto, 2020). Physical health and activity have been affected during this time as well.

A big-data analysis suggested that following the start of the pandemic, public interest in physical activity surged and 62% of adults identified that they believe it is more important to be physically active during the shut-downs (Ding et al., 2020). This increase in physical recreation time could be related to those in a furlough status or out of work having more time for leisure. The increase in overall physical activity level has also been observed in the field of Outdoor Recreation.

A study exploring the activity of birders found that while the distance traveled to engage in the Outdoor Recreation activity decreased, the time spent birding increased following the pandemic and lock down (Randler et al., 2020). This study also found that more people engaged in the activity of birding during the pandemic (Randler et al., 2020). Another study looking at Outdoor Recreation habits overall found that rural involvement in Outdoor Recreation increased even with the added constraints of social distancing and state quarantines (Rice et al., 2020).

Activities such as fishing, powersports, and biking have all seen significant increases in participation during the duration of the COVID-19 pandemic (Otto, 2020). Though the current

state of the world adds barriers and changes Outdoor Recreation behaviors, there remains a large field of motivation for Outdoor Recreation.

Motivation for Outdoor Recreation. Motivation as a whole means being moved or compelled to complete an action and is described by both the level, or amount of motivation, as well as the orientation, or reason behind the motivation (Deci & Ryan, 2000). Motivation can be broadly classified into two categories, extrinsic and intrinsic motivation. Intrinsic motivation is defined as engaging in an activity because it is “inherently desirable” while extrinsic motivation is when an individual is motivated because the action leads to a desirable outcome (Deci & Ryan, 2000).

Four main motivational factors have been found to influence an individual's desire to engage in Outdoor Recreation, “social interaction, physical health and fitness, relaxation and restoration, and nature interaction” (Whiting et al., 2017). In the same study, it was found that social interaction ranked as the highest valued asset of Outdoor Recreation across each racial demographic. These factors represent examples of both intrinsic and extrinsic motivation factors in Outdoor Recreation. Intrinsic factors being “relaxation, restoration, and nature interaction” while extrinsic factors are “social interaction, and physical health and fitness” (Whiting et al., 2017).

Self-Determination Theory (SDT) describes that different goals require different types of motivations (Deci & Ryan, 2000). According to this theory, motivation for an activity is derived from, “satisfying the need for competence, autonomy, and relatedness within the activity, resulting in feelings of overall positive well-being and therefore increasing the drive to continue the behavior” (Deci & Ryan, 2004). Cognitive Evaluation Theory, a subset of SDT argues that an individual's feeling of competence can be enhanced when completing actions out of intrinsic

motivation (Deci & Ryan, 2000). While the observation that those that participate in outdoor recreation value social interaction fulfills the aspect of “relatedness” in SDT, for the purpose of this research the primary focus will be on competence and autonomy.

Autonomy. Autonomy is defined as, “one’s perception of his or her social environment to the extent to which it provides choices and options, acknowledges one’s opinion, and provides rationale when suggesting choice” (Sweet et al., 2012). Autonomy has been identified as a key factor in predicting behaviors through Self-Determination Theory (Deci & Ryan, 2004). Competence was also found as a key factor in the theory however it has been observed that competence must be accompanied by a sense of autonomy in order to increase intrinsic motivation within the individual (Sweet et al., 2012).

The National Outdoor Leadership School (NOLS) focuses on the building of personal autonomy through outdoor experiences. A study that analyzes student development found that a participant’s perception of autonomy increased following an outdoor experience (Sibthorp et al., 2008). Furthermore, if the student’s experience was done in a solo and unassisted manner, it resulted in an even higher perception of autonomy and accomplishment for the individual. As an individual progresses in age and enters the later stages of life, their feeling of autonomy often suffers as they require more assistance with daily tasks. Physical performance, life span, mobility, and overall autonomy have been found to be positively correlated with recreation practices in older adults (Portegijs, et al. 2014).

Motivation and constraints to Outdoor Recreation are highly related, a study done in 2008 found that the higher the motivation to engage in Outdoor Recreation, the more likely someone was to overcome perceived constraints (White, 2008). Physical limitations and disabilities are commonly thought as constraints to active recreation in an outdoor environment however this

viewpoint was described as “disablist” and incorrect due to the amount of adaptive Outdoor Recreation activities that minimize risk that exist (Burns et al., 2013).

The principles of Self-Determination Theory as well as Cognitive Evaluation Theory clearly demonstrate that environment plays a key role in supporting or decreasing an individual's perception of autonomy and competence (Sweet et al., 2012). Intrinsic motivation and an increase in individual autonomy will only occur if the individual feels that they value the activity they are participating in and are participating by their own choice (Sweet et al., 2012) , and if the activity involved overcoming a pierced danger, there was a greater occurrence of positive changes in autonomy (Sibthorp et al., 2008). The wide range of activities under the umbrella of “Outdoor Recreation” as well as the inherent opportunity to overcome perceived dangers in these activities provides a paramount opportunity to enhance an individual’s competence and autonomy. The concept of increasing an individual's positive perception of themselves, competence, and ability relates directly to the theory of Self-Efficacy.

Self-Efficacy. Self-efficacy is defined as, “an individual's belief in his or her capacity to execute behaviors necessary to produce specific performance attainments” (Bandura, 1977). In simple terms, self-efficacy is a person’s belief in themselves and how successfully they will complete a task or challenge in front of them. Self-efficacy has found to be increased when faced with a task that seems threatening but is in fact safe and upon mastery of the task self-efficacy increases (Bandura, 1977). The concept of self-efficacy remains a key part of motivation for behavior because if someone does not believe in their ability to perform an action or behavior change, they are much less likely to engage in the behavior (Bandura, 2004).

There are four main sources of self-efficacy: performance outcomes, physiological feedback, vicarious experiences, and verbal persuasion (Bandura, 1977). Performance outcomes

are positive or negative experiences an individual has had surrounding a specific activity, physiological feedback describes the way a person feels while completing an activity, vicarious experiences refers to an individual watching another perform an activity and comparing their competence, and verbal persuasion describes the verbal feedback an individual receives (Bandura, 1977). Physical activity and the mastery of physical experiences has been shown to have a significant positive effect on an individual's self-efficacy (Sweet et al., 2012). The known correlation between physical activity and self-efficacy could have an even greater benefit for the individual when combined with the benefits of doing so in an outdoor environment.

Social Cognitive Theory (SCT) and Self-Efficacy Theory are commonly discussed together as they overlap. Social Cognitive Theory describes that learning often occurs in a social environment based on the interaction of the person, their environment, and behavior (Bandura, 2004). This theory has main determinants: knowledge, perceived self-efficacy, outcome expectations, goals, perceived facilitators, and impediments (Bandura, 2004). According to this theory, learning and growth cannot occur unless the individual also has a high level of self-efficacy.

In those that participate in Outdoor Recreation activities, self-efficacy has primarily been measured in terms of personal growth over time. It has been found that both male and female first-year college students experienced an increase in self-efficacy after participating in a wilderness program (Jones & Hinton, 2007). The previously mentioned increase of self-efficacy when an individual overcomes a perceived threatening activity can be directly related to Outdoor Recreation practices (Jones & Hinton, 2007). Though seemingly dangerous, many outdoor activities such as paddling, hiking, or rock climbing can be done completely safely and those that participate may experience this increase in self-efficacy (Sibthorp et al., 2008). The increase of

self-efficacy while engaging in Outdoor Recreation can also have a positive effect on an individual's perception of their autonomy and overall motivation.

In summary, Outdoor Recreation and recreation provides a unique experience that combines the known physical and cognitive benefits of traditional recreation with the added element of the outdoors. Figuring out what characteristics an individual has that might predispose them to engage in Outdoor Recreation activities, as well as what characteristics of self and self-perception change when involved in Outdoor Recreation could assist in various realms of research, marketing, and policy.

Though the field of Outdoor Recreation encompasses a vast and diverse group, many motivational similarities have been found throughout (Pomfret & Bramwell, 2014). There is a gap in literature relating autonomy and self-efficacy back to Outdoor Recreation behaviors. There is also a gap in literature specifically pertaining to the COVID-19 pandemic and Outdoor Recreation attitudes and practices. The aim of this study is to provide a better understanding of these aspects both as predictors to Outdoor Recreation behaviors and as defining characteristics of the Outdoor Recreation participant during the COVID-19 pandemic.

METHODS

This study was approved by the Institutional Review Board on January 21, 2021 (IRB-FY2021-353) (Appendix A.)

