

Green Physical Activity: Motivators, Barriers, and the Role of Social Media

A Dissertation  
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### **Dedication**

This dissertation is dedicated to all of the participants, the communities and organizations fighting for increased access to safe and fun green physical activity, and anybody who has helped me personally get outside along the way.

## **Abstract**

Performing physical activity in natural spaces, or green physical activity (GPA), could have positive synergistic effects on many aspects contributing to overall health including physical health, mental health and wellbeing, education and life-long learning, and active citizenship. Throughout U.S. history, however, largely white cisgender men without disabilities and the systems that uphold their “superiority” have made natural spaces more “off-limits” to female, transgender, and genderqueer individuals; the lesbian, gay, bisexual, queer, intersex, asexual, and more (LGBTQIA+) community; people with disabilities; and Black, Indigenous, and people of color (BIPOC). Statistics suggest these historically excluded groups still participate in GPA, but as the U.S. becomes more diverse, greater diversity in GPA participation rates should be a priority. This dissertation uses mixed methodologies to: (1) assess motivations for and barriers to participation in GPA in a diverse sample of adults in the U.S., and (2) explore social media as tools to increase GPA in historically excluded populations.

This dissertation includes three study manuscripts, entitled Chapters 4, 5, and 6. Participants (N=205) completed self-report survey measures of motivations for GPA, barriers to GPA, self-efficacy for GPA, GPA behavior, social media use, and sociodemographic information. Chapter 4 provides quantitative and qualitative motivators and barriers for GPA, additionally exploring differences by identity domain (i.e., gender, sexual identity, disability status, and race and ethnicity). Chapter 5 assesses associations between social media use, self-efficacy for GPA, and GPA behavior in a subsample of participants who view GPA-related social media content on social media (n=169). Finally, Chapter 6 presents focus group results regarding experiences viewing GPA-related social media content for a subsample of

participants (n=31) who follow GPA-related social media specifically on Facebook and/or Instagram. Collectively, this dissertation uses a distinct approach to provide a foundation for an interdisciplinary team to increase GPA participation in and representation of historically excluded identities.

## Table of Contents

List of Tables .....	viii
List of Figures .....	ix
<b>Chapter 1. Introduction</b> .....	<b>1</b>
1.1 Background .....	1
1.2 Rationale .....	3
1.3 Specific Aims and Hypotheses.....	4
<b>Chapter 2. Literature Review</b> .....	<b>6</b>
2.1 General Physical Activity and Green Physical Activity .....	7
2.2 The Great Outdoors.....	13
2.3 Media Representation.....	20
2.4 Social Media and Change Power .....	23
2.5 Informing Philosophies and Theoretical Grounding.....	26
2.6 Conclusion .....	29
<b>Chapter 3. Methods</b> .....	<b>34</b>
3.1 Study Design and Recruitment.....	34
3.2 Quantitative Data Collection.....	36
3.3 Qualitative Data Collection.....	39
3.4 Procedures .....	40
3.5 Statistical Procedures .....	41
3.6 Dissemination Plan .....	42
<b>Chapter 4. Study One</b> .....	<b>44</b>
4.1 Introduction .....	44
4.2 Methods.....	46



4.3 Results .....	48
4.4 Discussion .....	54
4.5 Implications and Conclusions .....	59
<b>Chapter 5. Study Two</b> .....	<b>65</b>
5.1 Introduction .....	65
5.2 Methods .....	70
5.3 Findings .....	74
5.4 Discussion .....	75
5.5 Conclusions and Further Research .....	80
<b>Chapter 6. Study Three</b> .....	<b>85</b>
6.1 Introduction .....	85
6.2 Methods .....	87
6.3 Results and Discussion .....	91
6.4 Summary .....	115
6.5 Conclusion .....	117
<b>Chapter 7. Conclusion</b> .....	<b>121</b>
7.1 Minor Changes to Dissertation .....	121
7.2 Summary of Specific Aims .....	123
7.3 Conclusion .....	125
Chapter 8. References .....	128
Chapter 9. Appendices .....	164

## **List of Tables**

Table 2-1. Glossary of common terms used in green physical activity literature.....	31
Table 4-1. Sociodemographics (Study One).....	61
Table 4-2. Motivation and barrier scale scores sample-wide and ANOVA comparisons by identity domain .....	62
Table 5-1. Sociodemographics (Study Two) .....	81
Table 5-2. Green physical activity and social media variables.....	82
Table 5-3. Regression model results for total green physical activity .....	83
Table 5-4. Regression model results for moderate-to-vigorous green physical activity .....	84
Table 6-1. Themes and sub-themes regarding green physical activity-related social media.	119

## **List of Figures**

Figure 2-1. 2015-2021 outdoor recreation statistics from The Outdoor Foundation.....	32
Figure 2-2. Theoretical framework for the dissertation study .....	33
Figure 4.1. Motivators for green physical activity identified qualitatively .....	63
Figure 4-2. Barriers to green physical activity identified qualitatively .....	64
Figure 6-1. Member checking document sent to focus group participants.....	120

## **Chapter 1. Introduction**

### **1.1 Background**

Sufficient aerobic physical activity (PA) has numerous health benefits, both physical (e.g., increased fitness and cardiovascular function; decreased risk for certain types of cancers, stroke, and type 2 diabetes (Warburton, 2006)) and mental (e.g., improved mood; protecting against cognitive decline (Penedo & Dahn, 2005)). However, data from the Centers for Disease Control and Prevention show that just over half (54.2%) of U.S. adults meet aerobic PA recommendations. Further, over 30% of U.S. adults are physically inactive, that is, participating in fewer than 10 minutes of PA per week (Physical Activity Guidelines Advisory Committee [PAGAC], 2018). Inactivity varies across racial and ethnic groups; data from 2015-18 show Hispanic (31.7%) and non-Hispanic Black (30.3%) adults had the highest prevalence of physical inactivity (An et al., 2016). Access to natural spaces (i.e., places with trees, diverse vegetation, local biodiversity, water features, parks, natural playscapes, community gardens, and school gardens) has been linked to lower levels of mortality and illness, higher levels of PA in those natural spaces, lower stress, a sense of well-being, and social capital (American Public Health Association [APHA], 2013; Twohig-Bennett & Jones, 2018). Performing PA in natural spaces, or green physical activity (GPA), could have positive synergistic effects on health (Eigenschenk et al., 2019; Thompson Coon et al., 2011). One of APHA's (2013) goals is to advise the public about the benefits of GPA and to increase access to natural spaces. About 53% of people in the U.S. (roughly 164 million) participated in GPA in 2021 and 6.8 million people participated for their first time (The Outdoor Foundation, 2022). However, 72% of those participants are white; as the U.S. population becomes more racially and ethnically diverse in the next few decades (Vespa et al., 2020), it must be a priority to diversify GPA rates as well (The Outdoor Foundation, 2022) to ensure all people across the U.S. are benefiting from GPA and natural spaces.

Increasing any type of PA requires understanding how to develop motivation to be physically active and addressing barriers to engaging in PA. Motivators for GPA include the convenience, the nature experience, and body-oriented beliefs (e.g., increasing strength, decreasing health risks) (Calogiuri & Elliott, 2017). However, motivations need to be further investigated in a diverse sample (e.g., race and ethnicity, gender) (Fraser et al., 2019). Further, much of the GPA-related research is conducted in European countries, which may not generalize to the U.S. (Calogiuri & Elliott, 2017). Removing barriers to GPA may increase GPA participation. Top barriers to GPA are people being too busy with family responsibilities, equipment being too expensive, and not having anybody to participate with (The Outdoor Foundation, 2018); however, there are likely additional barriers not yet identified. Methodology for exploring barriers to GPA is largely quantitative; qualitative methodologies can generate richer data (Bamberg et al., 2018).

Throughout U.S. history, natural spaces and GPA have been more “off-limits” to female/transgender/genderqueer people; the lesbian, gay, bisexual, queer, intersex, asexual, and more (LGBTQIA+) community; people with disabilities; and Black, Indigenous, and people of color (BIPOC) (N. Burns et al., 2013; Evans, 2002; Finney, 2014; Mills, 2014; Mortimer-Sandilands & Erickson, 2010). Yet statistics suggest these historically excluded groups still participate in GPA (The Outdoor Foundation, 2022; R. Williams et al., 2004). One barrier to increasing GPA participation for historically excluded groups is that classic media perpetuates the idea of “The Great Outdoors” as a white, cisgender male space (Frazer & Anderson, 2018; Martin, 2004; McNiel et al., 2012), which can perpetuate disparities in GPA participation rates. Social media have emerged as new tools for studying and increasing GPA for individuals with a variety of historically excluded identities (Low et al., 2020; Stanley, 2020). Seventy percent of U.S. adults say they use at least one social media

platform, with similar or higher usage rates for Black and Hispanic people in the U.S. (Auxier & Anderson, 2021). Social media can be part of a cost-effective and efficient intervention delivery for health behavior change interventions (Müller et al., 2018; Welch et al., 2018). However, more research is needed regarding GPA in a diverse population to inform any social media-based interventions and health promotion efforts.

## **1.2 Rationale**

There are gaps in the literature regarding the intersection of GPA, motivations, and barriers in a diverse sample in the U.S. regarding gender, sexual identity, disability status, and race and ethnicity. This dissertation aims to add to the literature regarding these topics and knowledge generated from the studies can help to inform public health efforts to increase GPA. Gaps in the literature supporting the need to conduct this research include:

1. Motivations for GPA needs to be further investigated in a diverse sample in terms of historically excluded identities (Fraser et al., 2019). Much of the GPA-related research is conducted in European countries, which may have different implications for the U.S.

