EXAMINING THE RELATIONSHIP BETWEEN SOCIAL MEDIA USERS' MOTIVATION AND PLACE ATTACHMENT TO NATIONAL PARKS

A Dissertation

by

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ABSTRACT

Social media (SM) is greatly impacting ways of life by reshaping how people obtain information, collaborate, and interact with each other. With the increasing popularity and prevalence of this communication technology, public land management agencies (e.g., the National Park Service and Texas Parks and Wildlife Department) have recognized the need for developing and implementing social media strategies. Despite the increased use of social media among these agencies, there is very limited knowledge on the role of social media on visitor experience and behavior.

The purpose of this research was to gain a better understanding of an individual's motivation for social media use and its impact on one's attachment to a national park. Specifically, this study aimed to investigate the relationships among dimensions of social media motivation, i.e., *social motivation* and *personal motivation,* and of place attachment, i.e., *place dependence, place identity,* and *place affect*. Furthermore, the current study examined the moderating effects of experience use history (EUH) and social media use behaviors on these relationships. The role of socio-demographic characteristics on SM motivation and place attachment was also examined.

This study conducted an online survey on individuals who have visited any U.S. national park and have followed that park's official social media account. Structural equation modeling (SEM) using a two-step approach was conducted to test the hypothesized relationships between SM motivation and place attachment. The moderating variables were examined using multiple regression analysis. Socio-demographic differences were examined using one-way ANOVA and independent samples *t*-tests.

This study provided an understanding of why individuals engage with national parks' social media and how their SM motivation affects their cognitive, affective, and functional attachment to the parks. Each dimension of SM motivation positively affected each dimension of place attachment, except for one hypothesized path between *personal motivation* and *place dependence*. The amount of exposure to national-park-related SM content moderated the relationships between *social motivation* and place attachment. Some socio-demographic differences on SM motivation and place attachment were found. The findings of this study will guide park managers in developing and implementing the appropriate social media strategies that will facilitate virtual visitors' place attachment to their parks.

Keywords: social media, place attachment, national parks, visitors, motivation

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NOMENCLATURE

EUH	Experience Use History
NPS	National Park Service
SM	Social Media

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CHAPTER I

INTRODUCTION

Background

Social media (SM), is greatly impacting ways of life by reshaping how people obtain information, communicate, collaborate, and interact with each other. Social media refers to Internet-based applications that allow their users to create and share contents (Kaplan & Haenlein, 2010). It includes various forms, such as blogs, virtual communities, social networking sites, and collaborative projects (Kaplan & Haenlein, 2010; Xiang & Gretzel, 2010). These social media platforms enable their users to connect with one another in a virtual world without spatial or temporal constraints and to actively participate in co-constructing media contents, rather than passively observing and receiving them (Ballew, Omoto, & Winter, 2015). In 2020, it was estimated that 3.6 billion people worldwide were social media users (Clement, 2020), and a typical (median) American used three of the eight SM platforms (e.g., Facebook, Twitter, Instagram, and YouTube) due to their various functions and uses (Smith & Anderson, 2018).

Research about why and how people use social media has largely been explored using uses and gratifications theory, which postulates that individuals use media to fulfill specific wants and needs (Katz, Blumler, & Gurevitch, 1973). This theory assumes people are active and motivated in selecting the media they choose to consume. Applying this theory, Whiting and Williams (2013) identified ten uses and gratifications for individuals using social media: (1) social interaction, (2) information seeking, (3) pass time, (4) entertainment, (5) relaxation, (6) expression of opinions, (7) communicatory utility, (8) convenience utility, (9) information sharing, and (10) surveillance/knowledge about others. Other researchers have followed and

contributed to expanding the current knowledge of social media by focusing on various social media platforms and individual characteristics, such as age, gender, education level, academic background, and personality traits (Alhabash & Ma, 2017; Correa, Hinsley, & De Zuniga, 2010; Kim, Sin, & Tsai, 2014).

In response to the increasing popularity and prevalence of this new communication technology, many groups and organizations have adopted social media as a communication tool. Some of their SM uses include distributing information, promoting a product or service, engaging stakeholders, receiving feedback, and facilitating public participation or collective action (Bhanot, 2012; Hays, Page, & Buhalis, 2013; Obar, Zube, & Lampe, 2012; Pantelidis, 2010). Among the organizations that have recognized the need for developing and implementing social media strategies are public land management agencies. For instance, the National Park Service (NPS) aims to advance agency goals, i.e., interpretation and education, civic engagement, and public involvement, by communicating with a broader society and creating a vibrant community of park supporters through social media (Jarvis, 2011; National Park Service [NPS], 2019). As of 2020, the NPS operated 774 social media accounts, mainly utilizing Facebook, Instagram, Twitter, Flickr, and YouTube (U.S. Digital Registry, n.d.). The NPS uses these platforms for various reasons. For example, the NPS has used Facebook to provide updates, news releases, photos, videos, and live streams from parks and to encourage Facebook users to share their own experiences. On Instagram, the NPS has shared photos, videos, and live stories from parks to inspire people.

Due to an increased presence of social media in public land management agencies, such use has recently begun to attract scholarly attention. In several studies, social media has been used as a data collection tool for research in parks and protected areas (Hausmann et al., 2017;

Kuehn et al., 2020). These researchers have utilized data collected from social media platforms, such as Flickr and Instagram, to understand patterns of recreational visitation and social media usage. However, only a few have investigated visitor use and experience in relation to social media (Miller & Freimund, 2017; Wilkins, Smith, & Keane, 2018). Therefore, it has been suggested more research is needed in order to better understand the role of social media on visitor behaviors, and the ways to utilize this technology to enhance visitor experience (Miller, Taff, Newman, & Lawhon, 2019).

The relationship between social media and one's attachment to a park is one area of study that likely deserves more attention. Place attachment has been used in various branches of social sciences to describe the bonding that occurs between individuals and their meaningful places. Place attachment "involves an interplay of affect and emotions, knowledge and beliefs, and behaviors and actions in reference to a place" (Low & Altman, 1992, p. 5). Place attachment has received much scholarly attention; however, there has been a lack of consensus on its definition and operationalization (Hernandez, Hidalgo, & Ruiz, 2014). In order to synthesize many definitions and components of place attachment, Scannell and Gifford (2010a) introduced a tripartite organizing framework that involves Person, Process, and Place dimensions. First, the Person dimension focuses on meanings an individual or a group attributes to a location based on personal memories and experiences or shared historical experiences and values. Second, the Process dimension includes the affective (emotional connection), cognitive (memories, beliefs, and knowledge), and behavioral (actions) components of attachment. Third, the Place dimension refers to characteristics of a place and includes spatial level, degree of specificity, and social and physical aspects of the place.

Resource management research has conceptualized place attachment as having four components: place dependence (Stokols & Schumaker, 1981), place identity (Proshansky, 1978), place social bonding (Kyle, Graefe, Manning, & Bacon, 2004), and place affect (Halpenny, 2010). Place dependence reflects an individual's functional assessment of a place, evaluating how well the place and its physical features serve one's instrumental values (Jorgensen & Stedman, 2001). Place identity refers to an individual's cognitive assessment of a place, in which one utilizes cognitions to draw similarities between oneself and the place and defines personal identity in relation to the place (Proshansky, 1978). Place social bonding highlights the importance of social ties to a place and reflects meanings attributed to the place based on social relationships (Kyle, Graefe, & Manning, 2005). Finally, place affect emphasizes an individual's feelings and affective/emotional connection to a place (Halphnny, 2010).

The importance of place attachment in natural resource management is evident due to its relations to various attitudes, perceptions, and behaviors. Moore and Graefe (1994) suggested that place attachment should be used during planning and public involvement processes as trail users' satisfaction may be influenced by any changes made to places that the users consider special. Visitor satisfaction has been suggested to measure the success of a protected area in delivering a high-quality visitor experience (Coghlan, 2012; McCool, 2006). This experience may result in increased revenue from visitor fees and other spending and in increased support for the protected area and conservation (Coghlan, 2012; McCool, 2006). Ramkissoon and her colleagues further added that place attachment positively influenced place satisfaction at a national park (Ramkissoon, Smith, & Weiler, 2013) and overall quality of life (Ramkissoon, Mavondo, & Uysal, 2018).

Place attachment has also been found to be relevant to the study of environmental perceptions and behaviors (Halpenny, 2010; Ramkissoon et al., 2013; Vaske & Kobrin, 2001). Several researchers have found a positive relationship between place attachment and pro-environmental behaviors (Halpenny, 2010; Vaske & Kobrin, 2001). These behaviors have included both place-specific (e.g., volunteering to reduce or stop visiting one's favorite spot for recovery purposes and encouraging others to pick up their litter at a park) and general, everyday behaviors (e.g., recycling, conserving water, and discussing environmental issues with others) (Halpenny, 2010; Vaske & Kobrin, 2001).

There are many ways in which social media may facilitate and intensify one's attachment to a place in a park setting. Place attachment has been argued to be characterized by the tendency of an individual to stay close to a place (Hidalgo & Hernandez, 2001; Scannell & Gifford, 2010a). Additionally, several researchers have found that repeated use and experience with a place over time intensified one's attachment (Eder & Arnberger, 2012; Hammitt, Backlund, & Bixler, 2004; Moore & Graefe, 1994). By offering a virtual space where individuals can virtually access and visit parks and interact with park employees and supporters, social media enables users to form an online community, which can facilitate attachment.

Bradshaw (2008) introduced the concept of 'post-place community' in which the traditional concept of communities, limited by physical boundaries, no longer describes all the manifestations of today's community. The Internet has allowed individuals to connect in virtual time and space and to create a community with those who share similar interests, norms, and values. In support of these claims, Breek, Hermes, Eshuis, and Mommaas (2018) found that the digital interactions on blogs facilitated various forms of attachment to a neighborhood. Given

these findings, it is important to understand social media's specific relevance to place attachment in a national park setting.

Nature of the Problem

News articles and blog posts written about social media have largely focused on this communication tool attracting large crowds to national parks and damaging natural resources (Forero, 2018; Solomon, 2017). Ron Judd, a writer of several guidebooks on camping and hiking, stated that the tension between attracting more people to enjoy the outdoors and preserving their wilderness is not new (Solomon, 2017). However, social media is now able to put a spotlight on a place with scenic photos that can be viewed by thousands of people in just a few minutes. Several landmarks that were once hidden gems have become incredibly famous on social media, resulting in growing crowds. For example, Horseshoe Bend in Arizona was a locals-only pitstop on the side of a highway (CPR News, 2019). However, once it became extremely popular on Instagram, the place has experienced a sharp increase in visitation, averaging 1,500 recreation visits per day in 2019 (National Park Service [NPS], 2020). In Yellowstone National Park, a new trail had to be built due to social trailing created by visitors who were seeking out a specific angle of Grand Prismatic Spring that was featured on pictures online (Forero, 2018).

In academic communities, social media research has largely focused on using social media as merely a data collection tool (e.g., Hausmann et al., 2017; Kuehn et al., 2020). These data were often collected from photo-sharing platforms, such as Instagram and Flickr. It can be argued that knowledge of in-depth use of social media by visitors and public land management agencies has been limited. Very few studies have been conducted to understand the effect of social media on visitor use and experience in the context of parks and protected areas. These

studies have been exploratory in nature and aimed at gaining a general understanding of park visitors' motivations (Miller & Freimund, 2017) and preferences for using social media (Wilkins et al., 2018). Studies by Miller and Freimund (2017) and Wilkins et al. (2018) both utilized data collected from on-site visitors to a single national park, thus limiting generalizability of their study findings. Additionally, none of these studies have examined how social media can influence psychological or cognitive process that may enhance or take away from visitor experience.

In understanding the effect of social media on visitor experience, place attachment is an important phenomenon to study in a national park setting as it has been suggested to affect place satisfaction (e.g., Ramkissoon et al., 2013) and environmental perceptions and behaviors (e.g., Halpenny, 2010; Vaske & Kobrin, 2001). These outcomes of place attachment may help to mitigate negative effects that heavy visitation, partially caused by the popularity on social media, can have on parks and protected areas. Therefore, it is believed to be important to explore the role of social media on place attachment to better understand the media's potential to influence visitor experiences and behaviors.

Another area that is believed to require further research is the relationship between place attachment and several antecedent variables (e.g., experience use history and socio-demographics). First, repeated use and experience with a place has been found to be positively related to place attachment. However, varying effects on different dimensions of place attachment have been found and, in some cases, no significant difference has been found (Eder & Arnberger, 2012; Williams & Vaske, 2003). Second, findings on the relationship between socio-demographic variables and place attachment vary in strength and nature of the relationship (Scannell & Gifford, 2017). For example, the general consensus has been that there is a positive

relationship between age and place attachment; however, mixed results have been found for gender (Ednie, Daigle, & Leahy, 2010; Kyle, Graefe, & Manning, 2004; Lewicka, 2005).

Given these gaps and mixed results in the literature, there is likely a need to examine the relationship between social media and place attachment to a national park. More specifically, social media users' motivation to engage with national parks will be systematically analyzed as well as the effects of those motivations on multiple dimensions of place attachment. The proposed study hopes to expand upon existing literature by linking social media motivations and place attachment and by incorporating experience use history and socio-demographic variables.

Purpose of the Study

This research aims to gain a better understanding of an individual's motivation for social media use and its impact on place attachment to a national park. The current study also intends to understand the effects of experience use history and social media use behaviors on this relationship, and to understand the role of socio-demographic characteristics on the level of place attachment and on social media users' motivation.

Three research questions will guide this study:

Research Question 1: What is the relationship between social media (SM) users' motivation to engage with a national park and their attachment to the park?

- Hypothesis 1 (H1): Each dimension of SM motivation, i.e., *information, community, action,* and *personal gratification*, will positively predict each dimension of place attachment, i.e., *place dependence, place identity, place social bonding,* and *place affect*.
- Hypothesis 2 (H2): The strength of the effect of SM motivation on place attachment will increase with experience use history.

- Hypothesis 3 (H3): The strength of the effect of SM motivation on place attachment will increase with more SM exposure.
- Hypothesis 4 (H4): The strength of the effect of SM motivation on place attachment will increase with more active SM engagement.

Research Question 2: What is the role of socio-demographic characteristics on the level of place attachment?

- Hypothesis 5 (H5): The level of place attachment will vary based on gender.
- Hypothesis 6 (H6): The level of place attachment will increase with age.
- Hypothesis 7 (H7): The level of place attachment will decrease with education level.
- Hypothesis 8 (H8): The level of place attachment will be higher for White participants, compared to other racial/ethnic groups.
- Hypothesis 9 (H9): The level of place attachment will decrease with household income.

Research Question 3: What is the role of socio-demographic characteristics on social media motivation?

- Hypothesis 10 (H10): The motivation to engage with national parks on social media will vary based on gender.
- Hypothesis 11 (H11): The motivation to engage with national parks on social media will decrease with age.
- Hypothesis 12 (H12): The motivation to engage with national parks on social media will increase with education level.
- Hypothesis 13 (H13): The motivation to engage with national parks on social media will vary based on race/ethnicity.

- Hypothesis 14 (H14): The motivation to engage with national parks on social media will increase with household income.

Need for the Study

As the number of social media users worldwide is projected to continue growing over the next five years (Clement, 2020), the use of social media in a national park setting will likely become more prevalent and important. Social media is often portrayed as a double-edged sword for national parks as it can be a great tool to connect with the public, educate them on stewardship, and get them excited about the parks. However, at the same time, it can attract and concentrate a large number of crowds to certain areas that are fragile and cannot sustain high levels of use (Forero, 2018). Therefore, there is a growing need to understand individuals who engage with national parks via social media and develop social media strategies to effectively utilize this communication tool to the parks' benefits.

The current study hopes to add to the existing body of knowledge by systematically analyzing social media users' motivation to engage with national parks. This study adopted the findings from past research about advocacy groups' social media use to analyze SM motivation of individuals who engage with national parks. This approach is likely to be useful because the NPS's mission is in concurrence with that of advocacy groups. Just as advocacy groups are tasked with supporting a cause, the NPS is tasked with preserving natural and cultural resources, educating the public about land stewardship, and encouraging the public to participate in conservation efforts. Therefore, the key functions of social media use by advocacy groups (Lovejoy & Saxton, 2012) are believed to be well-suited to capture why individuals use social media to engage with national parks. Park managers should also be able to utilize the study

findings to better understand what their virtual visitors desire in a park's SM contents and practices.

Most importantly, this study will extend the understanding of place attachment by focusing on social media motivations to engage with national parks. Although there were few community studies that have linked social media use to one's attachment to a neighborhood (e.g., Breek et al., 2018), this relationship has not yet been explored with attachment to national parks. Therefore, the current study aims to fill this gap in the literature by providing a comprehensive picture of place attachment that involves all three components of Scannell and Gifford's (2010a) Person-Process-Place (PPP) framework. The results can guide park managers in developing and implementing appropriate social media strategies for their parks. Park managers will also be able to create their SM contents in a way that develops and intensifies one's place attachment based on the findings.

Delimitations of the Study

There are several delimitations in this study:

1. Participants are limited in responding to the questions for one type of outdoor recreation setting: national parks.
2. Participants are limited to those who have visited any national park in the United States for recreation purposes and have followed a social media account operated by the National Park Service (NPS).
3. This research will only focus on the relationship between individuals' motivations to use social media and their place attachment; it will not include additional psychological or behavioral factors (e.g., satisfaction and revisit intention).

Limitations of the Study

There are several limitations in this study:

1. Participants will be recruited by a research panel provider. The sample of this study will be limited to those individuals who are active in the panel provider's database during the recruiting period.
2. A self-reported questionnaire will be used to assess the study variables: social media motivation, place attachment, experience use history, social media use behaviors, and socio-demographics. Although it is a widely used data collection method in social sciences, it may involve some measurement errors, such as response bias and response variance.
3. The ability to generalize the study findings to other outdoor recreation settings (e.g., national forests, state parks, and city parks) will be limited.

Definitions of Terms

Social media: a group of Internet-based applications that "allow the creation and exchange of user-generated content" (Kaplan & Haenlein, 2010, p. 61). It represents various forms, such as blogs, virtual communities, social networking sites, content communities, consumer review sites, and collaborative projects.

Social media motivation: the needs that an individual aims to fulfill by using social media, in this study, in relation to U.S. national parks (Park, Kee, & Valenzuela, 2009).

Social motivation: a dimension of social media motivation that highlights social aspects, such as interacting with others and being a part of an online community (Miller & Freimund, 2017; Park et al., 2009).

Personal motivation: a dimension of social media motivation that highlights personal benefits a social media user may receive, such as gaining information, being entertained, and relieving day-to-day stress (Miller & Freimund, 2017; Park et al., 2009).

Place attachment: the bonding that occurs between individuals and their meaningful places. It "involves an interplay of affect and emotions, knowledge and beliefs, and behaviors and actions in reference to a place" (Low & Altman, 1992, p. 5)

Place dependence: the functional attachment to a place based on an assessment of "the quality of current place and the relative quality of comparable alternative places" (Stokols & Schumaker, 1981, p. 458).

Place identity: the cognitive connection between the self and a place based on an assessment, in which one utilizes cognitions to draw similarities between oneself and the place and defines personal identity in relation to the place (Proshansky, 1978).

Place social bonding: the connection to a place based on social ties to the place (Kyle et al., 2005).

Place affect: the affective/emotional connection to a place (Ramkissoon et al., 2013).

Outdoor recreation: "natural resource oriented or dependent recreation" (Jensen, 1985, p. 8).

Experience use history (EUH): the amount and extent of participation in outdoor recreation. It is often measured in terms of frequency of visits and total years of use (Schreyer, Lime, & Williams, 1984)

CHAPTER II

REVIEW OF LITERATURE

This study seeks to investigate the role of social media in national parks by examining the relationships between one's motivation for social media use and place attachment. This inquiry is believed to be important because social media has become prevalent as a way for national parks to reach new and diverse audiences and create a vibrant community of park supporters (Jarvis, 2011; Yellowstone Center for Resources, 2014). In this chapter, past research and key variables are introduced.

Social Media in Today's Society

Social Media, a fairly new term that began to appear in the 1990s (Bercovici, 2010), is largely reshaping the way people communicate, collaborate, and interact with each other. Social media has been defined as "a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of user-generated content" (Kaplan & Haenlein, 2010, p. 61). It represents a variety of forms, such as blogs, virtual communities (e.g., Google Groups), social networking sites (e.g., Facebook, Twitter), content communities (e.g., YouTube, Instagram, Flickr, Snapchat), consumer review sites (e.g., TripAdvisor), and collaborative projects (e.g., Wikipedia) (Kaplan & Haenlein, 2010; Xiang & Gretzel, 2010).

In 2020, there were an estimated 3.6 billion social media users worldwide, and the number is expected to grow to almost 4.41 billion by 2025 (Clement, 2020). Smith and Anderson (2018) found that YouTube and Facebook were the most popular social media platforms among adults in the U.S., with 73% of Americans using YouTube and 68% using Facebook. Other

active platforms included: Instagram (35%), Pinterest (29%), Snapchat (27%), and Twitter (24%). Snapchat and Instagram were especially popular among those ages 18 to 24, with 78% of young adults using Snapchat and 71% using Instagram (Smith & Anderson, 2018).

These platforms serve different purposes and have various uses. For example, both Facebook and Twitter are social networking sites; however, Twitter restricts users to short, 280-character, micro-blog posts (Larson, 2017), while Facebook allows more flexibility by permitting users to post long comments, photos, videos, and links to other content on the Internet (Nations, 2019). YouTube and Instagram are content-sharing platforms, each focusing on videos and photos, respectively. Snapchat is used to share photos and videos for only a short period of time (Tillman, 2019). Due to these various functions, many individuals use multiple social media platforms with an average of three platforms per person (Smith & Anderson, 2018).

Much attention has been given to examining why and how individuals use social media (Hansen, Shneiderman, & Smith, 2010; Whiting & Williams, 2013). People have been found to use social media for various reasons, such as delivering private or public messages, posting strong feelings or opinions, contributing to community knowledge, sharing experiences, and expressing their creativity (Hansen et al., 2010). In an effort to systematically explain the reasons for social media use, Whiting and Williams (2013) applied uses and gratifications theory, which posits that individuals deliberately seek out media that fulfill their needs or goals. The researchers identified ten uses and gratifications for using social media: (1) social interaction (e.g., connect with family, friends, co-workers, old acquaintances, and new friends), (2) information seeking (e.g., find information, get how-to-instruction), (3) pass time (e.g., pass time at work or school), (4) entertainment (e.g., play games, listen to music, watch videos), (5) relaxation (e.g., relax, escape the stress of the real world), (6) expression of opinions (e.g., ‘like’

postings, write comments), (7) communicatory utility (e.g., find something to talk about with others), (8) convenience utility (e.g., readily available anytime and anywhere), (9) information sharing (e.g., share information about oneself), and (10) surveillance/knowledge about others (e.g., watch what others are doing). Building on these findings, many researchers have contributed to expanding current knowledge of social media by examining its use based on individual characteristics, such as age, gender, education level, academic background, and personality traits (Alhabash & Ma, 2017; Correa et al., 2010; Kim et al., 2014).

In response to the increasing popularity and prevalence of this new communication technology, many groups and organizations have joined social media to benefit from its large number of users and to improve organizational communication strategies. Social media use by various types of organizations will be introduced in the following sections.

Social Media Use in the Private and Public Sector

Social media has been widely adopted within organizations as a communication tool. Some of the specific areas of use include information distribution, marketing, promotion, customer service, fundraising, and stakeholder engagement (Bhanot, 2012; Hays et al., 2013; Pantelidis, 2010). In an organizational setting, social media technologies may enable communication practices that differ from those of traditional computer-mediated communications, such as e-mail, teleconferencing, and decision-support systems (Steinhuser, Smolnik, & Hoppe, 2011; Treem & Leonardi, 2013).

To understand how social media provides unique and rich opportunities to support organizational communication processes, Treem and Leonardi (2013) identified four affordances: *visibility, editability, persistence,* and *association*. First, social media affords *visibility* into behaviors and information by allowing its users to self-publish work-related

content and to see visible information about fellow employees and ongoing organizational activities. Second, *editability* refers to the ability of social media users to take their time to craft, revise, and reshape contents. This allows the users to improve information quality, to tailor messages for specific audiences, and to strategically regulate shared information. Third, social media affords *persistence* as contents created and stored in social media can sustain knowledge, be refined, and even grow over time. Fourth, social media allows *association* with other users or content and makes such association explicit. This enables the users to develop social connections with others in the organization, to create an online community, and to improve knowledge sharing (Treem & Leonardi, 2013).

Taking advantage of the above affordances, various types of organizations have adopted different social media platforms, objectives, and strategies. Barnes, Mazzola, and Killeen (2020) found that among the 2019 Fortune 500 companies, there was only one company that did not use any social media platforms, i.e., Facebook, Twitter, Instagram, YouTube, LinkedIn, and blogs, examined in their study. The researchers stated that the number of Fortune 500 companies that utilize these platforms has continued to grow over the years. In 2019, 99% of these companies used LinkedIn, 96% used Twitter, 95% used Facebook, and 90% used YouTube. Hence, these companies have adapted and taken advantage of new opportunities that arise in the constantly evolving social networking environment (Barnes et al., 2020).

The private sector is not the only group that has embraced social media. This fairly new communication technology is becoming prevalent at all levels of government (Mergel & Bretschneider, 2013). For example, former President Barack Obama was named the first "social media president" (Schulman, 2016). The Obama administration successfully used various social media platforms (e.g., Facebook, Twitter, Instagram, YouTube, and Snapchat) to directly

communicate and engage with Americans and people around the world. At a local government level, social media has been found to be widely used in the following ways: (1) disseminating information externally, (2) receiving feedback on service quality, (3) collaborating on internal work tasks, and (4) facilitating public participation (Oliveira & Welch, 2013). Such uses have increased transparency, encouraged collaboration, and extended the notions of participatory democracy. Thus, several researchers recommended more government agencies utilize social media technologies (Chun, Shulman, Sandoval, & Hovy, 2010; Mergel & Bretschneider, 2013).

In the following section, various uses of social media by advocacy groups will be explored, as these groups often work with public land management agencies to achieve the agencies' goals.

Social Media Use by Advocacy Groups

The goals of advocacy groups have been argued to support or champion a specific cause, represent the interests of citizens, and achieve policy goals (Guo & Saxton, 2014; Obar et al., 2012). The range of issues that these groups address and advocate for include: civil rights, democracy, healthcare, education, commerce, and the environment. Advocacy groups have embraced social media, taking advantage of its technological affordances (Obar et al., 2012). They have used various social media platforms, with Facebook and Twitter being most popular (Guo & Saxton, 2014, 2020). Guo and Saxton (2020) found that, of the 188 advocacy organizations listed on Charity Navigator, 97.3% used Facebook, 96.8% used Twitter, and 59.9% used YouTube in 2019.

Some social media studies on advocacy groups have largely focused on whether organizations use social media, while others have explored why and how they use it (Guo & Saxton, 2014; Lovejoy & Saxton, 2012; Obar et al., 2012; Petray, 2011; Svensson, Mahoney, &

Hambrick, 2015). By utilizing social media, advocacy groups have been found to be able to communicate with supporters quickly and at low cost, mobilize them in an advocacy effort, and supplement traditional, offline activism (Obar et al., 2012; Petray, 2011; Scott & Maryman, 2016). Obar et al. (2012) examined the use of social media among 53 advocacy groups in the United States. The researchers suggested that social media was mostly used on a daily basis to facilitate civic engagement and collective action. Petray (2011) added that Indigenous rights activists in Australia used social media to further their cause and to raise awareness of their struggles.

In an attempt to understand how advocacy groups used social media, Guo and Saxton (2014) analyzed randomly selected Twitter messages of 188 advocacy groups. They found that the advocacy groups put the greatest effort into providing information to stakeholders (69% of the messages). It was followed by building an online community (20%) and calling that community to action (12%). In a similar study with 46 sport-for-development organizations, Svensson et al. (2015) found that almost half of Twitter messages (44%) were focused on building an online community. Although informational use of Twitter messages was found to be most popular (48%), their findings suggested that the studied organizations were trying to encourage some level of engagement and action by actively involving stakeholders in conversations. Lovejoy and Saxton (2012) further added that *information*, *community*, and *action* were the three key functions of Twitter utilization by the 100 largest nonprofit organizations in the U.S. The researchers also suggested that these organizations were better able to utilize Twitter in strategically engaging their stakeholders than they have been with traditional websites.

The above findings suggest that the uses of social media are similar across advocacy groups. Informational use of social media (e.g., providing information, receiving feedback, and

raising awareness) was most frequent by these groups. Other popular uses included building an online community and facilitating public participation/collective action. Based on the findings of Lovejoy and Saxton (2012), the current study will include three key functions of social media, i.e., *information, community,* and *action*, to analyze the social media users' motivation for engaging with national parks.

Social Media in Parks and Protected Areas

In response to current communication technologies and trends, state and public land management agencies (the agencies) recently began to recognize the importance and the need for developing and implementing social media strategies. As emphasized by The Yellowstone Center for Resources and Jonathan Jarvis (a former director of the National Park Service), the agencies are tasked with educating the public, facilitating civic engagement, and promoting environmental stewardship (Jarvis, 2011; Yellowstone Center for Resources, 2014). In achieving their goals, the agencies have utilized social media to interact with the public.