Participants

Participants were recruited via voluntary access to a survey link. The sample included any adult over the age of 18 that currently engages in Outdoor Recreation practices. Participants were excluded if they are not currently participating in an Outdoor Recreation activity. All of the participants were provided consent prior to survey completion.

Sampling Procedures

Purposive sampling was used for this study. Surveys were distributed using multiple social media platforms including Instagram, Facebook and LinkedIn. Additional methods of distribution included word of mouth and sharing the survey link to outdoor professionals via text method. Survey links were also distributed via mass email to students in the Recreation and Kinesiology Department at Missouri State University, as well as to the employees of the Ozark National Scenic Riverway and the Missouri State Parks. The final distribution method involved displaying the QR survey code link at two separate fitness facilities in Springfield, Missouri. These facilities were Zenith Climbing Center and Outdoor Adventures on the campus of Missouri State University. Survey links were shared locally as well as nationally in order to obtain an accurate representation of Outdoor Recreation behaviors. An email was sent explaining the study and containing the survey link (Appendix B).

Measures

The survey tool was created using the Qualtrics platform. The first set of questions of the survey related to demographic information and general outdoor recreation participation. The next set of questions pertained to the COVID-19 pandemic. The final sets of questions were the Recreation Experience Preference Scale, or RE Pv2 (used to measure Autonomy for this study) and the Outdoor Recreation Self-efficacy Scale. Prior to taking the survey, each participant was given a statement with the description of the survey, what the survey would entail, and an opportunity to accept the terms of the survey. The participant were also informed that the survey and results was anonymous and confidential, what the results were used for, and that the survey took approximately 15 minutes to complete. Complete copies of all surveys are located in Appendix C.

Outdoor Recreation Self-Efficacy Scale (Mittlestaedt & Jones, 2009). The Outdoor Recreation Self-Efficacy Scale uses a 19-item scale that includes intrinsic values, such as feelings of confidence of success, to gauge an individual's perception of self-efficacy in outdoor recreation. Participants rated each item on a scale of 0-10, 0 being not true at all to them and 10 being very true. The ranking of each question was summed, the higher the total score, the higher an individual's self-efficacy is ranked. This scale has been shown to have high internal consistency reliability ($\alpha=0.96, p <.001$) (Mittelstaedt & Jones, 2009).

Modified Recreation Experience Preference Scale (RE Pv2). The Recreation Experience Preference Scale survey questions are a Likert-scale question format that focuses on an individual's relationship and opinions on various aspects of outdoor recreation.

In an analysis of the original scale, it was recommended that the questionnaire be used in its entirety (Manfredo et al., 1996) however due to the length of the survey, the researcher's

focus solely on the autonomy aspect, and previous research, it was decided to only include the 17 items. This decision was based on the recommendations of previous research (Kyle et al., 2004). This scale ranks each item from 1-5, one being not at all important and 5 being very important. (Kyle et al., 2004). The questions are divided into 6 focus areas: Learn (3 items), Autonomy (3 items), Activity (3 items), Social (3 items), Nature (2 items), and Health (3 items). The total score from each focus area is used to calculate an individual's development and value in that area. The higher the score, the more focused or developed that area is for the individual. This scale is based on the motivation continuum in self-determination theory (Markland & Tobin, 2004). Autonomy will be derived from this scale using the total points out of 15 from the Autonomy-focused questions.

The modified model shows an internal consistency value of (all $\alpha=.60$) (Kyle et al., 2004). While it has been previously suggested that a Cronbach's alpha coefficient is only acceptable at a value of .70 or greater (Nunnally, 1978), a separate study states that scales with six or less items and an alpha value of .60 or above is acceptable (Cortina, 1993).

COVID-19 Activity Survey. The COVID-19 Activity Survey questions were derived from COVID-19 behaviors in relation to outdoor recreation. These questions specifically ask about behaviors during the COVID-9 pandemic. This includes items such as whether the individual's activity frequency has changed, and whether they currently feel comfortable engaging in Outdoor Recreation during the pandemic.

Outdoor Recreation Behaviors. The questions on Outdoor Recreation behaviors were developed with two purposes. The first set of questions explores Outdoor Recreation practices such as: The activity participated in, frequency, distance traveled, and competition. The second set of questions explores Outdoor Recreation attitudes and perceived benefits such as: Sense of

community, physical activity opportunities, and stress relief. At the end of the survey, an open-ended question was included asking participants to provide any additional comments regarding how the COVID-19 pandemic has impacted their outdoor recreation or recreation habits or experiences.

Data Collection

The timeframe for survey collection took place upon IRB approval for a period of approximately 60 days. Data were collected from January 2021 through March of 2021. The surveys were a one-time only method with no pre/post-tests. Participants were able to complete the survey on their own time in any location that has access to a wireless network. Results were downloaded from Qualtrics and coded into the SPSS platform.

Data Analysis

This analysis was completed in steps. For the quantitative data, descriptive statistics including frequencies, means, and standard deviations were derived from sample demographic data and for participation in Outdoor Recreation behaviors. Data were analyzed using bivariate correlation and Pearson's R to explore relationships among levels of self-efficacy, autonomy, and participation in Outdoor Recreation activities during the COVID-19 pandemic. The alpha value was set at .05 to determine statistical significance. All quantitative analyses were conducted using IBM SPSS Statistics (Version 24; IBM, 2016) statistical analysis software. The analysis of open-ended responses was completed using a qualitative descriptive approach (Sandelowski & Barroso, 2007). Open-ended responses were downloaded from Qualtrics and put into an Excel spreadsheet. The researcher coded responses by grouping similar words/phrases

into categories, with the addition of new categories when a response did not meet the criteria for a previously established category (Creswell, 2013). The researcher met with her advisor to discuss coded responses and establish themes from the categories created (Sandelowski & Barroso, 2007).

RESULTS

A total of 1,089 participants started the survey. Data were analyzed from a total of 995 survey respondents. 920, or 92.5%, of surveys submitted were 100% complete. Surveys were considered invalid if they were left <60% complete. In addition, one survey was thrown out for invalid answers. Due to the widespread distribution method of this survey, it was impossible to know how many people had access to it. Ages of participants ranged from 18-85+, and 49 states of residence were represented (see Appendix D, Dataset 1). The majority of responses at 65% were female with 35% being male.

The first section of the survey focused on outdoor recreation behaviors. Participants identified permanent residents in each region of the United States (see Appendix D, Dataset 2). Travel behaviors were recorded with a range of 0-1,000+ miles with regards to how far one is willing to travel to engage in an outdoor recreation activity. (n=992) (Table 1). A majority of respondents reported being willing to travel with the largest response area being “1,000+ miles” at 29.6%.

Regarding training preferences and competition, participants were asked if they train for outdoor recreation (n=994) and prefer an activity to be competitive (n=995) (Table 2). They were also asked the intensity at which their recreation activity is at (n=994) with categories ranging from “Low intensity” (being able to hold a conversation while recreating) to “High intensity” (unable to hold a conversation, breathing hard) (Table 3).

Participants were also asked what their perceived benefits of outdoor recreation were (n=995) (Table 4). All applicable benefits to the individual could be selected. Physical activity

(89.2%), stress relief (87.8%), opportunity to connect with nature (82.1%), and disconnection from daily life (81.5%) were the top reported perceived benefits.

With regards to changes in outdoor recreation frequency, participants were asked to compare outdoor recreation frequency to two time periods, since March 2020 (beginning of United States pandemic) and when compared to pre-pandemic (n=675) (Table 5). They were also asked to compare the types of outdoor recreation activity they engaged in with the same two time period comparisons (n=995)(Figure 1).

Though a majority of the respondents did not identify social benefits as a key part of their outdoor recreation focus, it should be noted that in the open-ended responses those that identified a social impact due to COVID-19 was one of the highest-ranking response categories at 24.2%. The modified Recreation Experience Preference scale ranks each item from 1-5, one being not at all important and 5 being very important. The questions are divided into 6 focus areas: Learn (3 items), Autonomy (3 items), Activity (3 items), Social (3 items), Nature (2 items), and Health (3 items). The maximum total for each area is 15, 15, 15, 15, 10, and 15 respectively (n=964) (Table 6).

For interpreting the results, the higher the score, the more developed and valued that area is for an individual when related to outdoor recreation. Among this sample, the mean range was 8.14-12.47 with standard deviations between 1.59-3.04. Each category with 15 points total (Learning, Autonomy, Activity, Social, Health) had a range of 3 through 15 point totals for participants. Health focused questions had a range from 2 through 10. Autonomy had a range of 3-15 with the mean autonomy score was 9.85 with a standard deviation of 2.92.