(Calogiuri & Elliott, 2017) and for historically excluded groups.

2. Methodology for exploring barriers to GPA is largely quantitative. Using a mixed-methods methodology will allow for the use of established assessment tools (i.e., validated scales), but also generate richer data that can be used to inform public health efforts and further GPA research (Bamberg et al., 2018).

3. Social media have emerged as tools for studying and increasing GPA for individuals with a variety of identities, but research is still limited in this area. This dissertation will bring a novel lens to exploring GPA on social media through participants' thoughts and reactions to GPA-related social media.

### 1.3 Specific Aims and Hypotheses

To address the aforementioned gaps in the literature, the purpose of this cross-sectional mixed-methods study is three-fold. **First**, motivations for participating in GPA, as well as barriers to participation, will be identified; differences will be examined by identity domain (i.e., gender, sexual identity, disability status, and race and ethnicity). Emerging motivators and barriers outside of existing scales will be organized according to the Social Ecological Model. **Second**, the relationship between social media use and GPA behavior will be explored. **Third**, qualitative methodologies will be used to gain a deeper understanding of participant experiences with viewing GPA-related social media content. The following specific aims and associated hypotheses are proposed to be explored in a diverse sample of adults in the U.S.:

**Aim 1.** a) Assess sample-wide motivations and barriers for GPA using validated scales and open-ended responses, and b) examine potential differences in motivations and barriers by identity domain.

**Hypothesis.** Motivations and barriers measured by scale scores are suspected to be similar to previous literature (e.g., high enjoyment), but differences in motivations and increased barriers are expected for historically excluded groups (e.g., more structural barriers for historically excluded groups). Unique motivators and barriers will emerge beyond those presented in validated scales.

**Aim 2.** a) Describe social media use in a sample of people interested or currently participating in GPA, and b) explore associations between social media use, self-efficacy for GPA, and GPA behavior.

**Hypothesis.** Social media use statistics will be similar to previous literature and there will be positive associations between social media use, self-efficacy for GPA, and GPA.

**Aim 3.** Explore experiences with GPA-related social media content on Facebook and/or Instagram and how participants use/want to use GPA-related social media content.

**Hypothesis.** This is an exploratory aim, as there is a paucity of existing literature surrounding this topic. Thus, there is no a priori hypothesis. However, opportunities for GPA-related interventions, public health efforts, and health communication may be identified.



## **Chapter 2. Literature Review**

This literature review will present the prevalence of physical inactivity, motivations for physical activity (PA), benefits of green physical activity (GPA), and some of the systemic issues that may have contributed to the idea of natural spaces being for white, cisgender men without disabilities. The role classic media outlets (e.g., print advertisements) play in perpetuating this stereotype will be explored, and social media will be introduced as tools to shift representation to a more accurate picture of who is participating in GPA. Gaps in the research and significance of exploring these topics for the betterment of public health in the U.S. will also be presented. This chapter will conclude with the presentation of a theoretical framework driving the specific aims and hypotheses of the proposed study.

One challenge in studying PA that takes place in natural spaces is the term used; there is an inconsistency across the literature in naming it (Lahart et al., 2019). Terms include outdoor PA, nature-based PA, green exercise, PA in “green” spaces (i.e. open, undeveloped land or parks) and/or “blue” spaces (i.e. coasts, rivers, lakes), outdoor sport, outdoor recreation, and any combination of those terms (Eigenschenk et al., 2019; Lahart et al., 2019; Pasanen et al., 2019; Thompson Coon et al., 2011; Twohig-Bennett & Jones, 2018). For this reason, a glossary has been provided for operational definitions of these terms (see Table 2-1). This literature review will use the term “green physical activity” moving forward for simplicity, but all above terms and concepts were considered and included in the literature review and operational definition. Additionally, there are multiple modes of GPA including, but not limiting to, walking, biking, hiking, swimming, various adventure sports, and more. Participants in the present study were presented with the term “green physical activity” alongside Calogiuri and Elliott’s (2017) definition of “green exercise” (see Table 2-1). “Physical activity” replaced “exercise” because it was deemed more inclusive, particularly in a study prioritizing historically excluded groups’ experiences.

## **2.1 General Physical Activity and Green Physical Activity**

The *Physical Activity Guidelines* for aerobic PA recommends at least 150 minutes of moderate-intensity, 75 minutes of vigorous-intensity, or an equivalent combination of these intensities throughout the week to achieve health benefits (Piercy et al., 2018; U.S. Department of Health and Human Services, 2018). Sufficient aerobic PA has been linked to numerous physical and mental health benefits, ranging from decreased risk for certain types of cancers, stroke, and type 2 diabetes (Warburton, 2006) to protecting against cognitive decline (Penedo & Dahn, 2005). Some benefits from PA are experienced immediately, including acute reductions in anxiety symptoms and blood pressure (Piercy et al., 2018). These acute and chronic positive health outcomes are realized regardless of age, sex, and body weight (Piercy et al., 2018). Despite the health benefits associated with regular aerobic PA, the Centers for Disease Control and Prevention (CDC) finds just over half (54.2%) of U.S. adults meet aerobic PA recommendations, and data suggest that over 30% of U.S. adults are completely physically inactive (PAGAC, 2018). Adverse health effects associated with physical inactivity are particularly concerning within low-income, racial, and ethnic minority communities (Crespo et al., 2000; Floyd et al., 2009; A. J. Thomas et al., 2005). For example, data from 2015-18 show Hispanic (31.7%) and non-Hispanic Black (30.3%) adults had the highest prevalence of physical inactivity (An et al., 2016). It is a public health priority to increase PA across adults to help them accrue the physical and psychological health benefits (Office of Disease Prevention and Health Promotion, 2020). Understanding how to increase participation and why adults are or not physically active is not a one-size-fits-all prescription; there are different motivations and barriers that play a role.

### ***Motivations and Lifelong Physical Activity***

Part of increasing PA participation is understanding motivations to be physically active. Individuals are motivated for many different reasons; for example, they could be

motivated to engage in an activity because they love it or because they receive a tangible reward for engaging in said activity (R. M. Ryan & Deci, 2000). Specifically regarding PA engagement, physical performance and health may be examples of motivators to initiate PA (Kilpatrick et al., 2002), but these motivators may differ across the lifespan.

The umbrella term for “adults” generally encompasses at least three different age groups: young (or emerging) adults (18-24 years old), adults (25-44 years old), and middle-aged adults (45-64 years old) (Brunet & Sabiston, 2011). The reasons why an adult engages in PA may differ across these stages resulting from different values, life tasks, goals, and health circumstances in each stage (Miller & Iris, 2002). Young adults may find motivation through weight control for appearance purposes, physical attractiveness or social recognition (Brunet & Sabiston, 2011). However, as individuals move through later adult stages, they may place more importance on motivators such as physical function and ability or seeking new challenges (Brunet & Sabiston, 2011). One study examining questionnaires regarding motivation and PA across young adulthood, adulthood, and middle-aged adulthood found, notably, that participants reported being motivated because PA aligns with their personal values, goals, needs and/or because they find it enjoyable rather than obtaining rewards or avoiding punishment (Brunet & Sabiston, 2011). However, it is important to note that this study was conducted in a sample that was predominantly white.

### ***Location for Physical Activity***

Motivators for PA may affect where one chooses to be physically active. People can be active at home, in fitness centers, at work or school, and more. It is imperative to understand where people are being physically active in order to help support active living and ultimately increase PA across the population (Kelso et al., 2021). One location for PA is a natural environment, or a space with trees, diverse vegetation, local biodiversity, water features, parks, natural playscapes, community gardens, and school gardens (American

Public Health Association, 2013). Natural environments can be attractive for those who want the health benefits associated with PA and want to experience nature, instead of a gym space (Calogiuri & Elliott, 2017; M. P. White et al., 2016). Generally, natural environments are spaces that can provide restorative benefits and typically have lower levels of environmental stressors such as pollutants or noise (Pasanen et al., 2019). One of APHA's (2013) goals is to improve health and wellness through access to nature is to advise the public about the benefits of GPA and to work to increase access to natural spaces to raise awareness about their value.

Current evidence regarding the amount of GPA in which U.S. adults participate, however, suggests there is still room for improvement regarding APHA's initiative. One systematic review by Prince and colleagues (2019) suggests that parks and green spaces can be potential locations for PA, but only if they are being used; one specific study included in the analysis suggests parks were only used specifically for PA 12% of the time (Evenson et al., 2013). Further, a more recent systematic review suggests that recreational spaces, such as green spaces, are the least common locations to be physically active, following neighborhood spaces, the home, and the workplace (Kelso et al., 2021). Another U.S.-based survey found about 53% of people in the U.S. (roughly 164 million) participated in 2021, though 72% of those participants were white (The Outdoor Foundation, 2022). The COVID-19 pandemic also changed the locations in which people were able to be physically active which likely lead to a recent increase in these participation rates (The Outdoor Foundation, 2022); a study specifically in emerging adults showed an increase in GPA and time spent in natural environments as a result of the pandemic (Folk et al., 2021). Regardless, further examining motivations to participate in GPA may keep these rates high and increase diversity of GPA participants (The Outdoor Foundation, 2022).