Given the variety of social media platforms that enable communication, collaboration, and information-sharing among users, many land management agencies have adopted multiple platforms to serve different purposes. For example, the National Park Service (NPS) has been actively using various social media platforms to reach new audiences, provide information, promote their parks, and create a vibrant community of park advocates (NPS, 2019). Facebook has been one of the platforms that the NPS uses to provide updates, news releases, photos, videos, and live streams from parks, encouraging Facebook users to share their own photos and videos. Instagram has also been used to provide "daily inspiration of photos, videos, and live stories from parks" (NPS, 2019, p. 2). The NPS has used Twitter to provide park updates and

news releases, Flickr to share high-resolution images, and YouTube to share videos about wildlife, history, and visitor information (NPS, 2019).

In addition to this federal agency, state agencies have also utilized social media to reach their audiences. For instance, Texas Parks and Wildlife Department (TPWD) has used Facebook, Twitter, Instagram, YouTube, Flickr, Pinterest, and Snapchat to engage with the public (Texas Parks and Wildlife Department [TPWD], n.d.). In a study that interviewed nine social media administrators at Texas state parks, results showed that social media was largely used to provide visitor information, to share photos and videos of the parks, and to have two-way interactions between social media users and the administrators (Schuett, Song, & Lee, 2017).

Due to an increased presence of social media in public land management agencies, such use has recently begun to receive scholarly attention. Previous studies have adopted social media as a data collection tool for research in parks and protected areas (Hausmann et al., 2017; Hausmann et al., 2018; Kuehn et al., 2020; Levin, Kark, & Crandall, 2015; Sessions, Wood, Rabotyagov, & Fisher, 2016). To understand socio-economic, geographical, and biological factors that helped to explain social media use in sub-Saharan Africa's protected areas, Hausmann et al. (2017) analyzed geo-referenced pictures of the areas that were posted on Instagram. The researchers pointed out that social media could now be used to overcome one of the major challenges, a lack of visitation data across the entire region, and to better manage and promote the protected areas.

Social media has also been used to examine human dimensions in public lands. To measure recreational visitation, Sessions et al. (2016) collected crowd-sourced photographs for 38 U.S. national parks from Flickr. By comparing their photograph data to visitor use statistics reported by the National Park Service, the researchers found that the Flickr data were reliable in

indicating the number of visitors to a park in a given period and the home origins of visitors. Kuehn et al. (2020) added that, within the states of Maine, New Hampshire, Vermont, and New York, there were strong, positive relationships between a number of images posted to Flickr and summer visitation levels of 75 state and national parks. They also found that several park characteristics (e.g., size, road access, and number of facilities) helped better explain visitation levels for most parks.

Some limitations have existed in regard to any data obtained from social media. For example, Sessions et al. (2016) found that their Flickr data had a possible overrepresentation of international visitors and the varied popularity of the platform by different geographic regions, user groups, and years. Hausmann et al. (2018) also suggested that various social media platforms may attract different groups of people with diverse interests and background. For example, they found Instagram users to be younger and less experienced with traveling, compared to Flickr users. Despite these limitations, social media has been argued to provide an easy, cost-efficient way of obtaining data for conducting research and monitoring socio-ecological activities on public lands (Hausmann et al., 2018; Sessions et al., 2016).

The above studies lend support for the use of social media as a data collection tool; however, only a few studies have investigated the actual use of social media by land management agencies or visitors (Cheng, Wong, Wearing, & McDonald, 2017; Miller & Freimund, 2017; Wilkins et al., 2018). Cheng et al. (2017) conducted an exploratory study to understand how ecotourism management agencies in China used Sina Weibo (Weibo), a leading Chinese microblog platform. They chose five ecotourism sites (e.g., UNESCO World Heritage Sites and national parks) and analyzed Weibo postings from those sites' management agencies. Based on their results, they identified six themes: (1) unity of human beings and nature, (2)

culture, (3) education, (4) ethics, (5) health, and (6) travel guidance. Cheng et al. (2017) also found that the intended consequences of Weibo use included enhancing communication between ecotourists and management, creating a forum for discussion and social awareness, improving ecotourists' attitude and affection toward ecotourism sites, and improving travel experience, travel intention, and loyalty.

In addition to exploring management perspectives, Miller and Freimund (2017) conducted one of the first studies that directly looked at visitor use and experience in relation to social media. By investigating virtual visitors to Yellowstone National Park's (YNP) Facebook page, the researchers found that the vast majority of virtual visitors had visited Yellowstone National Park previously. These visitors were motivated to 'like' the Facebook page for social, affective, and education and entertainment purposes. The Facebook page was largely used as a way for virtual visitors to stay connected to the park after their on-site visits. This could mean that its potential to reach people before and during on-site visits and to reach those who were not current visitors to national parks was not fulfilled (Miller & Freimund, 2017).

Although there has been a very limited number of studies on how and why park visitors use social media, tourism scholars have given more attention to tourists' social media use. Xiang and Gretzel (2010) found somewhat contradictory results regarding tourists' pre-trip behavior. Unlike Miller and Freimund's (2017) speculation that YNP's Facebook page may not be reaching people before their on-site visits, Xiang and Gretzel (2010) found that social media played an important role in the online tourism domain, especially in relation to trip planning. Zeng and Gerritsen (2014) added that shared information on social media was viewed as an important information source during trip-planning and decision-making processes. In addition to examining the SM use before a trip, many studies have also looked at the use during and after the

trip, which involved both consumption and creation of the travel-related SM content (e.g., Amaro, Duarte, & Henriques, 2016; Yoo & Gretzel, 2012).

In a park setting, Wilkins et al. (2018) carried out another study that examined the use of social media from the visitor perspective. Visitors to Crater Lake National Park were surveyed on-site about their preferences in regard to types of social media platforms and content. The majority of respondents were active social media users, and Facebook was found to be the most popular platform. The type of content the respondents hoped to receive about the park varied based on different social media platforms (Wilkins et al., 2018). For example, those who used Facebook, Twitter, and Instagram preferred to receive park-related information on current weather and trails. This finding suggests that the respondents may value social media as an information source during a pre-trip stage just as tourists did in the above studies by Xiang and Gretzel (2010) and Zeng and Gerritsen (2014). Wilkins et al. (2018) also found that YouTube users preferred to receive content on the park's wildlife and its natural and cultural history, which supports the finding by Miller and Freimund (2017) that virtual visitors 'like' YNP's Facebook page for education and entertainment purposes.

Since the research on exploring the relationship between social media, visitor use and experience is still in its infancy, Miller et al. (2019) distinguished four critical themes that deserve further research, including: "1) the influence of social media on visitor behaviors, 2) using social media to enhance and facilitate the visitor experience both onsite and offsite, 3) reaching intended audiences, and 4) understanding management perspectives" (Miller et al., 2019, p. 134). In response to a call for further research on social media, the present study aims to address Miller et al.'s (2019) second theme by providing a deeper understanding of the social media's influence on virtual visitors. The current study will examine why these visitors virtually

engage with parks via social media and how this engagement affects their development of place attachment.

For a comprehensive understanding of social media users' motivation, the current study suggests a fourth category, *personal gratification*. While Lovejoy and Saxton's (2012) three key functions, i.e., *information, community,* and *action*, were used to understand why advocacy groups use social media, these key functions are believed to be well suited to also capture why individuals use social media. However, they fall short of capturing one important aspect of individuals' social media use, personal benefits or personal gratifications. Entertainment and diversion (escape from problems) have long been suggested to be those needs that individuals seek to fulfill by using various types of media (e.g., television, newspaper, and social media) (Chung & Yoo, 2008; McQuail, Blumler, & Brown, 1972; Whiting & Williams, 2013). Specific to social media, Whiting and Williams (2013) found that people use this type of media for entertainment and relaxation purposes. Alhabash and Ma (2017) further added that entertainment was one of the top motivations for college students to use all four social media platforms examined in their study: Facebook, Twitter, Instagram, and Snapchat. In a national park setting, Miller and Freimund (2017) found *education and entertainment* to be one of the three motivation components for 'liking' the Yellowstone National Park's Facebook page. Therefore, *personal gratification* will refer to the use of social media for personal benefits, such as entertainment, inspiration, and stress relief purposes, in the current study.

Socio-demographics

Several differences have been identified in examining the use of social media among various socio-demographic variables. These variables have included age/generation (McCorkindale, DiStaso, & Sisco, 2013; Miller & Freimund, 2017), gender (Krasnova, Veltri,

Eling, & Buxmann, 2017; Lin & Lu, 2011), household income (Yoo & Gretzel, 2008), and education (Amaro et al., 2016).

Since 2005, Pew Research Center (2021) tracked social media use of American adults and reported several trends. First, age was found to be strongly correlated with social media use, as young adults (ages 18-29) have typically been the most likely to use social media. However, Perrin (2015) found that social media usage among young adults has leveled off starting 2010, while usage among those 65 and older has more than tripled. Second, those with at least some college education have been more likely to use social media, compared to those with a high school degree or less (Pew Research Center, 2021). Third, household income has been positively correlated with social media use. On the other hand, Perrin (2015) did not find any difference by gender and race.

Some researchers have focused on one specific variable to explore demographic differences in individuals' social media use and motivation. McCorkindale et al. (2013) found that Millennials, born between 1981 and 2000, had specific preferences for why, how, and with who they wanted to engage on Facebook. Millennials tended to use Facebook to maintain current relationships with friends and families, rather than to make new friends. Similarly, Millennials were more likely to engage with smaller organizations they had some connection to (e.g., membership in the organization, passion for the organization), rather than with large corporations. In a park setting, Miller and Freimund (2017) found that non-Millennials, compared to Millennials, were more motivated to follow Yellowstone National Park's Facebook page for social and affective reasons and showed higher levels of engagement. On the other hand, Millennials were seeking relationships with the park itself, rather than with other visitors on social media (Miller & Freimund, 2017).

Gender is another variable that has received a lot of scholarly attention. Krasnova et al. (2017) found that while both men and women were motivated by the ability to engage in self-enhancement on social media, there were some gender differences in their social media use. They found that women tended to value relational uses, such as maintaining close relationships and obtaining social information on close friends and distant acquaintances, while men tended to focus on broader uses, such as gaining information on topics of general interest. Lin and Lu (2011) found that women were more likely to be influenced by peers in their intention to continue using social media, while men found usefulness and enjoyment to be more important.

In a tourism context, Amaro et al. (2016) provided a comprehensive understanding of social media users by conducting a cluster analysis to segment travelers based on their social media use. Younger travelers were found to be associated with both creation and consumption of travel-related SM content, while older travelers were shown to be less likely to use social media for travel purposes. Amaro et al. (2016) also found that doctoral degree level of education was associated with less creation of travel-related content.

Yoo and Gretzel (2008) added to the knowledge by exploring demographic differences in travelers' motivations to write online reviews. Females were found to be more motivated by the opportunity to help a travel service provider and to experience enjoyment and positive self-enhancement through their reviews, while males were shown to be more motivated by being able to vent negative feelings and to exercise collective power. Compared to the high-income group, the low-income group was more motivated by concerns for other consumers and by desires to vent negative feelings and to exercise collective power. Yoo and Gretzel (2008) did not find any significant difference for age, education, and marital status.

Given these documented differences for socio-demographic variables, the current study will examine if any difference exists in an individual's motivation to use social media among various socio-demographic groups.

Place Attachment

People-place relationships have gained much attention in recent years and have been researched in various branches of social sciences, including geography, anthropology, environmental psychology, natural resource management, environmental education, and leisure sciences and tourism (Brehm, Eisenhauer, & Krannich, 2006; Halpenny, 2010; Hidalgo & Hernandez, 2001; Kyle et al., 2005; Lee, 2011; Ramkissoon et al., 2013; Relph, 1976; Tuan, 1977; Vaske & Kobrin, 2001). The importance of place attachment has been well-established (Manzo & Devine-Wright, 2014); however, there is still a lack of consensus on definitions and how it should be operationalized (Hernandez et al., 2014). Low and Altman (1992) provided a working definition of place attachment, "the bonding of people to places" (p. 2). It "involves an interplay of affect and emotions, knowledge and beliefs, and behaviors and actions in reference to a place" (p. 5). Places refer to meaningful spaces, and can vary in specificity, tangibility, and scale, ranging from a very small object to a city, nation, or the entire planet (Low & Altman, 1992). Hidalgo and Hernandez (2001) supported this by affirming that people develop attachment to places in varying degrees and within different spatial ranges and dimensions.

Various definitions and applications of place attachment have led to numerous studies emphasizing different aspects of the concept. While some scholars have focused on one or two specific aspects (e.g., Brehm et al., 2006; Vaske & Kobrin, 2001), others have synthesized and created more inclusive frameworks or models (e.g., Scannell & Gifford, 2010a). These previous studies will be reviewed in the following sections.

Multi-dimensionality of Place Attachment

Past literature has shown that place attachment is a multi-dimensional construct that includes several aspects of people-place bonding. Early geography scholars argued that people acquire a sense of belonging to places that allow them to develop positive cognition related to such places, thus providing meaning to their lives (Relph, 1976; Tuan, 1977). Low and Altman (1992) also emphasized social aspects of place attachment by referring to places as "repositories and contexts within which interpersonal, community, and cultural relationship occur" (p. 7). They suggested that people may be attached to these social relationships, rather than to the place itself. Thus, the social dimension would explain individuals' attachment to a place because of their close ties with their neighbors, generational rootedness in the area, or strong religious symbolisms (Lewicka, 2011).

In early community studies that were carried out in traditional, urban residential areas, stronger emphasis was put on the social dimension of place attachment rather than on the physical dimension (Lewicka, 2011). As research interests broadened to include communities located in high-amenity areas and outdoor recreation places, many researchers began to put stronger emphasis on the physical dimension of place attachment. This physical dimension would explain place attachment based on the environmental features of a place, such as beautiful scenery and availability of recreational opportunities.

Hidalgo and Hernandez (2001) measured place attachment among residents of a town in Spain within three spatial ranges (house, neighborhood, and city) and two dimensions (social and physical). The studied residents felt attached to both social and physical dimensions of places, although social attachment was found to be greater than physical attachment. This meant that both social and physical dimensions of place attachment played a role and developed into a

general affective feeling toward the place of residence. Moreover, Brehm et al. (2006) added that socially-based attachment (social dimension) and natural environment-based attachment (physical dimension) were distinct among residents of three high-amenity rural communities. In support of the earlier work by Hidalgo and Hernandez (2001), Brehm et al. (2006) argued that it was important to include both social and physical dimensions in analyses of place attachment. This inclusion would likely help us to better understand how residents develop attachment to their communities and how this attachment can possibly lead to community activism, outreach, and public participation.

Scannell and Gifford (2010b) further expanded the existing knowledge of place attachment by examining the relationship between two dimensions of place attachment (natural/physical and civic/social) and pro-environmental behavior of residents from two proximate towns in Canada. Their findings demonstrated the need to independently consider these two dimensions due to their differing effects; that is, only the natural/physical dimension, but not the civic/social dimension, influenced the residents' pro-environmental behaviors. Overall, these studies suggest that both physical and social dimensions exist and play an important role in the development of one's place attachment.

In an attempt to synthesize many definitions and constructs of place attachment, Scannell and Gifford (2010a) introduced a tripartite organizing framework: Person, Process, and Place dimensions. First, the Place dimension refers to characteristics of a place and includes spatial level, degree of specificity, and previously introduced social and physical aspects. Place attachment has been examined at various spatial levels (e.g., home, neighborhood, city, or the world) and at different levels of specificity (e.g., a specific place or a class of places). The social aspect highlights attachment to places that facilitate social relationships, while the physical

aspect involves physical features and amenities of the place. Second, the Person dimension focuses on meanings of a location given at either an individual or a group level. For example, a person may develop connections to a place because of personal memories and experiences related to that setting. A group may have shared historical experiences, values, and symbols, and may collectively attribute meanings to a place. Third, the Process dimension includes the affective, cognitive, and behavioral components of attachment. The affective component is characterized by emotional connection to a place and often involves positive emotions, such as happiness, pride, and love. The cognitive component deals with memories, beliefs, meaning, and knowledge that individuals use to construct their place attachment. For example, people may be connected to a place based on their personal memories of the place, and even incorporate such connections at the most personal level into their self-definition or self-identity. The behavioral component refers to behavioral expression of place attachment, such as proximity-maintaining behaviors and reconstruction of meaningful place. This Person-Process-Place (PPP) framework has been found to be a useful tool for organizing many constructs within its three dimensions, creating operational definitions, and assisting in conflict resolution for land-use management (Scannell & Gifford, 2010a).

To summarize, researchers have contributed to conceptualizing place attachment in terms of specific components. The current study will utilize Scannell and Gifford's (2010a) PPP framework as an organizing framework and conceptualize place attachment in terms of four dimensions: place dependence (Stokols & Schumaker, 1981), place identity (Proshansky, 1978), place social bonding (Kyle, Graefe, Manning, & Bacon, 2004), and place affect (Halpenny, 2010). These four dimensions are believed to be a fair representation of the PPP framework because (a) for the Place dimension, social and physical elements of a place are highlighted by

place social bonding and place dependence, respectively, and (b) for the Process dimension, affective and cognitive elements are represented by place affect and place identity, respectively. The remaining elements of the PPP framework are embedded within the study design, which focuses on the individual level (for the Person dimension) and involves an individual's behavioral expression of engaging with national parks through social media (for the behavioral element of the Process dimension). The details on the four dimensions are introduced in the next section.

Place Attachment in Natural Resource Studies

Natural resource studies of place attachment have been suggested to be a continuation of community studies, as high-amenity communities and outdoor recreation places began to receive academic attention (Lewicka, 2011). Recognizing the importance of both social and physical aspects of a place and psychological process aspects within the Person-Process-Place framework, place attachment in natural resource studies has often been conceptualized in terms of four dimensions: place dependence, place identity, place social bonding, and place affect.

Place Dependence

Many scholars have conceptualized place attachment as having two dimensions: place dependence and place identity (Lee, 2011; Vaske & Kobrin, 2001). Place dependence concerns the physical characteristics of a place and how well the place, given a number of similar alternative places, serves instrumental values or goal achievements (Jorgensen & Stedman, 2001). Stokols and Schumaker (1981) added that place dependence is determined by two components: an individual's assessment of "the quality of current place and the relative quality of comparable alternative places" (p. 458). They emphasized that an individual can value a place because of its ability to provide certain functions that one desires. For example, in an outdoor

recreation setting, visitors may develop attachment to an area because of its unique physical characteristics, such as rock climbing spots, hiking trails, or a lake. In short, place dependence refers to an individual's functional assessment of a place, highlighting the physical features of the Place dimension within the PPP framework (Scannell & Gifford, 2010a).

Place Identity

Place identity, another well-established dimension of place attachment, reflects an individual's cognitive assessment of a place. Proshansky (1978) defined place identity as "dimensions of self that define the individual's personal identity in relation to the physical environment by means of a complex pattern of conscious and unconscious ideas, beliefs, preferences, feelings, values, goals, and behavioral tendencies and skills relevant to this environment" (p. 155). Thus, place identity has been operationalized as a component of self-identity that includes both cognitive and affective elements, helping to structure one's experience with the physical environment (Proshansky, 1978). In other words, individuals utilize cognitions (e.g., memories and thoughts) about the physical environment, draw similarities between themselves and the place, and incorporate such cognitions into their self-definitions. Therefore, place identity highlights the cognitive element of the Process dimension within the PPP framework (Scannell & Gifford, 2010a).

Additionally, place identity has been shown to develop over time as an individual repeatedly interacts with a place and is psychologically invested in the place (Williams & Patterson, 1999). In their study of trail users, Moore and Graefe (1994) supported the above finding by suggesting that repeat visitation based on place dependence may lead to place identity.

Place Social Bonding

In addition to the widely discussed two-dimensional structure of place attachment, a third dimension was introduced by Kyle et al. (2005): place social bonding. In environmental psychology literature, many scholars have emphasized the importance of social ties to place (Low & Altman, 1992; Hidalgo & Hernandez, 2001). Kyle et al. (2005) stated that if meaningful social relationships occur in specific settings, then people may develop attachment because these settings allowed them to have shared, meaningful experiences. For example, if an individual has fond memories of spending time with one's family at a national park, he/she may develop attachment to the park because it provided a setting for the individual to develop a family bond.

Hidalgo and Hernandez (2001) found that one's attachment to people who share the same place with the individual was greater than one's attachment to the physical place in all three settings: house, neighborhood, and city. Kyle et al. (2005) added that the meanings people attribute to a place may be more important than physical characteristics of the place and that social bonds may be the primary source of meaning in some contexts. This third dimension, place social bonding, reflects social dimension of place attachment (e.g., neighborhood ties) that was emphasized in early community studies (Lewicka, 2011). It also corresponds to the social aspects of the Place dimension within the PPP framework (Scannell & Gifford, 2010a).

Place Affect

Finally, place affect has been argued to be the fourth dimension of place attachment (Ramkissoon et al., 2013). The affective component, whether it be positive or negative emotions, has been discussed by scholars in various fields of study. In defining place attachment, Low and Altman (1992) argued that affect, emotion, and feeling are among the central elements of the concept. Jorgensen and Stedman (2001) supported this affective component in their study of

Sense of Place (SOP), which was conceptualized as having three dimensions: place attachment, place identity, and place dependence. The researchers equated place attachment with the affective/emotional component, and measured the concept using four items related to the emotions produced by staying in or away from participants' lake properties in Wisconsin. These participants were asked to rate their agreement with the following statements: "I feel relaxed when I'm at my lake property," "I feel happiest when I'm at my lake property," "My lake property is my favorite place to be," and "I really miss my lake property when I'm away from it for too long." Taken together, place affect reflects an individual's emotions and feelings for a place (Halpenny, 2010) and can be used to represent the affective component of the Process dimension within the PPP framework (Scannell & Gifford, 2010a).

In a park setting, Ramkissoon et al. (2013) surveyed on-site visitors to a national park in Australia and examined place attachment as an overarching concept consisting of four dimensions: place dependence, place identity, place social bonding, and place affect. Their results confirmed that the four dimensions (first-order factors) were appropriate indicators of place attachment (second-order factor). Drawing from their work, the current study will consider these four dimensions in measuring place attachment and investigate whether they are an accurate representation of the concept.

Antecedents of Place Attachment in Natural Resource Studies

Several variables, such as socio-demographics, frequency of visits, attitudes toward outdoor recreation, and ease of access to a place, have been suggested to be related to place attachment in natural resource studies (Hammitt et al., 2004; Kyle, Mowen, & Tarrant, 2004; Moore & Graefe, 1994).

Moore and Graefe (1994) were among the early scholars who explored numerous variables that may influence frequency of visits to a particular setting, which in turn may affect the level of place attachment. In their study of rail-trail users, the researchers conceptualized place attachment as having two dimensions: place identity and place dependence. They included user characteristics (e.g., age, length of time associated with trail), situational variables (e.g., distance between home and trail), and activity-related variables (e.g., importance ascribed to trail activity) in their "model of the development of place dependence and place identity" (Moore & Graefe, 1994, p.21). They found that a rail-trail user's level of place identity was best predicted by length of time associated with trail, importance ascribed to trail activity, and level of place dependence (all positive relationships). Level of place dependence was shown to be significantly related to distance between home and trail (negative) and frequency of use (positive). Frequency of use was found to be significantly related to age (positive), importance ascribed to trail activity (positive), and distance between home and trail (negative). These findings by Moore and Graefe (1994), along with others on various predictors of place attachment (e.g., Ednie et al., 2010; Kyle, Mowen, & Tarrant, 2004; Wilkins & de Urioste-Stone, 2018), provide a rationale to examine the effects of experience use history and socio-demographic variables in the hypothesized relationships between social media motivation and place attachment.

Experience Use History (EUH)

Several researchers have shown that repeated use and experience with a place over time can be linked to the intensity of one's attachment to the place (Eder & Arnberger, 2012; Moore & Graefe, 1994). Experience use history (EUH), which has been argued to represent "the amount and extent of participation by the individual in recreational pursuits" (Schreyer et al., 1984, p.34), has been utilized to understand a recreationist's behavioral patterns and perceptions and

has been largely measured in terms of frequency of visits and total years of use (Eder & Arnberger, 2012; Hammitt et al., 2004; Wynveen, Kyle, Hammitt, & Absher, 2007).

For instance, Hammitt et al. (2004) observed the relationship between experience use history (EUH) and place bonding among trout anglers of two Trout Unlimited chapters. Place bonding was conceptualized to involve five dimensions: Familiarity, Belongingness, Identity, Dependence, and Rootedness. Experience use history was measured by asking the anglers how many years total, how many times total, and how many times during the past year they have fished in the Chattooga National Wild and Scenic River and other local streams in South Carolina. Hammitt et al. (2004) found that those with a higher level of EUH had a significantly higher score of place bonding, compared to those with a lower level of EUH. These findings were supported by Wynveen et al. (2007) in their study of overnight campers at Sumter National Forest in South Carolina. They found that EUH with the site at which respondents were camping was positively predictive of all four place bonding dimensions: Familiarity, Dependence, Rootedness, and Affect.

Some researchers have found that experience use history has varying effects on different dimensions of place attachment (Eder & Arnberger, 2012; Williams & Vaske, 2003). Williams and Vaske (2003) conceptualized place attachment as having two dimensions, place identity and place dependence, and conducted a survey of university students about their attachment to four forest-based recreation sites in Colorado. For all four sites, the mean scores for place identity increased as the number of visits increased. However, for place dependence at two of the four sites, there were no statistically significant differences in the mean scores. Eder and Arnberger (2012) added to these findings by observing that the frequency of visits and area knowledge were

more strongly correlated with place dependence, while the years of area use were more strongly related to place identity.

Socio-demographics

The influence of socio-demographic variables on one's attachment to places has been examined in both residential and recreation settings. These variables include age (Hidalgo & Hernandez, 2001), gender (Scannell & Gifford, 2010b), education (Lewicka, 2005), race (Manzo, 2005), and length of residence/overall time spent in a place (Jorgensen & Stedman, 2006; Kelly & Hosking, 2008).

In community studies, many researchers have incorporated several socio-demographic variables into understanding place attachment among residents in high-amenity or natural areas. These variables have shown different patterns of relationship with place attachment. For instance, Hidalgo and Hernandez (2001) found that the intensity of place attachment increased with age and that women showed a greater level of place attachment, compared to men. However, Scannell and Gifford (2010b), in their study of residents from two proximate towns in Canada, showed that age, gender, and education were not related to place attachment. They also found that length of residence positively affected one of the two dimensions of place attachment (the civic/social dimension). Similarly, Jorgensen and Stedman (2006) stated that the number of days spent was one of the most influential variables with respect to property owners' attachment to their lakeshore homes in Wisconsin. In contrast to previous findings where residence length was found to be the most consistent positive predictor (Hay, 1998; Lewicka, 2005; 2010), the number of days spent at the property indirectly decreased place identity to one's lakeshore home by reducing the level of importance ascribed to one's own lake (Jorgensen & Stedman, 2006). Jorgensen and Stedman (2006) suspected that those who spent more time at the property would

have had greater opportunities to explore other lakes and have a more well-rounded experience of the area, thus reducing the level of importance ascribed to their own lake and, ultimately, lowering self-identification with their lakeshore home.

In the context of parks and protected areas, there is limited research on the relationships between socio-demographics and place attachment (Ednie et al., 2010). Kyle, Graefe, and Manning (2004) conducted a survey of hikers along the Appalachian Trail in the eastern region of the United States, and found that male hikers were more highly attached to the trail than female hikers and that age was positively related to place attachment. However, they did not find significant differences between attachment levels with regard to education and household income. Ednie et al. (2010) further added to the understanding of these relationships by exploring how various socio-demographic and travel variables influenced place attachment among visitors to the Maine coast. Similar to the findings of Kyle, Graefe, and Manning (2004), they found a positive relationship between age and place attachment, and no significant difference between attachment levels based on education. However, their result of no gender-based difference was contradictory to that of Kyle, Graefe, and Manning (2004).

Based on these documented relationships, experience use history and socio-demographic variables (e.g., age, gender, education) will be included in the current study.

Relationship between Social Media and Place Attachment

Place attachment, a bonding of people to places, has been argued to be characterized by the tendency of an individual to maintain closeness to a place (Hidalgo & Hernandez, 2001; Scannell & Gifford, 2010a). Kelly and Hosking (2008) supported this by stating that those who spend more time in a place are more likely to feel attached. Combined with the finding that virtual visitors of Yellowstone National Park's Facebook page were largely motivated to stay

connected to the park after their on-site visits (Miller & Freimund, 2017), a question about the role of social media in development of place attachment arises.

A few studies have examined the role of social media on place attachment, more specifically community formation and place making (Bradshaw, 2008; Breek et al., 2018). Breek et al. (2018) conducted a case study of two neighborhood blogs in Amsterdam by interviewing fourteen key actors involved in developing and maintaining the blogs. They found that digital interactions on the blogs generated various forms of place attachment: social, political, and economic. Social and political dimensions involved mutual contacts of blog participants, development of local social rootedness, and community involvement. The economic dimension was found to be related to the development and localization of economic activities and opportunities. Thus, the digital interactions produced collective and positive feelings toward the neighborhood (Breek et al., 2018).

Bradshaw's (2008) concept of post-place community strengthens the argument for the relationship between social media and place attachment, specifically place social bonding. He stated that the traditional concept of communities, which was largely defined based on a place ranging from a small town to urban city, was no longer able to describe all the manifestations of today's community. People socialized and felt a sense of place over a broader geographical area than their current neighborhood; and they participated in multiple communities that share similar interests, norms, and values. Bradshaw (2008) argued that "community is now separate from place" (p. 10) and that the Internet has contributed to connecting people in virtual time and space. Therefore, continued research about social media may help identify how users form a virtual community where place social bonding can be developed.