Self-efficacy was measured using a 19-item scale with each item being ranked from 0-10 (0 being not true at all, 10 being very true). Examples of scale items were prefaced by the phrase

“when I do outdoor activities I feel...” and included options such as but not limited to “capable” “competent” and “skilled” for participants to rank (n=915) (Table 7). An individual’s level of self-efficacy using this scale is directly related to their overall score. The scores ranged from 3-190 with a mean of 144.81 and a standard deviation of 25.37.

In interpreting the results, bivariate correlations were run between ORSE score, and REPV2 subcategories (Learning, autonomy, activity, social, nature, health). Point biserial correlations were run assessing ORSE and REPV2 subcategories with change in outdoor recreation pre-pandemic and change in outdoor recreation since March (Table 8). It should be noted that within this scale, the symbol “*” indicates that correlation is significant at the 0.05 level (2-tailed) while the symbol “**” indicates that correlation is significant at the 0.01 level (2-tailed).

Self-efficacy was found to be significantly positively correlated at least the 0.01 level within all variables: Learning ($r=.078$), autonomy ($r=.138$), activity ($r=.377$), social ($r=.319$), nature ($r=.347$), health ($r=.441$), OR change pre-pandemic ($r_{pb}=.158$) and OR change since March 2020 ($r_{pb}=.129$). Autonomy was found to be correlated at the 0.01 level with activity ($r=.175$), nature ($r=.283$), and health ($r=.364$), Health was found to be significantly correlated with both changes in OR when compared to pre-pandemic ($r_{pb}=.182$) as well as changes in OR since March 2020 ($r_{pb}=.168$) at the 0.01 level. Lastly, changes in OR when compared to pre-pandemic was significantly correlated with changes in OR since March 2020 at the 0.01 level ($r_{pb}=.861$).

Open-Ended Responses

In an open-ended response format, participants were asked to identify any other impacts of COVID-19 on outdoor recreation habits. A total of 434 respondents provided viable

information in response. These responses were grouped into 10 categories (Table 9). Roughly a third (31.6%) of respondents stated that COVID-19 decreased their social and group opportunities. Another 29.8% of responses identified that COVID-19 resulted in an increase in their outdoor recreation or physical activity. 24.8% of respondents stated having anxiety surrounding the pandemic, concerns about crowded outdoor recreation areas, or a negative mental state due to COVID-19. Further, 21.2% of people identified the outdoor recreation activity they participated in during the COVID-19 pandemic and lockdowns. Some respondents (12.8%) stated that they decreased both travel for outdoor recreation activities, the same percentage of respondents stated that they decreased outdoor recreation activities themselves. Finally, 12% of respondents recorded that they had a positive mental health benefit related to outdoor recreation during the COVID-19 pandemic.

Decreased social and group activities. The largest reported category was that the pandemic had caused a negative impact on an individual's social and group activities. One individual stated that they were "less likely to go out in a group I don't know." Another individual stated the social impact was tied into travel impact, "Concerns about travel and exposure along with spending time with others such as traveling in the same vehicle or camping in the same tent." A social impact was also tied into sports and competition with the cancellation of events. Competition impacts were noted by several individuals with statements such as "Didn't realize how much I relied on team sports for community & friends until it was taken away from me" and "It cancelled races I planned to compete in."

Increased outdoor recreation or physical activity. Another main impact noted in the open-ended response was the increase in outdoor recreation activities or physical activities. One individual replied, "Since being outside and working out is basically the only thing I can do to

relax or release stress now, I find myself outside every free moment I get.” This comment also states a mental health benefit which was observed in 12% of responses. Ease of outdoor access was also identified as a driving force behind outdoor recreation participation increase “Impacted in a positive manner. While being locked down the outdoors was always available.”

Negative mental state, COVID-19 anxiety, crowding/closures. The third highest category had to do with anxiety and a negative mental state surrounding COVID-19. Many individuals in this category stated that part of their anxiety stemmed from the excessive crowding on trails. Comments such as “changing times when I will go outside to avoid large crowds” and “some anxiety around crowded hiking areas” indicated that those outdoors were encountering more people than usual. Other areas of anxiety included not being able to perform as well athletically while masking. Social distancing was also a concern among respondents “I am concerned, even with a mask. Because others don’t always practice social distancing.” COVID-19 was also stated to add an additional barrier to outdoor recreation as one had to invest more time in preparation “I feel like there was another element of preparation added.”

Change in outdoor activity/outdoor recreation activity. The final top-ranking category included those that stated they found a new outdoor recreation activity, or identified an outdoor recreation activity they engaged in. Activities identified included: Walking, biking, camping, skiing, rock-climbing, running, disc golf, and tennis. Some examples of activity identification include, “I went camping and hiking more often over the spring/summer” and, “I have been able to do more involved workouts at home such as HIIT exercises as well as running. Sometimes I have time to get 2 workouts in a day”. Many activity changes were stated to be related with closures and limited access due to COVID-19 such as “I started mt biking because gyms were closed.”

Table 1. Travel for Outdoor Recreation Activities

	Respondents $n=992$
Travel Behavior	Number (%)
I am not willing to travel	25(2.5)
1-50 miles	268(27.0)
51-100 miles	160(16.1)
101-500 miles	245(24.7)
1,000+ miles	294(29.6)

Table 2. Training Preferences for Outdoor Recreation

	Respondents $n=994$
Do you physically train for Outdoor Recreation?	Number (%)
Yes	482(48.5)
No	512(51.5)
Do you prefer your outdoor recreation activity to be competitive?	Respondents $n=993$
Yes	174(17.5)
No	819(82.5)

Table 3. Intensity for Outdoor Recreation

Respondents <i>n</i> =994	
Recreation Intensity Level	Number (%)
Low intensity	216(21.7)
Moderate intensity	643(64.7)
High intensity	135(13.6)

Table 4. Perceived Benefits of Outdoor Recreation

Respondents <i>n</i> =995	
Perceived Benefit	Number (%)
An opportunity to engage in physical activity.	888(89.2)
A way to “disconnect” from daily life.	811(81.5)
A sense of community.	405(40.7)
Opportunities to be more mentally alert.	416(41.8)
An opportunity to connect with nature.	817(82.1)
A way to challenge myself physically.	665(66.8)
A sense of stress relief.	874(87.8)

**percentages do not equal 100%; some participants responded in more than one category*

Table 5. Effects of COVID-19 on Outdoor Recreation

Impact of pandemic on outdoor recreation	Number (%)
<hr/>	
Since March of 2020	<i>n</i> =675
Decrease in outdoor recreation frequency	278(41.2)
No change outdoor recreation frequency	72(10.7)
Increase in outdoor recreation frequency	325(48.1)
When compared to pre-pandemic	<i>n</i> =675
Decrease in outdoor recreation frequency	272(40.3)
No change outdoor recreation frequency	120(17.8)
Increase in outdoor recreation frequency	283(41.9)

Table 6. Recreation Experience Preference Scale

REP Characteristic	Mean	Standard Deviation
<i>n</i> =964		
Learning	8.33	3.04
Autonomy	9.85	2.92
Activity	8.14	2.82
Social	8.62	2.91
Nature	8.57	1.59
Health	12.47	2.13

Table 7. Outdoor Recreation Self-Efficacy Scale

Self-Efficacy Total	Mean	Standard Deviation
<i>n</i> =915	144.81	25.37

Table 8. Descriptive Statistics and Correlations for Study Variables

Variable	<i>n</i>	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9
1. Self Efficacy	915	144.8	25.37	-								
2. REP Learning	966	8.33	3.03	.078*	-							
3. REP Autonomy	969	9.84	2.92	.138**	.220**	-						
4. REP Activity	969	8.14	2.82	.377**	-.065*	.175**	-					
5. REP Social	969	8.62	2.91	.319**	0.05	-.025	.449**	-				
6. REP Nature	969	8.57	1.59	.347**	.267**	.283**	.101**	.126**	-			
7. REP Health	969	12.47	2.13	.441**	.037	.364**	.323**	.188**	.385**	-		
8. OR Change Pre-Pandemic	555	0.51	.50	.158**	-.114**	-.048	.128**	-.058	.027	.182**	-	
9. OR Change Since March	603	0.54	.50	.129**	-.109**	-.046	.104*	.014	.053	.168**	.861**	-