### ***Motivations for Green Physical Activity***

One component to consider in the exploration of how increase GPA includes examining the specific motivators for GPA, rather than just assuming they are the same as general PA. There are a plethora of options for mode of GPA, and there are motivation profiles of individuals that may differ from general PA (Calogiuri & Elliott, 2017). Experiencing nature, for example, is an important motivator for GPA that would not be in the motivational profile of one participating in sport- or gym-based exercise (Calogiuri & Elliott, 2017; Fraser et al., 2019). Calogiuri and Elliot (2017) conducted one of the first studies comparing motivations for nature-, gym-, and sports-based physical activity among 2168 adults in Norway (49.6% male, 63.5% highly education, and no race reported); the top three motivators overall were convenience of GPA, the nature experience, and body-oriented beliefs (e.g., to keep/reduce bodyweight, to get physical strength, or to prevent health problems). Nature exercisers in this study were defined as those who reporting doing some sort of GPA (Calogiuri & Elliott, 2017).

Fraser et al. (2019) built on Calogiuri & Elliott's evidence with a study of 184 adults (no other demographic information reported) who specifically are outdoor adventure sports participants in the United Kingdom. Participants were categorized into three groups: a competitive sport group, a recreational group, and an adventure sport group; all three groups cited "because it makes me happy" as a top motivator for GPA (Fraser et al., 2019). The competitive sport group and adventure sport group both had "because it's fun" in their top motivators, the competitive sport group and recreational group cited "to be physically fit," and the recreational group also cited "to maintain physical health" among the top motivators (Fraser et al., 2019). However, both of these studies only included those who were currently engaged in GPA and did not consider those just starting out or those who are interested in beginning GPA, though the information may be helpful in helping individuals choose a mode

of exercise based on their primary motives for participating in GPA (Fraser et al., 2019). Additional research is needed exploring motivations in various ethnic groups, between different gender identities, and across different sociodemographic groups (Fraser et al., 2019), as well as potentially a sample in the U.S.

### ***Additive Health Benefits***

Health-related motivations for GPA are supported in the current literature; in fact, GPA may have benefits beyond the health benefits of general PA. Access to natural spaces has been linked to lower levels of mortality and illness, higher levels of PA in those spaces, restoration from stress, a sense of well-being, and social capital (American Public Health Association, 2013; Twohig-Bennett & Jones, 2018). Twohig-Bennett and Jones conducted a systemic review and meta-analysis encompassing 103 observational studies and 40 interventional studies investigating roughly 100 physical health outcomes and their association to green spaces (Twohig-Bennett & Jones, 2018). Increased greenspace exposure was associated with decreased salivary cortisol (a biomarker of stress), decreased diastolic blood pressure, decreased HDL cholesterol, low frequency heart rate variability, and increased high frequency heart rate variability (Twohig-Bennett & Jones, 2018). However, this analysis was limited by inconsistencies in study quality and high levels of statistical heterogeneity for certain outcomes (Twohig-Bennett & Jones, 2018).

Being outdoors in nature also has been linked to some health benefits, including physical and mental health (Thompson Coon et al., 2011), but when one is physically active outside (i.e., GPA), the health benefits look even more promising. A systematic review shows evidence of health effects not only being combined, but potentially having a synergistic effect for even greater health benefits (Eigenschenk et al., 2019; Thompson Coon et al., 2011). A systematic literature review of 133 studies by Eigenschenk et al. (2019) categorized the benefits of GPA into six themes: physical health, mental health and wellbeing, education and

life-long learning, active citizenship (i.e., social inclusion, integration, volunteering, and community cohesion), crime reduction, and anti-social behavior. Due to the range in methodological rigor, study design, population, and targeted study outcomes, it is important to note that evidence is not equally strong in terms of data quality for all benefits within these themes and not all studies included in this systematic review were published within academic journals (Eigenschenk et al., 2019). Physical health benefits included increased fitness, increased cardiovascular function, reduced blood pressure, reduction in obesity, and a decreased resting heart rate (Eigenschenk et al., 2019). There is also, however, an increased risk of malignant melanoma (Moore et al., 2016) but, against assumptions, there is not a higher risk of injury or higher cases of death found (Eigenschenk et al., 2019). There is a frequent focus on mental health and wellbeing in this literature; benefits include a positive impact on general mental health and psychological stability, overall wellbeing, quality of life, happiness, and life satisfaction (Eigenschenk et al., 2019; Lahart et al., 2019).

One limitation to the existing literature is that many study designs are cross-sectional and these relationships may be complicated by the tendency for GPA to be longer in duration and potentially higher in intensity with a lower perceived effort; perhaps the benefits are from longer and more intense PA as compared to PA completed indoors (Lahart et al., 2019). Lahart et al. (2019) conducted a systematic review with the aim of comparing longitudinal physical and mental effects of GPA and indoor PA; they also attempted to conduct a meta-analysis to examine longitudinal effects of GPA when possible but it was often not possible due to the paucity of studies with a longitudinal design with similar outcome variables. There were ambiguous findings for energy, calmness, tension, anger, depressed mood, fatigue, attention and memory, intention for future exercise, biological markers, exercise intensity, and performance and null findings for perceived exertion (Lahart et al., 2019). The additive

benefits of GPA remain unclear, but the studies included in these systematic reviews may not be powered enough to get statistically significant results that show these benefits. Further, much of the existing literature focuses on walking or running as the targeted mode of GPA, where the myriad of recreation options extend the definition of “green physical activity” well beyond those two modes (Lahart et al., 2019; Thompson Coon et al., 2011).

## **2.2 The Great Outdoors**

To widen the idea of GPA in research and understand the relationship of people in the U.S. with natural spaces, it is important to consider the concept of “The Great Outdoors,” which is historically non-inclusive of identities other than white cisgender men without a disability. Outdoor recreation, and outdoor spaces in particular, have been touted as ways to achieve freedom, independence, and rejuvenation (McNiel et al., 2012). Wilderness plays a role in the collective American identity in a sense that it is an ideology, rather than a specific physical location you can point to, that represents the concept of an “ultimate good” (Weatherby & Vidon, 2018). Wild nature can be found in many places, but this concept of wilderness cannot and the idea of “The Great Outdoors” consists of socially constructed definitions containing specific ideas about what types of activities are appropriate in these spaces, as well as who is the appropriate person to participate in these activities (Espiner et al., 2011; Martin, 2004). National parks, for example, have been touted as “America’s Best Idea” and support some of these central values and experiences as an “American” (Weber & Sultana, 2013). However, these experiences are not shared equally by all, historically and present-day.

### ***Outdoor Recreation Statistics***

Outdoor recreation is a more specific concept than GPA that specifically encompasses activities taking place in wilderness or wildland settings (Martin, 2004). Outdoor recreation is leisure-time activity that takes place in the natural environment and involves a relationship



between the participant and nature, either an interaction or appreciation (C. R. Jensen & Guthrie, 2006). Clawson and Knetch (1966) defined three distinct areas for outdoor recreation: 1) user-oriented areas, such as golf courses or city parks, that are conducive to day visits; 2) resource-based areas, high quality “wild” lands such as mountains, canyons, forests, and seashores (generally what one finds in National Park Service lands); and 3) intermediate areas, which fall somewhere in the middle (e.g., a state park that one would travel to for a weekend trip). Additionally, not all activities under the umbrella of “outdoor recreation” are inherently GPA but have been included in this examination because they may facilitate PA (e.g., camping) because they do require an increased energy expenditure to accomplish. Of note, the definition posed by Martin (2004) is not the most inclusive definition of outdoor recreation and is in and of itself problematic in encouraging all people to take place in outdoor recreation, and thus needs to be challenged and changed.

While outdoor recreation spaces have been stereotyped as spaces for certain people (namely, white cisgender men without disabilities), participation rates do not reflect they are the *only* individuals recreating in this way. Overall, outdoor recreation has been following a trend of an increase over the past few years, particularly because of the COVID-19 pandemic (The Outdoor Foundation, 2022). In 2021, 164 million people above age 6 in the U.S. (roughly 53%) participated at least once in an outdoor recreation activity (The Outdoor Foundation, 2022). The Outdoor Foundation (2022) does not collect information on sexual identity or disability status, but participants were largely white (72%) and slightly male-dominated (53.5%). It is imperative to amplify those people with historically excluded identities who are already participating and diversify these participation rates.

### ***A White Masculine History***

The reason for identity-based disparities in outdoor recreation participation rates (and, more widely, GPA rates) run the gamut and may depend on the intersectionality of the

individual, or group of individuals, being polled. One overarching theme, however, is the socially constructed definition of the “wilderness” or “The Great Outdoors.” These spaces have been culturally and socially developed as spaces by and for white cisgender men without disabilities to participate in GPA – anybody outside of that mold participating in GPA is, in a sense, challenging that mold (Martin, 2004; McNiel et al., 2012). The “wild land” is something that set the U.S. settler’s new home apart from Europe (C. R. Jensen & Guthrie, 2006; O’Brien & Njambi, 2012). Before the 1890s, white settlers did not think highly of “wilderness” (Watters, 1985) but eventually the concept of wilderness became an ideology for people in the U.S. who “conquered” the wild land: “masculine” white men (Espiner et al., 2011; Evans, 2002). This concept continues to shape who society thinks of as an outdoor recreator today (Martin, 2004).