In addition to place social bonding, place attachment is hypothesized to encompass place dependence and place identity as well. As individuals depend on certain functions of a place and repeat their visits, place dependence is developed, which may lead to place identity (Moore & Graefe, 1994; Williams & Patterson, 1999). Due to the fact that many parks and protected areas are located in remote areas, it can be difficult for many people to visit regularly. Therefore, many land management agencies attempt to bring parks to those who may not be able to physically visit the parks (Song & Schuett, 2019). Social media users are able to virtually visit parks and protected areas by following social media accounts managed by land management agencies, friends groups, and conservation groups (Miller & Freimund, 2017). What is not known is whether social media can facilitate the development of place attachment through individuals' virtual visitation, and whether various social media use behaviors (e.g., frequency of exposure to park-related content, type of engagement) can influence the hypothesized relationship between social media and place attachment.

Despite the evidence for social media's specific relevance to place attachment, this relationship has not been given prominence in past literature. One way to explore this relationship is to apply uses and gratifications theory in examining why social media users follow and engage with national parks and what their needs or goals are. Uses and gratifications theory asserts that individuals use media to satisfy specific wants and needs. It characterizes individuals as active, goal-oriented, and motivated in selecting the media they choose to consume (Katz et al., 1973). Understanding the motivations of social media users who engage with national parks should help to explain the hypothesized relationship with place attachment. Therefore, the current study aims to examine the relationship between social media motivation

and place attachment to a national park, providing a more comprehensive understanding to this relationship. The following hypotheses are proposed:

Research Question 1: What is the relationship between social media (SM) users' motivation to engage with a national park and their attachment to the park?

- Hypothesis 1 (H1): Each dimension of SM motivation, i.e., *information, community, action,* and *personal gratification,* will positively predict each dimension of place attachment, i.e., *place dependence, place identity, place social bonding,* and *place affect*.
- Hypothesis 2 (H2): The strength of the effect of SM motivation on place attachment will increase with experience use history.
- Hypothesis 3 (H3): The strength of the effect of SM motivation on place attachment will increase with more SM exposure.
- Hypothesis 4 (H4): The strength of the effect of SM motivation on place attachment will increase with more active SM engagement.

Research Question 2: What is the role of socio-demographic characteristics on the level of place attachment?

- Hypothesis 5 (H5): The level of place attachment will vary based on gender.
- Hypothesis 6 (H6): The level of place attachment will increase with age.
- Hypothesis 7 (H7): The level of place attachment will decrease with education level.
- Hypothesis 8 (H8): The level of place attachment will be higher for White participants, compared to other racial/ethnic groups.
- Hypothesis 9 (H9): The level of place attachment will decrease with household income.

Research Question 3: What is the role of socio-demographic characteristics on social media motivation?

- Hypothesis 10 (H10): The motivation to engage with national parks on social media will vary based on gender.
- Hypothesis 11 (H11): The motivation to engage with national parks on social media will decrease with age.
- Hypothesis 12 (H12): The motivation to engage with national parks on social media will increase with education level.
- Hypothesis 13 (H13): The motivation to engage with national parks on social media will vary based on race/ethnicity.
- Hypothesis 14 (H14): The motivation to engage with national parks on social media will increase with household income.

CHAPTER III

METHOD

The procedures that were used in this study are discussed in the following sections. These include: a) Study Population and Data Collection, b) Measurement, and c) Data Analysis.

Study Population and Data Collection

This study's target population was individuals that (a) have visited any national park in the United States for recreation purposes and (b) have followed a social media account operated by the National Park Service (NPS). The social media account was not limited to a specific platform; it could be associated with any available platform (e.g., Facebook, Twitter, Instagram, Pinterest, YouTube, and Flickr). Also, the social media account could be managed by the NPS or by individual park units (e.g., Yosemite National Park, Grand Canyon National Park, and Great Smoky Mountains National Park).

Participants were recruited by Cint, a software company that provides a consumer network for digital survey-based research by partnering with suppliers of multiple research panels that are readily available to take surveys (Cint, 2021). Qualtrics, a web-based survey software, was utilized to administer an online survey. A Qualtrics survey link was posted on Cint's digital 'offer wall' for the suppliers to view and alert their research panels to participate in the survey.

For completing the survey, respondents received monetary payment, credit for an internal reward system, or other forms of compensation depending on Cint's supply partners. Monetary incentives in online surveys have been suggested to increase responses from less intrinsically motivated respondents, thus leading to higher rates of careless responses when compared to those

from intrinsically motivated respondents who were not promised any incentive (Shamon & Berning, 2020). Therefore, as recommended by many researchers, various types of attention check questions (e.g., reverse wording and instructed response items) were implemented throughout the survey to assess respondents' attentiveness to instructions and to ensure data quality (Cheung, Burns, Sinclair, & Sliter, 2017; Shamon & Berning, 2020; Sheehan, 2018). These attention check questions also helped ensure that respondents were not programs or 'bots' designed to automatically complete surveys.

Measurement

This study examined the relationship between one's motivation to use social media and his/her attachment to a national park. The social media motivation was measured based on four categories: *information, community, action,* and *personal gratification*. Place attachment was measured using four dimensions: *place dependence*, *place identity, place social bonding*, and *place affect*. The following section describes the instrument that was used in the study. A copy of the questionnaire is provided in Appendix A.

In the beginning of the questionnaire, there were three screening questions. The first two questions were: "Do you follow a social media account of U.S. national parks or the National Park Service (a federal agency that manages national parks)?" and "For recreation purposes, have you visited any of the national parks you follow on social media?" If respondents answered "Yes" to both questions, they were asked to select a U.S. national park that they have followed on social media and visited for recreation purposes from a dropdown list that included 62 national parks. These are the park units that were designated specifically as "National Park," and some examples include Yosemite National Park, Grand Canyon National Park, and Great Smoky Mountains National Park. In addition to the national park choices, there were two answer choices

that were intended to further screen out participants who did not represent the target population: "I have never visited a U.S. national park" and "I do not follow a social media account of U.S. national parks." If the respondents followed more than one visited park on social media, they were instructed to select a park that they have most recently visited. When respondents chose "No" to either of the first two questions or indicated that they have never visited a national park nor followed its social media account in the third question, they were directed to exit the survey. Their answers were not recorded.

Social Media Motivation

The items measuring the respondent's motivation for using social media so one may engage with national parks were developed based on three key functions identified by Lovejoy and Saxton (2012) – *information, community,* and *action* – and the fourth category, *personal gratification.* Lovejoy and Saxton (2012) examined the use of Twitter from the 100 largest nonprofit organizations in the U.S., by analyzing the content of 2,437 Twitter messages that were sent out by these organizations over a two-week period. *Information* referred to providing information about the organization, its activities, or anything of potential interest to social media users, and involved a one-way interaction. *Community* involved interacting and conversing with stakeholders in a way that led to the creation of an online community. *Action* involved mobilizing social media users to 'do something' and help the organization fulfill its mission.

In addition to these three categories, the current study suggested a fourth category, *personal gratification.* Based on the findings by Whiting and Williams (2013) and Miller and Freimund (2017), this fourth category was designed to capture the motivation of those that use social media for personal benefits, such as entertainment, inspiration, and stress relief purposes.

While the above four categories were used to capture various facets of one's motivation to engage with national parks on social media, individual items were developed from a literature review of the existing research on social media and were adapted to fit the context of this study (e.g., Miller & Freimund, 2017; NPS, 2019; Wilkins et al., 2018; Zeng & Gerritsen, 2014). The items were reworded to improve the readability and consistency throughout the instrument.

The *information* section had four items that were related to receiving information about a national park that respondents selected during the screening process. This section involved a simple one-way interaction that flows from the park to social media users. The individual items addressed receiving park updates/news, visitor information, pictures, videos, and information about the park's natural and cultural history. They were developed based on the NPS's social media web page (NPS, 2019) and the findings by Miller and Freimund (2017) on social media users' motivations for liking YNP's Facebook page.

The *community* section had six items that examined the respondent's use of social media in order to be involved with the park's online community. Unlike the *information* section, this section highlighted a two-way exchange of information and network creation. Four of the six items were developed based on Miller and Freimund (2017), addressing one's desires to be a part of the online community, to stay connected to the park, to talk to others about the park, and to show what the individual values. The other two items, drawn from Song and Schuett (2019) and NPS (2019), involved directly communicating with park employees and sharing one's own experience at the park.

The *action* section consisted of five items that explored the social media motivations of supporting and advocating for the park. This section focused on one's motivations of doing something for the park, such as promoting the park, voicing his/her opinions about park-related

issues, and learning about ways to help the park. All five items were developed based on the findings of Lovejoy and Saxton (2012).

The *personal gratification* section had five items that measured the benefits one may receive from engaging with national parks on social media. These items were borrowed from Miller and Freimund (2017) and included reducing the stresses of everyday life, maintaining a connection to nature, and feeling entertained, inspired, and excited.

Respondents were asked to indicate their level of agreement with all 20 items on a five-point Likert scale, ranging from 1 = “Strongly Disagree” to 5 = “Strongly Agree.” For a complete list of social media items, refer to Table 1.

Table 1 Social Media Items

I follow the park's social media account …
Information
To receive visitor information (e.g., opening hours, fees, things to do)
To receive park updates/news releases
To view pictures/videos of the park
To learn about the park and its natural and cultural history
Community
To be a part of the park's online community
To directly communicate with the park employees
To meet and talk to other social media users about the park
To share my experience at the park
To let others know what I value
To stay connected to the park
Action
To encourage my social media friends to visit the park
To encourage my social media friends to learn about the park and its natural and cultural history
To encourage my social media friends to support the park
To voice my opinions about park-related issues (e.g., park rules/policies, changes in the park, management issues)
To learn about ways to help the park
Personal gratification
To entertainment myself
To feel inspired
To feel excited
To reduce the stresses of everyday life
To maintain a connection to the natural world

Place Attachment

Following the works of Kyle, Mowen, and Tarrant (2004) and Ramkissoon et al. (2013), place attachment was measured using four dimensions: *place dependence, place identity, place*

social bonding, and *place affect*. The scale used in this study was derived from previous research (e.g., Jorgensen & Stedman, 2001; Kyle et al., 2005; Williams & Roggenbuck, 1989; Williams & Vaske, 2003).

Williams and Roggenbuck (1989) developed 27 items to verify the assumption of two dimensions of place attachment: place identity and place dependence. Many authors have adopted and modified this place attachment scale and have demonstrated its reliability and validity (e.g., Jorgensen & Stedman, 2001; Kyle et al., 2005; Moore & Graefe, 1994; Williams & Vaske, 2003). For example, Williams and Vaske (2003) tested a 12-item scale drawn from previous studies by Williams and colleagues (e.g., Williams, Patterson, Roggenbuck, & Watson, 1992; Williams & Roggenbuck, 1989). The researchers found strong evidence of the two-dimension structure of place attachment and showed the validity and generalizability of the scale. Williams and Vaske (2003) also found that good reliability could be achieved with as few as four items for each dimension.

In measuring place dependence, five items were taken from the Williams and Roggenbuck's (1989) place attachment scale. These items examined respondents' functional assessment of a park that they selected during the screening process. Respondents were asked to rate their agreement with statements, such as "This park is the best place for what I like to do" and "I wouldn't substitute any other area for the type of recreation I do at this park."

Place identity was measured using four items drawn from Williams and Roggenbuck (1989) and Jorgensen and Stedman (2001). These items asked about respondents' cognitive assessment of their selected park, which dealt with how much they identified themselves with the park. The respondents were asked to record their level of agreement with statements, such as "I feel like this park is a part of me" and "Visiting this park says a lot about who I am."

Place affect was measured using four items drawn from Williams and Roggenbuck (1989) and Kyle, Mowen, and Tarrant (2004). Although Williams and Roggenbuck's (1989) scale was designed to measure two dimensions of place attachment, place dependence and place identity, several researchers have proposed the affective component as a distinct dimension of place attachment and have modified the scale to measure this dimension (e.g., Halpenny, 2010; Ramkissoon et al., 2013). The items included "This park means a lot to me" and "I feel a strong sense of belonging to this park and its settings/facilities."

Finally, five place social bonding items were taken from Kyle et al. (2005). These items measured respondents' attachment to people who shared the same place and included "I have a lot of fond memories about this park" and "If I were to stop visiting this park, I would lose contact with a number of friends."

All 18 place attachment items were rated on a five-point Likert scale, ranging from 1 = "Strongly Disagree" to 5 = "Strongly Agree." A complete list of place attachment items can be found in Table 2.

Table 2 Place Attachment Items

Place dependence
This park is the best place for what I like to do.
No other place can compare to this park.
I get more satisfaction out of visiting this park than any other park.
Visiting this park is more important to me than visiting any other park.
I wouldn't substitute any other area for the type of recreation I do at this park.
Place identity
I feel like this park is a part of me.
I identify strongly with this park.
Visiting this park says a lot about who I am.
This park reflects the type of person I am.
Place social bonding
I have a lot of fond memories about this park.
I have a special connection to the people who visit this park.
I don't tell many people about this park.
I will (do) bring my children to this park.
If I were to stop visiting this park, I would lose contact with a number of friends.
Place affect
This park means a lot to me.
I am very attached to this park.
This park is very special to me.
I feel a strong sense of belonging to this park and its settings/facilities.

Experience Use History and Social Media Use Behavior

To determine the profiles of participants and examine if any difference exists between participants based on how frequently they visit a national park and how active they are on social media, the questionnaire included several questions regarding experience use history (EUH) and social media use behavior. The EUH items measured the amount and history of park visitation by respondents. Drawing from the works of Schreyer et al. (1984) and Petrick (2002), respondents

were asked to write in how many U.S. national parks they have visited in their lifetime for recreation purposes and how many times in their lifetime they have visited the specific park that they selected during the screening process. They were also asked about their average number of annual visits to any U.S. national park and how many years they have been visiting national parks. The answers to these two questions were multiplied to find the total number of national park visits.

Five items that asked about respondents' social media use behavior were included. These items measured the type of SM platforms respondents utilize, the frequency of exposure to park-related SM content, and the type of engagement. First, respondents were asked to indicate which social media platform they use the most in their daily lives and to check all social media platforms (e.g., Facebook, Twitter, Instagram, and YouTube) they use to follow the park they selected earlier. Then, they were asked how many months they have followed the park's social media account and how often they see social media content about the park. To understand how respondents usually engage with the park-related content, they were asked to write in how many times per month they usually engage in the five activities, i.e., reading/viewing, clicking on the 'like' button, making comments, sharing, and posting original content, with an "Other" option where they could specify.

Socio-demographic Variables

This study included five items to document participants' socio-demographic characteristics: gender, age, education, race/ethnicity, and household income. These characteristics were used to compile the profiles of respondents and to examine their influence on the level of place attachment (RQ2) and social media motivation (RQ3).

Gender was measured with three response categories: Male, Female, Prefer to self-describe as _____ (Please specify. E.g., non-binary, third gender). Age was measured by asking respondents to write down the year in which they were born. To measure education, respondents were asked to choose one out of five response categories, i.e., Some high school, High school graduate/GED, Some college or 2-year degree, Bachelor's degree, and Graduate work or graduate degree, that best describes their highest level of education completed. To measure race/ethnicity, a partially closed-ended question was used with seven response categories, i.e., White, Black or African American, Hispanic or Latino, American Indian or Alaska Native, Asian, Native Hawaiian or Other Pacific Islander, and 2+ Races, with an "Other" option where respondents could fill in their own response. To measure household income, respondents were given seven response categories ranging from "Less than $15,000" to "$100,000 or more." Respondents had an option to choose "Prefer not to answer" for gender, education, race/ethnicity, and household income questions.

Data Analysis

Data were extracted from Qualtrics and saved in SPSS and Minitab databases. Questionnaires were considered incomplete and removed from the database if respondents missed any of the questions. If the respondents failed more than two of the four attention check questions, their questionnaires were considered invalid and removed from further analysis. After the data cleaning, socio-demographic, experience use history, and social media use behavior variables were used to compile the profiles of the respondents.

Pilot Study

After the cleaning of these data, a portion of the sample was randomly selected for a pilot study. The purpose of the pilot study was (a) to measure the reliability of the social media

motivation scale, which was developed by the author based on past literature, and (b) to confirm the underlying dimensions of social media motivation. Cronbach's alpha coefficient was used to determine the internal consistency of the social media motivation scale and of the place attachment scale, so that its appropriate use in this study can be assured (Cronbach, 1951). Then, using SPSS version 27.0, exploratory factor analysis (EFA) was conducted to group the social media motivation items into similar conceptual categories. EFA is a statistical approach used to analyze interrelationships among a large number of variables and to summarize data by grouping correlated variables into their common underlying factors. This approach is used when there is no prior specification on the number of underlying factors (Anderson & Gerbing, 1988).

Final Study

A structural equation modeling (SEM), using a two-step approach that includes a measurement model and a structural model (Anderson & Gerbing, 1988), was conducted to test the hypothesized model. Linear Structural Relations (LISREL) version 10.3 was used to conduct SEM. The first step was to perform a confirmatory factor analysis (CFA) with a maximum likelihood (ML) estimation on each factor structure, i.e., social media motivation and place attachment, to assess the validity of observed measures. Confirmatory factor analysis specifies the relations, suggested by *a priori* theory, of the observed measures to their underlying latent factors (Anderson & Gerbing, 1988; Brown, 2006). Thus, CFA was used to verify the four dimensions of place attachment, i.e., *place dependence, place identity, place social bonding*, and *place affect*, reported by Kyle, Mowen, and Tarrant (2004) and Ramkissoon et al. (2013). It was also used to verify the dimensions of social media motivation that emerged from EFA.

Composite reliability, which reflects the internal consistency of the items that measure each factor and is comparable to Cronbach's alpha, was evaluated (Raykov, 1997). To ensure

convergent validity, the factor loadings of each item were examined. Discriminant validity was examined by comparing inter-correlations between the factors to the square root of the variance shared between the factors and their measures (average variance extracted; AVE) (Fornell & Larcker, 1981).

After establishing a valid measurement model, the structural model was tested to examine the hypothesized relationships among the constructs. A series of fit indices, such as non-normed fit index (NNFI) (Bentler & Bonett, 1980), comparative fit index (CFI) (Bentler, 1990), and root mean square error of approximation (RMSEA) (MacCallum, Browne, & Sugawara, 1996), was assessed to determine whether the structural model indicated a satisfactory fit.

Given that the intensity of place attachment has been shown to be related to repeated use and experience (Eder & Arnberger, 2012; Moore & Graefe, 1994), the effect of respondents' experience use history (EUH) on the hypothesized model was examined. Drawing from the works of Schreyer et al. (1984) and Petrick (2002), EUH was operationalized by using a composite measure that combined (a) the total number of national park visits, (b) the number of visited national parks, and (c) the total number of visits to the specific park that respondents selected during the screening process. For each of the three variables, respondents were divided into 'high' or 'low' groups based on the median value. A total of eight EUH categories were possible; however, some categories were combined in order to have adequate sample sizes. Three EUH categories were ultimately used: Beginners (persons with generally low experience at national parks and at their selected park), Intermediates (persons with some experience at national parks), and Veterans (persons with generally high experience at national parks and at their selected park). Using multiple regression analysis, the effect of differing EUH levels on the relationship between social media motivation and place attachment was examined.

Additionally, the current study aimed to examine whether social media use behaviors, i.e., amount of exposure to park-related content and type of engagement, were related to the development or intensification of one's attachment to a national park through repeated virtual visitation. For the SM exposure, respondents were divided into three groups: High exposure (persons who viewed park-related content daily or every other day), Medium exposure (persons who viewed the content weekly), and Low exposure (persons who viewed the content less than once a week). For the SM engagement, the frequency of reading/viewing park-related posts were compared to the frequency of engaging in more active uses: 'liking', commenting, sharing, and creating the posts. Previous researchers have characterized passive usage as monitoring of other SM users' profiles and posts (e.g., scrolling through, reading, and looking at others' posts) without directly communicating with them, while active usage has been characterized as facilitating direct communication with others (e.g., 'liking' posts, sharing links, and posting pictures and messages) (Burke, Kraut, & Marlow, 2011; Verduyn, Ybarra, Résibois, Jonides, & Kross, 2017). Based on these differences, respondents were assigned to a Passive engagement group if the frequency of reading/viewing was higher than the frequency of their active uses, or to an Active engagement group if the opposite was true. The effect of these two social media use behaviors on the hypothesized model was examined separately using multiple regression analysis.

Finally, given the mixed results on the effect of socio-demographic variables on one's place attachment (Ednie et al., 2010; Kyle, Graefe, & Manning, 2004), one-way analysis of variance (ANOVA) and independent samples *t*-test were conducted. These analyses were used to show if any difference in the level of place attachment exists between various socio-demographic groups. Socio-demographic differences in social media motivation were also explored.

CHAPTER IV

RESULTS

This chapter presents the research findings that tested the hypotheses introduced in Chapter 1. The following sections include information on data cleaning process, profile of the respondents, descriptive statistics, exploratory factor analysis (EFA), structural equation modeling (SEM), and bivariate analyses.

Data Cleaning

Data were collected from January 25, 2021 to February 2, 2021. Although information on response rates was not available, a total of 573 completed responses were recorded and were examined for any invalid responses. Seven respondents took less than 2 minutes and 20 seconds to complete the survey, which is much shorter than an average survey completion time of 10 minutes and at the bottom 2% of response time, and were thus removed from the dataset. To be included in this study, respondents had to have been following a social media account of U.S. national parks and have visited any of those parks that they follow on social media. Eight respondents falsely passed the screening process and were removed from the dataset. These respondents were identified because they wrote in a '0' for the number of national parks they have visited or for the number of visits to the specific park that they selected during the screening process.

Four attention check items (two reverse wording and two instructed response items) were included in this survey as recommended by previous researchers (Cheung et al., 2017; Shamon & Berning, 2020; Sheehan, 2018). A reverse wording item involves asking respondents to indicate the degree to which they agree or disagree with the two reversely worded statements, such as

"This park is the best place for what I like to do" and "This park is not the best place for what I like to do," on a Likert scale. If they indicated that they agree with the first statement, they would have to choose either 'neutral' or 'disagree' to pass this check. Likewise, if they disagreed with the first statement, they would have to choose either 'neutral' or 'agree'. An example of an instructed response item is "To be included in this survey, please check disagree." If respondents chose anything other than 'disagree', they would not pass this check. Ninety-nine respondents failed more than two attention check items and were thus removed from further analysis. An additional 22 responses were deleted from the dataset by analyzing patterns of the answers to Likert scale questions and the answers to open-ended questions. After the data cleaning process, 437 valid responses were retained for further analysis.

Pilot Study

The purpose of this pilot study was to measure the reliability of both social media motivation and place attachment scales and to confirm the underlying dimensions of social media motivation through an exploratory factor analysis. The following sections report the descriptive characteristics of a pilot sample, reliability of items, and results from EFA.

Descriptive Statistics

Socio-demographic Background

One-third of the responses (n=109) was randomly selected from the entire dataset as a pilot sample. Respondents were predominantly female (55.0%). A profile of respondents showed a mean age of 39.9 years with a range of 20 to 67. The majority of respondents were between the ages of 25 and 44 (66.3%). The overwhelming majority were White (79.4%), while Asians made up the second largest group (10.3%). Hispanic or Latino and Black or African American made up 4.7% and 3.7% of the sample, respectively. The majority of the sample (57.8%) had at least a

bachelor's degree, while about a quarter of the sample (27.5%) had some college experience or 2-year degree. The household income level varied with $50,000 to $74,999 being the largest income group (31.2%), followed by $75,000 - $99,999 (22.9%) and $100,000 or more (22.0%) income groups. Most respondents were not involved in a conservation or environmental group (78.9%). Frequencies and percentages for the pilot sample can be found in Table 3.

Table 3 Descriptive Statistics for Socio-demographic Items for the Pilot Sample

Variables	Categories	Frequency	Percentage
Gender	Male	46	42.2%
(*n*=109)	Female	60	55.0%
	Other	3	2.8%
Age	18-24	6	6.3%
(*n*=95)	25-34	31	32.6%
	35-44	32	33.7%
	45-54	9	9.5%
	55-64	10	10.5%
	65+	7	7.4%
Race/Ethnicity	White	85	79.4%
(*n*=107)	Black or African American	4	3.7%
	Hispanic or Latino	5	4.7%
	Asian	11	10.3%
	Other	2	1.9%
Education	Some High School	1	0.9%
(*n*=109)	High school graduate/GED	15	13.8%
	Some college or 2-year degree	30	27.5%
	Bachelor's degree	37	33.9%
	Graduate work or graduate degree	26	23.9%
Household Income	Less than $25,000	11	10.1%
(*n*=109)	$25,000 - $49,999	15	13.8%
	$50,000 - $74,999	34	31.2%
	$75,000 - $99,999	25	22.9%
	$100,000 or more	24	22.0%
Environmental group membership (*n*=109)	Yes	23	21.1%
	No	86	78.9%

Social Media Motivation

Twenty items were used to measure one's motivation to engage with national parks and other park supporters on social media. The scale was developed by the author based on previous research (e.g., Lovejoy & Saxton, 2012; Miller & Freimund, 2017; NPS, 2019; Wilkins et al.,

2018; Zeng & Gerritsen, 2014). A five-point Likert scale, ranging from 1 = "Strongly Disagree" to 5 = "Strongly Agree," was used to measure the items.

The internal consistency for the social media motivation scale was measured using Cronbach's alpha (Cronbach, 1951). The alpha coefficient was 0.92, indicating highly satisfactory internal consistency across all items in the scale. The alpha coefficients for the four dimensions were: *information* = 0.70, *community* = 0.84, *action* = 0.87, and *personal gratification* =0.85. Each of these alpha coefficients indicated sufficient internal consistency across all items in each construct (Litwin, 1995).

Descriptive statistics for the SM motivation items can be found in Table 4. The results showed that participants were highly motivated by reasons related to *information* (M=4.20; SD=0.91) and *personal gratification* (M=4.12; SD=0.90). Regarding the *information* items, participants were most highly motivated to view pictures/videos of the parks (M=4.46; SD=0.89). They were also highly motivated by receiving park updates/news releases (M=4.24; SD=0.80) and learning about the park and its natural and cultural history (M=4.17; SD=0.86).

All five items that measured *personal gratification* received average scores of 4.06 or higher. These items were: to entertain oneself (M=4.17; SD=0.93), to feel inspired (M=4.16; SD=0.92), to feel excited (M=4.08; SD=0.83), to reduce the stresses of everyday life (M=4.06; SD=1.00), and to maintain a connection to the natural world (M=4.16; SD=0.83).

On the other hand, participants reported slightly lower levels of motivation to engage with national parks for *community*- (M=3.43; SD=1.22) and *action*-related reasons (M=3.49; SD=1.16), compared to the other two reasons discussed above. Among the *community* items, motivation to stay connected to the park received the highest average score (M=3.99; SD=0.99),

while motivation to directly communicate with the park employees received the lowest, falling below a 3 that represented ‘neutral’ (M=2.83; SD=1.14).

Similarly, participants reported fairly neutral responses toward all five *action* items. Motivation to learn about ways to help the park received the highest average score among them (M=3.68; SD=1.09), while motivation to voice one’s opinions about park-related issues received the lowest (M=3.20; SD=1.19).

Table 4 Descriptive Statistics for Social Media Motivation for the Pilot Sample (n=109)

Items	Mean	SD
Information	**4.20**	**0.91**
To view pictures/videos of the park	4.46	0.89
To receive park updates/news releases	4.24	0.80
To learn about the park and its natural and cultural history	4.17	0.86
To receive visitor information (e.g., opening hours, fees, things to do)	3.94	1.03
Community	**3.43**	**1.22**
To stay connected to the park	3.99	0.99
To share my experience at the park	3.58	1.22
To be a part of the park's online community	3.57	1.07
To let others know what I value	3.46	1.27
To meet and talk to other social media users about the park	3.16	1.31
To directly communicate with the park employees	2.83	1.14
Action	**3.49**	**1.16**
To learn about ways to help the park	3.68	1.09
To encourage my social media friends to support the park	3.59	1.09
To encourage my social media friends to learn about the park and its natural and cultural history	3.54	1.18
To encourage my social media friends to visit the park	3.44	1.20
To voice my opinions about park-related issues (e.g., park rules/policies, changes in the park, management issues)	3.20	1.19
Personal gratification	**4.12**	**0.90**
To entertain myself	4.17	0.93
To feel inspired	4.16	0.92
To maintain a connection to the natural world	4.16	0.83
To feel excited	4.08	0.83
To reduce the stresses of everyday life	4.06	1.00

Place Attachment

The place attachment scale was developed and tested by Williams and colleagues (e.g., Williams et al., 1992; Williams & Roggenbuck, 1989; Williams & Vaske, 2003). The four-

dimensional scale used in this study was drawn from the works of Kyle, Mowen, and Tarrant (2004) and Ramkissoon et al. (2013). Eighteen items were used to measure an individual's attachment to a national park that one has visited and followed on social media. A five-point Likert scale, ranging from 1 = "Strongly Disagree" to 5 = "Strongly Agree," was used to measure these items. The scores of one *place social bonding* item were reverse-coded because it was phrased negatively.

Cronbach's alpha was used to measure the internal consistency for the place attachment scale (Cronbach, 1951). The scale's alpha coefficient of 0.90 indicated highly satisfactory internal consistency. Three out of four dimensions showed satisfactory internal consistency: *place dependence* = 0.83, *place identity* = 0.84, and *place affect* =0.90. However, the alpha coefficient for the *place social bonding* dimension was 0.34, which was below an acceptable level of 0.60 for scales with a reduced number of items (e.g., six or less) (Cortina, 1993). Although it showed a poor internal consistency, *place social bonding* was retained for the final study because data were already collected on this dimension and further reliability and validity analyses based on factor loadings would eliminate bad items or factors.