Table 9. Other Impacts of COVID-19 (open-ended response)

Theme/Description	Respondents <i>n</i> =434	Number	Percentage of of People Total Responses*
Decreased Social and Group Activities		137	31.6%
Increased Outdoor Recreation or Physical Activity		129	29.8%
Negative Mental State, COVID-19 Anxiety, Crowding/Closures		107	24.8%
Change in Outdoor Activity/Outdoor Recreation Activity Identified**		92	21.2%
Decreased Travel for Outdoor Recreation		56	12.8%
Decreased Outdoor Recreation or Physical Activity		56	12.8%
Positive Mental Health Benefit		52	12%
Increased Travel for Outdoor Recreation		9	2.1%
Increased Social and Group Activities		8	1.8%
Initial Increase, then Decrease in Outdoor Recreation		4	0.9%

**percentages do not equal 100%; some participants responded in more than one category*

***Activities identified include: Walking, biking, camping, skiing, rock-climbing, running, disc golf, and tennis*

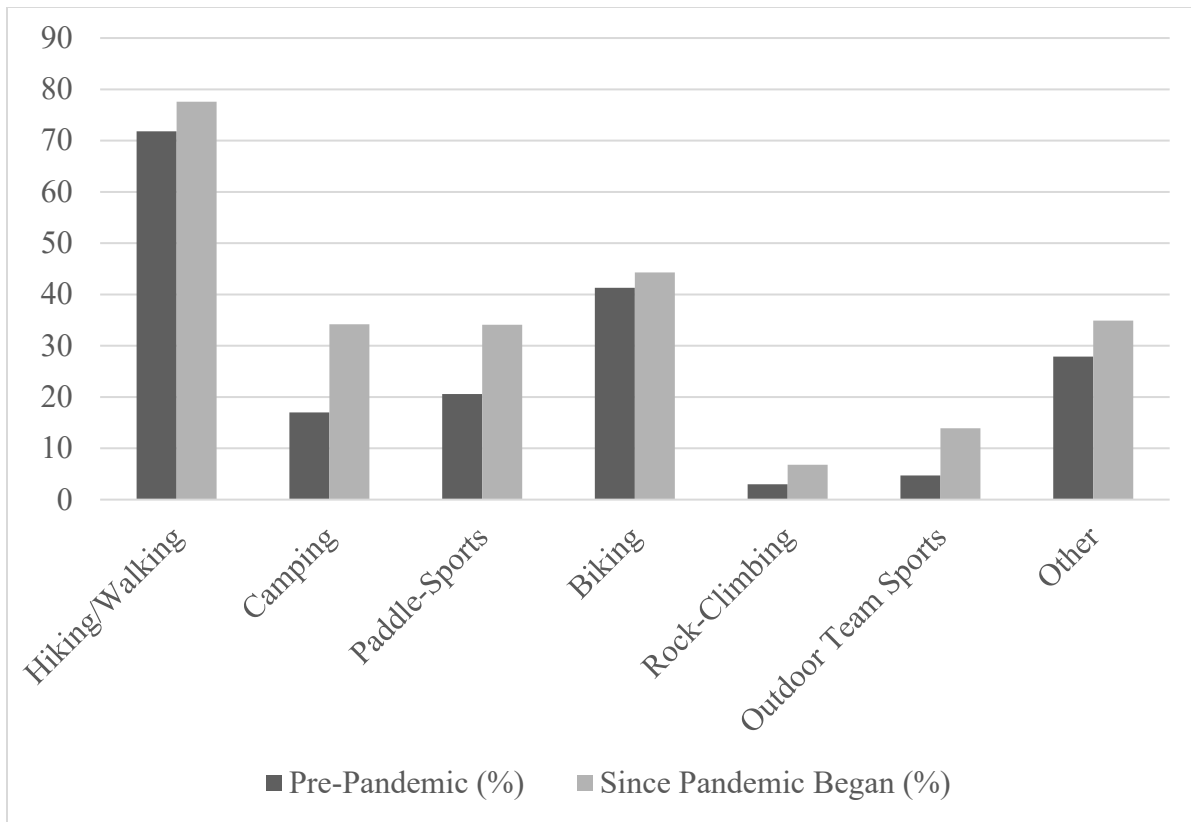


Figure 1. Change in Outdoor Activity Due to COVID-19

DISCUSSION

The aim of the current study was to explore the relationships between self-efficacy, autonomy, and outdoor recreation behaviors among those that engage in OR during the COVID19 pandemic. The mean scores of the participants for the RE Pv2 (autonomy subscale) and ORSE were 9.85 ± 2.92 and 144.81 ± 25.37 respectively. Scoring for each of these scales has a direct relationship to the level of autonomy or self-efficacy. A higher level of each item is represented by a higher score, the opposite is true for lower scales. Total possible points for the RE Pv2 autonomy subscale and ORSE were 15 and 190 respectively.

In the present study, both of these scores represent generally high levels of self-efficacy and autonomy. Additional factors explored in the study included other subscales of the RE Pv2 (learning, activity, social, nature, health) and changes in OR pre/post pandemic. A key theme observed in the data was the relationship between self-efficacy and various aspects of outdoor recreation observed in the RE Pv2 subscales. Another theme among the data was the relationship between outdoor recreation changes compared to pre-pandemic, outdoor recreation changes since March 2020, and a focus on activity and health.

Additionally, the study sought to identify barriers and facilitators to OR practices during the COVID-19 pandemic. In an open-ended response format, 4 main areas of themes, barriers, and facilitating factors to OR were identified. These areas were: “Decreased social and group activities”, “Increased outdoor recreation or physical activity”, “Negative mental state/ COVID-19 anxiety/ crowding/closures”, and “Change in outdoor activity/outdoor recreation activity”. The frequencies of responses in these categories were 31.6%, 29.8%, 24.8%, 21.2% respectively. In the current study, autonomy scores had a mean of 9.85 ± 2.92 (out of 15 possible points). Though autonomy was not found to be significantly correlated with changes in

OR pre/post pandemic, the higher rating of autonomy among individuals participating in OR behaviors could indicate a relationship between the two. The possibility of a relationship between high levels of autonomy and OR behaviors is supported by previous research in physical activity and recreation (Portegijs et al., 2014). A study relating specifically to outdoor recreation also observed higher levels of individual autonomy following an outdoor experience (Sibthorp et al., 2008). An area of possible discrepancy here is that a higher autonomy score was found to have a positive correlation with a higher activity score on the REPV2 ($r = 0.175$, $p < 0.01$). Since activity is closely related to OR, this is a discrepancy in the data.

Being a key factor in predicting behaviors through Self-Determination Theory (Deci & Ryan, 2004), the researcher believes that the high level of autonomy in those that participate in OR can be seen as a determining factor to the OR behaviors. Furthermore, it has been observed that the more motivated an individual is to participate in an OR behaviors, the more likely they are to overcome perceived barriers (White, 2008). Overcoming perceived barriers and believing one can succeed in an activity relates directly back to autonomy and supports the idea that those engaging in OR could possess or develop higher levels of autonomy (Sibthorp et al., 2008).

When examining self-efficacy through the ORSE, the current study suggests a strong positive correlation between self-efficacy both pre-pandemic ($r = 0.158$, $p < 0.01$) and since March 2020 ($r = 0.129$, $p < 0.01$). This indicates that self-efficacy may have a positive relationship with OR behaviors. Previous self-efficacy, physical activity, and OR research supports this finding (Jones & Hinton, 2007). The present study also identified significant strong correlation between self-efficacy and autonomy ($r = 0.138$, $p < 0.01$). Given the definitions of self-efficacy (Sweet et al., 2012) and autonomy (Bandura, 1977) provided in the review of literature, one would expect these areas to be correlated. Overall self-efficacy levels reported in this study were also high ($M \pm SD, 144.81 \pm 25.37$).

Open ended responses revealed that while the social component of the RE Pv2 did not rank among the highest valued aspects of individuals, when given the opportunity to respond as to how COVID-19 had impacted their OR experiences, individuals identified negative social impacts in 31.6% of responses. This discrepancy is noteworthy as another one of the highest response categories of the open-ended responses, *Negative mental state/ COVID-19 anxiety/ crowding/closures*, seemed to have comments that overlapped between these two categories. Responses such as, “I didn’t realize how much I relied on team sports for community and friends” as well as “I miss group rides and hikes” frequented this category. Many of the respondents also identified missing their friends due to COVID-19 restrictions, “I would usually play with friends, that went down greatly.”