The history of outdoor recreation (and, for the sake of this study, GPA) in the U.S. often starts in the 1800s (Clawson, 1985; Cordell et al., 1990; Watters, 1985), which mirrors the founding of what is now known as the U.S., but fails to acknowledge Indigenous people living on the land before settlers arrived from Europe (C. R. Jensen & Guthrie, 2006). Specifically, with the creation of these national preserves, Indigenous people were not only displaced from their land, but seen as threats to preservation and the purity of nature because of their hunting and resourcing practices (O’Brien & Njambi, 2012). Additionally, before the concept of “outdoor recreation” was termed in the U.S., Indigenous people not only depended on the natural environment for life, but also participated in activities on the land for fun (i.e., recreation outdoors) (Cordell et al., 1990). Despite this, outdoor recreation is touted as being part of “America’s heritage” and the government has had a hand in sectioning off and/or creating natural spaces for people to recreate in the U.S. (Cordell et al., 1990).

The sanctioning off of land for preservation purposes, and thus creations of national parks, has been touted as “America’s Best Idea” and lauded for increasing environmental awareness in the U.S. (O’Brien & Njambi, 2012; Weber & Sultana, 2013). It began in 1833 with the establishment of the first national preserve in Arkansas; this establishment was inspired by a want to protect the land, but also influenced by Romanticism works fetishizing the way Indigenous people were close to the land (Cordell et al., 1990; Cosgrove, 1995; O’Brien & Njambi, 2012; Watters, 1985). More local green spaces were also being created in the 1800s alongside the building of cities – Central Park in New York City was established in the 1850s and between 1880 and 1890, about 80 city parks were established (Cordell et al., 1990). In creating these city parks, though, park creators removed swaths of people to make room for these spaces; Central Park, for example, required the forced removal of Seneca Village, the largest community of African American landowners in New York City (Manevitz, 2022). The late 1800s also brought about the creation of outdoor clubs interested in land protection such as the Sierra Club, founded in 1892 (Bialeschki, 1992; Watters, 1985). These groups were not only exclusive to white males, rather white women made up nearly half of the membership (Bialeschki, 1992). However, most of them were exclusive to middle- and upper-class white people and were not welcoming to other races (Brune, 2020). John Muir, the founder of the Sierra Club, made derogatory remarks about Black and Indigenous peoples and aligned himself with white supremacists and eugenics supporters (Brune, 2020).

In the 1900s there was a shift to a shorter work day for some, which increased time for leisure activities (Clawson, 1985; Cordell et al., 1990). An influx of immigrants along with an increase in freed Black people upset white people in regards to outdoor recreation but also more generally; the white population shifted south and west (Clawson, 1985; O’Brien &

Njambi, 2012), closer to some of these pristine natural spaces and away from cities. Even for those who did not move closer, in the 1920s with the invention of cars, transportation to places such as Yellowstone National Park (established in 1872) increased for those who could afford cars (Cordell et al., 1990). The 1930s brought the Great Depression, which was beyond difficult for many, but was actually beneficial for outdoor recreation because the scramble to increase jobs brought positions that improved recreation lands and facilities (Cordell et al., 1990). However, even these efforts were led by the Civilian Conservation Corps, which was segregated against Black individuals (Salmond, 1965). Post-World War II saw outdoor recreation becoming more accessible to middle- and lower-class individuals for the first time; cars became more common, work hours for some decreased again, and disposable income increased for many (Clawson, 1985; Cordell et al., 1990; Watters, 1985). In 1963, the Outdoor Recreation Resources Review Commission (ORRRC) was established with the aim of rebuilding facilities that were not maintained during the war and predicting resource needs until 2000 (Cordell et al., 1990; Manning, 2000). The ORRRCs earliest research noted recreation differences between races (Manning, 2000). The 1980s saw a sharp increase in private facilities (e.g., golf clubs, ski resorts) and an introduction of new activities as technology increased (e.g., hang gliding, biking on trails) (Clawson, 1985). The concept of fees as a barrier to GPA are still being explored today for the limiting effects they have on some classes (Manning, 2000). In 1985, Marion Clawson, an economist, predicted that people would continue to be interested in outdoor recreation over the next 25 years, but voiced uncertainty regarding how immigrants from Asia and Latin America might change outdoor recreation – would they have different recreation preferences, for example (Clawson, 1985)? Clawson also, though, predicted that there would be no significant differences between races (including Black and white as the only categories) in the next generation of

outdoor recreators because age, income, health, and location would be equal for all groups (Clawson, 1985).

Clawson's prediction was misguided and failed to consider how systems that were created for white people to succeed would persist through the decades. Still in the 2000s there was a call to examine cases of institutional discrimination, as well as examine the relationship between gender and outdoor recreation (Manning, 2000). It must not be ignored that resource-based spaces created for preservation were done so in an exclusionary manner and were based on ideals that were (white) race and (upper-/middle-) class based (Byrne & Wolch, 2009). User-oriented and intermediate areas most convenient for people of color, too, show evidence of lack of money, long travel distance from home, inequitable park programming, and racial discrimination (Byrne, 2012). In fact, differing levels of access reinforce power structures of white supremacy and patriarchy (Finney, 2014; Ray, 2013; Savoy, 2015; Whitson, 2021). Additionally, the cultural concept of "wildness" has not included genders outside of male, people of color, and the queer community (Evans, 2002). In some ways to amend this, researchers continue to conduct specific research regarding identities and their relationship to GPA, including gender, sexual identity, disability status, and race and ethnicity.

Perhaps unsurprisingly, outdoor recreation skews towards white males (see Figure 2-1) (The Outdoor Foundation, 2022). Other surveys regarding specifically national park usage find similar patterns – in 2003, 36% of visitors were non-Hispanic white people, 33% were Indigenous, 29% were Asian American, 27% were Hispanic, and 13% of visitors were Black (Solop et al., 2003). This pattern is similar to ones found in other years (Taylor et al., 2011). Another study by Williams et al. (2004) found that, while people with mobility disabilities were less likely to spend time outdoors generally, their participation rates were similar to

those without mobility disabilities for some specific green physical activities (e.g. canoeing, horse riding, backpacking). If the industry wants to increase outdoor recreation, and thus GPA, they should aim to bring more diversity to the GPA in general and address the systemic barriers to GPA. This would be beneficial not only for the health of all people in the U.S., but would be economically beneficial as well (The Outdoor Foundation, 2022; Weber & Sultana, 2013).

### ***Gatekeeping, Racism, and other Systemic Issues***

It is imperative to note some of the constraints to GPA differ from person to person, and most likely are influenced by a variety of identity domains. There are many hypotheses suggested as to why somebody may not participate in GPA, beyond a lack of interest. Lower socioeconomic status, insufficient leisure time, concerns about safety, discrimination, physical inaccessibility, geographical inaccessibility, and presence of a person with a disability in the household are just a few of these reasons (R. C. Burns & Graefe, 2007; Martin, 2004; McNeil et al., 2012; Weber & Sultana, 2013). It is particularly imperative to comment on the systemic racism that may affect GPA participation. Large areas for GPA opportunities are not without their systemic challenges; discrimination has always been present in parks (both National Parks and more local parks) whether through removing Indigenous groups from their land or limiting visitation for African Americans or Latinx people (Byrne, 2012; McCammack, 2017; Weber & Sultana, 2013; West, 1989). Even today, when visible lines of segregation are not present as they were historically, a qualitative study conducted with an African American population in Denver, Colorado suggest National Parks are still seen by some to be a “white” activity that is “hostile to Black culture” (Erickson et al., 2017).

There are further stereotypes of historically excluded groups as “not belonging” in nature. For example, one stereotype asserts that females (as measured by the gender binary;

largely, anybody who is not a cisgender males) are too frail, passive, and emotionally unstable (Bialeschki, 1992). Girl Scouts of the USA, a group that identifies GPA as one of its primary activities, adopted a “don’t ask, don’t tell” stance to LGBTQIA+ members and as recently as 2001, only 8% local councils had guidelines protecting members against discrimination based on sexual orientation (Argus, 2018). This was different from stance taken by the Boy Scouts, who actually described being gay as “immoral,” but harmful nonetheless (Argus, 2018; Knauer, 2000). People with disabilities carried the stereotypes of being too “risky” and not “worth” the burden of risk for outdoor recreation managers to facilitate activity (N. Burns et al., 2013). The National Parks again contribute to these stereotypes with their “Healthy Parks, Healthy People” campaign, which suggests that “unhealthy” people somehow ruin the idea of “health” in the National Parks (Stanley, 2020) This suggests that GPA does not belong to “deviant bodies” (Stanley, 2020). Further, early researchers hypothesized people of color were not fit for outdoor recreation based on their cultural preferences and behaviors (Washburne, 1978; West, 1989). These stereotypes are not only a part of U.S. history and, instead, they can be perpetuated still today through media.

### **2.3 Media Representation**

In 2012, outdoor recreation media outlets served as a \$400 million market and has most likely grown beyond that today (McNiel et al., 2012). Media, and advertisements in particular, are powerful tools in upholding societal stereotypes because they depict “reality” and can show people what to expect in natural spaces (McNiel et al., 2012). Advertising reflects upon images and themes found in society and can influence how viewers of those images perceive the world around them (Martin, 2004). Thus, media serve as potential tools to be a gateway into GPA *and* can work to decrease the disparities that are seen in GPA participation rates (Martin, 2004; McNiel et al., 2012). However, the current state of GPA media does not work to make the outdoors less white or less masculine and, rather, furthers

these disparities. Few studies have examined GPA-related media, but those that have find disparities in who is represented in terms of gender, disability status, and race and ethnicity (Frazer & Anderson, 2018; Martin, 2004; McNiel et al., 2012). Representation in media does not match GPA participation demographics.