The means and standard deviations for all place attachment items are reported in Table 5. Participants reported medium to high levels of place attachment to their selected national park. Of the four dimensions of place attachment, *place dependence* (M=3.65; SD=1.00) and *place social bonding* (M=3.65; SD=1.21) received the lowest mean scores. For *place dependence*, participants seemed to agree that their selected park was the best for what they like to do (M=3.95; SD=0.83) and that no other place compared to their park (M=3.84; SD=1.01). However, they reported the lowest mean score for the statement, "I wouldn't substitute any other area for the type of recreation I do at this park" (M=3.33; SD=1.05).

Compared to *place dependence, place social bonding* items showed more variability within the dimension. Participants indicated that they had a lot of fond memories about their selected park (M=4.33; SD=0.81) and they would bring their children to the park (M=4.01; SD=0.94). However, they somewhat disagreed with a statement, "If I were to stop visiting this park, I would lose contact with a number of friends" (M=2.52; SD=1.22).

The four items that measured *place identity* (M=3.77; SD=0.98) reported similar average scores that ranged from 3.70 to 3.89. Participants appeared to identify with their selected park (M=3.89; SD=0.94), to feel that the park was a part of them in some ways (M=3.79; SD=0.97), and to believe that the park somewhat reflected the type of person they were (M=3.70; SD=0.96).

Participants reported the highest average score for the *place affect* dimension (M=4.12; SD=0.92). Three out of four items received average scores of 4.15 or higher, and they were: "This park means a lot to me" (M=4.28; SD=0.82), "I am very attached to this park" (M=4.15; SD=0.96), and "This park is very special to me" (M=4.17; SD=0.87).

Table 5 Descriptive Statistics for Social Media Motivation for the Pilot Sample (n=109)

Items	Mean	SD
Place dependence	**3.65**	**1.00**
This park is the best place for what I like to do.	3.95	0.83
No other place can compare to this park.	3.84	1.01
I get more satisfaction out of visiting this park than any other park.	3.70	1.00
Visiting this park is more important to me than visiting any other park.	3.42	0.96
I wouldn't substitute any other area for the type of recreation I do at this park.	3.33	1.05
Place identity	**3.77**	**0.98**
I identify strongly with this park.	3.89	0.94
I feel like this park is a part of me.	3.79	0.97
Visiting this park says a lot about who I am.	3.70	1.04
This park reflects the type of person I am.	3.70	0.96
Place social bonding	**3.65**	**1.21**
I have a lot of fond memories about this park.	4.33	0.81
I will (do) bring my children to this park.	4.01	0.94
I don't tell many people about this park. (r)	3.72	1.17
I have a special connection to the people who visit this park.	3.68	1.05
If I were to stop visiting this park, I would lose contact with a number of friends.	2.52	1.22
Place affect	**4.12**	**0.92**
This park means a lot to me.	4.28	0.82
This park is very special to me.	4.17	0.87
I am very attached to this park.	4.15	0.96
I feel a strong sense of belonging to this park and its settings/facilities.	3.88	1.00

Exploratory Factor Analysis

Exploratory factor analysis for the social media motivation scale was conducted to confirm the underlying dimensions that were hypothesized to exist by the author. Principal axis extraction method was utilized as it does not require the assumption of multivariate normal distribution of the variables (Brown, 2006). To obtain simple structure, oblique rotation (Direct

oblimin) was used under the assumption that the factors were correlated, since they were expected to capture different aspects of social media motivation (e.g., Lovejoy & Saxton, 2012; Miller & Freimund, 2017).

EFA generated two factors that had eigenvalues of over 1.00 and explained 51.67% of the variance collectively (Table 6). Based on the guidelines of Hair, Anderson, Tatham, and Black (1998), two items were removed because they had loadings of less than 0.4 on all factors. The factor loadings for the 18-item scale are presented in Table 7.

All but one item that were originally designed to measure two separate dimensions of social media motivation, *community* and *action*, loaded on the first factor. This factor explained the most variance, 39.15%, indicating its importance to the pilot study sample. Conceptually, this factor seemed to highlight social aspects of social media motivation, such as wanting to be a part of a park's online community, sharing one's love for the parks with others, and contributing to the park community. This factor had high internal consistency (Cronbach's alpha coefficient = 0.91). The factor was labeled *social motivation.*

The second factor consisted of all five items that were intended to measure *personal gratification*, two *information* items, and one *community* item. This factor was focused on personal aspects of social media motivation. The five *personal gratification* items were intended to measure the personal benefits a social media user may receive from engaging with national parks. In addition, the two *information* items were interpreted as personally benefiting from being informed and educated about the park. The inclusion of the *community* item was explained because it was similarly worded ("To stay connected to the park") as one of the *personal gratification* items ("To maintain a connection to the natural world"). The internal consistency of

this factor was satisfactory (Cronbach's alpha coefficient = 0.87). The factor was labeled *personal motivation.*

Table 6 Variance Explained for the Social Media Motivation Scale for the Pilot Sample

Factor	Eigenvalue	% of Variance Explained
1	7.047	39.153
2	2.253	12.519
Total		51.672

Table 7 Pattern Matrix for the Social Media Motivation Scale for the Pilot Sample

Items	Factor 1	Factor 2
To let others know what I value	0.824	
To meet and talk to other social media users about the park	0.804	
To encourage my social media friends to support the park	0.794	
To voice my opinions about park-related issues (e.g., park rules/policies, changes in the park, management issues)	0.707	
To encourage my social media friends to learn about the park and its natural and cultural history	0.700	
To directly communicate with the park employees	0.695	
To share my experience at the park	0.676	
To encourage my social media friends to visit the park	0.675	
To be a part of the park's online community	0.585	
To learn about ways to help the park	0.549	
To entertain myself		0.770
To feel inspired		0.758
To view pictures/videos of the park		0.728
To feel excited		0.683
To maintain a connection to the natural world		0.676
To reduce the stresses of everyday life		0.660
To learn about the park and its natural and cultural history		0.504
To stay connected to the park		0.415

Note. Factor loadings under 0.3 were suppressed.

Final Study

Data analysis of the final sample involved four steps. First, descriptive statistics (e.g., frequencies, mean, and standard deviations) for the participants' socio-demographic characteristics, social media use characteristics, social media motivation, and place attachment were examined. Second, structural equation modeling was used to address Hypothesis 1 of Research Question 1, which explored the relationship between each dimension of social media motivation and each dimension of place attachment. Then, multiple regression analysis was conducted to address the remaining part of Research Question 1, which aimed to understand the effect of experience use history and social media use behaviors on the relationship. Finally, bivariate analyses were utilized in addressing Research Questions 2 and 3 that examined the socio-demographic influences on place attachment and social media motivation. The following sections present the research findings.

Descriptive Statistics

Socio-demographic Background

The final sample consisted of 328 participants. The majority of respondents were female participants (52.2%), while male participants made up 46.9% of the sample. Most were between the ages of 25 and 44 (59.3%). The average age was 39.2 years old, and the range was 18 to 67 years old. The largest race/ethnicity group was White (72.8%), followed by Hispanic or Latino (9.8%), Asian (8.6%), and Black or African American (7.6%). The majority of the sample had at least a bachelor's degree (57.2%), while a quarter of the sample had some college experience or 2-year degree (25.1%). Only 17.7% of the sample did not have any college experience. The household income groups were split fairly evenly with $100,000 or more (23.4%) being the largest income group. It was followed by $50,000 to $74,999 (22.8%), $25,000 to $49,999

(21.8%), and $75,000 to $99,999 (20.0%) income groups. Most respondents were not involved in a conservation or environmental group (81.4%). Table 8 presents frequencies and percentages for the final sample.

Table 8 Descriptive Statistics for Socio-demographic Items for the Final Sample

Variables	Categories	Frequency	Percentage
Gender	Male	152	46.9%
(*n*=324)	Female	169	52.2%
	Other	3	0.9%
Age	18-24	39	12.0%
(*n*=326)	25-34	91	27.9%
	35-44	102	31.3%
	45-54	42	12.9%
	55-64	41	12.6%
	65+	11	3.4%
Race/Ethnicity	White	238	72.8%
(*n*=327)	Black or African American	25	7.6%
	Hispanic or Latino	32	9.8%
	Asian	28	8.6%
	Other	4	1.2%
Education	Some High School	4	1.2%
(*n*=327)	High school graduate/GED	54	16.5%
	Some college or 2-year degree	82	25.1%
	Bachelor's degree	115	35.2%
	Graduate work or graduate degree	72	22.0%
Household Income	Less than $25,000	39	12.0%
(*n*=325)	$25,000 - $49,999	71	21.8%
	$50,000 - $74,999	74	22.8%
	$75,000 - $99,999	65	20.0%
	$100,000 or more	76	23.4%
Environmental group membership (*n*=328)	Yes	61	18.6%
	No	267	81.4%

Social Media Use Characteristics

Table 9 summarizes various social media use characteristics of the final sample. Of the 328 respondents, 50.9% indicated that they use Facebook the most in their daily lives. Instagram was the next popular SM platform (22.9%), followed by YouTube (16.2%) and Twitter (7.6%). On average, participants used two social media platforms to follow the national park that they selected during the screening process, while a few of them utilized as many as seven platforms. The most popular SM platform was Facebook, which was used by 68.6% of the participants to follow their selected park. Almost half of the sample (46.6%) used Instagram, 32.3% used YouTube, 29.3% used Twitter, and 11.3% used Pinterest.

Participants have followed a social media account of their selected park for an average of 20 months. The median value was 12 months, while the range was less than one month to eight years. Most participants were frequently exposed to park-related social media content. About one-third of the sample (31.3%) viewed the content either daily or every other day, and another one-third (35.7%) viewed it weekly. The rest viewed the content every other week (10.7%), monthly (13.1%), or less than once per month (9.5%). Finally, the majority of participants (68.7%) engaged in more active uses, such as ‘liking’, sharing, and creating park-related posts, while 31.3% engaged in more passive uses, such as reading the posts.

Table 9 Descriptive Statistics for Social Media Use Characteristics for the Final Sample

Variables	Categories	Frequency	Percentage
Social media platform used most in daily life (*n*=328)	Facebook	167	50.9%
	Instagram	75	22.9%
	YouTube	53	16.2%
	Twitter	25	7.6%
	Pinterest	4	1.2%
	Other (e.g., Snapchat)	4	1.2%
Social media platform used to follow national parks (*n*=328)	Facebook	225	68.6%
	Instagram	153	46.6%
	YouTube	106	32.3%
	Twitter	96	29.3%
	Pinterest	37	11.3%
	Other (e.g., Snapchat, Flickr)	25	7.6%
Amount of exposure to park-related social media content (*n*=328)	Daily	40	12.2%
	Every other day	62	18.9%
	Weekly	117	35.7%
	Every other week	35	10.7%
	Monthly	43	13.1%
	Less than once per month	31	9.5%
Social media engagement (*n*=323)	Active ('like', comment, share, create posts)	222	68.7%
	Passive (read/view posts)	101	31.3%

Social Media Motivation

As with the pilot study, the final study used the same scale, developed by the author based on previous research (e.g., Lovejoy & Saxton, 2012; Miller & Freimund, 2017; NPS, 2019; Wilkins et al., 2018; Zeng & Gerritsen, 2014), to measure a social media user's motivation to engage with national parks. The scale used a five-point Likert scale, ranging from 1 = "Strongly Disagree" to 5 = "Strongly Agree." Based on the results from exploratory factor analysis that identified two factors of social media motivation and retained 18 items, the final study included the same 18 items.

Cronbach's alpha was used to measure the internal consistency for the social media motivation scale (Cronbach, 1951). The alpha coefficient was 0.93 and indicated highly satisfactory internal consistency across all 18 items in the scale. Both factors of the scale showed sufficient internal consistency across all items in each factor. The alpha coefficients were: *social motivation* = 0.92 and *personal motivation* = 0.87.

Table 10 shows descriptive statistics for the SM motivation items. The results showed that participants were more highly motivated to engage with national parks on social media based on *personal motivation* (M=4.22; SD=0.83), rather than *social motivation* (M=3.57; SD=1.14). All eight items that measured *personal motivation* received average scores of 4.09 or higher. Participants were most highly motivated to view pictures/videos of the park (M=4.54; SD=0.71). Motivations to entertain oneself (M=4.25; SD=0.76), to learn about the park and its natural and cultural history (M=4.23; SD=0.82), and to maintain a connection to the natural world (M=4.20; SD=0.83) also received high average scores.

Participants reported neutral to slightly positive responses toward all *social motivation* items. Among these items, motivation to learn about ways to help the park received the highest average score (M=3.90; SD=0.94), followed by motivations to be a part of the park's online community (M=3.77; SD=1.05) and to encourage their social media friends to support the park (M=3.71; SD=1.07). Participants were least motivated to directly communicate with the park employees (M=3.08; SD=1.24).

Table 10 Descriptive Statistics for Social Media Motivation for the Final Sample (n=328)

Items	Mean	SD
Social motivation	**3.57**	**1.14**
To learn about ways to help the park	3.90	0.94
To be a part of the park's online community	3.77	1.05
To encourage my social media friends to support the park	3.71	1.07
To encourage my social media friends to learn about the park and its natural and cultural history	3.66	1.05
To encourage my social media friends to visit the park	3.63	1.14
To share my experience at the park	3.61	1.15
To let others know what I value	3.52	1.13
To voice my opinions about park-related issues (e.g., park rules/policies, changes in the park, management issues)	3.41	1.17
To meet and talk to other social media users about the park	3.37	1.21
To directly communicate with the park employees	3.08	1.24
Personal motivation	**4.22**	**0.83**
To view pictures/videos of the park	4.54	0.71
To entertain myself	4.25	0.76
To learn about the park and its natural and cultural history	4.23	0.82
To maintain a connection to the natural world	4.20	0.83
To feel inspired	4.17	0.89
To stay connected to the park	4.17	0.79
To feel excited	4.12	0.88
To reduce the stresses of everyday life	4.09	0.91

Place Attachment

As with the pilot study, the final study adopted a four-dimensional scale, drawn from the works of Kyle, Mowen, and Tarrant (2004) and Ramkissoon et al. (2013), to measure an individual's place attachment to a national park that one has visited and followed on social media. The scale included 18 items and used a five-point Likert scale, ranging from 1 =

"Strongly Disagree" to 5 = "Strongly Agree." The scores of one *place social bonding* item were reverse-coded because it was phrased negatively.

Cronbach's alpha was used to measure the internal consistency for the place attachment scale (Cronbach, 1951). The alpha coefficient was 0.89, which indicated satisfactory internal consistency across all 18 items in the scale. Three dimensions showed sufficient internal consistency: *place dependence* = 0.81, *place identity* = 0.88, and *place affect* = 0.85. However, the alpha coefficient for *place social bonding* was 0.35, which was below an acceptable level of 0.60 for scales with a reduced number of items (e.g., six or less) (Cortina, 1993). Despite a poor internal consistency, *place social bonding* was retained, with a possibility of being eliminated based on further reliability and validity analyses.

Table 11 shows the means and standard deviations for all place attachment items. Of the four dimensions, *place affect* received the highest average score and was the only dimension with a score over 4 that represented 'agree' (M=4.18; SD=0.82). Participants agreed that their selected park meant a lot to them (M=4.30; SD=0.77) and that the park was very special to them (M=4.24; SD=0.74). They also indicated that they were very attached to the park (M=4.13; SD=0.86) and felt a strong sense of belonging to the park and its settings/facilities (M=4.05; SD=0.89).

The *place identity* dimension received the second highest average score (M=3.89; SD=0.90), and its four items showed similar average scores that ranged from 3.85 to 3.97. Participants identified with their selected park (M=3.97; SD=0.87) and somewhat felt that the park was a part of them (M=3.87; SD=0.90). They also seemed to believe that the park reflected, to some extent, the type of person they were (M=3.86; SD=0.89) and that visiting the park said something about who they were (M=3.85; SD=0.94).

Participants reported a fairly low average score for *place dependence* (M=3.74; SD=0.96). Of the five *place dependence* items, “this park is the best place for what I like to do” received the highest mean score of 4.09 (SD=0.76), while the other four items received mean scores that fell below a 4 that represented ‘agree’. The lowest mean score was reported for “I wouldn’t substitute any other area for the type of recreation I do at this park” (M=3.52; SD=1.04).

Of the four dimensions of place attachment, participants reported the lowest mean score for *place social bonding* with the most variability within the dimension (M=3.70; SD=1.19). Participants appeared to have a lot of fond memories about their selected park (M=4.23; SD=0.85) and agreed that they would bring their children to the park (M=4.12; SD=0.97). However, they somewhat disagreed that if they were to stop visiting the park, they would lose contact with a number of friends. This *place social bonding* item received the lowest mean score that fell below a 3 that represented ‘neutral’ (M=2.84; SD=1.29).

Table 11 Descriptive Statistics for Place Attachment for the Final Sample (n=328)

Items	Mean	SD
Place dependence	**3.74**	**0.96**
This park is the best place for what I like to do.	4.09	0.76
I get more satisfaction out of visiting this park than any other park.	3.77	0.92
No other place can compare to this park.	3.75	0.93
Visiting this park is more important to me than visiting any other park.	3.56	1.02
I wouldn't substitute any other area for the type of recreation I do at this park.	3.52	1.04
Place identity	**3.89**	**0.90**
I identify strongly with this park.	3.97	0.87
I feel like this park is a part of me.	3.87	0.90
This park reflects the type of person I am.	3.86	0.89
Visiting this park says a lot about who I am.	3.85	0.94
Place social bonding	**3.70**	**1.19**
I have a lot of fond memories about this park.	4.23	0.85
I will (do) bring my children to this park.	4.12	0.97
I don't tell many people about this park. (r)	3.66	1.25
I have a special connection to the people who visit this park.	3.64	1.00
If I were to stop visiting this park, I would lose contact with a number of friends.	2.84	1.29
Place affect	**4.18**	**0.82**
This park means a lot to me.	4.30	0.77
This park is very special to me.	4.24	0.74
I am very attached to this park.	4.13	0.86
I feel a strong sense of belonging to this park and its settings/facilities.	4.05	0.89

Structural Equation Modeling – Testing the Measurement Model

The hypothesized model of the relationship between social media motivation and place attachment was tested using structural equation modeling (SEM), which is a two-step approach involving a measurement model and a structural model (Anderson & Gerbing, 1988). To test the measurement model, confirmatory factor analysis (CFA) with a maximum likelihood (ML)

estimation was performed in LISREL version 10.3. This was to assess the suitability of hypothesized factor structures of social media motivation and place attachment (e.g., the number of factors and the patterns of indicator-factor loadings) for empirical data.

The overall model fit was examined using a series of fit indices. Chi-Square value (χ^2) was expected to be significant because when a sample size is as large (n=328) as that used in this study, trivial deviations from a perfect model often lead to an overall significant value (Tanaka, 1987). Thus, some of the widely used indices of practical fit were reported: comparative fit index (CFI) (Bentler, 1990), non-normed fit index (NNFI) (Bentler & Bonett, 1980), and root mean square error of approximation (RMSEA) (MacCallum et al., 1996). The criteria for each fit index are: (1) CFI values greater than 0.90 indicate an acceptable fit of data, while values higher than 0.95 indicate a good fit (Hu & Bentler, 1998); (2) NNFI values exceeding 0.90 indicate an acceptable fit, while values higher than 0.95 indicate a good fit (Bentler & Bonett, 1980); and (3) RMSEA values of less than 0.08 indicate an acceptable fit, while values less than 0.05 indicate a good fit (MacCallum et al., 1996). Additionally, composite reliability was evaluated to determine the internal consistency of the measures. Convergent validity and discriminant validity were also examined.

Social Media Motivation Dimensions

Social media motivation was initially hypothesized to include four dimensions: *information, community, action,* and *personal gratification.* However, based on the results of exploratory factor analysis on the pilot sample, social media motivation was specified to have two factors: *social motivation* and *personal motivation*. These two factors were specified to be correlated because they were expected to measure different facets of social media motivation (e.g., Lovejoy & Saxton, 2012; Miller & Freimund, 2017). Ten items measured *social*

motivation, while eight items measured *personal motivation.* These items were measured on a five-point Likert scale, ranging from 1 = "Strongly Disagree" to 5 = "Strongly Agree."

An initial LISREL output indicated that allowing several error terms, associated with the observed measures, to correlate could significantly improve the model fit. In research with psychological constructs, it has often been necessary to allow error terms to correlate in order to achieve a well-fitting model (Byrne, Shavelson, & Muthén, 1989). Because these represented nonrandom measurement error due to method effects, parameter specifications were justified (Byrne et al., 1989). In this study, similarity in item wording and level of measurement may have attributed to the common source of error variance. Correlated error terms were specified between the following: "To encourage my social media friends to support the park" and "To encourage my social media friends to learn about the park and its natural and cultural history"; "To directly communicate with the park employees" and "To meet and talk to other social media users about the park"; and "To share my experience at the park" and "To meet and talk to other social media users about the park."

After allowing error terms to correlate, the hypothesized model adequately fit the sample data with $\chi^2_{(131,\ N=328)}$=397.01, CFI=0.92, RMSEA=0.08, and NNFI=0.91. As displayed in Table 12, the majority of factor loadings were moderate to high, with only one loading falling below 0.50 (Hair et al., 1998). However, the loading of 0.49 for "To view pictures/videos of the park" was still considered acceptable, and the item was retained. The loadings ranged from 0.61 to 0.84 for *social motivation* and from 0.49 to 0.82 for *personal motivation.* The *t*-values were all significant, indicating that all paths assisted in the prediction of their assigned measures, thus supporting the convergent validity of the indicators (Anderson & Gerbing, 1988). Composite reliability was calculated to examine the internal consistency of the items for each of the factors

(Raykov, 1997). Both *social motivation* and *personal motivation* had composite reliability scores greater than 0.80, suggesting that each of the items reliably measured their respective factors. Discriminant validity was found since the square root of average variance extracted (AVE) values for each of the factors were larger than the correlation of the same factors (See Table 13) (Fornell & Larcker, 1981). Therefore, social media motivation was determined to consist of two factors, *social motivation* and *personal motivation*; and this two-dimension measurement model was used in the subsequent data analysis.

Table 12 Confirmatory Factor Analysis and Composite Reliability Scores for Social Media Motivation

Factors/Items	Factor loadings	*t*-Value	CR
Social motivation			0.921
S_1 To encourage my social media friends to visit the park	0.837	-	
S_2 To encourage my social media friends to support the park	0.800	17.036	
S_3 To encourage my social media friends to learn about the park and its natural and cultural history	0.784	16.530	
S_4 To share my experience at the park	0.765	16.001	
S_5 To let others know what I value	0.738	15.223	
S_6 To voice my opinions about park-related issues (e.g., park rules/policies, changes in the park, management issues)	0.730	14.994	
S_7 To meet and talk to other social media users about the park	0.719	14.634	
S_8 To be a part of the park's online community	0.686	13.788	
S_9 To learn about ways to help the park	0.649	12.816	
S_{10} To directly communicate with the park employees	0.605	11.729	
Personal motivation			0.874
P_1 To feel excited	0.823	8.835	
P_2 To feel inspired	0.788	8.687	
P_3 To maintain a connection to the natural world	0.741	8.466	
P_4 To reduce the stresses of everyday life	0.688	8.182	
P_5 To learn about the park and its natural and cultural history	0.655	7.991	
P_6 To stay connected to the park	0.624	7.790	
P_7 To entertain myself	0.613	7.720	
P_8 To view pictures/videos of the park	0.486	-	

Table 13 Discriminant Validity Analysis for Social Media Motivation

	Social motivation	Personal motivation
Social motivation	0.734	
Personal motivation	0.672	0.685

Note. The diagonal numbers represent the square root of the variance shared between the constructs and their measures (average variance extracted; AVE). Off diagonal number represents the inter-correlations of the constructs. For discriminant validity, the diagonal numbers should be larger than any other corresponding row or column entry.

Place Attachment Dimensions

Confirmatory factor analysis was conducted to confirm the hypothesized four-factor structure of place attachment. The four factors were *place dependence, place identity, place social bonding,* and *place affect.* They were specified to be inter-correlated, based on previous research that suggested these factors captured various facets of place attachment (Kyle et al., 2005; Kyle, Mowen, & Tarrant, 2004). The place attachment scale consisted of 18 items, measured on a five-point Likert scale, ranging from 1 = "Strongly Disagree" to 5 = "Strongly Agree." Of those, five items measured *place dependence*, four measured *place identity*, five measured *place social bonding*, and four measured *place affect*.

The initial LISREL results showed a poor model fit ($\chi^2_{(129,\ N=328)}$=568.63, CFI=0.85, RMSEA= 0.10, and NNFI=0.82). After inspecting the *t*-values associated with factor loadings, one *place social bonding* item, "I don't tell many people about this park (reverse-coded)," was removed because its *t*-value (*t* = 0.50) was not statistically significant. Although the model fit improved slightly after the removal, it was still unacceptable ($\chi^2_{(113,\ N=328)}$=462.73, CFI=0.88, RMSEA= 0.10, and NNFI=0.85).

To further improve the model fit, one *place dependence* item, "This park is the best place for what I like to do," was removed because it showed evidence of cross-loading onto all the other three factors. The fit indices improved, but RMSEA and NNFI were still at unacceptable levels ($\chi^2_{(98,\ N=328)}$=348.78, CFI=0.91, RMSEA= 0.09, and NNFI=0.88).

After examining modification indices, error terms of "Visiting this park says a lot about who I am" and "This park reflects the type of person I am" from the *place identity* subscale were correlated. This specification was justified based on method effects, which was likely caused by similarly worded items and level of measurement (Byrne et al., 1989). The fit of this place

attachment model achieved a good fit ($\chi^2_{(97,\ N=328)}$=297.82, CFI=0.92, RMSEA= 0.08, and NNFI=0.91).

However, reliability and validity analyses revealed several issues in this model. First, composite reliability of the *place social bonding* factor was 0.57, which was below an acceptable level of 0.7 (Hair, Hult, Ringle, & Sarstedt, 2017). Second, discriminant validity analysis indicated that several inter-correlations between the factors were larger than the square root of average variance extracted values for each of the factors, mainly due to the low square root of AVE value of *place social bonding* (See Table 14). Therefore, *place social bonding* was removed; the removal was justified based on previous studies that operationalized place attachment without the social dimension (e.g., Eder & Arnberger, 2012; Vaske & Kobrin, 2001; Williams & Roggenbuck, 1989). These studies often considered place attachment as having two distinct dimensions: place identity and place dependence.

Table 14 Discriminant Validity Analysis for 4-Factor Place Attachment

	Place dependence	Place identity	Place social bonding	Place affect
Place dependence	0.738			
Place identity	0.629	0.790		
Place social bonding	0.686 [a]	0.958 [a]	0.510	
Place affect	0.569	0.847 [a]	0.851 [a]	0.774

Note. The diagonal numbers represent the square root of the variance shared between the constructs and their measures (average variance extracted; AVE). Off diagonal numbers represent the inter-correlations of the constructs. For discriminant validity, the diagonal numbers should be larger than any other corresponding row or column entry.
Note. [a] Values larger than the diagonal numbers (the square root of AVE values); These indicate poor discriminant validity.

Place attachment was specified to have three factors: *place dependence*, *place identity*, and *place affect*. There were 12 items in the scale with each of the factors being measured by four items. This model adequately fit the sample data with $\chi^2_{(50,\ N=328)}$=100.97, CFI=0.98,

RMSEA=0.06, and NNFI=0.97. As shown in Table 15, all factor loadings were moderate to high (Hair et al., 1998). The factor loadings ranged from 0.632 to 0.830 for *place dependence,* from 0.715 to 0.844 for *place identity,* and from 0.726 to 0.803 for *place affect.* The t-values were all significant, which indicated that all paths assisted in the prediction of their assigned measures. This supported the convergent validity of the indicators (Anderson & Gerbing, 1988). Table 15 also presents composite reliability, which reflects the internal consistency of the indicators (Raykov, 1997). All three factors had composite reliability scores greater than 0.80, suggesting that all items reliably measured their respective factors.

Discriminant validity was evaluated by comparing the square root of AVE for each of the factors to the inter-correlations of the factors (Fornell & Larcker, 1981). The inter-correlation between *place identity* and *place affect* was larger than those factors' square root of AVE values, indicating poor discriminant validity (See Table 16). This large correlation between *place identity* and *place affect* was explained based on previous studies that operationalized and supported *place identity* as having both cognitive and emotional components (e.g., Moore & Graefe, 1994; Williams & Vaske, 2003). However, the author decided to keep *place identity* and *place affect* distinct, following the works of other researchers in environmental psychology and tourism that have recognized the significance of the *place affect* dimension (e.g., Han, Kim, Lee, & Kim, 2019; Kyle, Mowen, & Tarrant, 2004; Ramkissoon & Mavondo, 2017). Discriminant validity was found between *place dependence* and *place identity,* and also between *place dependence* and *place affect*.

Based on CFA and reliability and validity analyses, place attachment was determined to consist of three factors: *place dependence, place identity,* and *place affect.* This three-dimension measurement model for place attachment was used in the subsequent data analysis.