Comments tying these two areas together lead the researcher to two conclusions. The first being that individuals value the social aspect of OR more than they realize at first when asked to rank it in the RE Pv2 scale. The second being that the social aspect of OR ties in greatly with positive mental effects of OR behaviors as many people stated negative mental state due to not being able to socialize as much in their OR activities. This is supported by previous research as Social Cognitive Theory describes that learning often occurs in a social environment based on the interaction of the person, their environment, and behavior (Bandura, 2004). This theory also ties back into self-efficacy as previously stated. Assuming there is correlation between OR and self-efficacy, based off of the core concept of SCT as well as the four main components of SE, performance outcomes, physiological feedback, vicarious experiences, and verbal persuasion (Bandura, 1977), one can assume the social component of OR to be highly valued among participants in this study. These four main components can be found in responses such as, “They are not having any events to compete against my age group” which shows a lack of performance

outcomes. Another response that provided the main components of self-efficacy was

My husband and I have biked and/or skied every day for years. The pandemic didn't change that. What it did change is the interactions with others in those communities. No riding or skiing with friends, no going to the pub for beers after. Way fewer social interactions but thankful to still be able to do the things that are necessary for our mental and physical well being.

Open ended responses also identified closures as a large barrier to OR practices during COVID-19. This category represented 24.8% of the responses. Facilities that rented equipment were closed as well as shuttle services and, in some states, hiking trails as well. Another identified barrier to OR was that trails and local OR locations were crowded. While this was identified as a barrier, it could also support the idea that the closures and restrictions put on indoor environments during COVID-19 lead to an increase in OR practices. This statement is supported by literature published recently surrounding COVID-19 and OR (David & Cox, 2020).

Open ended responses also indicated a change in OR activity and increased OR or physical activity. Many of these responses were tied into comments that included the aspects of “free time”. This supports the previously stated foundation of recreation behavior and definition of recreation needing the involvement of “free time” (Stebbins, 2005). With more time on their hands, individuals looked to fill it, and with facilities being closed, they chose OR. Furthermore, many individuals identified OR as a way to combat the negative mental health effects of COVID-19 and used OR as a way to provide stress relief as identified in the following comment. All of these ideals are tied together with the comment, “Because of Covid, and working from home, I was able to run outside on my breaks and this decreased my stress levels throughout the day.” It should be noted that this was not the only comment to include an overlap of these

factors. Changes in OR activities or increase can to improve well-being can be supported by the component of self-efficacy “physiological feedback” (Bandura, 1977).

Data Limitations

All data were self-reported and therefore it was subject to social desirability bias. To navigate this possibility, steps were taken at the beginning of the survey to ensure that those participating engaged in OR practices. The study was conducted strictly through an online survey format, and therefor entirely anonymous. Having been conducted in this method, there was no way to assure than answers were honest. There was also no way to verify that each individual completed the survey only once. There was no incentive program used and participation in the study was entirely voluntary. Due to the researcher’s location of residence, the majority of survey respondents were located in the Midwest. Location bias may affect answers such as distance traveled and types of OR the individual identified participating in. During the climate of COVID-19, variance in restrictions and shut-downs state-to-state may have also impacted data on an individual’s ability to gather, travel, and recreate. Lastly, the limitation of the respondents to be adults over the age of 18 who participated in OR behaviors could be viewed as a limitation, however research specifically in the area of OR was needed for the purpose of this study.

Recommendations for Future Research

The most crucial aspect for future research in this area will be to expand upon the literature available relating intrinsic aspects (such as autonomy and self-efficacy) and the potential relationships to OR. This is a field that has a lack of literature available, though what is available has shown strong possibilities of correlation. The ORSE and REPV2 scales must also

be further tested and validated. Another area of research that is pressing for these scales would be to establish average scores as well as ranges of scores to associate with specific levels of autonomy and self-efficacy. Currently, this research states that higher scores reflect higher levels of each aspect. It would be beneficial to make those ranges clearer to future researchers. The REPV2 scale was also developed for recreation in general, future research to establish validated scales related to OR specifically would be beneficial to the future of OR research.

Understanding how these factors relate to OR behaviors could aid in validated and promoting the fields of therapeutic recreation as well as provide OR practitioners and agencies with an understanding of the population they serve. The research could also aid national and municipal parks and recreation agencies with validated benefits of OR for their clients. When relating to COVID-19, using the research to promote OR behaviors as a way of maintaining and improving overall well-being, self-efficacy, and autonomy during times of isolation and stress (whether due to future pandemics or any other circumstance) could benefit those experiencing negative effects of these scenarios (Kim et al., 2020).

This use of OR as a resource for those dealing with the negative effects of a year of isolation and social distancing could parallel other programs. Re-acclimation through recreation can be observed in veteran programs as well as programs for youth and teens in foster care. This researcher believes that the mental effects and background trauma from COVID-19 could be mitigated and improved through reacclimating for the general citizen with OR programming.

In conclusion, outdoor recreation participants were found to have high levels of both self-efficacy and autonomy in the present study. Participants were also found to identify social, mental health, and activity type barriers and facilitators to outdoor recreation as well as an increase in outdoor recreation activities during the COVID-19 pandemic. These results suggest that those that participate in outdoor recreation possess higher levels of self-efficacy and

autonomy. Furthermore, efforts should be made to promote participation in outdoor recreation behaviors in order to better overall wellness in any similar epidemic in the future.

REFERENCES

- American Institute of Stress. (2017, January 4). America's no. 1 health problem. Retrieved November 12, 2020, from <https://www.stress.org/americas-1-health-problem>
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, *84*(2), 191-215. doi:10.1037/0033-295x.84.2.191
- Bandura, A. (2004). Health promotion by social cognitive means. *Health Education & Behavior*, *31*(2), 143-164. doi:10.1177/1090198104263660
- Burns, N., Watson, N., & Paterson, K. (2013). Risky bodies in risky spaces: Disabled people's pursuit of Outdoor Recreation. *Disability & Society*, *28*(8), 1059-1073. doi:10.1080/09687599.2012.749180
- CDC. (2020, August 26). Coronavirus disease 2019 (COVID-19). Retrieved November 12, 2020, from <https://www.cdc.gov/dotw/covid-19/index.html>
- CDC. (2020, October 7). Benefits of physical activity. Retrieved October 18, 2020, from <https://www.cdc.gov/physicalactivity/basics/pa-health/index.htm>
- Cortina, J. M. (1993). What is coefficient alpha? An examination of theory and applications. *Journal of Applied Psychology*, *78*(1), 98-104.
- Creswell, J. W. (2013). *Qualitative inquiry and research design: Choosing among five approaches* (3rd ed). SAGE Publications.
- David, W., & Cox, J. (2020, May 21). COVID-19 crisis highlights need for greener parks. Retrieved April 03, 2021, from <https://www.nrpa.org/parks-recreationmagazine/2020/june/covid-19-crisis-highlights-need-for-greener-parks/>
- Deci, E. L., & Ryan, R. M. (2000). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary Educational Psychology*, *25*(1), 54-67. doi:10.1006/ceps.1999.1020
- Deci, E. L., & Ryan, R. M. (Eds.). (2004). *Handbook of self-determination research*. University of Rochester Press.
- Depp, C. A., & Jeste, D. V. (2006). Definitions and predictors of successful aging: A comprehensive review of larger quantitative studies. *The American Journal of Geriatric Psychiatry*, *14*, 6-20.
- Ding, D., Cruz, B. D., Green, M. A., & Bauman, A. E. (2020). Is the COVID-19 lockdown nudging people to be more active: A big data analysis. *British Journal of Sports Medicine*, *54*(20), 11831187.