One researcher examining the publications *Outside*, *Time*, and *Ebony* during the years from 1985 to 2000 hypothesized there would be more white models in the outdoors and engaging in outdoor leisure activities (Martin, 2004). In general, the only publication to have more Black models than white models was *Ebony*, a publication catering more to the Black community, with 92.4% of their models being coded by researchers as Black (Martin, 2004). Both *Outside* and *Time* had a majority of white models, 95.2% and 91.0%, respectively (Martin, 2004). This shows a general media preference towards white models, but a more specific comparison of only models in the outdoor ads, the disparities become even more apparent. In the outdoors, *Ebony*'s presence of Black models drops to 67.9% and both *Outside* and *Time* see an increase in proportion of white models (98.7% and 100%, respectively) (Martin, 2004). A later analysis between 2011 and 2014 focused on outdoor publications (specifically *Backpacker*, *Climbing*, and *Rock and Ice*), and found a similar overrepresentation of white models across all three publications with roughly 97.57% of models being white (Frazer & Anderson, 2018). In both of these studies, the main analysis included a white category, a Black category, and an "other" category (Frazer & Anderson, 2018; Martin, 2004). This is an overly simplistic representation of races that participate in GPA and needs to be explored further.

The earlier mentioned study by Frazer & Anderson (2018) also examined gender representation in *Backpacker*, *Climbing*, and *Rock and Ice*. *Backpacker* had the highest (but still low) representation of females (39.9%), followed by *Climbing* (29.0%), and finally *Rock*



*and Ice* (24.5%) (Frazer & Anderson, 2018). An analysis of *Outside* and *Backpacker* over two years in the 2000s also examined not only the presences of women models in the outdoors, but how these women were depicted as well (McNiel et al., 2012). Women were shown in 46% of the ads with a person in it included in the second analysis and, further, only 28% of women were shown without a man in the ad alongside of them (McNiel et al., 2012). Women were more often depicted in ads for vacation destinations and clothing and, while they may have been present in the ad, they were rarely shown actively engaging and rarely dirty or unkempt (McNiel et al., 2012). For example, when comparing two North Face ads a man is shown rock climbing (a “higher risk” activity), while a woman is shown hiking (a “lower risk” activity) or, even more passively, reclined in a sleeping bag (McNiel et al., 2012). When women were engaged in an activity, often times they needed assistance from a man in the ad or from a product from the company (e.g., “easy to set up equipment with no experience necessary” phrases tended to include women rather than men) (McNiel et al., 2012). Ads featuring women insinuated an escape from motherhood or bringing the family along to care for them (e.g., camp cooking equipment claiming they can “Cook anything on the menu, just like home”), which supports the stereotype of caretaker for women being an obstacle to spending time outdoors (Espiner et al., 2011; McNiel et al., 2012). When women were highly engaged in GPA, they are mostly professionals who are identified by name, some featuring backstories that support the idea that these women possess traits beyond the average women (something not present for men – insinuating that the average man can actively engage in the outdoors, but not the average woman) or have different experiences from men who participate in the same activity (e.g. a female ultramarathon runner “chats” with others while she races, while a man has large numbers next to his face highlighting the distances he has covered) (McNiel et al., 2012). It is important to note that most of the data is

presented as a gender binary because only one model in *Backpacker* was identified by researchers as transgender or gender nonconforming (Frazer & Anderson, 2018). This is a continued erasure of transgender and gender nonconforming individuals and should be amended in analyses moving forward. Assuming that this conclusion would be present across publications, this is a much-needed issue to address in GPA-related media. One solution to this limitation, and the limitation of representation in GPA-related media in general, may be social media.

#### **2.4 Social Media & Change Power**

Social media carry the potential to shape attitudes and potentially shape some of the stereotypes discussed in section 2.2 (Khosravini & Unger, 2015). Social media serve as platforms for communication activities and examples include online social networks such as Twitter, Facebook, YouTube, and Instagram (G. Williams et al., 2014). A Pew Research Center (2021) study found that seven in ten people in the U.S. say they use at least one social media site. There seems to be no significant difference in proportion of the population that uses social media based on race or ethnicity or binary gender categories; those with higher education levels, higher household income, and urban residents tend to have higher proportions that use social media, though usage at all levels are on the rise (Perrin, 2015).

Facebook specifically is the most popular social network in the U.S. and worldwide, with about 2.85 billion monthly active users in the first quarter of 2021 (Statista Research Department, 2021b, 2021a). Facebook may be useful as a tool to increase social support and encourage PA behaviors (Rote et al., 2015) and due to its popularity, it may serve as a way to reach a wide audience. Specifically, it may also be an optimal platform for health education delivery to intervention participants (Edney et al., 2017; Welch et al., 2018). A randomized controlled trial using social media for health behavior change has found to be effective at increasing PA in insufficiently active adults (Maher et al., 2015). Randomized controlled

trials have also been successful in college students (Cavallo et al., 2012; Rote et al., 2015; Zhang et al., 2015) and young adult cancer survivors (Valle et al., 2013).

Newer social media platforms, such as TikTok, Snapchat, or Instagram are less likely to be featured in research (Goodyear, Boardley, Chiou, Fenton, Makopoulou, Stathi, Wallis, Veldhuijzen van Zanten, Wood, et al., 2021). However, Instagram-based research, particularly regarding the role of Instagram in promotion and adoption of health and/or recreation behaviors, has increased in the past two years (DiBisceglie & Arigo, 2021; Folkvord et al., 2020; Liu et al., 2021; Reade, 2021; Stanley, 2020; Weatherby & Vidon, 2018). Outside of a research setting, the general population receives health information on social media as well; 65% of adult participants in a study conducted during 2020 reported seeing PA information on social media, a higher proportion than other health behavior information (i.e., diet or quality of life) (Goodyear, Boardley, Chiou, Fenton, Makopoulou, Stathi, Wallis, Veldhuijzen van Zanten, & Thompson, 2021). Further, 43% of that same participant pool indicated social media were a good source of PA information (Goodyear, Boardley, Chiou, Fenton, Makopoulou, Stathi, Wallis, Veldhuijzen van Zanten, & Thompson, 2021). Instagram has risen in popularity, particularly among emerging adults (Auxier & Anderson, 2021; GWI, 2022b), as a source of PA-related information generally, as well as a space for GPA-related content.

### ***Social Media & Green Physical Activity***

To date, social media-based interventions to increase GPA specifically are sparse, but literature suggests social media users may hold power to change the narrative of the outdoors being a white, masculine space (Low et al., 2022; Stanley, 2020; Weatherby & Vidon, 2018; Whitson, 2021). One study analyzed websites, blogs, public Facebook groups, and Instagram to investigate how women were changing the GPA narrative on social media (Weatherby & Vidon, 2018). Instagram photos and captions gave these individuals the power to tell their

own stories, photograph themselves in power poses (e.g., flexing muscles) to increase power recognition, and increasing visibility in outdoor spaces (Weatherby & Vidon, 2018). Also of note, these women were able to show active engagement, rather than the passive engagement found in many outdoor magazine advertisements (Frazer & Anderson, 2018; Weatherby & Vidon, 2018). These online communities also offer a place where individuals can offer support to one another as they enter these spaces that were not inherently socialized as being “for them,” expanding their circle of social influence (Weatherby & Vidon, 2018). Beyond and individual-user level, organizations centering historically excluded identities (e.g., Latino Outdoors), have utilized Facebook Groups as part of their mission to bring Latino families and youth to nature (Flores & Kuhn, 2018).

In fact, GPA-related advertisers have capitalized on social media as well. For example, REI started a “Force of Nature” campaign in response to the lack of representation in media (Stritzke, 2017; Weatherby & Vidon, 2018). The CEO and President of REI, Jerry Stritzke (2017), wanted to combat 6 in 10 women’s beliefs that men’s interests in GPA are taken more seriously than women’s, REI wanted to “create real change right now” by “putting women – of all ages, races, sizes, gender expressions – front and center in all things we do.” While REI should not be touted as the perfect company in all actions, this initiative attempted to increase women’s visibility and, to a certain extent, intersectionality in outdoor spaces. Social media are also being used to objectively study nature-based tourism and GPA, both in terms of spaces being visited but also geographic data regarding where those tourists are from (Wood et al., 2013). It should be of note that the social media landscape and popular platforms have changed since the publication of the report explaining this, so this methodology may have changed. Social media have emerged as tools for studying and increasing GPA for all people, though there is still a gap to fill regarding how a diverse

sample views this content, rather than just *what* that content is. A focus on historically excluded groups' perspectives can change the social media landscape to ultimately increase diversity in GPA-related social media content and GPA behavior more largely.