Table 15 Confirmatory Factor Analysis and Composite Reliability Scores for 3-Factor Place Attachment

Factors/Items	Factor loadings	*t*-Value	CR
Place dependence			0.826
PD_4 Visiting this park is more important to me than visiting any other park.	0.830	12.808	
PD_3 I get more satisfaction out of visiting this park than any other park.	0.777	12.269	
PD_2 No other place can compare to this park.	0.701	-	
PD_5 I wouldn't substitute any other area for the type of recreation I do at this park.	0.632	10.248	
Place identity			0.867
PI_1 I feel like this park is a part of me.	0.844	-	
PI_2 I identify strongly with this park.	0.820	17.048	
PI_4 This park reflects the type of person I am.	0.767	15.524	
PI_3 Visiting this park says a lot about who I am.	0.715	14.064	
Place affect			0.857
PA_2 I am very attached to this park.	0.803	13.719	
PA_4 I feel a strong sense of belonging to this park and its settings/facilities.	0.786	13.442	
PA_3 This park is very special to me.	0.781	13.360	
PA_1 This park means a lot to me.	0.726	-	

Table 16 Discriminant Validity Analysis for 3-Factor Place Attachment

	Place dependence	Place identity	Place affect
Place dependence	0.739		
Place identity	0.627	0.788	
Place affect	0.569	0.845[1]	0.775

The diagonal numbers represent the square root of the variance shared between the constructs and their measures (average variance extracted; AVE). Off diagonal numbers represent the inter-correlations of the constructs. For discriminant validity, the diagonal numbers should be larger than any other corresponding row or column entry.
[1] Value larger than the diagonal numbers (the square root of AVE values); These indicate poor discriminant validity.

Structural Equation Modeling – Testing the Structural Model

After establishing a valid measurement model, the next step involved testing the hypothesized relationships among the constructs. This procedure addressed the revised Hypothesis 1 of Research Question 1: Each dimension of social media motivation, i.e., *social motivation* and *personal motivation,* will positively predict each dimension of place attachment, i.e., *place dependence, place identity,* and *place affect*. This hypothesis was revised based on the results of CFA for social media motivation and place attachment.

The initial results indicated that one regression path between *personal motivation* and *place dependence* was not statistically significant at $p < 0.05$ ($t = 0.76$); this path was removed. Figure 1 illustrates the regression paths and regression coefficients of the final structural model. Five of the six hypothesized paths were statistically significant, indicating that there were positive path relationships. The final model indicated a satisfactory model fit ($\chi^2_{(392, N=328)}$=872.98, CFI=0.92, RMSEA= 0.06, and NNFI=0.91).

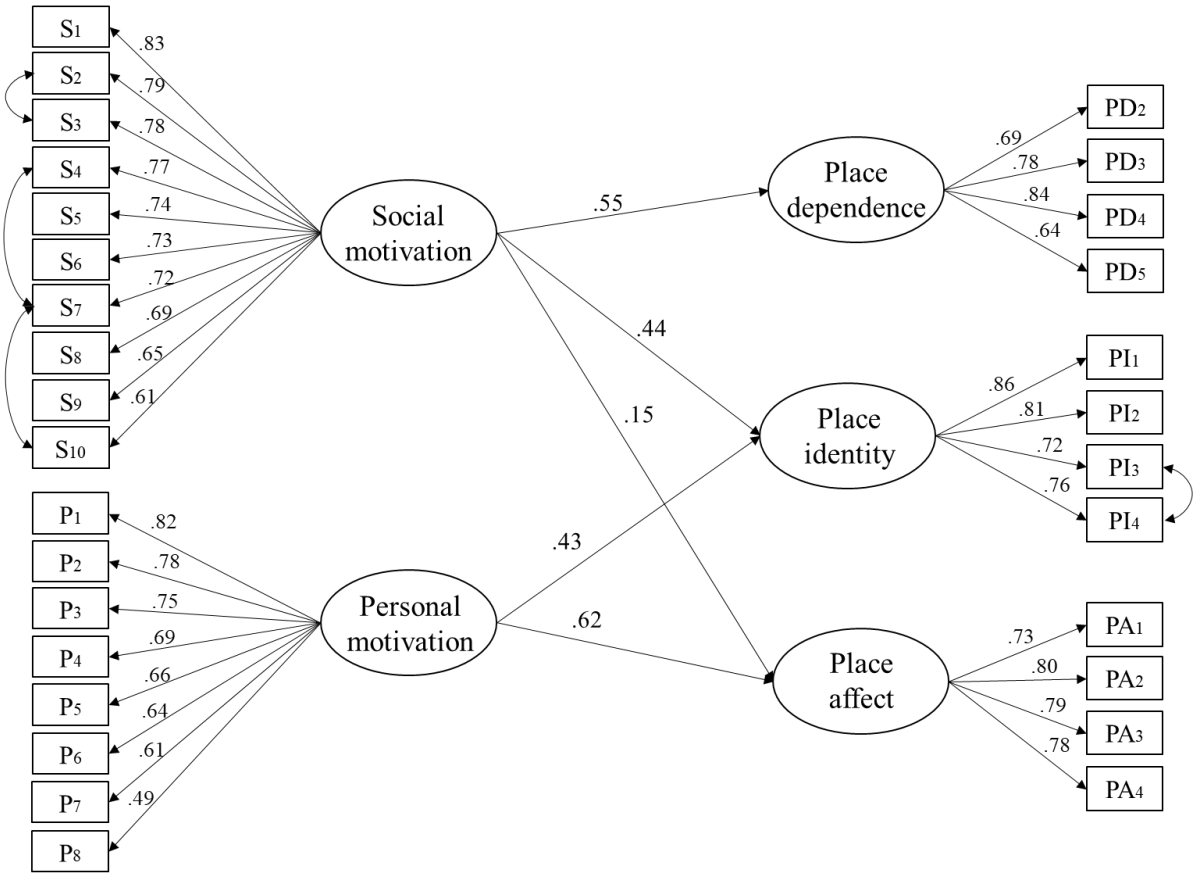

Figure 1 Structural Model with Standardized Estimates of Regression Coefficients

Table 17 presents a summary of regression paths. *Place dependence* was positively affected by *social motivation* (β = 0.55, t = 8.18, p < 0.001), but not by *personal motivation.* The squared multiple correlation (equivalent to R^2) was 0.301 for *place dependence*, which indicated that 30.1% of variance in this dimension could be attributed to *social motivation*. *Place identity* was positively influenced by both *social motivation* (β = 0.44, t = 6.71, p < 0.001) and *personal motivation* (β = 0.43, t = 5.66, p < 0.001). The R^2 value suggested that 62.9% of variance in *place identity* could be explained by the two factors of social media motivation. Finally, *place affect* was positively predicted by both *social motivation* (β = 0.15, t = 2.09, p < 0.05) and *personal motivation* (β = 0.62, t = 6.29, p < 0.001). In the *place affect* dimension, 51.9% of variance could be attributed to both factors of social media motivation. Based on these findings,

H1 was partially supported, with the exception of the *personal motivation* to *place dependence* path being the only one not supported.

Table 17 Regression Coefficients for Relationships between Social Media Motivation and Place Attachment

Path			B	SE	β	t	R^2
Social motivation	→	Place dependence	0.367	0.045	0.548	8.178***	0.301
Social motivation	→	Place identity	0.354	0.053	0.436	6.709***	0.629
Personal motivation	→	Place identity	0.956	0.169	0.430	5.658***	
Social motivation	→	Place affect	0.085	0.041	0.145	2.086*	0.519
Personal motivation	→	Place affect	0.989	0.157	0.615	6.293***	

* $p < 0.05$; *** $p < 0.001$.

Multiple Regression Analysis

Multiple regression analysis was used to examine the moderating effects of experience use history (H2), social media exposure (H3), and social media engagement (H4) on the relationship between social media motivation and place attachment. Drawing from Baron and Kenny's (1986) approach, the analysis involved the following: (a) standardize independent variables (*social motivation* and *personal motivation*) and dependent variables (*place dependence*, *place identity*, and *place affect*) by converting to Z-scores, to reduce multicollinearity; (b) multiply the standardized independent variables to moderator variables (EUH, SM exposure, and SM engagement), to create interaction terms; and (c) determine if the moderator variables alter the strength of the relationship between the independent and dependent variables. Minitab version 19 was used to conduct the analysis.

Experience Use History

Experience use history was operationalized by using a composite measure that combined (a) the total number of national park visits, (b) the number of visited national parks, and (c) the total number of visits to a specific park that respondents selected during the screening process (Petrick, 2002; Schreyer et al., 1984). Based on the median value, respondents were divided into 'high' or 'low' groups for each of the three variables. Although eight EUH categories were possible, some categories were combined to have adequate sample sizes. Ultimately, three categories were used: Veterans, Intermediates, and Beginners (See Table 18). Veterans (*n*=121; 36.9%) were individuals with more than 20 visits to national parks and with more than 2 visits to a specific park they selected during the screening process. Intermediates (*n*=104; 31.7%) were Individuals with more than 20 visits to national parks but only 1-2 visits to their selected park, or 20 or less visits to national parks but with more than 2 visits to their selected park. Beginners (*n*=103; 31.4%) were Individuals with 20 or less visits to national parks and with 1-2 visits to their selected park.

Table 18 Experience Use History Categories

		No. of visits to any national park			
		High (21+)		*Low (1-20)*	
		No. of parks visited		No. of parks visited	
		High (8+)	*Low (1-7)*	*High (8+)*	*Low (1-7)*
No. of visits to a selected park	*High (3+)*	Veteran (n=121)		Intermediate 1 (n=64)	
	Low (1,2)	Intermediate 2 (n=40)		Beginner (n=103)	

Note. Intermediate 1 and Intermediate 2 were combined to form an Intermediate category (*n* = 104).

Based on the SEM results that supported five out of six regression paths, the moderating role of EUH on five relationships were examined to address Hypothesis 2. The following hypotheses were proposed:

- H2a: The strength of the relationship between *social motivation* and *place dependence* will increase with experience use history.
- H2b: The strength of the relationship between *social motivation* and *place identity* will increase with experience use history.
- H2c: The strength of the relationship between *personal motivation* and *place identity* will increase with experience use history.
- H2d: The strength of the relationship between *social motivation* and *place affect* will increase with experience use history.
- H2e: The strength of the relationship between *personal motivation* and *place affect* will increase with experience use history.

Table 19 presents the results from the multiple regression analysis of the role of EUH on the relationship between *social motivation* and *place dependence*. Variance Inflation Factors (VIF), which estimate how much variance within regression coefficients is inflated due to multicollinearity in the model, were assessed based on a common rule of thumb: a VIF above 10 suggests high correlation and is a reason for concern (Marquardt, 1970). In this model, VIFs associated with each of the variables were well below 10, suggesting low to moderate correlation.

The overall regression model was statistically significant ($F_{(5, 322)} = 20.76$, $p < 0.001$), with only *social motivation* contributing to the model. Based on the R^2 value, 24.4% of the

variance for *place dependence* was explained in this model. As with the SEM results, there was a positive relationship between *social motivation* and *place dependence*. EUH did not have significant impact on *place dependenc*e, nor moderated the relationship between *social motivation* and *place dependence*. Thus, H2a was not supported.

Table 19 Multiple Regression Analysis for Dependent Variable of Place Dependence

Analysis of Variance	df	SS	MS	*F*	*p*	R^2
Regression	5	79.702	15.940	20.76	0.000***	0.244
Social motivation	1	29.160	29.160	37.97	0.000***	
EUH	2	0.752	0.376	0.49	0.613	
Social motivation*EUH (Moderator)	2	1.438	0.719	0.94	0.393	
Error	322	247.298	0.768			
Total	327	327.000				

Variable	*β*	SE *β*	*t*	*p*	VIF
Constant	0.058	0.080	0.72	0.471	
Social motivation	0.471	0.076	6.16	0.000***	2.49
EUH					
Intermediate	-0.035	0.118	-0.29	0.770	1.29
Beginner	-0.116	0.119	-0.98	0.330	1.30
Social motivation*EUH (Moderator)					
Intermediate	-0.095	0.128	-0.74	0.460	1.59
Beginner	0.084	0.112	0.75	0.454	1.93

*** $p < 0.001$.

The effect of EUH on the second relationship between s*ocial motivation* and *place identity* was examined (See Table 20). Regarding multicollinearity, VIFs showed acceptable correlations among independent variables. The overall model was statistically significant ($F_{(5, 322)} = 45.25$, $p < 0.001$), with *social motivation* and EUH contributing to the model. The R^2 value showed that 41.3% of the variance for *place identity* was explained. There was a positive relationship between *social motivation* and *place identity*, which supported the earlier SEM results. Based on the significant impact of EUH in the model, group differences were examined

using the Tukey test. Veterans (M = 0.14) showed a significantly higher *place identity* mean, compared to Beginners (M = -0.14). Looking at the interaction term, EUH did not moderate the relationship between *social motivation* and *place identity*; thus, H2b was not supported.

Table 20 Multiple Regression Analysis for Dependent Variable of Place Identity

Analysis of Variance	df	SS	MS	*F*	*p*	R^2
Regression	5	134.951	26.990	45.25	0.000***	0.413
Social motivation	1	45.006	45.006	75.46	0.000***	
EUH	2	4.417	2.208	3.70	0.026*	
Social motivation*EUH (Moderator)	2	2.745	1.373	2.30	0.102	
Error	322	192.049	0.596			
Total	327	327.000				

Variable	*β*	SE *β*	*t*	*p*	VIF
Constant	0.141	0.070	2.00	0.047*	
Social motivation	0.585	0.067	8.69	0.000***	2.49
EUH					
Intermediate	-0.116	0.104	-1.12	0.265	1.29
Beginner	-0.285	0.105	-2.72	0.007**	1.30
Social motivation*EUH (Moderator)					
Intermediate	-0.108	0.113	-0.96	0.338	1.59
Beginner	0.134	0.099	1.36	0.175	1.93

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Table 21 presents the results from the multiple regression analysis of the role of EUH on the relationship *personal motivation* and *place identity*. Multicollinearity was not found to be a problem as VIFs showed low to moderate correlations among independent variables. The overall model was statistically significant ($F_{(5, 322)} = 47.93$, $p < 0.001$), with *personal motivation* and EUH contributing to the model. Looking at the R^2 value, 42.7% of the variance for *place identity* was explained. As with the earlier SEM results, there was a positive relationship between *personal motivation* and *place identity*. EUH was a significant predictor of *place identity* when controlling for *personal motivation.* The Tukey test revealed that Beginners (M = -0.23) showed

lower *place identity* mean, compared to both Veterans (M = 0.14) and Intermediates (M = 0.06). A nonsignificant interaction term indicated that EUH did not moderate the relationship between *personal motivation* and *place identity*. Thus, H2c was not supported.

Table 21 Multiple Regression Analysis for Dependent Variable of Place Identity

Analysis of Variance	df	SS	MS	*F*	*p*	R^2
Regression	5	139.525	27.905	47.93	0.000***	0.427
Personal motivation	1	57.809	57.809	99.29	0.000***	
EUH	2	7.720	3.860	6.63	0.002**	
Personal motivation*EUH (Moderator)	2	1.177	0.588	1.01	0.365	
Error	322	187.475	0.582			
Total	327	327.000				

Variable	*β*	SE *β*	*t*	*p*	VIF
Constant	0.136	0.069	1.97	0.050	
Personal motivation	0.699	0.070	9.96	0.000***	2.76
EUH					
Intermediate	-0.080	0.102	-0.79	0.432	1.28
Beginner	-0.362	0.103	-3.52	0.000***	1.28
Personal motivation*EUH (Moderator)					
Intermediate	-0.121	0.107	-1.13	0.259	1.75
Beginner	-0.128	0.099	-1.29	0.199	2.02

** $p < 0.01$; *** $p < 0.001$.

The effect of EUH on the relationship between *social motivation* and *place affect* was examined (See Table 22). VIFs showed low to moderate correlations among independent variables, thus multicollinearity was not found to be a problem. The overall model was statistically significant ($F_{(5, 322)} = 23.69$, $p < 0.001$), with *social motivation* and EUH contributing to the model. The R^2 value showed that 26.9% of the variance for *place affect* was explained. As with the earlier SEM results, there was a positive relationship between *social motivation* and *place affect*. Additionally, EUH was a significant predictor of *place affect* when controlling for *social motivation.* The test of group differences, using the Tukey test, indicated that Veterans

received a statistically higher mean (M = 0.21), compared to Beginners (M = -0.15). EUH did not have a moderating effect on the relationship between *social motivation* and *place affect*; H2d was not supported.

Table 22 Multiple Regression Analysis for Dependent Variable of Place Affect

Analysis of Variance	df	SS	MS	*F*	*p*	R^2
Regression	5	87.953	17.590	23.69	0.000***	0.269
Social motivation	1	15.637	15.637	21.06	0.000***	
EUH	2	7.784	3.892	5.24	0.006**	
Social motivation*EUH (Moderator)	2	4.033	2.016	2.72	0.068	
Error	322	239.047	0.742			
Total	327	327.000				

Variable	*β*	SE *β*	*t*	*p*	VIF
Constant	0.208	0.078	2.66	0.008**	
Social motivation	0.345	0.075	4.59	0.000***	2.49
EUH					
Intermediate	-0.264	0.116	-2.27	0.024*	1.29
Beginner	-0.361	0.117	-3.09	0.002**	1.30
Social motivation*EUH (Moderator)					
Intermediate	0.127	0.126	1.01	0.313	1.59
Beginner	0.256	0.110	2.33	0.020*	1.93

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

The effect of EUH on the relationship between *personal motivation* and *place affect* was analyzed (See Table 23). Regarding multicollinearity, VIFs showed low to moderate correlations among independent variables. The overall model was statistically significant ($F_{(5, 322)} = 47.47$, $p < 0.001$), with *personal motivation* and EUH contributing to the model. In this model, 42.4% of the variance for *place affect* was explained. There was a positive relationship between *personal motivation* and *place affect*, supporting the SEM results. EUH was also a significant predictor of *place affect* when controlling for *personal motivation.* The Tukey test showed that Veterans had statistically higher mean (M = 0.20), compared to Beginners (M = -0.19). EUH did not have a

moderating effect on the relationship between *personal motivation* and *place affect*. Thus, H2e was not supported.

Table 23 Multiple Regression Analysis for Dependent Variable of Place Affect

Analysis of Variance	df	SS	MS	*F*	*p*	R^2
Regression	5	138.751	27.750	47.47	0.000***	.424
Personal motivation	1	32.646	32.646	55.84	0.000***	
EUH	2	8.442	4.221	7.22	0.001**	
Personal motivation*EUH (Moderator)	2	2.635	1.317	2.25	0.107	
Error	322	188.249	0.585			
Total	327	138.751				

Variable	*β*	SE *β*	*t*	*p*	VIF
Constant	0.200	0.070	2.87	0.004**	
Personal motivation	0.525	0.070	7.47	0.000***	2.76
EUH					
Intermediate	-0.224	0.102	-2.19	0.029*	1.28
Beginner	-0.388	0.103	-3.76	0.000***	1.28
Personal motivation*EUH (Moderator)					
Intermediate	0.048	0.108	0.44	0.657	1.75
Beginner	0.204	0.099	2.05	0.042*	2.02

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

To summarize, the multiple regression results did not support H2 as experience use history did not moderate the relationship between social media motivation and place attachment (See Table 24).

Table 24 Summary Results for Hypothesis Two

Hypothesis		Outcome
H2a	The strength of the relationship between *social motivation* and *place dependence* will increase with experience use history.	Not supported
H2b	The strength of the relationship between *social motivation* and *place identity* will increase with experience use history.	Not supported
H2c	The strength of the relationship between *personal motivation* and *place identity* will increase with experience use history.	Not supported
H2d	The strength of the relationship between *social motivation* and *place affect* will increase with experience use history.	Not supported
H2e	The strength of the relationship between *personal motivation* and *place affect* will increase with experience use history.	Not supported

Social Media Exposure

The moderating role of the amount of exposure to national-park-related social media content on the relationship between social media motivation and place attachment was examined using multiple regression analysis (H3). Respondents were divided into three groups: High exposure (persons who viewed park-related content daily or every other day; *n*=102, 31.1%), Medium exposure (persons who viewed park-related content weekly; *n*=117, 35.7%), and Low exposure (persons who viewed park-related content less than once a week; *n*=109, 33.2%). Based on the SEM results that supported five out of six regression paths, the following hypotheses were proposed:

- H3a: The strength of the relationship between *social motivation* and *place dependence* will increase with more SM exposure.
- H3b: The strength of the relationship between *social motivation* and *place identity* will increase with more SM exposure.
- H3c: The strength of the relationship between *personal motivation* and *place identity* will increase with more SM exposure.

- H3d: The strength of the relationship between *social motivation* and *place affect* will increase with more SM exposure.
- H3e: The strength of the relationship between *personal motivation* and *place affect* will increase with more SM exposure.

Table 25 presents the results from the multiple regression analysis of the moderating role of social media exposure on the relationship between s*ocial motivation* and *place dependence*. Multicollinearity was not found to be a problem since VIFs showed low to moderate correlations among independent variables. The overall model was statistically significant ($F_{(5, 322)} = 22.65$, $p < 0.001$), and the R^2 value showed that 26.0% of the variance for *place dependence* was explained. There was a positive relationship between *social motivation* and *place dependence,* which supported the earlier SEM results. SM exposure was not found to be a significant predictor of *place dependence*. However, there was a significant interaction effect, indicating that the amount of social media exposure moderated the relationship between *social motivation* and *place dependence*. Therefore, Pearson's *r* correlation coefficients for three SM exposure groups were compared to examine the group differences. The strength of the relation between *social motivation* and *place dependence* was significantly stronger ($z = 2.50$, $p < 0.01$) for the High exposure group, compared to the Low exposure group. Based on these findings, H3a was supported.

Table 25 Multiple Regression Analysis for Dependent Variable of Place Dependence

Analysis of Variance	df	SS	MS	*F*	*p*	R^2
Regression	5	85.073	17.015	22.65	0.000***	0.260
Social motivation	1	39.826	39.826	53.01	0.000***	
Exposure	2	2.791	1.396	1.86	0.158	
Social motivation*Exposure (Moderator)	2	6.186	3.093	4.12	0.017*	
Error	322	241.927	0.751			
Total	327	327.000				

Variable	*β*	SE *β*	*t*	*p*	VIF
Constant	-0.094	0.010	-0.95	0.344	
Social motivation	0.691	0.095	7.28	0.000***	3.92
Exposure					
Medium	0.162	0.128	1.27	0.206	1.64
Low	-0.063	0.135	-0.46	0.643	1.77
Social motivation*Exposure (Moderator)					
Medium	-0.274	0.131	-2.10	0.037*	2.12
Low	-0.357	0.128	-2.78	0.006**	2.51

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

The role of social media exposure on the second relationship between s*ocial motivation* and *place identity* was examined (See Table 26). VIFs showed low to moderate correlations among independent variables, so multicollinearity was not found to be an issue. The overall model was significant ($F_{(5, 322)} = 47.17$, $p < 0.001$), with 42.3% of the variance for *place identity* explained. There was a positive relationship between s*ocial motivation* and *place identity*, which supported the earlier SEM results. SM exposure also had a significant impact in the model, and the Tukey test was used to examine the group differences. The Medium exposure group (M = 0.12) showed a significantly higher *place identity* mean, compared to the High exposure (M = -0.17) and to the Low exposure (M = -0.16) groups. Based on the significant interaction term, Pearson's *r* correlation coefficients for three SM exposure groups were compared. The strength of the relationship between *social motivation* and *place identity* was significantly stronger for the

High exposure group, compared to the Medium exposure group ($z = 2.55$, $p < 0.01$) and also to the Low exposure group ($z = 3.10$, $p < 0.01$). Therefore, H3b was supported.

Table 26 Multiple Regression Analysis for Dependent Variable of Place Identity

Analysis of Variance	df	SS	MS	*F*	*p*	R^2
Regression	5	138.248	27.650	47.17	0.000***	0.423
Social motivation	1	64.358	64.358	109.79	0.000***	
Exposure	2	5.333	2.666	4.55	0.011*	
Social motivation*Exposure (Moderator)	2	8.251	4.125	7.04	0.001**	
Error	322	188.752	0.586			
Total	327	327.000				

Variable	*β*	SE *β*	*t*	*p*	VIF
Constant	-0.170	0.088	-1.93	0.054	
Social motivation	0.878	0.084	10.48	0.000***	3.92
Exposure					
Medium	0.287	0.113	2.54	0.012*	1.64
Low	0.014	0.119	0.12	0.904	1.77
Social motivation*Exposure (Moderator)					
Medium	-0.369	0.116	-3.19	0.002**	2.12
Low	-0.383	0.113	-3.38	0.001**	2.51

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

The moderating role of social media exposure on the relationship between *personal motivation* and *place identity* was examined (See Table 27). Multicollinearity was not found to be an issue in this model since VIFs showed low to moderate correlations among independent variables. The overall model was significant ($F_{(5, 322)} = 50.05$, $p < 0.001$), and 43.7% of the variance for *place identity* was accounted for. There was a positive relationship between *personal motivation* and *place identity*, supporting the earlier SEM results. The amount of SM exposure was a significant predictor of *place identity*, and the group differences were examined using the Tukey test. The Low exposure group (M = -0.23) showed a significantly lower *place identity* mean, compared to both High exposure (M = 0.16) and Medium exposure (M = 0.06)

groups. A nonsignificant interaction term indicated that SM exposure did not moderate the relationship between *personal motivation* and *place identity.* Therefore, H3c was not supported.

Table 27 Multiple Regression Analysis for Dependent Variable of Place Identity

Analysis of Variance	df	SS	MS	*F*	*p*	R^2
Regression	5	142.995	28.599	50.05	0.000***	0.437
Personal motivation	1	55.678	55.678	97.43	0.000***	
Exposure	2	8.254	4.127	7.22	0.001**	
Personal motiv*Exposure (Moderator)	2	3.123	1.561	2.73	0.067	
Error	322	184.005	0.571			
Total	327	327.000				

Variable	*β*	SE *β*	*t*	*p*	VIF
Constant	0.163	0.076	2.14	0.033*	
Personal motivation	0.722	0.073	9.87	0.000***	3.06
Exposure					
Medium	-0.106	0.103	-1.02	0.308	1.41
Low	-0.389	0.107	-3.65	0.000***	1.45
Personal motiv*Exposure (Moderator)					
Medium	-0.241	0.103	-2.34	0.020*	2.01
Low	-0.118	0.105	-1.13	0.259	2.04

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 28 displays the results from the multiple regression analysis of the effect of social media exposure on the relationship between s*ocial motivation* and *place affect.* Low VIFs indicated that multicollinearity was not found to be a problem. The overall model was significant ($F_{(5, 322)} = 22.43$, $p < 0.001$), and the R^2 value showed that 25.8% of the variance for *place affect* was explained. In support of the earlier SEM results, there was a positive relationship between s*ocial motivation* and *place affect*. Although social media exposure was not found to be a predictor of *place affect,* it was found to moderate the relationship. Pearson's *r* correlation coefficients for three SM exposure groups were compared. The strength of the relationship between *social motivation* and *place affect* was significantly stronger when SM exposure was

high, as compared to when SM exposure was medium ($z = 3.01$, $p < 0.01$) or low ($z = 3.93$, $p < 0.001$). Based on these findings, H3d was supported.

Table 28 Multiple Regression Analysis for Dependent Variable of Place Affect

Analysis of Variance	df	SS	MS	*F*	*p*	R^2
Regression	5	84.459	16.892	22.43	0.000***	0.258
Social motivation	1	45.856	45.856	60.88	0.000***	
Exposure	2	1.750	0.875	1.16	0.314	
Social motivation*Exposure (Moderator)	2	8.771	4.385	5.82	0.003**	
Error	322	242.541	0.753			
Total	327	327.000				

Variable	*β*	SE *β*	*t*	*p*	VIF
Constant	-0.143	0.100	-1.44	0.152	
Social motivation	0.741	0.095	7.80	0.000***	3.92
Exposure					
Medium	0.177	0.128	1.38	0.168	1.64
Low	0.036	0.135	0.27	0.788	1.77
Social motivation*Exposure (Moderator)					
Medium	-0.338	0.131	-2.58	0.010*	2.12
Low	-0.420	0.129	-3.27	0.001**	2.51

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

The moderating role of social media exposure on the relationship between *personal motivation* and *place affect* was examined (See Table 29). VIFs showed low to moderate correlations among independent variables; thus, multicollinearity was not found to be a problem. The overall model was significant ($F_{(5, 322)} = 42.84$, $p < 0.001$), with 39.9% of the variance for *place affect* explained. There was a positive relationship between *personal motivation* and *place affect*. However, SM exposure was not a significant predictor in this model nor moderated the relationship between *personal motivation* and *place affect.* Therefore, H3e was not supported.

Table 29 Multiple Regression Analysis for Dependent Variable of Place Affect

Analysis of Variance	df	SS	MS	*F*	*p*	R^2
Regression	5	130.632	26.126	42.84	0.000***	0.399
Personal motivation	1	45.707	45.707	74.95	0.000***	
Exposure	2	2.820	1.410	2.31	0.101	
Personal motiv*Exposure (Moderator)	2	0.362	0.181	0.30	0.743	
Error	322	196.368	0.610			
Total	327	327.000				

Variable	*β*	SE *β*	*t*	*p*	VIF
Constant	0.130	0.079	1.65	0.100	
Personal motivation	0.654	0.076	8.66	0.000***	3.06
Exposure					
Medium	-0.155	0.107	-1.45	0.147	1.41
Low	-0.233	0.110	-2.11	0.035*	1.45
Personal motiv*Exposure (Moderator)					
Medium	-0.079	0.107	-0.74	0.459	2.01
Low	-0.059	0.108	-0.55	0.583	2.04

* $p < 0.05$, *** $p < 0.001$.

Taken together, the multiple regression results partially supported H3 (See Table 30). The amount of social media exposure moderated the relationship between *social motivation* and all three dimensions of place attachment: *place dependence, place identity,* and *place affect*. However, it did not moderate the relationship between *personal motivation* and place attachment.