- Fallahpour, M., Borell, L., Luborsky, M., & Nygård, L. (2016). Leisure-activity participation to prevent later-life cognitive decline: A systematic review. *Scandinavian Journal of Occupational Therapy*, 23(3), 162-197. doi:10.3109/11038128.2015.1102320
- Figueroa, C. A., & Aguilera, A. (2020). The need for a mental health technology revolution in the COVID-19 Pandemic. *Frontiers in Psychiatry*, 11, 523. doi:10.3389/fpsy.2020.00523
- Godbey, G. (2009). Outdoor recreation, health, and wellness: Understanding and enhancing the relationship. *SSRN Electronic Journal*. doi:10.2139/ssrn.1408694
- Gunter, B., & Gunter, N. (1980). Leisure styles: A conceptual framework for modern leisure. *Sociology Quarterly*, 21(3), 361-374. doi:10.1111/j.1533-8525.1980.tb00618
- Healthday News. (2020, October 20). Pandemic putting Americans under great mental strain: Poll. Retrieved November 12, 2020, from <https://consumer.healthday.com/infectiousdisease-information-21/coronavirus-1008/pandemic-putting-americans-under-greatmental-strain-poll-762304.html>
- Hodgson, S., & Lloyd, C. (2002). Leisure as a relapse prevention strategy. *British Journal of Therapy and Rehabilitation*, 9(3), 86-91. doi:10.12968/bjtr.2002.9.3.13609
- Hossain, M. M., Sultana, A., & Purohit, N. (2020). Mental health outcomes of quarantine and isolation for infection prevention: A systematic umbrella review of the global evidence. *Epidemiology and Health*, 42, e2020038. doi:10.4178/epih.e2020038
- IBM Corp. Released 2016. IBM SPSS Statistics for Windows, Version 24.0. Armonk, NY: IBM Corp.
- Jones, J. J., & Hinton, J. L. (2007). Study of self-efficacy in a freshman wilderness experience program: Measuring general versus specific gains. *Journal of Experiential Education*, 29(3), 382-385. doi:10.1177/105382590702900311
- Kim, Y. J., Cho, J. H. & Park, Y. J. (2020). Leisure sports participants' engagement in preventive health behaviors and their experience of constraints on performing leisure activities during the COVID-19 pandemic. *Frontiers in Psychology*, 11, 589708. doi:10.3389/fpsyg.2020.589708
- Kyle, G. T., Mowen, A. J. & Tarrant, M. A. (2004). Linking place preferences with place meaning: An examination of the relationship between place motivation and place attachment. *Journal of Environmental Psychology*, 24(4), 439-454.
- Laidley, T., & Conley, D. (2018). The effects of active and passive leisure on cognition in children: Evidence from exogenous variation in weather. *Social Forces*, 97(1), 129156. doi:10.1093/sf/soy020

- Lee, Y., & Chi, I. (2015). Do cognitive leisure activities really matter in the relationship between education and cognition? Evidence from the aging, demographics, and memory study (ADAMS). *Aging & Mental Health, 20*(3), 252-261. doi:10.1080/13607863.2015.1011081
- Lotan, M., Merrick, J., & Carmeli, E. (2005). A review of physical activity and well-being. *International Journal of Adolescent Medicine and Health, 17*, 23–31. <https://doi.org/10.1515/ijamh.2005.17.1.23>
- Manfredo, M. J., Driver, B. L., & Tarrant, M. A. (1996). Measuring leisure motivation: a metanalysis of the recreation experience preference scales. *Journal of Leisure Research, 28*, 188–213.
- Markland, D., & Tobin, V. (2004). A modification to the behavioral regulation in exercise questionnaire to include an assessment of amotivation. *Journal of Sport and Exercise Psychology, 26*, 191–196. doi:10.1123/jsep.26.2.191
- Mittelstaedt, R. D., & Jones, J. J. (2009). Outdoor recreation self-efficacy: Scale development, reliability, and validity. *Journal of Outdoor Recreation, Education, and Leadership, 1*(1), 97-120.
- Nesse, R., & Williams, G. (1996). *Why we get sick*. New York: Vintage Books.
- Nunnally, J. C. (1978). *Psychometric theory* (2nd ed). New York: McGraw-Hill.
- O'Dell, K. L. (2010). Leisure attitude, leisure satisfaction, and perceived freedom in leisure within family dyads. *Leisure Sciences, 22*(4), 281-296. doi:10.1080/01490409950202302
- Otto, E. (2020, July 23). Safe at home, but happier outside: COVID-19's impact on outdoor recreation. Retrieved November 12, 2020, from <https://c-k.com/safe-at-home-but-happieroutside-covid-19s-impact-on-outdoor-recreation/>
- Outdoor Foundation. (2018, July 17). Outdoor Participation Report. Retrieved 2020, from https://cdn.ymaws.com/www.americancanoe.org/resource/resmgr/generaldocuments/2018_outdoor_recreation_part.pdf
- Paggi, M. E., Jopp, D., & Hertzog, C. (2016). The importance of leisure activities in the relationship between physical health and well-being in a life span sample. *Gerontology, 62*(4), 450-458. doi:10.1159/000444415
- Parr, M. G., & Lashua, B. D. (2004). What is leisure? The perceptions of recreation practitioners and others. *Leisure Sciences, 26*(1), 1-17. doi:10.1080/01490400490272512
- Phipps, M. (1990, November 30). Definitions of outdoor recreation and other associated terminology. Retrieved October 02, 2020, from <https://eric.ed.gov/?id=ED335189>

- Pomfret, G., & Bramwell, B. (2014). The characteristics and motivational decisions of outdoor adventure tourists: A review and analysis. *Current Issues in Tourism, 19*(14), 1447-1478. doi:10.1080/13683500.2014.925430
- Pomfret, G., & Varley, P. (2019). Families at leisure outdoors: Well-being through adventure. *Leisure Studies, 38*(4), 494-508. doi:10.1080/02614367.2019.1600574
- Portegijs, E., Rantakokko, M., Mikkola, T. M., Viljanen, A., & Rantanen, T. (2014). Association between physical performance and sense of autonomy in outdoor activities and life-space mobility in community-dwelling older people. *Journal of the American Geriatrics Society, 62*(4), 615-621. doi:10.1111/jgs.12763
- Randler, C., Tryjanowski, P., Jokimäki, J., Kaisanlahti-Jokimäki, M.-L., & Staller, N. (2020). SARS-CoV2 (COVID-19) pandemic lockdown Influences nature-based recreational activity: The case of birders. *International Journal of Environmental Research and Public Health, 17*(19), 7310.
- Rice, W. L., Mateer, T. J., Reigner, N., Newman, P., Lawhon, B., & Taff, B. D. (2020). Changes in recreational behaviors of outdoor enthusiasts during the COVID-19 pandemic: Analysis across urban and rural communities, *Journal of Urban Ecology, 6*(1), juaa020. doi:10.1093/jue/juaa020
- Sandelowski, M., & Barroso, J. (2007). *Handbook for synthesizing qualitative research*. Springer Publishing Company.
- Särkämö, T. (2017). Music for the ageing brain: Cognitive, emotional, social, and neural benefits of musical leisure activities in stroke and dementia. *Dementia, 17*(6), 670-685. doi:10.1177/1471301217729237
- Sibthorp, J., Paisley, K., Gookin, J., & Furman, N. (2008). The pedagogic value of student autonomy in adventure education. *Journal of Experiential Education, 31*(2), 136-151. doi:10.5193/jee.31.2.136
- Sonnentag, S. (2012). Psychological detachment from work during leisure time. *Current Directions in Psychological Science, 21*(2), 114-118. doi:10.1177/09637214111434979
- Stebbins, R. A. (2005). Choice and experiential definitions of leisure. *Leisure Sciences, 27*(4), 349-352. doi:10.1080/01490400590962470
- Sweet, S. N., Fortier, M. S., Strachan, S. M., & Blanchard, C. M. (2012). Testing and integrating self-determination theory and self-efficacy theory in a physical activity context. *Canadian Psychology/Psychologie Canadienne, 53*(4), 319-327. doi:10.1037/a0030280
- Weng, P., & Chiang, Y. (2014). Psychological restoration through indoor and outdoor recreation activities. *Journal of Leisure Research, 46*(2), 203-217. doi:10.1080/00222216.2014.11950320

White, D. D. (2008). A structural model of leisure constraints negotiation in outdoor recreation. *Leisure Sciences*, 30(4), 342-359. doi:10.1080/01490400802165131

Whiting, J. W., Larson, L. R., Green, G. T., & Kralowec, C. (2017). Outdoor recreation motivation and site preferences across diverse racial/ethnic groups: A case study of Georgia state parks. *Journal of Outdoor Recreation and Tourism*, 18, 10-21. doi:10.1016/j.jort.2017.02.001

APPENDICES

Appendix A: IRB Approval



To:
Sara Powell
Kinesiology

Date: Jan 21, 2021 9:04:06 AM CST

RE: Notice of IRB Exemption
Study #: IRB-FY2021-353
Study Title: Exploring the Influence of Self-Efficacy and Autonomy on Outdoor Recreation Behaviors During the COVID-19 Pandemic

This submission has been reviewed by the Missouri State University Institutional Review Board (IRB) and was determined to be exempt from further review. However, any changes to any aspect of this study must be submitted, as a modification to the study, for IRB review as the changes may change this Exempt determination. Should any adverse event or unanticipated problem involving risks to subjects or others occur it must be reported immediately to the IRB.