## **2.5 Informing Philosophies and Theoretical Grounding**

This dissertation study and larger research lines around increasing representation in GPA-related media and natural spaces, are inspired by scholars examining the role of identity domains in natural spaces such as Carolyn Finney (2014) and the editorial team of Catriona Mortimer-Sandilands and Bruce Erickson (2010). Finney's (2014) work aims to redefine the environmental narrative in the U.S., mostly informed by white perspectives, by highlighting African American's experiences with the environment. Mortimer-Sandilands and Erickson's (2010) work explores and redefines the relationship between the environment and another identity domain: sexual identity. Both bodies of work weave feminist theory throughout (Finney, 2014; Mortimer-Sandilands & Erickson, 2010), and this dissertation too is inspired specifically by intersectionality, the idea that power of different identity domains (i.e., gender, sexual identity, disability status, race and ethnicity) work together to affect aspects of the social world (Collins & Bilge, 2020; Crenshaw, 2017). An intersectionality framework allows provides a more complete framework to challenge social problems, rather than highlighting one identity (e.g., gender within feminism) (Collins & Bilge, 2020), which informed featuring experiences of multiple identity domains simultaneously in the present study.

The dissertation study is inspired by intersectionality scholars and with these foundational works in mind. However, two behavior change theoretical frameworks shaped the specific aims and research questions: the Social Ecological Model and Self-Efficacy Theory. There are three reasons that frameworks benefit health behavior change research: 1) theory facilitates understanding of and manipulation of determinants of health behaviors, 2) it

allows stronger design and implementation of effective health behavior change interventions, and 3) can enable more straightforward examination of the relationships and phenomena observed in health behavior change intervention work (Brug et al., 2005; Lox et al., 2019; J. R. Thomas et al., 2011).

### ***Social Ecological Model***

The Social Ecological Model (SEM) is a model for health promotion by McLeroy and colleagues (1988) that identifies five levels that determine behavior: intrapersonal factors, interpersonal processes and primary groups, institutional factors, community factors, and public policy. Each of these levels of influence can affect a health behavior, but further, this model proposes that people are not only influenced by the people around them, but can influence those around them (i.e., reciprocal causation) (National Cancer Institute, 2005). Currently, PA intervention research is faced with the challenge of maintaining physical activity changes long term, though there is a great focus on individual factors (Arbillaga-Etxarri et al., 2018). However, there are multiple levels of factors that can influence one's GPA and many disparities lie in higher levels of the SEM (see section 2.2) (CDC, 2012). Health promotion efforts, including those on social media, would benefit from attempting to address multiple levels of this model (National Cancer Institute, 2005), but it is also important for researchers studying motivation and barriers to behavior to consider more than just the individual level of the SEM.

### ***Self-Efficacy Theory***

Self-Efficacy Theory is a social cognitive behavior change theory. The key concept of this theory, introduced by Albert Bandura (1977), is self-efficacy. Self-efficacy “focuses on the extent to which an individual feels [they] will be successful in performing a desired behavior, given the abilities [they] possess and the unique situation in which [they] find [themselves]” (Lox et al., 2019). Self-efficacy is similar to the concept of self-confidence, but

is situation specific (Lox et al., 2019), so in the case of a behavior change model refers to the confidence a person has that they will be successful at accomplishing said behavior. Self-efficacy is typically measured via its level (i.e., various elements of a task) or strength (i.e., degree of conviction towards task completion) (Bandura, 1977; Luszczynska et al., 2005; M. S. Rogers James E. Maddux, Blaise Mercandante, Steven Prentice-Dunn, Beth Jacobs, Ronald W., 2016). An individual is more likely to try a new behavior and adhere to the behavior when self-efficacy is strong (Bandura, 1997).

Within SET, there are four sources of self-efficacy defined by Bandura: physiological and affective states, past performance accomplishments, vicarious experiences, and social persuasion (Bandura, 1977). Physiological (e.g., heart rate, fatigue) and affective (i.e., emotional) states work together as one source of self-efficacy (Lox et al., 2019). Physiological states may have an inverse effect on self-efficacy (e.g., higher heart rate may lead to less self-efficacy) and more positive emotional states may lead to greater self-efficacy (Lox et al., 2019). For example, higher enjoyment (an example of a positive emotion) of PA leads to greater self-efficacy for PA (Lewis et al., 2016). Past performance accomplishments are activities similar to a target behavior that the person has previously succeeded at; the past activity does not have to be exactly the same, but the more similar it is the greater affect it has on self-efficacy (Lox et al., 2019). Vicarious experiences can also be referred to as modeling (Lox et al., 2019). This concept involves seeing another person achieve the desired behavior, or even practicing imagery and imagining oneself perform the target behavior successfully (Lox et al., 2019). Social persuasion is communication (both verbal and non-verbal) from others (Bandura, 1977). Similar to the other concepts' effects on self-efficacy, the more influential or the closer the person that is giving off social persuasion, the stronger effect on self-efficacy (Bandura, 1977; Lox et al., 2019).

SET has been chosen as one of the frameworks because there is evidence social media may support the four sources of self-efficacy (Kashian & Liu, 2020; Pope et al., 2019; Wang & Willis, 2018). The effects of posting PA behavior on social media with self-efficacy for general PA behavior has been explored. One study found no statistically significant relationship between affective experiences expressed on social media and self-efficacy for general PA (Kashian & Liu, 2020). However, the same study by Kashian and Liu (2020) found posting about exercise past performance/mastery experiences on social media is positively related to self-efficacy for general PA. Vicarious experiences' effects on general PA have been studied on PA-sharing specific platforms (i.e., MapMyRun); the size of the social network and amount of posting via that platform have shown to be associated with greater general PA (Carpenter & Amaravadi, 2019). Social persuasion on social media can be indicated by reactions to posts (e.g., liking) and supportive comments (Cavallo et al., 2014) and factors such as social support have been shown to affect self-efficacy on PA apps (Yang et al., 2015). The effects of social media on self-efficacy specifically for GPA remain largely unexplored in the literature.

## **2.6 Conclusion**

In summary, GPA may offer additive health benefits as compared to general PA (Eigenschenk et al., 2019; Thompson Coon et al., 2011). Motivators for people who engage in GPA can be similar compared to general PA (i.e. body-oriented motivators) or unique (i.e., the opportunity to be close to nature) (Calogiuri & Elliott, 2017; Fraser et al., 2019). Regardless of the similarities or differences, there is a gap in the literature exploring these motivators in a diverse sample of adults in the U.S. These motivational profiles can aid in increasing GPA rates in a diverse population, including historically excluded groups in terms of gender, sexual identity, disability status, or race and ethnicity that may benefit from health outcomes associated with GPA.



However, increasing GPA in the U.S., particularly in historically excluded communities, cannot be done respectfully and responsibly without acknowledging specific systemic barriers to participation in GPA, from the physical spaces (e.g., National Park history) to media representation (or lack thereof) of those historically excluded identities enjoying nature. Social media may be tools to help increase representation and appeal to GPA participants outside of the white, cisgender male stereotype seen in classic media (Weatherby & Vidon, 2018). **Therefore, this dissertation will aim to assess motivations and barriers for GPA, explore associations between social media use and GPA, and utilize focus groups to explore participants' experiences with GPA-related social media content** using constructs of the above-described frameworks (see Figure 2-2).

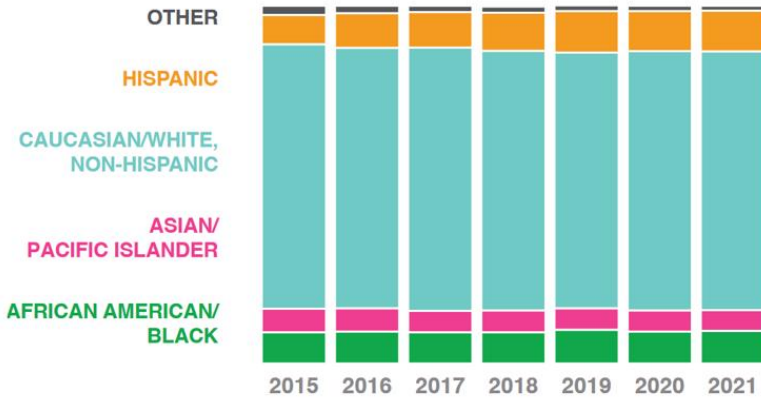
The first aim of the proposed dissertation will assess motivators for and barriers to GPA and identify ones outside of validated scales. Each layer of the SEM has space for motivators for and barriers to GPA at multiple levels, but these are still undetermined for a diverse population (Calogiuri & Elliott, 2017; Fraser et al., 2019). Expanding the inner two circles of SEM, social media are present in the interpersonal layer. Social media content may be a provider of self-efficacy (Pope et al., 2019; Wang & Willis, 2018), which may be true for GPA-related social media as well. The second aim of this dissertation will examine associations between social media use, self-efficacy for GPA, and GPA. Finally, the third aim will qualitatively explore participant experiences with GPA-related social media content.