Table 30 Summary Results for Hypothesis Three

Hypothesis		Outcome
H3a	The strength of the relationship between *social motivation* and *place dependence* will increase with more social media exposure.	Supported
H3b	The strength of the relationship between *social motivation* and *place identity* will increase with more social media exposure.	Supported
H3c	The strength of the relationship between *personal motivation* and *place identity* will increase with more social media exposure.	Not supported
H3d	The strength of the relationship between *social motivation* and *place affect* will increase with more social media exposure.	Supported
H3e	The strength of the relationship between *personal motivation* and *place affect* will increase with more social media exposure.	Not supported

Social Media Engagement

Multiple regression analysis was utilized to examine the moderating role of the type of social media engagement on the relationship between social media motivation and place attachment (H4). Respondents were assigned to a Passive engagement group (persons who read/viewed national-park-related posts more often than 'liked', commented, shared, and created them; *n*=101, 31.3%) and an Active engagement group (persons who 'liked,' commented, shared, and created national-park-related posts more often than read/viewed them; *n*=222, 68.7%). Based on the earlier SEM results that supported five out of six regression paths, the following hypotheses were proposed:

- H4a: The strength of the relationship between *social motivation* and *place dependence* will increase with more active SM engagement.
- H4b: The strength of the relationship between *social motivation* and *place identity* will increase with more active SM engagement.
- H4c: The strength of the relationship between *personal motivation* and *place identity* will increase with more active SM engagement.

- H4d: The strength of the relationship between *social motivation* and *place affect* will increase with more active SM engagement.
- H4e: The strength of the relationship between *personal motivation* and *place affect* will increase with more active SM engagement.

Table 31 displays the results for the multiple regression analysis of the moderating role of social media engagement on the relationship between s*ocial motivation* and *place dependence.* Multicollinearity was not found to be an issue, since VIFs showed low to moderate correlations among independent variables. The overall model was statistically significant ($F_{(3, 319)} = 33.94$, $p < 0.001$), with *social motivation* contributing to the model. The R^2 value indicated that 24.2% of the variance for *place dependence* was explained. There was a positive relationship between *social motivation* and *place dependence*, which supported the earlier SEM results. However, SM engagement was not found to be a predictor in the model nor moderated the relationship between *social motivation* and *place dependence*. Therefore, H4a was not supported.

Table 31 Multiple Regression Analysis for Dependent Variable of Place Dependence

Analysis of Variance	df	SS	MS	*F*	*p*	R^2
Regression	3	77.929	25.976	33.94	0.000***	0.242
Social motivation	1	12.494	12.494	16.33	0.000***	
Engagement	1	2.560	2.560	3.35	0.068	
Social motiv*Engagement (Moderator)	1	1.534	1.534	2.00	0.158	
Error	319	244.125	0.765			
Total	322	322.054				

Variable	*β*	SE *β*	*t*	*p*	VIF
Constant	-0.197	0.107	-1.84	0.067	
Social motivation	0.347	0.086	4.04	0.000***	3.12
Engagement					
Active	0.227	0.124	1.83	0.068	1.40
Social motiv*Engagement (Moderator)					
Active	0.159	0.113	1.42	0.158	2.51

*** $p < 0.001$.

The moderating role of social media engagement on the relationship between *social motivation* and *place identity* was examined (See Table 32). Based on low VIFs, multicollinearity was not found to be a problem. The overall model was significant ($F_{(3, 319)} = 68.62$, $p < 0.001$), with 39.2% of the variance for *place identity* accounted for. There was a positive relationship between *social motivation* and *place identity*, which supported the earlier SEM results. SM engagement was not a significant predictor in this model nor moderated the relationship between *social motivation* and *place identity*. Therefore, H4b was not supported.

Table 32 Multiple Regression Analysis for Dependent Variable of Place Identity

Analysis of Variance	df	SS	MS	*F*	*p*	R^2
Regression	3	126.905	42.302	68.62	0.000***	0.392
Social motivation	1	30.102	30.102	48.83	0.000***	
Engagement	1	0.091	0.091	0.15	0.701	
Social motiv*Engagement (Moderator)	1	1.266	1.266	2.05	0.153	
Error	319	196.650	0.616			
Total	322	323.555				

Variable	*β*	SE *β*	*t*	*p*	VIF
Constant	-0.059	0.096	-0.62	0.536	
Social motivation	0.538	0.077	6.99	0.000***	3.12
Engagement					
Active	0.043	0.111	0.38	0.701	1.40
Social motiv*Engagement (Moderator)					
Active	0.145	0.101	1.43	0.153	2.51

*** $p < 0.001$.

Table 33 displays the results for the multiple regression analysis of the effect of SM engagement on the relationship between *personal motivation* and *place identity*. VIFs showed low to moderate correlations among independent variables; thus, multicollinearity was not found to be an issue. The overall model was significant ($F_{(3, 319)} = 75.95$, $p < 0.001$), with *personal motivation* and SM engagement contributing to the model. The R^2 value showed that 41.7% of the variance for *place identity* was explained. There was a positive relationship between *personal motivation* and *place identity*. The Tukey test was used to examine the SM engagement group differences; Active engagement group (M = 0.09) showed a significantly higher *place identity* mean, compared to Passive engagement group (M = -0.23). Given a nonsignificant interaction term, SM engagement did not moderate the relationship; therefore, H4c was not supported.

Table 33 Multiple Regression Analysis for Dependent Variable of Place Identity

Analysis of Variance	df	SS	MS	*F*	*P*	R^2
Regression	3	134.815	44.938	75.95	0.000***	0.417
Personal motivation	1	36.467	36.467	61.63	0.000***	
Engagement	1	6.645	6.644	11.23	0.001**	
Personal motiv*Engagement (Moderator)	1	0.242	0.242	0.41	0.523	
Error	319	188.740	0.592			
Total	322	323.555				

Variable	*β*	SE *β*	*t*	*P*	VIF
Constant	-0.228	0.082	-2.80	0.005**	
Personal motivation	0.557	0.071	7.85	0.000***	2.74
Engagement					
Active	0.325	0.097	3.35	0.001**	1.10
Personal motiv*Engagement (Moderator)					
Active	0.058	0.091	0.64	0.523	2.58

** $p < 0.01$, *** $p < 0.001$.

The effect of social media engagement on the relationship between *social motivation* and *place affect* was examined (See Table 34). Regarding multicollinearity, VIFs showed acceptable correlations among independent variables. The overall model was significant ($F_{(3, 319)} = 31.95$, $p < 0.001$), and 23.1% of the variance for *place affect* was explained. A positive relationship existed between *social motivation* and *place affect*, which supported the SEM results. SM engagement was not found to be a significant predictor in this model nor moderated the relationship. Therefore, H4d was not supported.

Table 34 Multiple Regression Analysis for Dependent Variable of Place Affect

Analysis of Variance	df	SS	MS	*F*	*P*	R^2
Regression	3	74.353	24.784	31.95	0.000***	0.231
Social motivation	1	19.579	19.579	25.24	0.000***	
Engagement	1	0.005	0.005	0.01	0.936	
Social motiv*Engagement (Moderator)	1	0.467	0.467	0.60	0.438	
Error	319	247.489	0.776			
Total	322	321.842				

Variable	*β*	SE *β*	*t*	*p*	VIF
Constant	-0.010	0.108	-0.09	0.928	
Social motivation	0.434	0.086	5.02	0.000***	3.12
Engagement					
Active	-0.010	0.125	-0.08	0.936	1.40
Social motiv*Engagement (Moderator)					
Active	0.088	0.113	0.78	0.438	2.51

*** $p < 0.001$.

Table 35 shows the results from the multiple regression analysis of the effect of SM engagement on the relationship between *personal motivation* and *place affect*. Low VIFs indicated that multicollinearity was not found to be a problem. The overall model was significant ($F_{(3, 319)} = 67.71$, $p < 0.001$), with *personal motivation* contributing to the model. Based on the R^2 value, 38.9% of the variance for *place affect* was explained. There was a positive relationship between *personal motivation* and *place affect*, supporting the earlier SEM results. However, SM engagement was not found to be a significant predictor in this model nor moderated the relationship between *personal motivation* and *place affect.* Therefore, H4e was not supported.

Table 35 Multiple Regression Analysis for Dependent Variable of Place Affect

Analysis of Variance	df	SS	MS	*F*	*P*	R^2
Regression	3	125.210	41.737	67.71	0.000***	0.389
Personal motivation	1	43.871	43.871	71.17	0.000***	
Engagement	1	1.003	1.003	1.63	0.203	
Personal motiv*Engagement (Moderator)	1	0.006	0.006	0.01	0.919	
Error	319	196.632	0.616			
Total	322	321.842				

Variable	*β*	SE *β*	*t*	*p*	VIF
Constant	-0.081	0.083	-0.98	0.329	
Personal motivation	0.611	0.072	8.44	0.000***	2.74
Engagement					
Active	0.126	0.099	1.28	0.203	1.10
Personal motiv*Engagement (Moderator)					
Active	-0.009	0.093	-0.10	0.919	2.58

*** $p < 0.001$.

To summarize, the multiple regression results did not support H4 as social media engagement did not moderate the relationship between social media motivation and place attachment (See Table 36).

Table 36 Summary Results for Hypothesis Four

Hypothesis		Outcome
H4a	The strength of the relationship between *social motivation* and *place dependence* will increase with more active social media engagement.	Not supported
H4b	The strength of the relationship between *social motivation* and *place identity* will increase with more active social media engagement.	Not supported
H4c	The strength of the relationship between *personal motivation* and *place identity* will increase with more active social media engagement.	Not supported
H4d	The strength of the relationship between *social motivation* and *place affect* will increase with more active social media engagement.	Not supported
H4e	The strength of the relationship between *personal motivation* and *place affect* will increase with more active social media engagement.	Not supported

Socio-demographic Differences in Place Attachment

Research Question 2 aimed to address the effects of socio-demographic characteristics, i.e., gender, age, education, race/ethnicity, and household income, on an individual's level of place attachment. These effects were examined for each dimension of place attachment: *place dependence*, *place identity*, and *place affect*. Each participant's mean score for each of the three dimensions was calculated by adding the scores for each item that loaded on a factor and then dividing the total score by the number of items in that factor (Ednie et al., 2010). SPSS version 27.0 was utilized to conduct a series of one-way ANOVA and independent *t*-tests.

Gender

Independent *t*-tests were performed to determine whether the levels of *place dependence*, *place identity*, and *place affect* varied based on gender (H5). There were two gender groups in this study: Male (n=152) and Female (n=169). The 'Other' category was removed because it had an insufficient sample size (n=3).

As displayed in Table 37, there were significant gender differences in two of the three dimensions of place attachment: *place dependence* (t = -2.04, $p < 0.05$) and *place identity* (t = -2.50, $p < 0.05$). For *place dependence*, male participants received a mean score of 3.74 (SD=0.79), while female participants had a mean score of 3.56 (SD=0.78). For *place identity*, male participants' mean score was 3.99 (SD=0.74), while female participants' mean score was 3.78 (SD=0.79). Cohen's d was used to measure the magnitude of differences in place attachment for male and female groups. Cohen (1988) suggested that the effect size is considered small when d = 0.20, medium when d = 0.50, and large when d = 0.80. Effect sizes for *place dependence* and *place identity* were -0.23 and -0.28, respectively, indicating small differences for

male and female participants. There was no significant difference in the level of *place affect* for male and female groups (t = -1.38, p = 0.17).

Overall, compared to female participants, male participants were more likely to show higher levels of *place dependence* and *place identity* toward a national park that they have visited and followed on social media. These results partially supported Hypothesis 5, which states that the level of place attachment varies based on gender.

Table 37 Results of Independent t-tests by Gender

	Female (n=169)		Male (n=152)		t-value		
Dimension	Mean	SD	Mean	SD	(df=319)	p-value	Cohen's d
Place Dependence	3.558	0.778	3.737	0.791	-2.043	0.042*	-0.228
Place Identity	3.778	0.793	3.993	0.744	-2.500	0.013*	-0.280
Place Affect	4.120	0.720	4.225	0.639	-1.382	0.168	

Note. * $p < 0.05$.
Note. Equal variances assumed based on Levene's Test for Equality of Variances.

Age

One-way ANOVA tests were conducted to analyze the effect of age on the levels of *place dependence, place identity,* and *place affect* (H6). It was hypothesized that there will be a positive relationship between age and place attachment. There were five age groups: 18 to 24 years old (n=39), 25 to 34 years old (n=91), 35 to 44 years old (n=102), 45 to 54 years old (n=42), and 55 and above (n=52).

Table 38 presents the results of the one-way ANOVAs based on age groups. There was no significant effect of age on *place dependence* ($F_{(4, 321)}$=1.27, p=0.28), *place identity* ($F_{(4, 321)}$=1.56, p=0.18), and *place affect* ($F_{(4, 126)}$=1.68, p=0.16). The mean scores for all three dimensions of place attachment did not statistically differ among the various age groups.

Therefore, Hypothesis 6, which states that the level of place attachment will increase with age, was not supported.

Education

A series of one-way ANOVA tests was conducted to understand the differences in the participants' levels of *place dependence, place identity,* and *place affect* based on their education level (H7). It was hypothesized that there will be a negative relationship between education and place attachment. There were four education categories in this study: No college (Some high school and High school graduate/GED categories combined; n=58), Some college or 2-year degree (n=82), Bachelor's degree (n=115), and Graduate work or graduate degree (n=72).

Table 39 displays the results of the one-way ANOVAs based on education groups. There was a significant difference in the level of *place identity* among the various education groups ($F_{(3, 323)}$=2.92, $p < 0.05$). Effect size (eta-squared; η^2) was calculated to measure the strength of association between education and *place identity*. Cohen (1988) suggested that the effect size is considered small when $\eta^2 = 0.01$, medium when $\eta^2 = 0.06$, and large when $\eta^2 = 0.14$. For *place identity,* eta-squared was 0.03, indicating small to medium differences among the education groups. Group differences were examined using the Tukey test. Participants with a Bachelor's degree (M=3.97, SD=0.74) were more likely to report a higher level of *place identity,* compared to those with no college experience (M=3.63, SD=0.87). There were no significant differences in the levels of *place dependence* ($F_{(3, 323)}$=0.67, p=0.57) and *place affect* ($F_{(3, 323)}$=2.00, p=0.11) based on education. Overall, these results did not support Hypothesis 7, which states that the level of place attachment decreases with education level.

Table 38 Results of One-Way ANOVA by Age

	18-24 years old (*n*=39)	25-34 years old (*n*=91)	35-44 years old (*n*=102)	45-54 years old (*n*=42)	55+ years old (*n*=52)			
Dimension	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	df	*F*	*p*
Place Dependence [a]	3.65 (0.74)	3.63 (0.84)	3.75 (0.71)	3.72 (0.82)	3.46 (0.84)	4, 321	1.268	0.282
Place Identity [a]	3.64 (0.89)	3.93 (0.82)	3.95 (0.76)	3.95 (0.70)	3.78 (0.65)	4, 321	1.564	0.184
Place Affect [b]	3.90 (0.87)	4.15 (0.72)	4.23 (0.62)	4.17 (0.57)	4.31 (0.61)	4, 126	1.681	0.158

Note. [a] Equal variances assumed based on Levene's Test for Equality of Variances.
Note. [b] Equal variances not assumed based on Levene's Test for Equality of Variances. Welch's ANOVA used.

Table 39 Results of One-Way ANOVA by Education

	No college (*n*=58)	Some college (*n*=82)	Bachelor's degree (*n*=115)	Graduate work (*n*=72)	*F*		
Dimension	M (SD)	M (SD)	M (SD)	M (SD)	(df=3, 323)	*p*	η^2
Place Dependence	3.66 (0.77)	3.56 (0.86)	3.67 (0.77)	3.74 (0.75)	0.668	0.572	
Place Identity	3.63 (0.87)[a]	3.95 (0.74)	3.97 (0.74)[b]	3.91 (0.75)	2.922	0.034*	0.026
Place Affect	4.09 (0.82)	4.32 (0.61)	4.19 (0.66)	4.08 (0.66)	2.001	0.114	

Note. * $p < 0.05$.
Note. Equal variances assumed based on Levene's Test for Equality of Variances.

Race/Ethnicity

To examine the differences in the level of place attachment based on race/ethnicity, one-way ANOVA was used (H8). There were four race/ethnicity categories in this study: White (*n*=238), Black or African American (*n*=25), Hispanic or Latino (*n*=32), and Asian (*n*=28). The 'Other' category was removed because it had an insufficient sample size (*n*=4).

The results of the one-way ANOVAs are presented in Table 40. There was no significant effect of race/ethnicity on *place dependence* ($F_{(3, 319)}$=0.81, p=0.49), *place identity* ($F_{(3, 319)}$=1.00, p=0.39), and *place affect* ($F_{(3, 319)}$=0.39, p=0.76). The four racial/ethnic groups did not report significantly different mean scores for any dimension of place attachment. Based on these findings, Hypothesis 8, which states that the level of place attachment will be higher for White participants compared to other racial/ethnic groups, was rejected.

Table 40 Results of One-Way ANOVA by Race/Ethnicity

	White (*n*=238)	Black or African American (*n*=25)	Hispanic or Latino (*n*=32)	Asian (*n*=28)	*F*	
Dimension	M (SD)	M (SD)	M (SD)	M (SD)	(df=3, 319)	*p*
Place Dependence	3.63 (0.79)	3.81 (0.76)	3.78 (0.68)	3.55 (0.92)	0.810	0.489
Place Identity	3.86 (0.77)	4.02 (0.77)	4.06 (0.78)	3.81 (0.82)	0.998	0.394
Place Affect	4.20 (0.66)	4.19 (0.70)	4.17 (0.69)	4.05 (0.79)	0.393	0.758

Note. Equal variances assumed based on Levene's Test for Equality of Variances.

Household Income

One-way ANOVA tests were performed to examine whether participants with a varying level of household income reported different levels of *place dependence*, *place identity*, and *place affect* (H9). It was hypothesized that there will be a negative relationship between

household income and place attachment. This study included five income groups: Less than $25,000 ($n$=39), $25,000 - $49,999 ($n$=71), $50,000 - $74,999 ($n$=74), $75,000 - $99,999 ($n$=65), and $100,000 or more ($n$=76).

The results of the one-way ANOVAs based on household income are displayed in Table 41. There was a significant difference in the level of *place dependence* based on household income ($F_{(4, 320)}$=2.43, $p < 0.05$). The η^2 value was 0.03 indicating small to medium differences among various income groups. However, the Tukey test did not show any significant difference between groups. This contradicting result may be due to the p-value being very close to a significance level of 0.05. In terms of *place identity* ($F_{(3, 323)}$=0.99, p=0.41) and *place affect* ($F_{(3, 323)}$=0.86, p=0.49), there were no significant differences among the income groups. Overall, these findings did not support Hypothesis 9, which states that the level of place attachment decreases with household income.

Table 41 Results of One-Way ANOVA by Household Income

Dimension	< $25k (*n*=39) M (SD)	$25k-$49k (*n*=71) M (SD)	$50k-$74k (*n*=74) M (SD)	$75k-$99k (*n*=65) M (SD)	> $100k (*n*=76) M (SD)	*F* (df=4, 320)	*p*	η^2
Place Dependence	3.45 (0.83)	3.74 (0.82)	3.48 (0.80)	3.70 (0.72)	3.79 (0.76)	2.432	0.047*	0.030
Place Identity	3.66 (0.90)	3.92 (0.81)	3.93 (0.69)	3.92 (0.72)	3.93 (0.79)	0.988	0.414	
Place Affect	4.12 (0.73)	4.27 (0.68)	4.24 (0.66)	4.09 (0.65)	4.16 (0.71)	0.857	0.490	

Note. * $p < 0.05$.
Note. Equal variances assumed based on Levene's Test for Equality of Variances.

To summarize, one-way ANOVA and independent samples *t*-tests were performed to examine any difference in the level of place attachment among various socio-demographic groups. Table 42 presents the summary results for hypotheses 5 through 9.

Table 42 Summary Results for Hypotheses Five through Nine

Hypothesis		Outcome
H5	The level of place attachment will vary based on gender.	Partially supported
H6	The level of place attachment will increase with age.	Not supported
H7	The level of place attachment will decrease with education level.	Not supported; Some association existed
H8	The level of place attachment will be higher for White participants, compared to other racial/ethnic groups.	Not supported
H9	The level of place attachment will decrease with household income.	Not supported

Socio-demographic Differences in Social Media Motivation

Research Question 3 focused on addressing the role of socio-demographic characteristics on an individual's motivation to engage with national parks on social media. The socio-demographic differences were examined for each dimension of social media motivation: *social motivation* and *personal motivation*. Each participant's mean score for these dimensions was calculated by adding the scores for each item that loaded on a factor and dividing the total score by the number of items in that factor. One-way ANOVA and independent *t*-tests were conducted using SPSS version 27.0.

Gender

To examine the effect of gender on an individual's social media motivation, independent *t*-tests were conducted (H10). This study included two gender groups: Male (n=152) and Female (n=169). The category of 'Other' was removed due to low sample size (n=3). As displayed in Table 43, there was a significant gender difference in *social motivation* ($t = 2.59$, $p < 0.05$). A

Cohen's *d* value of 0.29 indicated a small difference for male and female participants. Male participants (M=3.69, SD=0.84) were more likely to report a higher *social motivation* mean, compared to female participants (M=3.44, SD=0.86). There was no significant difference in *personal motivation* based on gender (t = 1.21, p = 0.23). Taken together, these results partially supported Hypothesis 10, which states that the motivation to engage with national parks on social media varies based on gender.

Table 43 Results of Independent t-tests by Gender

	Female (n=169)		Male (n=152)					Cohen's
Dimension	Mean	SD	Mean	SD	df	t-value	p-value	d
Social Motivation [a]	3.444	0.860	3.691	0.844	319	2.593	0.010*	0.290
Personal Motivation [b]	4.181	0.671	4.261	0.514	311	1.211	0.227	

Note. * $p < 0.05$.
Note. [a] Equal variances assumed based on Levene's Test for Equality of Variances.
Note. [b] Equal variances not assumed based on Levene's Test for Equality of Variances.

Age

One-way ANOVA was utilized to examine any difference in the levels of *social motivation* and *personal motivation* based on age (H11). It was hypothesized that there will be a negative relationship between age and social media motivation. There were five age groups: 18 to 24 years old (n=39), 25 to 34 years old (n=91), 35 to 44 years old (n=102), 45 to 54 years old (n=42), and 55 and above (n=52).

As presented in Table 44, there was no significant effect of age on *social motivation* ($F_{(4, 321)}$=1.25, p=0.29) and *personal motivation* ($F_{(4, 321)}$=1.02, p=0.40). The mean scores for both dimensions of social media motivation did not significantly differ across the age groups. These

results did not support Hypothesis 11, which states that the motivation to engage with national parks on social media will decrease with age.

Education

To understand the effect of the participant's education level on their *social motivation* and *personal motivation*, one-way ANOVA was utilized (H12). A positive relationship between education and social media motivation was hypothesized. There were four education categories: No college (Some high school and High school graduate/GED categories combined; n=58), Some college or 2-year degree (n=82), Bachelor's degree (n=115), and Graduate work or graduate degree (n=72).

Table 45 presents the results of the one-way ANOVAs based on education. The mean scores for *social motivation* and *personal motivation* did not differ significantly across the four education groups. In other words, there was no significant effect of education on both *social motivation* ($F_{(3, 323)}$=1.25, p=0.29) and *personal motivation* ($F_{(3, 323)}$=1.08, p=0.36). These findings did not support Hypothesis 12, which states that the motivation to engage with national parks on social media will increase with education level.

Table 44 Results of One-Way ANOVA by Age

	18-24 years old (*n*=39)	25-34 years old (*n*=91)	35-44 years old (*n*=102)	45-54 years old (*n*=42)	55+ years old (*n*=52)	*F*	
Dimension	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	(df=4, 321)	*p*
Social Motivation	3.46 (0.88)	3.64 (0.85)	3.66 (0.84)	3.47 (0.87)	3.39 (0.90)	1.252	0.289
Personal Motivation	4.08 (0.71)	4.21 (0.67)	4.21 (0.60)	4.33 (0.48)	4.27 (0.46)	1.015	0.400

Note. Equal variances assumed based on Levene's Test for Equality of Variances.

Table 45 Results of One-Way ANOVA by Education

	No college (*n*=58)	Some college (*n*=82)	Bachelor's degree (*n*=115)	Graduate work (*n*=72)	*F*	
Dimension	M (SD)	M (SD)	M (SD)	M (SD)	(df=3, 323)	*p*
Social Motivation	3.40 (0.92)	3.64 (0.80)	3.56 (0.80)	3.66 (0.92)	1.248	0.293
Personal Motivation	4.16 (0.73)	4.30 (0.54)	4.25 (0.52)	4.15 (0.66)	1.075	0.360

Note. Equal variances assumed based on Levene's Test for Equality of Variances.

Race/Ethnicity

A series of one-way ANOVA tests was performed to examine the differences in *social motivation* and *personal motivation* based on race/ethnicity (H13). There were four race/ethnicity categories in this study: White (*n*=238), Black or African American (*n*=25), Hispanic or Latino (*n*=32), and Asian (*n*=28).

Table 46 shows the results of the one-way ANOVAs based on race/ethnicity. There was a significant difference in *social motivation* ($F_{(3, 319)}$=2.69, $p < 0.05$). The η^2 value of 0.3 indicated small to medium differences across the racial/ethnic groups. The Tukey test was used to examine group differences; Black or African American (M=4.02, SD=0.65) participants were more likely to report a higher level of *social motivation*, compared to White participants (M=3.52, SD=0.87). There was no significant difference in the level of *personal motivation* ($F_{(3, 319)}$=0.07, p=0.98). These findings partially supported Hypothesis 13, which states that the motivation to engage with national parks on social media varies based on race/ethnicity.

Table 46 Results of One-Way ANOVA by Race/Ethnicity

Dimension	White (*n*=238) M (SD)	Black or African American (*n*=25) M (SD)	Hispanic or Latino (*n*=32) M (SD)	Asian (*n*=28) M (SD)	*F* (df=3, 319)	*p*	η^2
Social Motivation	3.52 (0.87) [a]	4.02 (0.65) [b]	3.59 (0.88)	3.59 (0.74)	2.686	0.047*	0.025
Personal Motivation	4.23 (0.58)	4.23 (0.72)	4.23 (0.71)	4.17 (0.51)	0.071	0.976	

Note. * $p < 0.05$.
Note. Equal variances assumed based on Levene's Test for Equality of Variances.

Table 47 Results of One-Way ANOVA by Household Income

Dimension	< $25k (*n*=39) M (SD)	$25k-$49k (*n*=71) M (SD)	$50k-$74k (*n*=74) M (SD)	$75k-$99k (*n*=65) M (SD)	> $100k (*n*=76) M (SD)	*F* (df=4, 320)	*p*
Social Motivation	3.41 (0.99)	3.65 (0.86)	3.46 (0.71)	3.66 (0.85)	3.65 (0.89)	1.168	0.325
Personal Motivation	4.13 (0.77)	4.30 (0.55)	4.27 (0.48)	4.20 (0.61)	4.18 (0.64)	0.779	0.539

Note. Equal variances assumed based on Levene's Test for Equality of Variances.

Household Income

To examine any difference in social media motivation based on household income, one-way ANOVA was conducted (H14). It was hypothesized that there will be a positive relationship between household income and social media motivation. This study had five income groups: Less than $25,000 (*n*=39), $25,000 - $49,999 (*n*=71), $50,000 - $74,999 (*n*=74), $75,000 - $99,999 (*n*=65), and $100,000 or more (*n*=76).

As displayed in Table 47, there was no significant effect of household income on *social motivation* ($F_{(4, 320)}$=1.17, p=0.33) and *personal motivation* ($F_{(4, 320)}$=0.78, p=0.54). The five income groups did not report significantly different mean scores for any dimension of social media motivation. Hypothesis 14, which states that the motivation to engage with national parks on social media will increase with household income, was not supported.

In summary, one-way ANOVA and independent samples *t*-tests were conducted to examine any difference in the level of social media motivation among various socio-demographic groups. The results for hypotheses 10 through 14 are summarized in Table 48.

Table 48 Summary Results for Hypotheses Ten through Fourteen

Hypothesis		Outcome
H10	The motivation to engage with national parks on social media will vary based on gender.	Partially supported
H11	The motivation to engage with national parks on social media will decrease with age.	Not supported
H12	The motivation to engage with national parks on social media will increase with education level.	Not supported
H13	The motivation to engage with national parks on social media will vary based on race/ethnicity.	Partially Supported
H14	The motivation to engage with national parks on social media will increase with household income.	Not supported

CHAPTER V

DISCUSSION AND CONCLUSIONS

Social media has widely been adopted by public land management agencies, including the National Park Service (NPS), as a communication, outreach, and education tool (Jarvis, 2011; Yellowstone Center for Resources, 2014). By engaging with national parks and other park supporters, social media users have been able to gain park-related information and to stay connected to parks (Miller & Freimund, 2017). Combined with the finding that place attachment could be characterized by the tendency to maintain closeness to a place (Scannell & Gifford, 2010a), research into the role of social media in one's development of place attachment deserves attention.

The purpose of this study was to examine the relationship between an individual's motivation to engage with a national park on social media and their place attachment to the park. The hypothesized model posited that social media motivation would positively affect place attachment and that experience use history, amount of exposure to park-related SM content, and type of SM engagement would moderate the relationship. I also hypothesized that the levels of place attachment and social media motivation would vary based on several socio-demographic characteristics: gender, age, education level, race/ethnicity, and household income. This last chapter includes four main sections: (1) discussion of the findings, (2) theoretical implications, (3) practical implications, and (4) recommendations for future research.