This study was reviewed in accordance with federal regulations governing human subjects research, including those found at 45 CFR 46 (Common Rule), 45 CFR 164 (HIPAA), 21 CFR 50 & 56 (FDA), and 40 CFR 26 (EPA), where applicable.

Researchers Associated with this Project:
PI: Sara Powell
Co-PI:
Primary Contact: Katheryn Carpenter
Other Investigators: Melinda Novik, Hugh Gibson, Katheryn Carpenter

Appendix B: Recruitment Email, Informed Consent, Outdoor Recreation Behaviors

Survey

Recruitment Email

Hello,

You are being asked to participate in a graduate research study, exploring the influence of self-efficacy and autonomy on Outdoor Recreation behaviors during the COVID-19 pandemic. This study will hopefully further advance our knowledge on how participating in Outdoor Recreation activities may benefit the self-efficacy and autonomy of individuals during the COVID-19 pandemic. If you choose to participate, you can access the survey through the link below.

INSERT QUALTRICS LINK

I appreciate your time and if you have any further questions feel free to contact any member of the research team at the emails listed below.

Thank you for your time and consideration!

Katheryn Carpenter, Graduate Student, Katheryn102@live.missouristate.edu

Sara Powell, Ph.D., SaraPowell@MissouriState.edu

Information to Consider about this Research

Exploring the Influence of Self-Efficacy and Autonomy on Outdoor Recreation Behaviors During the COVID-19 Pandemic.

Principal Investigators: Katheryn Carpenter

You are being asked to participate in a research survey exploring the influence of self-efficacy and autonomy on Outdoor Recreation behaviors during the COVID-19 pandemic. You will be asked questions about your current Outdoor Recreation habits, exercise behaviors, and exercise ability beliefs. The purpose of this study is to explore if there is a relationship between Outdoor Recreation, autonomy, and self-efficacy during the COVID-19 pandemic. Participants for this research need to be age 18 or older and currently participate in an Outdoor Recreation activity. There are no other requirements.

You will be asked to answer a number of survey questions regarding your thoughts and behaviors. These surveys will be taken online, should take approximately 15 minutes to complete, and are completely anonymous.

There is no compensation for participation, but this research is designed to help advance knowledge regarding the influence of self-efficacy and autonomy on Outdoor Recreation behaviors during the COVID-19 pandemic. There are no direct benefits to the participant in this study.

Participating in this study is completely voluntary. Even if you decide to participate now, you may change your mind and stop at any time. You may choose not to answer a question or stop the survey at any time for any reason.

If you have questions about this research study, you may contact:

Sara Powell, SaraPowell@MissouriState.edu or Katheryn Carpenter,
Katheryn102@live.missouristate.edu

By continuing to the questionnaire, I acknowledge that I am at least 18 years old, have read the above information, and agree to participate.

Appendix C: Measures

Exploring the Influence of Self-Efficacy and Autonomy on Outdoor Recreation Behaviors
During the COVID-19 Pandemic

Principal Investigators: Katheryn Carpenter, Sara Powell, Ph.D.

Other Investigators: Hugh Gibson, Ed.D., Melinda Novik, Ph.D.

You are being asked to participate in a research survey exploring the influence of self-efficacy and autonomy on outdoor recreation and leisure behaviors during the COVID-19 pandemic. You will be asked questions about your current outdoor recreation/leisure habits, exercise behaviors, and exercise ability beliefs. The purpose of this study is to explore if there is a relationship

between Outdoor Recreation, autonomy, and self-efficacy during the COVID-19 pandemic. Participants for this research need to be age 18 or older and currently participate in an outdoor recreation/leisure activity. There are no other requirements.

You will be asked to answer a number of survey questions regarding your thoughts and behaviors. These surveys will be taken online, should take approximately 15 minutes to complete, and are completely anonymous.

There is no compensation for participation, but this research is designed to help advance knowledge regarding the influence of self-efficacy and autonomy on outdoor recreation/leisure behaviors during the COVID-19 pandemic. There are no direct benefits to the participant in this study.

Participating in this study is completely voluntary. Even if you decide to participate now, you may change your mind and stop at any time. You may choose not to answer a question or stop the survey at any time for any reason.

If you have questions about this research study, you may contact:

Sara Powell, SaraPowell@MissouriState.edu

Katheryn Carpenter, Katheryn102@live.missouristate.edu

Hugh Gibson, HughGibson@MissouriState.edu

Melinda Novik, MelindaNovik@MissouriState.edu

By continuing to the questionnaire, I acknowledge that I am at least 18 years old, have read the above information, and agree to participate.

a. yes

b. no

Section 1: Demographic Information

1. What is your age?

a. 18-24 years old

b. 25-34 years old

c. 35-44 years old

d. 45-54 years old

e. 55-64 years old

f. 65-69 years old

g. 70-74 years old

h. 75-79 years old

i. 80-84 years old

j. 85-89 years old

k. 90-94 years old

l. 95-99 years old

m. Over 99 years old

2. To which gender identity do you most identify?

a. Male

- b. Female
- c. Transgender Female
- d. Transgender Male
- e. Gender Variant/Non-Conforming
- f. Not Listed: _____
- g. Prefer not to answer

3. How do you describe your ethnicity? (select all that apply)

- a. American Indian or Alaska Native
- b. Asian
- c. Black or African American
- d. Hispanic or Latino
- e. Native Hawaiian or Other Pacific Islander
- f. White
- g. Unknown
- h. Other/Prefer to Self-Describe: _____
- i. Prefer not to answer

4. What is your marital status?

- a. Single, never married
- b. Married or domestic partnership
- c. Widowed
- d. Divorced
- e. Separated
- f. Prefer not to answer

5. What is the highest degree or level of education you have completed?"

- a. No schooling completed
- b. Nursery school to 8th grade
- c. Some high school, no diploma
- d. High School graduate, diploma or the equivalent (i.e. GED)
- e. Some college credit, no degree
- f. Trade/vocational/technical training
- g. Associate degree
- h. Bachelor's Degree
- i. Master's Degree
- j. Professional degree
- k. Ph.D. or higher
- l. Prefer not to answer

6. What is your current employment status?

- a. Employed Full-Time (40+ hours per week)
- b. Employed Part-Time (less than 40 hours per week)
- c. Out of work and looking for work
- d. Out of work but not currently looking for work
- e. A homemaker f. A student (no outside employment)
- g. A Student and employed full-time
- h. A Student and employed part-time
- i. Military
- j. Retired

k. Unable to work

l. Prefer not to answer

10. What is your current state of residence? _____

Section 2: Outdoor Recreation Behaviors

For the purpose of this survey, an outdoor recreation/leisure activity will be defined as:

An activity that occurs outdoors in an urban or man-made environment as well as those activities traditionally associated with the natural environment (Phipps, 1991). These activities occur during free time that is often a state of mind or attitude that allows one to recover from the strains of life and has qualities of perceived freedom, pleasure, and intrinsic motivation (Kleiber, 1999).

1. What region of the country are you located in?

- a. Northwest
- b. West
- c. Southwest
- d. Midwest
- e. Southeast
- f. Mid Atlantic
- g. Northeast
- h. Prefer not to answer

2. Do you travel to participate in outdoor recreation/leisure activities?

- a. Yes
- b. No

3. How far are you willing to travel to participate in outdoor recreation/leisure activities?

- a. I am not willing to travel

- b. 1-50 miles
 - c. 51-100 miles
 - d. 101-500 miles
 - e. 1,000 or more miles
4. Do you physically train for your outdoor recreation/leisure activities?
- a. Yes
 - b. no
5. What intensity level would you consider your outdoor recreation/leisure activity to be at?
- a. Low intensity (able to maintain a conversation, not breathing heavy)
 - b. Moderate intensity (moderately heavy breathing, still able to talk)
 - c. High intensity (breathing hard, unable to talk)
6. Do you prefer your outdoor recreation/leisure activity to be competitive?
- a. Yes
 - b. no

The following question relates to perceived benefits of recreation/Outdoor Recreation.