**Table 2-1.** Glossary of common terms used in green physical activity literature.

<b>Term</b>	<b>Definition</b>
Adventure Sport	activities that involve land, air and water-based activities, ranging from short, adrenaline-fueled encounters, such as bungee jumping and wind-surfing, to longer experiences, such as cruise expeditions and mountaineering (Pomfret & Bramwell, 2016)
Blue Spaces	environments characterized by the presence of water (e.g., lakes, rivers, oceans) (Calogiuri & Elliott, 2017)
Great Outdoors	socially constructed notion of a type of place characterized by a sense of isolation and remoteness found in areas that typically are far removed from the urban environment (Martin, 2004)
Green Exercise	physical activity taking place in natural environments, such as “green” spaces, “blue” spaces, and even “orange” spaces (i.e., landscapes dominated by fall foliage color) (Calogiuri & Elliott, 2017)
Green Spaces	environments dominated by the presence of grass and green foliage colors (Calogiuri & Elliott, 2017; Health, 2017)
Natural Environment	a location featuring trees, diverse vegetation, local biodiversity, water features, parks, natural playscapes, community gardens, or school gardens (American Public Health Association, 2013)
Nature	generally features as a set of environmental features that are there to be looked at; in GPA research, often defined by a visual encounter with “green” (Bamberg et al., 2018)
Nature-based Physical Activity	physical activity carried out in nature (Eigenschenk et al., 2019)
Outdoor Physical Activity	physical activity performed outside
Outdoor Recreation	activities taking place in wilderness or wildland settings (Martin, 2004)
Outdoor Sport	often used interchangeably with outdoor physical activity; all forms of physical activity which, through casual or organized participation, aim at expressing or improving physical fitness and mental well-being, forming social relationships or obtaining results in competition at all levels (Eigenschenk et al., 2019)
Wilderness	ideology synonymous with “Great Outdoors” (Martin, 2004)

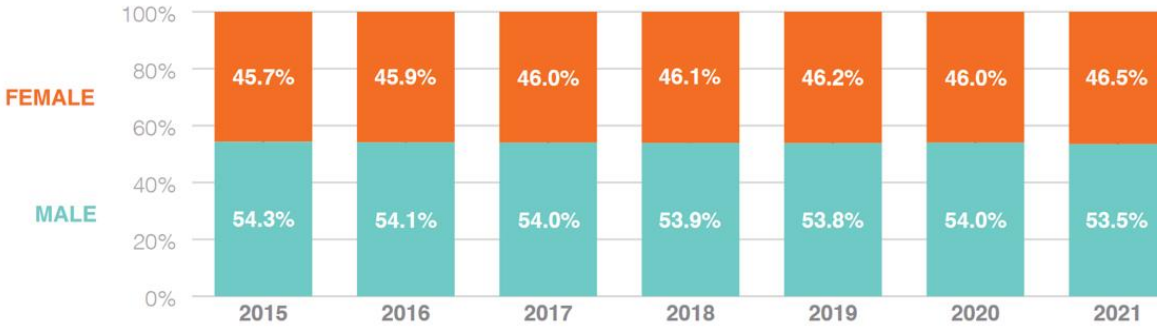
## DIVERSITY IN PARTICIPATION

2015 TO 2021

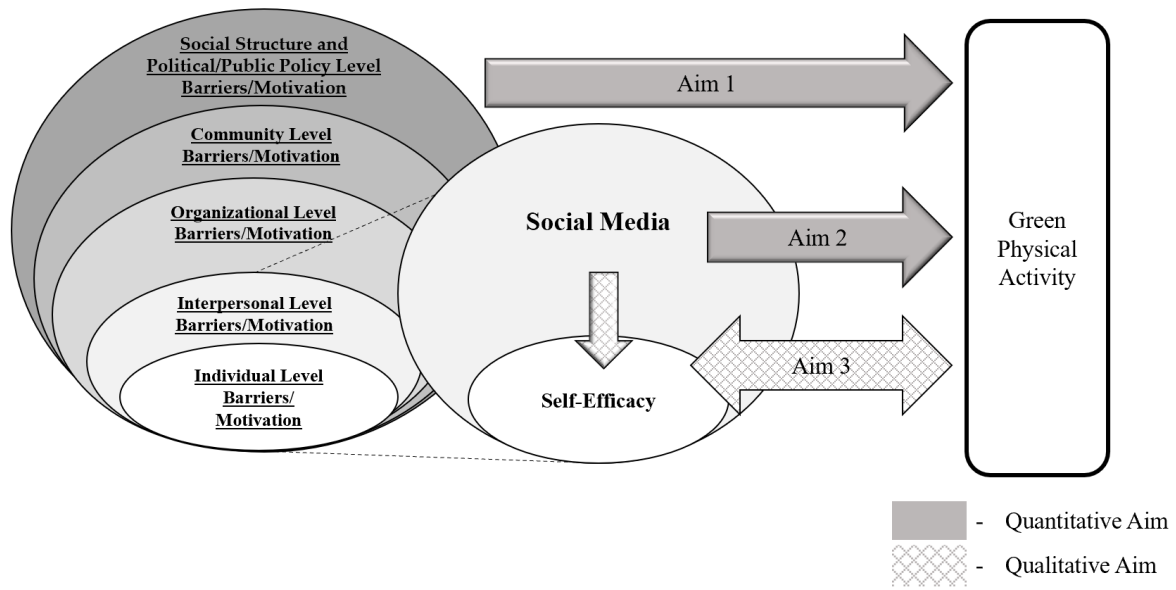


## PARTICIPATION BY GENDER

2015 TO 2021



**Figure 2-1.** 2015-2022 outdoor recreation statistics from The Outdoor Foundation (2022).



**Figure 2-2.** Framework for the dissertation study.

## Chapter 3. Methods

### 3.1 Study Design and Recruitment

#### *Study Design*

This dissertation utilized a cross-sectional mixed methods study design consisting of two phases: a quantitative survey (Specific Aims 1 and 2) and qualitative focus groups (Specific Aim 3). In the first phase, an online survey was distributed via Qualtrics querying participants on green physical activity (GPA) behavior, motivations for GPA, barriers to GPA, as well as social media use. Sociodemographic information was also collected. In the second phase, a purposeful sample of participants who follow GPA-related social media based on responses from the survey items were invited to participate in online focus groups. These focus groups gave participants the opportunity to discuss their experiences with GPA-related social media content. Participant recruitment, screening, and survey participation began in the Spring of 2022 and continued through Summer of 2022. Specific participants were identified from survey responses (i.e., do they follow GPA-related social media content on Facebook and/or Instagram?) and invited to participate in online focus groups conducted in Fall of 2022; more details can be found in sections below.

#### *Participants and Recruitment*

This study aimed to recruit 200 participants, based on a sample size calculation using data from previously published work related to motivations for GPA (Fraser et al., 2019). The sample size equation (Kadam & Bhalerao, 2010) and actual calculation is presented:

$$n = \frac{2(Z_{\alpha} + Z_{1-\beta})^2 \sigma^2}{\Delta^2} = \frac{2(1.96 + 0.8416)^2 1.39^2}{0.25^2} = 159 \text{ participants}$$

Inclusion criteria were: (1) adults between the age of 18-64 who live in the U.S., (2) those who currently participate in GPA *or* want to participate in GPA (defined by engaging in

PA taking place in natural environments, such as “green” spaces, “blue” spaces, and even “orange” spaces (i.e., landscapes dominated by fall foliage color)), (3) users of Facebook and/or Instagram, and (4) access to a computer or smartphone with a reliable internet connection. Exclusion criteria included: (1) any self-defined contraindications to exercise (i.e., doctor’s orders, injury, etc.) completed at screening, (2) inability to consent to participate in research for any reason, and (3) unwillingness to disclose age, socioeconomic status, gender, sexual identity, disability status, race, and ethnicity. Identities historically excluded from GPA (i.e., female/transgender/genderqueer people, the LGBTQIA+ community, people with disabilities, and BIPOC) were oversampled to aim to recruit a diverse sample.

Digital fliers with study details and inclusion/exclusion criteria were created for recruitment. The study was nationwide, so participants were heavily recruited through social media platforms including, but not limited to, Facebook and Instagram. Specific Facebook groups and Instagram accounts related to outdoor recreation and/or GPA were contacted, especially those for people with historically excluded identities (e.g., women, trans, and femme (W/T/F) cycling groups, BIPOC Outdoor Twin Cities). GPA-related non-profit organizations (e.g., Outdoor Women’s Alliance, Latino Outdoors, Outdoor Afro, Native Women’s Wilderness, The Venture Out Project) were also identified and contacted for recruitment in the form of sharing a flier or speaking with group members. University of Minnesota IRB approval was obtained prior to recruitment and data collection (STUDY00015389).

### ***Screening and Informed Consent***

Participants were screened via a Qualtrics survey on a rolling basis over a five-month period. If participants were eligible based on screening criteria, they were emailed a link to

second Qualtrics survey containing the informed consent form (and, subsequently, the survey).

### **3.2 Quantitative Data Collection**

Once informed consent was obtained, participants continued to a survey completed via the online platform, Qualtrics. The following measurements were completed in the survey and used to address Specific Aims 1 and 2. More information can be found in Appendix A.

#### ***Sociodemographic Variables***

Identity domains are the basis of the proposed study. Participants were queried on age, socioeconomic status (using survey questions regarding education level and employment status as proxies), gender, sexual identity, disability status, and race and ethnicity.

#### ***Green Physical Activity Assessment***

Amount of general physical activity (PA) was measured using the Godin-Shepard Leisure Time Exercise Questionnaire (Godin, 2011). The questionnaire for the current study was modified to assess minutes spent engaging in mild, moderate, and strenuous exercise during a normal 7-day period. Participants were also asked to specify how much of this PA occurred in natural spaces. Total GPA was calculated only counting PA participants identified to take place in natural spaces.

Motivations for GPA were examined using the Physical Activity Leisure and Motivation Scale (PALMS) (Molanorouzi et al., 2014; Zach et al., 2012) modified for GPA. This survey, though modified, was deemed more appropriate than using non-validated and potentially different survey questions. This 40-item scale contains eight sub-scales of motivation: competition/ego, appearance, others' expectations, affiliation, physical condition, psychological condition, mastery, and enjoyment (see Appendix C). Possible responses were on a scale from 1 (strongly disagree) to 5 (strongly agree).