Discussion of the Findings

Respondents' Socio-demographic Characteristics

The current study revealed several socio-demographic characteristics of virtual visitors who use social media to engage with national parks and other park supporters. Participants in the final study were primarily female (52.2%), White (72.8%), between the ages of 25 and 44 (59.3%), and with at least a bachelor's degree (57.2%). They were fairly evenly split based on household income, with $100,000 or more (23.4%) being the largest income group. These results showed both similarities and differences when compared to Visitor Services Project (VSP) survey data that were collected by the University of Idaho in collaboration with the NPS between 2001 and 2011 and then aggregated by Vaske and Lyon (2014). A total of 38 VSP surveys on 28 national parks were included in Vaske and Lyon's (2014) study; participants of the current social media study (SM participants) were compared to respondents from those 38 surveys (VSP participants).

SM participants' age showed a notable difference when compared to VSP participants. In the current study, younger age categories (18-24, 25-34, and 35-44) were overrepresented, while older age categories (45-54, 55-64, and 65+) were underrepresented. For example, over 71% of SM participants were between the ages of 18 to 44; however, only 38% of VSP participants were in the same age bracket. Additionally, only a small portion of SM participants (3%) were over the age of 65, while a nontrivial number of VSP participants (13%) were in that age category. This can be explained by a strong correlation between age and social media use, as young adults have adopted social media early and have been the most likely group to use it (Pew Research Center, 2021). Thus, it was not surprising that there were more young participants in this study than in the VSP surveys.

Race/ethnicity was another variable that showed several differences. Historically, national park visitors have been predominantly White; Vaske and Lyon (2014) added to this finding by showing that 96% of VSP participants were White. By comparison, SM participants were more diverse since the proportion of White participants was 73%. This number was close to U.S. Census data that reported an estimated 76% of Americans identifying as White (U.S. Census Bureau, 2019b). Additionally, there were overrepresentations of Black or African Americans and Asians in the current study. Therefore, the current sample was racially more diverse than VSP participants.

Having a younger and more racially diverse sample, compared to VSP participants, signals that the NPS's effort in utilizing social media to reach underserved populations, i.e., youth and minority groups, is heading in the right direction (Jarvis, 2011). Previous studies have pointed out a lack of diversity in outdoor recreation and land management agencies' slow responses to major racial and ethnic demographic shifts in America (Allison & Hibbler, 2004; Flores & Kuhn, 2018). For the first time in 2019, non-Whites and Hispanics were the majority group among those under age 16, and U.S. Census Bureau projected that the White population would drop below 50% and become a minority by 2045 (NBC News, 2020). Given the social media's ability to reach younger and more diverse groups, as presented in this study, and in response to the major demographic shifts in America, the NPS should invest in finding out best ways to communicate on social media and invite these historically underserved populations to outdoors to better mirror such change and accommodate the growing demand.

VSP participants reported similar but slightly higher levels of education, compared to SM participants. Sixty-five percent of VSP participants received at least a bachelor's degree, compared to 57% of SM participants. Also, only 13% of VSP participants reported having no

college experience at all, while 18% of SM participants did. This comparison shows that the current study's sample is a fair representation of national park visitors and supports Vaske and Lyon's (2014) finding that national park visitors are highly educated.

Additionally, VSP participants reported higher income levels compared to SM participants. For example, more than a third of VSP participants (35%) earned $100,000 or more, compared to 23% of SM participants. The percentage of VSP participants that earned less than $25,000 (5%) was also lower than that of SM participants (12%). However, when compared to the general public, SM participants still reported higher income levels; thus, they were successful in representing a group of national park-goers who have been argued to be characterized as affluent (Vaske & Lyon, 2014).

There was no information on VSP participants' gender distribution in the Vaske and Lyon's (2014) study. However, when compared to U.S. Census data, the current study's sample was representative of the general public since there were slightly more female participants than male participants in this study (U.S. Census Bureau, 2019a).

Social Media Motivation

The two-factor structure emerged for social media motivation and was found to have internal consistency, convergent validity, and discriminant validity. The first factor was named *social motivation* and highlighted social aspects, such as being a part of the national park's online community and advocacy efforts for the park. The second factor was named *personal motivation* and highlighted the personal benefits of being educated and entertained and staying connected to the park and nature.

Based on results for the *personal motivation* items, participants were highly motivated by viewing pictures/videos of the park, being entertained, and learning about the park's natural and

cultural history. They seemed to view social media as a source for both entertainment and education on their selected national parks. This supports Miller and Freimund's (2017) finding that learning about national parks was a part of the entertainment experience for virtual visitors to Yellowstone's Facebook page.

Personal motivation seemed to be a stronger motivation than *social motivation* for participants. This finding is similar to that of Miller and Freimund (2017) who found that education, entertainment, and affective motivations were similarly strong for virtual visitors, while their social motivations appeared to be considerably less important. Because of this difference in social media motivation, the current finding also adds to Wilkins et al. (2018) that observed visitors to Crater Lake National Park using social media predominantly for social purposes in their daily lives. Based on this finding, Wilkins et al. (2018) suggested that people may use social media differently when engaging with national parks, compared to when using social media in their daily lives. The current study proposes that specific SM motivations for engaging with national parks may include being entertained, learning about parks, staying connected to the natural world, and reducing the stresses of everyday life.

The results also suggest that social media is not being used to its full potential. The two most used platforms by participants in this study were Facebook and Instagram, which were mainly used for social purposes in people's daily lives (Wilkins et al., 2018). However, *personal motivation* seemed to be more important than *social motivation* when engaging with national parks on social media. Building an online community has been suggested to be important because online communities can provide powerful partners for organizations, generate positive word-of-mouth and loyal customer feedback, lead to brand loyalty and innovation, and facilitate a higher willingness to pay premium prices (Bowen & Whalen, 2017; Goode & Harris, 2007;

Matzler, Pichler, Füller, & Mooradian, 2011). Additionally, the National Park Service has emphasized the importance of involving the public and creating a community of park supporters through social media (Jarvis, 2011; Yellowstone Center for Resources, 2014). Since participants were not as strongly motivated for social purposes as compared to personal purposes, the NPS may be missing out on opportunities to build a strong online community that can provide valuable input in management decisions and can generate a pool of volunteers, park advocates, and donors.

Place Attachment

Guided by the works of Kyle, Mowen, and Tarrant (2004) and Ramkissoon et al. (2013), place attachment was hypothesized to have four dimensions: *place dependence, place identity, place social bonding*, and *place affect*. CFA was conducted with final sample data to verify the underlying dimensions and test reliability and validity of the scale.

Place social bonding was removed due to low reliability and validity. The removal was justified based on previous studies that have operationalized place attachment as having just two dimensions, place identity and place dependence (e.g., Lee, 2011; Vaske & Kobrin, 2001). However, the removal was contrary to a growing number of studies that have supported the inclusion of a social dimension (e.g., Kyle et al., 2005). Within the *place social bonding* dimension, there were a lot of variabilities. The dimension included two items that received very high mean scores but also had one item with the lowest mean score in the place attachment scale. The statement, "If I were to stop visiting this park, I would lose contact with a number of friends," was the only item with a mean score below a 3, which represented 'neutral.' Participants' disagreement with this statement could be due to the study's setting being national parks. As these parks are often located in remote areas, people may visit national parks with their

family or close friends that they would remain close regardless of trips to national parks together. This item may better gauge one's place social bonding in settings, such as municipal and state parks, that are more easily accessible.

With the removal of *place social bonding*, a three-factor structure for place attachment emerged. Overall, participants showed medium to slightly high levels of place attachment toward a national park that they have visited and followed on social media. Of the three dimensions, i.e., *place dependence, place identity,* and *place affect*, participants reported the highest mean score for *place affect*. This may be explained by a proposed relationship between restorative qualities of natural places and an individual's emotional well-being and self-regulation (Korpela, Hartig, Kaiser, & Fuhrer, 2001). People are more likely to develop attachments and affection toward places, such as parks and forests, where they can rely on to have relaxed and enjoyable experiences that enable positive mood change, contemplation of self, and restoration of attention capacity (Korpela et al., 2001). This affection in turn contributes to the development of place identity. Based on these findings by Korpela et al. (2001), it is suspected that participants have developed the highest level of *place affect* among other aspects of place attachment.

Place dependence showed the lowest mean score. This may be explained by a fairly low number of visits to participants' selected national parks. On average, they had visited their selected park 5 times. Of 328 participants, 43.6% of them visited their selected park only once or twice, which is likely not enough time to assess the park's functional ability to satisfy their recreation needs and to develop a dependence on that specific park. Another possible explanation is that after participants visit a park, they may prefer to visit different national parks or other protected areas that offer similar visit experiences in a novel setting. For example, visiting every national park in the U.S. is a goal for many park-goers. They may find several national parks that

offer similar recreation and sightseeing opportunities, further reducing their level of place dependence on a single park. It is possible that, rather than on a single park, these visitors develop a higher level of place dependence on national parks in general or the National Park System, which involves many other designations, such as monuments, battlefields, historic sites, lakeshores, and recreation areas.

An interesting finding was that participants reported a higher mean score for *place identity* than for *place dependence*. This result somewhat contradicts previous findings that suggested repeat visitation based on place dependence may lead to the development of place identity (Moore & Graefe, 1994) because it seemed that participants identified with their selected national park more than they depended on that park. A higher level of *place identity* could be explained by the participants' desires to affiliate with a prestigious institution like the NPS and what it stands for (e.g., conservation and stewardship) and with some of the very well-known national parks, such as Grand Canyon and Yellowstone, by visiting and self-identifying with these places.

CFA and a series of reliability and validity analyses revealed that the three factor-structure for place attachment was reliable and valid. *Place dependence* and *place identity* showed high reliability and validity as these have been well-established factors of place attachment (Moore & Graefe, 1994; Williams & Vaske, 2003). *Place affect* was found to be highly correlated with *place identity*. This finding resembles previous studies that operationalized place identity as having both cognitive and emotional components (Moore & Graefe, 1994; Williams & Vaske, 2003). Place identity has been argued to develop as the emotional or symbolic meaning is assigned to a place by individuals, groups, or society (Williams & Roggenbuck, 1989). Korpela et al. (2001) also added that one's attachment toward

a place, based on its ability to fulfill emotional needs, contributes to the development and maintenance of self-identity. Simply put, a feeling of affection may be a necessary step for one to develop place identity.

Relationship between Social Media Motivation and Place Attachment

Based on Bradshaw's (2008) concept of post-place community, which highlights online communities where people with similar interests and values can connect with one another across time and space, the current study aimed to understand the social media's role in the development of place attachment among virtual visitors to national parks. This investigation was grounded in uses and gratifications theory, which postulates that people use media to fulfill specific wants and needs (Katz et al., 1973). The hypothesized model suggested that individual's motivation to engage with national parks on social media would positively influence their attachment to the parks. The first step of the SEM revealed a two-factor structure for social media motivation (*social motivation* and *personal motivation*) and a three-factor structure for place attachment (*place dependence, place identity,* and *place affect*). The second step of the SEM showed that five out of six hypothesized paths were significant. In the discussion below, the relationships among dimensions of social media motivation and place attachment are discussed.

Social Motivation and Dimensions of Place Attachment

Social motivation was a statistically significant predictor of all three dimensions of place attachment: *place dependence, place identity,* and *place affect*. First, the relationship between *social motivation* and *place dependence* indicates that the respondents' desires to interact with national parks on social media for social purposes positively affect their assessment of the park's functional ability to satisfy their needs. Their needs may be having a place to form a community of park supporters, learn about ways to help the park, or promote/advocate the park. The finding

suggests that social media is providing virtual space for respondents to achieve these goals. Therefore, it is reasonable to assume that respondents have grown dependent on their chosen national park for the benefit of having a virtual space where they could join a park community and show their support for the park.

Second, *social motivation* positively predicted *place affect* toward the respondents' selected national park. That is, virtual social interactions contributed to the facilitation of positive feelings toward the park, which was consistent with previous findings in the community studies (Breek et al., 2018). Additionally, Miller and Freimund (2017) found that virtual visitors to Yellowstone National Park's Facebook account were largely motivated to stay connected to the park after their on-site visits. Combined with this finding, the current study suggests that social media may be encouraging individuals to reflect upon their actual park visits, reminding them of positive and negative experiences, and enhancing these memories as they share their experiences and love for the park with other members of the online community and their social media friends.

Third, the relationship between *social motivation* and *place identity* suggests that the degree of self-identification with a national park increases with one's motivation to interact with the park on social media for social purposes. Place identity has been suggested to be a final product of individuals' repeat visitation based on place dependence (Moore & Graefe, 1994), psychological investment (Williams & Patterson, 1999), and emotional and cognitive assessments of a place (Proshansky, 1978). Given that *social motivation* positively influenced both *place dependence* and *place affect*, it is not surprising that it had a positive effect on *place identity* as well.

The self-concept theory that has been used to explain why individuals contribute to online communities would also be useful in understanding the relationship between *social motivation* and *place identity* (Wang & Fesenmaier, 2003). The theory suggests that individuals adopt roles that are expected by their reference groups in order to satisfy their own needs of affiliation, power, and development of positive self-image and high self-esteem (McLeod, 2008). By being active in national parks' online communities, respondents are able to provide quality information, pictures, and videos of national parks that they have visited, to associate themselves with the NPS and what it stands for (e.g., conservation and stewardship), and to have an influence on their social media friends. These activities contribute to the formation and assurance of positive self-value and self-identity. As a result of using social media, national parks become a place with which people can identify themselves.

Taken together, these findings highlighted the importance of having a space for respondents to participate in the park community, showcase their support for the park, and interact with park employees and other park supporters. Although the current study did not find place social bonding to be one of the dimensions of place attachment, the significant relationships between *social motivation* and all three dimensions of place attachment added to previous studies that have recognized the importance of social dimension within the concept of place attachment (Kyle, Mowen, & Tarrant, 2004; Lewicka, 2011; Ramkissoon et al., 2013; Scannell & Gifford, 2010a).

Personal Motivation and Dimensions of Place Attachment

Personal motivation positively influenced two of the three dimensions of place attachment: *place identity* and *place affect*. The *personal motivation* dimension included items related to restorative qualities, such as "I follow the park's social media account to reduce the

stresses of everyday life" and "to feel inspired." Therefore, this finding strengthens the earlier discussion of the associations among restorative experiences at natural places, a person's psychological well-being, and the development of affective attachment and self-identification with those places (Korpela et al., 2001).

Additionally, respondents' desires "to view pictures/videos of the park" and "to learn about the park and its natural and cultural history" virtually through social media had a positive effect on their levels of *place affect* and *place identity*. Given Proshansky's (1978) inclusion of both cognitive and affective elements to help structure one's experience with the setting, it is expected that knowledge about national parks, which can be obtained through the parks' social media pages, is an important component to the development of *place identity*. The finding was also consistent with tourism literature reporting that nature-based, wildlife tourism experiences involving observation and education aroused tourists' emotions, facilitated understanding of wildlife to better relate with, and care for the wildlife's well-being (Ballantyne, Packer, & Sutherland, 2011). The current study indicates that social media may be capable of facilitating virtual visits that continue to induce emotional and cognitive responses, as evidenced by social media having positive effects on *place affect* and *place identity*, after respondents' on-site visits to national parks.

Unlike the other two dimensions, *place dependence* was not affected by *personal motivation*. Participants were not dependent on their selected parks for satisfying their personal needs of seeing and learning about the park and staying connected to the natural world. One possible reason is that these needs may be easily fulfilled through interactions with other parks and protected areas on social media, so virtual visitors in this study are not dependent on a single park. Another possibility is that individuals' functional assessment of a national park may not

involve viewing pictures and reading information about the park while staying indoors or being away from the park. U.S. national parks provide various outdoor recreation opportunities. While social media may be able to remind virtual visitors of their on-site experiences, it cannot provide actual recreation opportunities. Therefore, social media's ability to virtually bring national parks to people may not satisfy their needs of being outdoors and enjoying the parks in person. As a result, people may be motivated to physically visit the parks more often, eventually developing place dependence over time.

To summarize, the current study supported five of the six proposed relationships between social media motivation and place attachment. Smaldone, Harris, Sanyal, and Lind (2005) stated that one's continuous and evolving personal and social relationships with a place influence the way one views the place. The current findings support this statement and suggest that social media may be an important tool in connecting visitors to national parks even long after their on-site visits and facilitating place attachment to the parks. These findings are of value to national park managers, as they understand the effects of their social media efforts, and help to shape their SM content to fulfill virtual visitors' social and personal needs. The attached visitors will benefit the parks as they return to visit, become stewards of nature, and engage in place-protective behaviors (Halpenny, 2010; Vaske & Kobrin, 2001).

Moderating Variables

To better understand the relationship between social media motivation and place attachment, the moderating effects of experience use history, social media exposure, and social media engagement were examined using multiple regression analysis. Based on the SEM results, the effects of these moderating variables on five significant regression paths were examined: *social motivation* and *place dependence, social motivation* and *place identity, personal*

motivation and *place identity*, *social motivation* and *place affect*, and *personal motivation* and *place affect*. The moderating effects on the relationship between *personal motivation* and *place dependence* were not examined because the SEM analysis found this relationship to be nonsignificant. The results for each moderating variable are discussed below.

Experience Use History

It was hypothesized that the strength of the five relationships among dimensions of social media motivation and place attachment would increase with experience use history (H2). Multiple regression analyses revealed that EUH along with each dimension of social media motivation, i.e., *social motivation* and *personal motivation*, significantly predicted *place identity* and *place affect*. In these four relationships, Veterans consistently reported significantly higher mean scores for *place identity* and *place affect*, compared to Beginners. Simply put, those respondents with more experiences at national parks were more emotionally attached and self-identified more closely with their selected parks. These results were expected based on previous studies that have found a positive relationship between EUH and place attachment (Eder & Arnberger, 2012; Hammitt et al., 2004).

Although EUH had a significant role in explaining *place identity* and *place affect*, it was not of the moderating nature, thus rejecting Hypothesis 2. This meant that whether respondents had extensive or little experience with national parks, the effect that their social media motivation had on place attachment was the same. This suggests that social media can be useful, especially for remote national parks, in facilitating and intensifying place attachment among their past visitors who are not able to return often. Additionally, since social media is a popular social networking tool all around the globe, it can also be helpful in connecting with international

visitors. As long as these visitors are motivated to interact with parks on social media, their place attachment would be positively influenced.

Regarding the relationship between *social motivation* and *place dependence*, it was surprising that EUH was not a significant predictor nor moderated this relationship. This result contradicts previous studies that have found a link between repeated visitation and place dependence (Moore & Graefe, 1994). While this can be explained from the insufficient time and interactions to develop dependence by a fairly low number of visits to respondents' selected parks, social media motivation may be playing a novel role (e.g., having a virtual space for social interactions) to develop place dependence, regardless of EUH.

Social Media Exposure

Hypothesis 3 stated that the strength of the relationships among dimensions of social media motivation and place attachment would increase with more social media exposure. Multiple regression analyses revealed that SM exposure moderated the relationships between one of the social media motivation dimensions (*social motivation*) and all three place attachment dimensions. As respondents were more exposed to national-park-related content on social media, the effect that their *social motivation* had on place attachment was stronger. Despite its role as a moderator, SM exposure did not significantly predict two of the three dimensions of place attachment. It only played a small role in explaining *place identity,* while each of the social media motivation dimensions played larger roles.

Taken together, these results suggest that being exposed to park-related content on social media alone does little to increase one's level of place attachment. However, when a person is motivated to engage with parks on social media, seeing the content more often can augment the effects, positively influencing the person's place attachment. These findings indicate that in a

virtual setting, SM exposure may be equivalent to experience use history. Both EUH and SM exposure seem to have positive effects on place attachment. The difference is that, while EUH may directly influence place attachment, SM exposure may only be capable of amplifying the effects that social media motivation has on place attachment. Further investigation into the role of SM exposure in one's place attachment is warranted; details on this issue are discussed in the limitations and future research section.

Social Media Engagement

Hypothesis 4 stated that the strength of the five relationships among dimensions of social media motivation and place attachment would increase with more active social media engagement. This hypothesis was rejected as the type of SM engagement did not moderate the relationships. SM engagement's only effect was that, along with *personal motivation,* it significantly predicted *place identity*; the Active engagement group reported a significantly higher level of *place identity*, compared to the Passive engagement group.

Overall, whether respondents simply viewed park-related SM posts or actively engaged with them, (a) their level of place attachment was rarely influenced and (b) the effect that their social media motivation had on place attachment was the same. These findings suggest that the type of SM engagement may not be crucial in developing one's place attachment as long as one is motivated to use social media for either passively or actively interacting with park-related content. This can also mean that both passive and active engagement types should be recognized when trying to build an engaged online community, which has been argued to generate positive word-of-mouth, develop brand loyalty, and provide powerful partners for organizations (Bowen & Whalen, 2017; Goode & Harris, 2007; Matzler et al., 2011).

Social media marketers have put an emphasis on building relationships by encouraging conversations and maintaining active interactions with consumers (Barefoot & Szabo, 2010). It can be argued that passive engagement, such as simply reading or scrolling through SM content posted by others, has not received much attention from the marketers. However, the current findings suggest that passive engagement with national parks' social media accounts also has value. This assertion is in line with the previous finding that a positive relationship existed between passive social media engagement and affective attachment to a travel agency (van Asperen, de Rooij, & Dijkmans, 2018).

One way that passive engagement can add value to the development of place attachment is that it is an act of receiving information by reading comments and viewing images. As discussed earlier, gaining knowledge about national parks may contribute to the structuring of one's experience with the parks and to developing place attachment; and virtual visitors on social media are able to learn about the parks through passive engagement. Additionally, viewing others' photos, videos, and comments may enable individuals to virtually experience a wider range of recreation activities that others have participated in. Previous studies have suggested a link between recreational activities and place attachment (Schuster, Sullivan, Kuehn, & Morais, 2011; Wilkins & de Urioste-Stone, 2018). Wilkins and de Urioste-Stone (2018) found a positive correlation between the number of recreation activities and place attachment. More specifically, Schuster et al. (2011) found that participation in cultural activities, but not in nature-based and water recreation activities, was a significant predictor of place attachment among residents in Hudson River Valley, New York communities. Based on these past findings, the variety of virtual experiences gained via social media may motivate individuals to want to revisit national parks in person and continuously shape their opinions and feelings toward the parks.

Socio-demographic Differences

Research Questions 2 and 3 aimed at examining the role of socio-demographic characteristics on one's level of place attachment and social media motivation, respectively, using one-way ANOVA and independent *t*-tests. Understanding the socio-demographic differences is important especially for practical implications because it is easier for management to direct their actions toward members of a certain socio-demographic group, rather than to individuals with varying levels of place attachment or social media motivation (Ednie et al., 2010). The results are discussed below.

Place Attachment

Gender differences were found in respondents' level of place attachment as male participants were more likely to report higher mean scores for *place dependence* and *place identity*, compared to female participants. In the literature on place attachment, there have been mixed results on this relationship. While some found no significant differences (Ednie et al., 2010; Lewicka, 2005; Wilkins & de Urioste-Stone, 2018), Kyle, Graefe, and Manning (2004) showed that male hikers were more attached to the Appalachian Trail, and Hidalgo and Hernandez (2001) reported that women were more attached to their house, neighborhood, and city. The current study adds to the literature by suggesting that men may be more likely to report higher levels of place attachment in outdoor recreation settings. A possible reason for this may be related to gender inequality in participation in outdoor activities. Women's involvement with the outdoors has been limited due to several reasons, such as traditional gender norms and concerns about safety (Kling, Margaryan, & Fuchs, 2020; Shores, Scott, & Floyd, 2007). Until today, women in outdoor settings might be feeling uncomfortable and out of place, even

unconsciously, leading to the feelings of less belonging and less attachment to the settings compared to men.

Regarding age, there have been mixed results on the relationship between age and place attachment, and no definitive consensus has emerged in the literature. Some researchers have found a positive relationship between age and place attachment (Ednie et al., 2010; Hidalgo & Hernandez, 2001; Kyle, Graefe, & Manning, 2004; Lewicka, 2005), while others have found nonsignificant results (Kil et al., 2021; Wilkins & de Urioste-Stone, 2018). The current finding adds to the literature by reporting that there was no significant difference in place attachment to national parks based on age. Combined with previous findings, age could be more likely to influence attachment to places where people have easy, regular access. These places may be close in proximity or have well-developed infrastructure (e.g., roads, airports, and utilities). The reasoning behind it is that the length of residency and repeated visitation have often been predictors of place attachment in residential (e.g., Lewicka, 2005; 2010; Scannell & Gifford, 2010b) and outdoor recreation settings (e.g., Hammitt et al., 2004; Moore & Graefe, 1994; Wynveen et al., 2007), respectively. Although some have found significant age differences in attachment to recreation areas among visitors to those areas (e.g., Ednie et al., 2010; Kyle, Graefe, & Manning, 2004), the chances are that as people age, they would have lived in their residence longer or visited nearby recreation sites more often, thus increasing their level of place attachment to those places.

Since national parks are often located in remote areas, age may not have had much influence on one's level of place attachment to the parks in the current study. However, this finding may relate to the concept of amenity migration, which refers to the movement of people toward natural amenity-rich rural communities (Moss, 2006). Since these migrants are primarily

motivated by the natural environment and recreation and leisure opportunities it provides (Moss, 2006), it is suspected that their age and place attachment to surrounding natural areas will be more likely to be positively related. In the context of the current study, it is possible that age may have had some effects on place attachment among those who had fairly easy access to their chosen national park. Because the current study did not collect respondents' location information, future research may consider including this demographic variable.

Education level did have some effects on the level of place attachment; those with a bachelor's degree reported higher *place identity* scores, compared to those without any college experience. This contradicts Lewicka's (2005) finding that education negatively predicted place attachment among residents of three regions in Poland. Overall, there was a fairly small difference based on education, only affecting one of the three dimensions of place attachment, in the current study. Therefore, the present finding supports previous studies that have found no significant differences based on education (Ednie et al., 2010; Kil et al., 2021; Wilkins & de Urioste-Stone, 2018).

Race/ethnicity had no significant effect on place attachment. This result was unexpected based on previous research that have highlighted different perceptions and meanings attached to nature and limited use of non-urban green spaces by immigrants or minority groups (Buijs, Elands, & Langers, 2009; Manzo, 2005; Virden & Walker, 1999). There are several possible reasons for this nonsignificant result. One possible reason may be that the sample did not have a sufficient number of participants for each of the non-White groups. For example, Black or African American and Asian groups each had sample size of less than 30, which is often considered a minimum number of observations needed for proper analysis. Another reason is that national parks today might be viewed as safe, well-developed, and well-managed places by all,

unlike wildland environments that have often been viewed as unmanaged and threatening by minority groups due to their fear of possible unpleasant encounters with other humans (Buijs et al., 2009; Virden & Walker, 1999). Several studies have suggested that minority groups were likely to view national parks or forests more as the domain of Whites (Buijs et al., 2009; Virden & Walker, 1999); however, the current finding suggests that minority groups may no longer view national parks as a place just for White Americans. This may be due to the NPS's efforts to be more inclusive by hiring a diverse workforce and making parks more relevant to minority groups in America (Ebbs & Dwyer, 2020).

Household income was another variable that did not affect place attachment. This finding contradicts Wilkins and de Urioste-Stone's (2018) study that found a negative relationship between income and place attachment among visitors to Mount Desert Island, Maine where Acadia National Park is the main attraction. However, the current finding is consistent with those of Kyle, Graefe, and Manning (2004) and Kil et al. (2021) who found no significant differences in place attachment among trail users in the United States and South Korea, respectively. This similar result may be explained by the commonality between the sample in this study to samples of Kyle, Graefe, and Manning (2004) and Kil et al. (2021) that included participants from multiple states and regions.

Social Media Motivation

Gender differences were found in individuals' motivation to use social media to engage with national parks: male participants were more likely to report a higher level of *social motivation*, compared to female participants. This result was unexpected and contradicted previous findings on gender differences in social media use. For example, Krasnova et al. (2017) found that women were more likely to use social media for social purposes, such as maintaining

relationships with friends, while men tended to have broader uses, such as gaining information. It also contradicted past studies that found no significant gender differences in the creation and consumption of travel-related SM content (Amaro et al., 2016; Yoo & Gretzel, 2012).

The current finding on gender differences can be explained by past studies on online travel reviews (Gretzel, Yoo, & Purifoy, 2007; Yoo & Gretzel, 2008). Compared to women, men were more likely to write online reviews and more motivated to exercise collective power (Gretzel et al., 2007; Yoo & Gretzel, 2008). These activities resemble some of the *social motivation* items, such as sharing experiences and encouraging social media friends to visit, support, and learn about the park. It is suspected that the items that were originally developed to capture the *action* dimension may have contributed to a higher *social motivation* score among male participants in this study. The current finding also adds to the literature by suggesting that men and women may have different motivations to use social media when it comes to traveling and visiting national parks, compared to using it for general purposes.

Another variable that had a significant impact on participants' social media motivation was race/ethnicity. Black or African Americans reported a significantly higher *social motivation* score, compared to White participants. There have been very few studies that examined this relationship in the context of travel-related social media use. This is likely to be one of the few studies on this relationship and somewhat supports Yoo and Gretzel's (2012) finding that among travelers who used the Internet to plan their trips, those who used social media sites were more likely to be from minority groups, i.e., Hispanic and Asian, compared to non-SM users.

Age did not have a significant impact on social media motivation. In the literature, there have been contradictory results on age differences in social media use for travel purposes. While many studies reported a negative relationship between age and travel-related SM use (Amaro et

al., 2016; Gretzel et al., 2007; Yoo & Gretzel, 2012), Miller and Freimund (2017) reported a positive relationship, in which non-Millennials (born before 1981) were more likely to engage with Yellowstone National Park's Facebook page, compared to Millennials (born between 1981 and 2000). The finding of this study provides new evidence to previous contradicting results by reporting no significant age difference in individuals' social media motivation when engaging with national parks.