Please identify which aspects you believe leisure provides you with:

7. *Outdoor recreation/leisure provides me with.....*

____An opportunity to engage in physical activity

____A way to “disconnect” from daily life

____A sense of community

____Opportunities to be more mentally alert

____An opportunity to connect with nature

____A way to challenge myself physically

____A sense of stress relief

Section 3: COVID-19 Activity Survey

Questions Related to Stress and COVID-19 Pandemic

1. Has the COVID-19 pandemic affected your outdoor recreation/leisure habits since March of 2020?

a. Yes

b. No

If YES to #1, how did the COVID-19 pandemic affect your outdoor recreation/leisure habits since March of 2020?

a. I decreased my Outdoor Recreation frequency

b. I increased my Outdoor Recreation frequency

c. I did not change my Outdoor Recreation frequency

If YES to #1, how does the COVID-19 pandemic affect your current outdoor recreation/leisure, when compared to pre-pandemic (before March 2020)?

a. I have decreased my Outdoor Recreation frequency

b. I have increased my Outdoor Recreation frequency

c. I have not changed my Outdoor Recreation frequency

2. Before the COVID-19 pandemic began, what forms of outdoor recreation/leisure did you engage in most frequently?

a. Hiking/walking

- b. Camping
- c. Paddlesports (Kayak, Canoe, Stand-up Paddleboard)
- d. Biking
- e. Rock-climbing
- f. Swimming
- g. Outdoor team sports
- h. Other _____(Please specify)

3. After the COVID-19 pandemic began, what forms of outdoor recreation/leisure did you engage in most frequently?

- i. Hiking/walking
- j. Camping
- k. Paddlesports (Kayak, Canoe, Stand-up Paddleboard)
- l. Biking
- m. Rock-climbing
- n. Swimming
- o. Outdoor team sports
- p. Other _____(Please specify)

4. Please provide any additional comments regarding how the COVID-19 pandemic has impacted your Outdoor Recreation or recreation habits or experiences. (open-ended)

Section 6: Recreation Experience Preference Scale (REPV2)



Recreation Experience Preference Scale

PsycTESTS Citation:

Kyle, G. T., Mowen, A. J., & Tarrant, M. (2004). Recreation Experience Preference Scale [Database record]. Retrieved from PsycTESTS. doi: <https://dx.doi.org/10.1037/t26162-000>

Instrument Type:

Rating Scale

Test Format:

Respondents to the Recreation Experience Preference Scale were asked to indicate the importance of the items in terms of their visits to a specific park; items were measured along a scale where 1 = not at all important through 5 = extremely important.

Source:

Kyle, Gerard T., Mowen, Andrew J., & Tarrant, Michael. (2004). Linking place preferences with place meaning: An examination of the relationship between place motivation and place attachment. *Journal of Environmental Psychology*, Vol 24(4), 439-454, doi: <https://dx.doi.org/10.1016/j.jenvp.2004.11.001>. © 2004 by Elsevier. Reproduced by Permission of Elsevier.

Permissions:

Test content may be reproduced and used for non-commercial research and educational purposes without seeking written permission. Distribution must be controlled, meaning only to the participants engaged in the research or enrolled in the educational activity. Any other type of reproduction or distribution of test content is not authorized without written permission from the author and publisher. Always include a credit line that contains the source citation and copyright owner when writing about or using any test.

**Recreation Experience Preference Scale
REP**

Items

Learn

- To learn about the local history of the area
- To learn about the natural history of the area
- To learn about the countryside

Autonomy

- To experience solitude
- To be on my own
- To think about my personal values

Activity

- To test my endurance
- To show others I can do it
- To take risks

Social

- To be with members of my group
- To share my skill and knowledge with others
- To meet new people

Nature

- To be close to nature
- To enjoy the view

Health

- To help reduce built-up tension
- To relax physically
- To get exercise

Section 5: Outdoor Recreation Self-Efficacy Scale (Mittlestaedt & Jones, 2009)

Please rate the following on a scale of 0-10.

When I do outdoor activities I have the feeling or belief:

	Not At All True ----- Very True										
When I do outdoor activities I (am, have):	0	1	2	3	4	5	6	7	8	9	10
Capable											
Competent											
Skilled											
Intimidated											
Confident											
Adequate											
Successful											
A sense of achievement											
A sense of enjoyment											
A sense of accomplishment											
Challenged											
I get excited											
I have a good time											
Energized											
Really involved in what I am doing											
Able to choose the activity											
I have fun											
I have the support needed											
Believe I can succeed											

Appendix D: Datasets

Dataset 1. Participant Characteristics

Characteristic	Number (%)
Age	<i>n</i> =980
18-24	171(17.4)
25-29	64(6.5)
30-34	67(6.8)
35-39	79(8.1)
40-44	109(11.1)
45-49	114(11.6)
50-54	161(16.4)
55-59	104(10.6)
60-64	66(6.7)
65-69	29(3.0)
70-74	13(1.3)
75-79	2(0.2)
80-84	0(0)
85+	1(.1)
Ethnicity	<i>n</i> =995
American Indian or Alaska Native	5(0.5)
Asian	18(1.8)
Black or African American	12(1.2)
Hispanic or Latino/a/x	32(3.2)
Native Hawaiian or Other Pacific Islander	1(0.1)
White	931(93.6)
Other/Prefer to Self-Describe	17(1.7)
Prefer not to answer	5(0.5)
Gender	<i>n</i> =994

Male	352(35.4)
Female	636(64.0)
Transgender male	1(0.1)
Gender variant/non-conforming	2(0.2)
Not Listed	1(0.1)
Prefer not to answer	2(0.2)
<hr/>	
Marital status	<i>n</i> =993
<hr/>	
Single, never married	284(28.6)
Married or domestic partnership	592(59.6)
Widowed	11(1.1)
Divorced	95(9.6)
Separated	6(0.6)
Prefer not to answer	5(0.5)
<hr/>	
Education	<i>n</i> =994
<hr/>	
High school graduate, diploma or equivalent (e.g, GED)	41(4.1)
Some college credit, no degree	167(16.8)
Trade/vocational/technical training	22(2.2)
Associate's degree	73(7.3)
Bachelor's degree	384(38.6)
Master's degree	225(22.6)
Professional degree	17(1.7)
Terminal degree (i.e., PhD, MD, JD)	63(6.3)
Prefer not to answer	2(0.2)
<hr/>	
Employment status	<i>n</i> =993
<hr/>	
Employed full-time	589(59.3)
Employed part-time	108(10.9)
Out of work and looking for work	15(1.5)
Out of work and not currently looking for work	14(1.4)

A homemaker	25(2.5)
A student (no outside employment)	65(6.5)
A student and employed part-time	87(8.8)
A student and employed full-time	12(1.2)
A member of the Military	3(0.3)
Retired	67(6.7)
Unable to work	5(0.5)
Prefer not to answer	3(0.3)

State of Residence	<i>n</i> =997
Alabama	3(0.3)
Alaska	1(0.1)
Arizona	17(1.7)
Arkansas	9(0.9)
California	34(3.5)
Colorado	25(2.6)
Connecticut	50(5.1)
Delaware	0(0)
Florida	12(1.2)
Georgia	10(1.0)
Hawaii	1(0.1)
Idaho	5(0.5)
Illinois	20(2.0)
Indiana	11(1.1)
Iowa	5(0.5)
Kansas	53(5.4)
Kentucky	5(0.5)
Louisiana	1(0.1)
Maine	6(0.6)
Maryland	7(0.7)
Massachusetts	14(1.4)

Michigan	22(2.3)
Minnesota	54(5.5)
Mississippi	3(0.3)
Missouri	396(40.5)
Montana	7(0.7)
Nebraska	2(0.2)
Nevada	1(0.1)
New Hampshire	8(0.8)
New Jersey	7(0.7)
New Mexico	3(0.3)
New York	17(1.7)
North Carolina	17(1.7)
North Dakota	1(0.1)
Ohio	3(0.3)
Oklahoma	4(0.4)
Oregon	13(1.3)
Pennsylvania	30(3.1)
Rhode Island	7(0.7)
South Carolina	23(2.4)
South Dakota	3(0.3)
Tennessee	5(0.5)
Texas	10(1.0)
Utah	1(0.1)
Vermont	6(0.6)
Virginia	12(1.2)
Washington	9(0.9)
West Virginia	2(0.2)
Wisconsin	19(1.9)
Wyoming	3(0.3)

Dataset 2. Region of the Country Participant is Located

Characteristic	Number (%)
Region	<i>n</i> =991
Northwest	41(4.1)
West	55(5.5)
Southwest	45(4.5)
Midwest	574(57.9)
Southeast	71(7.2)
Mid-Atlantic	29(2.9)
Northeast	134(13.5)
South	26(2.6)
Prefer not to answer	16(1.6)