In addition to age, education level and household income were other socio-demographic variables that did not influence one's social media motivation in this study. Since the two variables have been suggested to be positively related to each other (Abdullah, Doucouliagos, & Manning, 2015; Yang & Qiu, 2016), it was not surprising that they acted similarly and had no significant effects. The current findings contradict previous studies that found positive relationships among general social media use, education, and income (Jha & Ye, 2016; Perrin, 2015). In the context of travel, however, these nonsignificant results do support Yoo and Gretzel's (2012) findings that showed no significant differences in motivation to use and create travel-related SM content based on education and income.

These nonsignificant results can be explained by a widespread use of social media across various education and income groups. For example, those without any college experience (64%) were least likely to use social media, while college graduates (77%) were most likely to use it (Pew Research Center, 2021). Regarding income, the least amount of SM usage came from the $50,000-$74,999 income group (65%), while the most came from the $75,000+ income group (78%) (Pew Research Center, 2021). Although more educated, higher income groups used social media the most, the gap between the most and the least amount of user groups was fairly small with only 13% differences. The findings from this study add to support the utility of social media

in reaching the general public, including those who have not been traditional visitors of national parks (e.g., the less formal education and the less affluent).

Overall, participants of various socio-demographic groups were similarly motivated to engage with national parks on social media. Therefore, it is recommended that the National Park Service (a) be aware that they have a wide range of SM audiences wanting to engage with park employees and other park supporters, (b) strive to further understand whether certain demographic groups prefer certain SM platforms and types of content, and (c) incorporate any differences into their social media strategy.

Theoretical Implications

The following section describes several theoretical implications of this study for future research in the fields of outdoor recreation and environmental psychology.

Research on Social Media in Parks and Protected Areas

Previous research on social media in parks and protected areas has largely focused on adopting social media as a data collection tool, rather than exploring how visitors use it. Unlike tourism studies that have examined actual social media use by tourists in their travel-related activities, very few studies have looked at how national park visitors utilize social media to enrich their experiences, who these virtual visitors are, and what effects social media has on these virtual visitors. The current study strived to explore and provide an understanding of these issues.

The hypothesized model put forth in this study adopted uses and gratifications theory (Katz et al., 1973) in understanding national park visitors' motivation to engage with parks on social media. The model explored how this motivation was related to a complex psychological concept of place attachment, the bonding of people to places. The constructs applied in this study

(e.g., *social motivation* and *place identity*) were tested to be psychometrically reliable and valid. Most importantly, the constructs were successful in explaining the relationship between social media motivation and place attachment. The moderating effect of social media exposure on this relationship was revealed. There were some socio-demographic differences in social media motivation and place attachment. The findings from this study will enable future researchers to better understand why individuals follow and engage with national parks' social media accounts and what the benefits are for these individuals and for the National Park Service.

Development of the Social Media Motivation Scale

This is one of the first studies attempting to measure virtual visitors' motivations for following and engaging with national parks on social media. The items were developed from the National Park Service's social media goals and from a literature review of the existing research on individuals' and organizations' social media use. A series of analyses (e.g., EFA on the pilot data and CFA on the final data) was performed to test its reliability and validity, resulting in a two-dimensional scale of social media motivation. The current study was limited to a specific context, i.e., national parks, and more research is necessary to determine the motivation scale's generalizability across various outdoor recreation settings, such as state parks and national forests. However, it is believed that this scale will guide future researchers in understanding virtual visitors' motivations and how these motivations are related to other constructs beyond place attachment. This scale may provide a starting point for future researchers in better measuring social media motivation by (a) examining the redundancy of items to make the scale concise and to reduce the burden on respondents and (b) expanding upon the scale to include potential dimensions of social media motivation that were not identified in this study. These potential dimensions may be able to tap into the social media activities that individuals

participate in during their trip-planning and decision-making stages (e.g., reading reviews written by other visitors) or during their on-site visits (e.g., sharing real-time location and pictures).

Relationship between Social Media and Place Attachment

The structural model contributes to the literature by providing an increased understanding of virtual visitors to national parks. Miller et al. (2019) called upon the research community and pointed out a need to further examine the role of social media on visitor behaviors and experiences. Some studies have begun to explore this issue by studying national park visitors' motivations and preferences for using social media (Miller & Freimund, 2017; Wilkins et al., 2018). However, the current study is one of the first attempts to relate social media use to visitor experience by drawing a connection to place attachment. The model showed that social media, in fact, does improve virtual visitors' cognitive (*place identity*), affective (*place affect*), and functional (*place dependence*) attachment to national parks that they have visited in the past. This could mean that social media has the potential to enhance the visitor experience by improving place satisfaction, which has been found to be positively related to place attachment (Ramkissoon et al., 2013). The current findings may motivate researchers to expand upon the current model by adding concepts that are more directly related to visitor experiences and behaviors, such as satisfaction and revisit intention.

Methodological Contributions

The current study contributes to the research of outdoor recreation methodologically. The social media studies on visitors to parks and protected areas have largely focused on a single park. For example, Hausmann et al. (2018) examined social media content created by visitors to Kruger National Park in South Africa; and Miller and Freimund (2017) surveyed virtual visitors to Yellowstone National Park's Facebook page. The current study did not limit its scope to a

single national park by asking participants to choose a park that they have visited in person and have followed on social media. This resulted in 45 out of 62 national parks (at the time of data collection) being represented in the study. Therefore, the findings of this study are believed to appropriately represent the relationship between social media motivation and attachment to national parks making the study's findings more generalizable to other outdoor settings (e.g., national forests, state parks, etc.).

Moreover, the use of structural equation modeling has become increasingly popular in the social sciences due to its ability to simultaneously model latent variables and measurement errors, thus assessing and modifying theoretical models in a comprehensive manner (Anderson & Gerbing, 1988). The application of SEM in this study will guide future research to further develop the current model and provide a more comprehensive and accurate view of the social media use phenomenon by adding related variables and examining direct and indirect relationships among social media, place attachment, and other factors.

Practical Implications

The main finding of this study is that using social media to engage with national parks positively affects virtual visitors' level of place attachment. This relationship is moderated by the amount of social media exposure, and some socio-demographic differences exist in social media motivation and place attachment. The following section illustrates the implications of this study from a management perspective.

Recommendations Based on Social Media

The current study revealed that the most popular social media platform that respondents used to follow national parks was Facebook, followed by Instagram, YouTube, and Twitter. Park managers would be able to reach more people by using more platforms. However, park

employees often “wear many different hats,” and managing social media accounts is often an additional task given to them (Song & Schuett, 2019). Because of their limited time and resources, it would be most effective to focus their efforts on a few platforms that are most popular among their current and future visitors. Although it currently seems that utilizing Facebook would have the largest reach, the parks’ social media managers should be aware of the differences across various platforms and continuously monitor the current trends in social media and its platforms. For example, in the U.S., Facebook has been losing younger users (e.g., teens and Millennials), with YouTube, Instagram, and Snapchat being the most popular among the users (Anderson & Jiang, 2018; eMarketer, 2018). Therefore, the park managers should not rely on Facebook in reaching one of their most desired audiences, the youth. With YouTube and Instagram being popular among younger users in the U.S. and respondents in the current study, the managers should incorporate these platforms and target their messages toward the younger generation. In doing so, they may examine the feasibility of recruiting park staff or citizen volunteers who are skilled in creating social media content that appeals to the younger generation.

In addition to monitoring the current trends, the National Park Service should also work to streamline their approval process when it comes to social media. Young people are most likely to adopt new social media platforms and rapidly move onto a newer platform when older people begin to join. Even when park managers are aware of new trends in social media, they are not able to adopt new platforms immediately because of the delay caused by governmental approval processes. Therefore, it is recommended that the National Park Service tries to streamline their approval process and that park managers are given more authorities to propose and modify their social media strategies.

Understanding what motivates individuals to engage with national parks on social media is important because the park managers can incorporate this information into developing and improving their social media strategies. The current study revealed two dimensions of social media motivation. Looking at *personal motivation*, respondents were highly motivated to engage with national parks for personal purposes. Echoing the findings by Miller and Freimund (2017), *personal motivation* in this study included being entertained and being educated about parks. Given that respondents were asked about a national park that they have visited in the past, this finding indicates that learning about the park and its natural and cultural resources does not stop when visitors leave the park. Rather, they are highly motivated to learn more by following and engaging with the park's social media accounts even after they return home.

Park managers should take advantage of this motivation to learn, providing educational SM content that contains entertaining photos or videos that can grab the virtual visitors' attention. These virtual visitors may have been curious about the reasoning behind the rules they saw being enforced while they were visiting in person. They may be interested in learning about plants, insects, and animals they saw or did not see during their visits. They may wish to learn about how the NPS is conserving their favorite national parks. Whatever the virtual visitors' reasons may be, social media provides managers with an effective tool to continuously educate, communicate conservational values, and encourage the public to become better stewards of their parks.

On the other hand, respondents were not as motivated to engage with national parks for social purposes as they were for personal purposes. As previously mentioned, this could mean that the NPS is missing out on the opportunities to build a strong online community that can provide a pool of volunteers, park advocates, and donors. Within *social motivation*, respondents

were most motivated by learning about ways to help national parks. Although providing information was one of the main goals of national parks' social media use, the provided information was limitedly focused on visitor information (e.g., visiting hours, weather, and road closures) and the parks' natural and cultural resources and its mission (Song & Schuett, 2019). Based on this study, it is recommended that the park managers should also use social media to highlight opportunities for virtual visitor participation (e.g., volunteering events, public hearings) to help the parks.

Within *social motivation*, virtually talking to park employees and to other social media users about the park were the two lowest scored items, while encouraging one's own social media friends to visit and support the park were among the highest scored items. These findings suggest that virtual visitors may not care about or feel comfortable talking to people outside their own social media friends' group. To address this issue, the park managers may consider collaborating with "influencers." Influencers are social media content creators who have gained a large number of followers as they share their personal, everyday life experiences and opinions (De Veirman, Cauberghe, & Hudders, 2017). These content creators are believed to be very accessible and relatable, and at the same time, they can be considered opinion leaders (Abidin, 2016; De Veirman et al., 2017). The NPS should consider developing a new social media strategy to partner with influencers that are passionate about the parks and have gained a sizeable network of followers by posting photos or videos of traveling and engaging in outdoor recreation activities. Park managers and these influencers could co-create park-related content to be posted on both of their social media accounts while crediting each other. The managers could also empower a handful of influencers to be "social media ambassadors" who regularly share their park experiences and initiate park-related conversations with their followers. By doing so, park

managers would be able to reach an even wider audience, including those who are currently not engaging with parks' social media, and present themselves to be more approachable and welcoming of conversations with the public rather than being an authoritative government entity.

Recommendations Based on the Relationship between Social Media and Place Attachment

In the management of parks and protected areas, the role of place attachment has received increasing attention as researchers have called for a greater consideration of people as a part of the ecosystem, rather than as an independent agent outside the system (Kyle, Graefe, & Manning 2004; Williams et al., 1992). As place attachment has been found to positively affect park-specific pro-environmental behaviors and concern for the environment in general (Halpenny, 2010; Ramkissoon et al., 2013), the NPS should focus on increasing visitors' level of place attachment to national parks. Several recommendations based on the relationship between social media motivation and place attachment are discussed below.

This study revealed that both dimensions of social media motivation were positively related to *place identity* and *place affect*. This indicates that by understanding virtual visitors' motivation and meeting their social media needs, park managers would be able to increase their affective and cognitive attachment to parks. It is recommended that the park managers focus on appealing to virtual visitors' emotions and self-identity when creating social media posts. For example, the posts can be about encouraging virtual visitors to think back at their park visits and asking them about their special places within park boundaries. Regarding *place dependence*, this dimension seemed to be more difficult to improve via social media as it was positively affected by *social motivation*, but not by *personal motivation*. These findings suggest that *place dependence* may be best improved by physically visiting and experiencing the park in person. So

the park managers should understand this possible limitation of social media and focus on trying to motivate people to go outdoors and be physically active even if it is not at a national park.

In the relationship between social media motivation and place attachment, the park managers should take into consideration SM use behaviors that either did or did not moderate the relationship. Virtual visitors engaged with national parks' social media in two primary ways, i.e., passive and active, and the type of SM engagement rarely affected place attachment nor moderated the relationship between the variables. These findings suggest that the park managers should value both types of engagement when evaluating their own social media presence. In social media communication, getting the audience to react by 'liking,' commenting on, or sharing SM posts is often emphasized, while less attention is given to those who simply view the posts. The national parks' social media managers also put a lot of value in getting reactions from their followers so they would often ask direct questions to the followers and try to start the conversations (Song & Schuett, 2019). However, this study suggests that the type of engagement does not matter as long as individuals are motivated to follow and view the parks' social media pages. Although it is more difficult to measure passive engagement, the park managers should not discount the value of this engagement type and should focus on creating SM content that satisfies virtual visitors' social and personal needs in following and engaging passively or actively with the national parks. Simply put, encouraging any type of engagement is essential in managing social media.

While the type of engagement did not have much influence in the structural model, the amount of exposure to park-related SM content did amplify the effect that *social motivation* had on all three dimensions of place attachment. This relationship was consistently strongest for the High exposure group, who viewed the content daily or every other day, compared to the Medium

exposure and the Low exposure groups. Based on these findings, it is recommended that the park managers try to post on social media either every day or every other day. However, this may be difficult for smaller parks that have a very limited number of staff, compared to some of the bigger parks like Yellowstone National Park. These smaller parks should adopt the best practices by some national parks interviewed by Song and Schuett (2019): (1) set aside time every day to be on social media, (2) invest in creating a lot of contents, when you can, and schedule the contents to be posted one at a time every day or every other day, (3) recruit staff from various departments, such as interpretation, maintenance, and law enforcement, to work as a team that can provide diverse views and stories, and (4) assign different themed days (e.g., Wildlife Wednesday and Science Friday) to team members. It is believed that adopting some of these practices would enable the park managers to better manage their social media presence, and have positive effects on facilitating the virtual visitors' place attachment.

Recommendations Based on Socio-demographic Differences

Overall, respondents with various socio-demographic characteristics were similarly motivated to engage with national parks on social media. Also, their level of place attachment to national parks that they have visited and followed on social media did not show much difference across groups. Based on these findings, it is recommended that the park managers focus on reaching a wide audience with various socio-demographic characteristics on social media, motivate their followers to stay engaged on the parks' social media, and encourage them to physically visit the parks. However, U.S. national parks have largely been visited by a group of people who tend to be highly educated, affluent White males (Vaske & Lyon, 2014). Given that social media has become a widespread communication tool, it is recommended that park

managers use this tool in addressing expectations and barriers to outdoor recreation that are specific to non-traditional park-goers, especially women and minority groups.

Regarding gender, women have been less involved in outdoor activities, and one of the reasons can be attributed to traditional gender norms (Kling et al., 2020; Shores et al., 2007). Kling et al. (2020) found that recreation and tourism media in the Swedish mountains today still portrayed and favored traditionally masculine modes of engagement with nature. For example, women were often pictured in calm environments (e.g., receiving a spa treatment, admiring the scenic view), while men were often portrayed as action-seeking adventurers and conquerors of the outdoors (e.g., mountain biking, rafting). The park managers should be aware of this issue, examine how they have been portraying gender on their social media, and be careful not to send out messages, even unconsciously, that reinforce this traditional, male-focused view of the outdoors. At the agency level, the NPS should invest in researching how gender has been portrayed on their print and digital publications and in training staff on gender sensitivity that is specific to outdoor recreation setting.

Regarding race/ethnicity, minority groups have varying preferences and barriers to outdoor recreation, compared to Whites (Buijs et al., 2009; Virden & Walker, 1999). The NPS has paid attention and is working to be more inclusive and address the racial disparity in the outdoors by marketing to non-white communities, training staff on racial sensitivity, and hiring people from more diverse backgrounds (Ebbs & Dwyer, 2020). Looking at several national parks' social media accounts, the common practices seem to include posting pictures and stories of park rangers and visitors of various racial/ethnic groups and featuring park units that have cultural and historical meanings to minority groups.

In addition to these practices, another approach that the park managers can take is to highlight their visitor-friendly facilities and programs. Previous studies have found that minority groups preferred more developed and managed recreation areas and that they were less likely to know what to do at national parks, compared to White visitors (Buijs et al., 2009; Virden & Walker, 1999). Compared to other types of public lands (e.g., national forests and wilderness areas), national parks may be better positioned to market themselves as a place for everyone, as they tend to be more widely known by the public and more visitor-focused with many developed facilities, ranger-led programs, well-maintained hiking trails, and other easily available recreation opportunities. Therefore, the park managers are recommended to provide information on these visitor-friendly facilities and programs in their efforts to reach and invite historically underserved populations of minority groups.

Limitations and Recommendations for Future Research

Study Design

This study has several limitations that lead to recommendations for future research. First, the study was limited to a specific outdoor recreation setting, i.e., U.S. national parks. The researchers should use caution in interpreting the current findings to other recreation settings, such as state parks and national forests. The findings would be better generalizable to different contexts with a more diverse sample from other types of parks and protected areas. These future works are expected to provide a greater understanding of the relationship between social media and attachment to a place of recreation.

Additionally, future research should consider employing additional data collection methods. Given limited time and resources, data were collected from the research panel provider's database over a short period of time. Although the sample of this study was a fair

representation of national park visitors, it did not have a sufficient number of participants for each of Asian and Black or African American groups. Moreover, because the survey was both distributed and administered online, the current sample may be more technologically advanced than an average national park visitor. Therefore, future research is recommended to utilize other data collection methods, such as on-site survey at selected national parks, and to collect data over an extended period covering both peak (usually summer) and non-peak seasons. Future research could investigate if social media users have differing social media motivation and place attachment based on certain characteristics of national parks (e.g., rural vs. urban; big vs. small) and seasons, which often affect the availability of outdoor activities.

This study was limited in that respondents were asked about a single national park that they have visited in the past and have followed on social media. People develop attachment to places within varying specificity, scale, and spatial range (Hidalgo & Hernandez, 2001; Low & Altman, 1992). Given that visiting every national park in the U.S. is a goal for many park-goers, it is suspected that people may develop place attachment to national parks in general or the National Park System that includes all units managed by the NPS, rather than to a single national park. Future research could examine whether virtual visitors' social media motivation has different effects on their attachment to a single park, national parks in general, and the National Park System. For example, future research could investigate if one's social media motivation to engage with one national park contributes to the development of place attachment toward all U.S. national parks in general.

Dimensions of Place Attachment

Future research should further examine the relationships among the dimensions of place attachment in outdoor recreation settings. First, the current study found *place identity* and *place*

affect to be highly correlated. Combined with the previous findings (Korpela et al., 2001; Williams & Roggenbuck, 1989), it was suggested that a feeling of affection may be a necessary step for one to develop place identity. This topic deserves further attention as this knowledge can add to a deeper understanding of the development process of place attachment. From a management perspective, park management agencies would be able to better target their strategies in facilitating their visitors' attachment to parks.

Second, further investigation into the *place social bonding* dimension is recommended. Contrary to the literature (e.g., Kyle et al., 2005), the current study did not find *place social bonding* to be a distinct dimension of place attachment. However, the importance of social aspects was continuously brought up, as *social motivation* positively predicted all three dimensions of place attachment in this study. It is suspected that the *place social bonding* items used in this study were not appropriate in the national park setting. Future research should reexamine the items used in this study and further look into the social aspects of place attachment. For example, one place social bonding item, "I have a lot of fond memories about this park," could be argued to represent an affective aspect of place attachment. This item could be reworded to include "fond memories with family and friends" to emphasize the social relationship.

Another finding related to the social aspects was that *social motivation* positively predicted *place dependence* in this study. This hinted that the respondents may have grown dependent on a national park for the benefit of having a virtual space where they could join a park community and show their support for the park. Future research could investigate this relationship by adopting more specific *place dependence* items, such as 'this park has the best online community' and 'I get more satisfaction out of engaging with this park's online

community than any other.' Another way to investigate this would be to compare place dependence scores of visitors who belong to the park's online community to that of visitors who do not belong. Such work could provide valuable knowledge on the role of online park community in the development of place attachment among virtual visitors.

Social Media Use

The study findings suggested that social media exposure amplified the positive effects that *social motivation* had on all three dimensions of place attachment and that SM exposure in a virtual setting may play a similar role as experience use history. These findings raise a question whether social media alone would be capable of facilitating one's place attachment without having to visit a national park in person. This question can be pursued by comparing place attachment of past visitors who follow the park's social media to that of purely virtual visitors who have not visited the park in person. This future research will be very interesting and will provide useful insights to park managers who aim to virtually bring parks to people who cannot physically visit.

Finally, examining the type of social media content that is most effective in delivering educational messages, eliciting one's emotional and cognitive responses, and positively affecting one's place attachment, was beyond the scope of this study. Future research efforts should address ideal ways to virtually engage with social media followers. This knowledge would especially be beneficial to park managers in achieving their social media goals of reaching and inviting the general public to the outdoors.

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APPENDIX A

QUESTIONNAIRE

Social Media Survey

This survey is being conducted by researchers from Texas A&M University. Our research team is currently conducting a study of individuals who use social media in relation to national parks. The purpose of this survey is to better understand your use of social media and its impact on developing a personal attachment to a park. The information gathered will provide parks and recreation agencies (e.g., the National Park Service) with data to understand and improve social media communications.

This questionnaire will take approximately 10-15 minutes to fill out. Your participation in this study is voluntary, and your answers will remain anonymous. Only aggregated results will be reported. Please review the information below for further details about this study.

We appreciate you taking the few minutes necessary to complete this questionnaire. Thank you in advance for your participation!

Screening questions (required)

1. Do you follow a social media account of U.S. national parks or the National Park Service (a federal agency that manages national parks)?
    a. Yes (proceed to #2)
    b. No (exit the survey)
2. For recreation purposes, have you visited any of the national parks you follow on social media?
    a. Yes (proceed to #3)
    b. No (exit the survey)
3. Please select a U.S. national park that you have followed on social media and visited for recreation purposes. (If there is more than one national park in your mind, please select the park you visited most recently.)
    a. Dropdown list of 62 national parks
    b. “I have never visited a U.S. national park.” (exit the survey)
    c. “I do not follow a social media account of U.S. national parks.” (exit the survey)

Experience use history

Please tell us about your park visitation history.

4. On average, how many times per year do you visit any national park in the United States?
   _____ times per year
5. How many years have you been visiting U.S. national parks for recreation purposes?
   _____ years
6. During your lifetime, how many U.S. national parks have you visited?
   _____ national parks
7. During your lifetime, how many times have you visited the park you selected in Question 3?
   _____ times

Social media

Please tell us about your social media use.

8. Which social media platform do you use the most in your daily life? (Please check one)
   a. Facebook
   b. Twitter
   c. Instagram
   d. YouTube
   e. Flickr
   f. Pinterest
   g. Snapchat
   h. Other _____
9. Please check all social media platforms that you use to follow the park you selected in Question 3.
   a. Facebook
   b. Twitter
   c. Instagram
   d. YouTube
   e. Flickr
   f. Pinterest
   g. Snapchat
   h. Other _____

10. How many months have you been following a social media account of the park you selected in Question 3?

    _____ months

11. On average, how often do you see social media content about the park you selected in Question 3?
    a. Daily
    b. Every other day
    c. Weekly
    d. Every other week
    e. Monthly
    f. Less than once per month

12. How many times per month do you engage in the following activities in regard to the park-related social media content?
    a. I just read/view the posts. _____
    b. I click on the 'like' button. _____
    c. I comment on the posts. _____
    d. I share the posts with others. _____
    e. I create my own original park-related contents. _____
    f. Other (Please specify) _____

13. Please indicate the extent to which you agree or disagree with the following statements regarding the reasons you follow the social media account(s) of the park you selected in Question 3.

I follow the park's social media account …	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree
Information					
To receive visitor information (e.g., opening hours, fees, things to do)					
To receive park updates/news releases					
To view pictures/videos of the park					
To learn about the park and its natural and cultural history					
Community					
To be a part of the park's online community					
To directly communicate with the park employees					
To meet and talk to other social media users about the park					

To share my experience at the park					
To let others know what I value					
To stay connected to the park					
Action					
To encourage my social media friends to visit the park					
To encourage my social media friends to learn about the park and its natural and cultural history					
To encourage my social media friends to support the park					
To voice my opinions about park-related issues (e.g., park rules/policies, changes in the park, management issues)					
To learn about ways to help the park					
Personal gratification					
To entertain myself					
To feel inspired					
To feel excited					
To reduce the stresses of everyday life					
To maintain a connection to the natural world					

Place attachment

Please tell us how you feel about the park you selected earlier.

14. Please indicate the extent to which you agree or disagree with the following statements about the park you selected in Question 3.

	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree
Place dependence					
This park is the best place for what I like to do.					
No other place can compare to this park.					

I get more satisfaction out of visiting this park than any other park.					
Visiting this park is more important to me than visiting any other park.					
I wouldn't substitute any other area for the type of recreation I do at this park.					
This park is not the best place for what I like to do. (r)					
Place identity					
I feel like this park is a part of me.					
I identify strongly with this park.					
Visiting this park says a lot about who I am.					
This park reflects the type of person I am.					
Place social bonding					
I have a lot of fond memories about this park.					
I have a special connection to the people who visit this park.					
I don't tell many people about this park. (r)					
I will (do) bring my children to this park.					
If I were to stop visiting this park, I would lose contact with a number of friends.					
Place affect					
This park means a lot to me.					
I am very attached to this park.					
This park is very special to me.					
I feel a strong sense of belonging to this park and its settings/facilities.					
I am not very attached to this park. (r)					
Place memory					
My experiences in this park are unique.					
My experiences in this park are unforgettable.					

My experiences in this park make me love this park more.					
I feel connected to this park due to my experiences here.					
Place expectation					
In the future, I expect this park to be better than now.					
In the future, I expect to continue creating unique experiences at this park.					
In the future, I expect that I will be enjoying this park more than now.					
In the future, I expect that I will feel connected to this park due to my experiences here.					

15. Please indicate the likelihood of engaging in the following activities in regard to the park you selected in Question 3?

	Very unlikely	Somewhat unlikely	Neither	Somewhat likely	Very likely
Revisit intentions					
I will continue to visit this park in the future.					
I will visit other national parks in the U.S.					
Positive word-of-mouth intentions					
I will spread positive word-of-mouth messages about this park.					
I will recommend this park to other people.					
I will encourage my family and friends to visit this park.					

Background/Demographics

Please tell us about yourself.

16. Are you a member of a conservation or environmental group?
    a. Yes
    b. No

17. What is your gender?
    a. Male
    b. Female
    c. Prefer to self-describe as _____ (Please specify. E.g., non-binary, third gender)
    d. Prefer not to say
18. In what year were you born? _____
19. Which of the following best describes the highest level of education you have completed?
    a. Some high school
    b. High school graduate/GED
    c. Some college or 2-year degree
    d. Bachelor's degree
    e. Graduate work or graduate degree
    f. Prefer not to answer
20. Race/ethnicity
    a. White
    b. Black or African American
    c. Hispanic or Latino
    d. American Indian or Alaska Native
    e. Asian
    f. Native Hawaiian or Pacific Islander
    g. 2+ Races (Please specify) _____
    h. Other _____
    i. Prefer not to answer
21. Household income before taxes last year (2019)
    a. Less than $15,000
    b. $15,000 - $24,999
    c. $25,000 - $34,999
    d. $35,000 - $49,999
    e. $50,000 - $74,999
    f. $75,000 - $99,999
    g. $100,000 or more
    h. Prefer not to answer

22. Is there anything else you would like to share with us?

Thank you for your participation!

APPENDIX B

LIST OF NATIONAL PARKS SELECTED BY PARTICIPANTS

National Parks	No. of participants
Yosemite National Park, California	41
Yellowstone National Park, Idaho, Montana, and Wyoming	32
Great Smoky Mountains National Park, North Carolina and Tennessee	31
Grand Canyon National Park, Arizona	27
Big Bend National Park, Texas	19
Acadia National Park, Maine	18
Everglades National Park, Florida	15
Shenandoah National Park, Virginia	12
Cuyahoga Valley National Park, Ohio	11
Biscayne National Park, Florida	8
Black Canyon of the Gunnison National Park, Colorado	8
Hot Springs National Park, Arkansas	8
Rocky Mountain National Park, Colorado	8
Arches National Park, Utah	7
Gateway Arch National Park, Missouri and Illinois	6
Zion National Park, Utah	6
Congaree National Park, South Carolina	5
Death Valley National Park, California and Nevada	5
Olympic National Park, Washington	5
Redwood National Park, California	5
Bryce Canyon National Park, Utah	4
Channel Islands National Park, California	4
Isle Royale National Park, Michigan	4
Mount Rainier National Park, Washington	4
Badlands National Park, South Dakota	3
Denali National Park, Alaska	3

Guadalupe Mountains National Park, Texas	3
Joshua Tree National Park, California	3
Mammoth Cave National Park, Kentucky	3
Dry Tortugas National Park, Florida	2
Glacier National Park, Montana	2
Great Sand Dunes National Park, Colorado	2
Kings Canyon National Park, California	2
Canyonlands National Park, Utah	1
Gates of the Arctic National Park, Alaska	1
Glacier Bay National Park, Alaska	1
Grand Teton National Park, Wyoming	1
Hawai'i Volcanoes National Park, Hawaii	1
Indiana Dunes National Park, Indiana	1
Lake Clark National Park, Alaska	1
Lassen Volcanic National Park, California	1
Petrified Forest National Park, Arizona	1
Pinnacles National Park, California	1
Sequoia National Park, California	1
Wrangell-St. Elias National Park, Alaska	1
TOTAL	**328**