Self-efficacy for GPA was measured using the Outdoor Recreation Self-Efficacy Scale (Mittelstaedt & Jones, 2009). This is a 17-item scale that helps understand factors that contribute most to self-efficacy of outdoor recreation activities, which are included in the definition of GPA for the present study. This scale has proved reliable and valid in a sample of women who participate in outdoor activities (Mittelstaedt & Jones, 2009).

Barriers to GPA were based on an outdoor recreation leisure constraint survey; a 13-item survey concerning barriers to outdoor recreation (Hubbard & Mannell, 2001; Raymore et al., 1993; D. D. White, 2008). Eight items represented structural barriers (e.g., “I am unlikely to do a new leisure activity if I don’t have time), seven items represented interpersonal barriers (e.g., “The people I know usually don’t have time to start a new GPA with me”), and thirteen items represented intrapersonal barriers (e.g., “I’m too shy to start a new GPA”). See Appendix C for the full scale. Possible responses were presented on a scale from 1 (not at all) to 5 (very much) and were recoded on a 0 to 4 scale for analysis. Higher scores indicate more of a barrier.

### ***Social Media Behaviors***

Parameters around “social media” are imperative if social media is to be used in research because it is such a wide-umbrellaed concept. The present project used Facebook, due to the strong use of the platform in previous research (Goodyear, Boardley, Chiou, Fenton, Makopoulou, Stathi, Wallis, Veldhuijzen van Zanten, Wood, et al., 2021). Additionally, this project included Instagram, both for its similarly strong feature of both visual and textual information and for the fact that Instagram and Facebook are owned by the same company, Meta (Meta, n.d.-a). Social media use statistics presented by age group also indicated Facebook and Instagram were the most appropriate for the participant age range (18-64) (Auxier & Anderson, 2021). Further, Facebook and Instagram had both been



preliminarily studied in regards to outdoor activities (Weatherby & Vidon, 2018) and had been identified by a qualitative analysis as platforms where users follow content related to leisure activities (Aydın & Arslan, 2016).

Survey questions measuring social media use are often vastly different from study to study. This study used two:

Social Media Use (hours/week) was self-reported by participants in response to the question, “In the past week, on average, approximately how many total minutes per day have you spent using social media (e.g., Facebook, Twitter, Instagram, Reddit, Pinterest, TikTok, or Snapchat?)” Response options were: “less than 10 minutes a day,” “10-30 minutes a day,” “31-60 minutes a day,” “1-2 hours a day,” “2-3 hours a day,” and “3+ hours a day” coded as 5, 20, 45, 90, 150, and 225 minutes, respectively. Values were multiplied by 7 days in a week and divided by 60 minutes to calculate average hours/week of social media.

A modified Social Media Use Integration Scale (SMUIS) (Jenkins-Guarnieri et al., 2012) was also used. This scale has been validated in emerging adults, not an adult population over multiple generations, but offers a solution rather than using different questions from the literature. SMUIS is a 10-item scale originally written to measure the integration of Facebook into ones’ life, with the intention of replacing “Facebook” with the most relevant definition of social media (e.g., specific platform) (Jenkins-Guarnieri et al., 2012). It was modified for this study by changing “Facebook” to “social media (e.g., Facebook, Twitter, Instagram, Reddit, Pinterest, TikTok, or Snapchat)” for all scale statements. Response options ranged from 1 (“strongly disagree”) to 6 (“strongly agree”). Per the scale’s scoring criteria, one statement was reverse-coded.

Participants were asked if they follow GPA-related content on social media platforms. Participants were able to mark as many response options as they wished, which included “Facebook,” “Instagram,” “Other” (with an open-text box to specify), and “No.” Anybody who chose either “Facebook” or “Instagram” were considered for focus group participation.

### **3.3 Qualitative Data Collection**

There were two items on the electronic survey that were analyzed qualitatively. When querying participants on motivations and barriers for GPA, an “other” option was available. If participants choose “other,” they were prompted to fill in a free response explaining further. The participants were told to use this option when the scales used for quantitative data collection did not suffice.

Based on responses from the survey items, a purposeful sample of participants who follow GPA-related social media on Facebook and/or Instagram were invited to participate in online focus groups. Focus groups were conducted on Zoom in groups of 3-5. A focus group guide was created with questions regarding two general topics: history of GPA and GPA-related social media content (see Appendix B).

The focus groups were approached with an emergent design, allowing for questions to change slightly depending on the direction of the focus group or interview (Saldaña, 2003). Utilizing this approach was a valuable tool and allowed the researcher to acknowledge identities may not answer questions in the same way and provided flexibility in discussions based on what is deemed important to the participants.

### **3.4 Procedures**

Due to events related to the COVID-19 pandemic in the U.S. and the fact that the sample is being recruited from across the U.S., all procedures were conducted through online and virtual platforms.

#### ***Cross-Sectional Survey***

After participants were screened and consented, they were directed to the survey questionnaire, which addressed Specific Aims 1 and 2. They had two weeks to complete the survey from the time that they opened it. The survey was automatically closed by Qualtrics after this time period. This survey included survey scales outlined in section 3.2. Survey completion occurred over a two-month period. A \$10.00 gift card was distributed to participants who complete the survey electronically using Tango gift cards. Recruitment was closed once approximately 200 participants' surveys were completed and recorded.

#### ***Focus Groups***

Based on responses from the survey items, a purposeful sample of participants who follow GPA-related social media on Facebook and/or Instagram were invited to participate in online focus groups. Focus groups are interviews in group settings in which a researcher “attempts to understand the world from the subjects’ point of view, to unfold the meaning of their experience, to uncover their lived world” (Kvale & Brinkmann, 2009). Focus groups were formed according to two criteria: (1) which platform they indicated using (Instagram, Facebook, or both Instagram and Facebook), and (2) levels of self-reported GPA (“low,” “moderate,” and “high,” defined by sample-based tertiles). These categories encouraged sharing of experiences in a similar group (Creswell & Poth, 2016) and facilitated understanding of social media platform features (e.g., Facebook Groups, Instagram Reels).

A theoretical sampling method did not allow for the determination of a sample size a priori, sample size was based on the saturation of information obtained from the interviews.

Nine 60-minute focus groups of 3-5 participants was the goal because 1) this is an exploratory aim, and 2) there was no current evidence suggesting the experience of GPA-related social media in any sample, let alone a diverse one, to base the sample size calculation off of. A \$25.00 Tango gift card was distributed electronically to participants who completed their focus group. Focus group recruitment would have closed once a maximum of 40 participants attended and completed a focus group.

### **3.5 Statistical Procedures**

All statistical analyses for quantitative data was conducted using SAS 9.4 (SAS Institute, Cary, NC, 2015). Statistical significance was set at  $p \leq 0.05$ .

#### Specific Aim 1: To determine motivations and explore barriers to GPA.

Means and standard deviations or frequencies were calculated for sociodemographic information, GPA behaviors, and sample-wide motivators and barriers to GPA. Differences in scale-measured motivations and barriers between identity domains (gender, sexual identity, disability status, and race and ethnicity) were determined using a one-way ANOVA. Open-ended responses to motivations and barriers for GPA were noted and organized into themes using methods similar to those described below for Aim 3.

#### Specific Aim 2: To determine the role of social media in GPA.

Means and standard deviations or frequencies were calculated for each of the sociodemographic, GPA, and social media-related variables. Multiple linear regression models were used to examine associations between social media use and GPA. All models controlled for gender, sexual identity, disability status, race and ethnicity, education, and employment due to documented differences in GPA participation rates (The Outdoor Foundation, 2022). The multiple linear regression analysis method also allowed for comparisons to be made between gender, sexual identity, disability status, race and ethnicity, education, and employment.

### Specific Aim 3: Qualitatively explore participant experiences of GPA-related social media.

This aim was answered using qualitative data analyses. Codes and themes were not pre-determined but emerged from the data (Addison, 1999; Prasad et al., 2021). This common methodology for analyzing qualitative data includes describing, organizing, connecting, corroborating, and representing the information gathered from participants. Two independent raters trained in qualitative analysis read and coded the data. The raters worked separately to identify preliminary codes and to organize participant responses to create a codebook. After codes were finalized, both raters independently coded each comment. Any discrepancy between raters was resolved by consensus. Themes were e-mailed to focus group participants for member-checking. Member checking, or a process of checking in with participants, is an example of a technique to engage in credible and confirmable research. Member checking gives power to the participant to a certain extent – they can correct a misconception, intention, or recall additional details they would like to add (Lincoln & Guba, 1985). This is a way to lessen the power differential that has been abused in the past and a way to conduct research *with* a community, rather than use them as a spectacle or token funding technique.

### **3.6 Dissemination Plan**

Dissemination of data from this dissertation project has aimed to share information with communities historically excluded from academic conferences and publications. Papers and presentations will be submitted to academic journals and conferences, respectively, with open-access publications being prioritized, if financially possible. In addition, “popular” platforms (i.e., news outlets, popular magazines, social media itself) will also be chosen for dissemination of any information collected to increase representation of historically excluded groups. For example, data has shown women publishing in popular magazines and books

gave other women “permission” to participate in GPA in the past (Bialeschki, 1992). Much of the research cited in the present paper is academic. However, by choosing popular outlets for dissemination, this information can be made more available to the general population or non-profit organizations who may benefit from the findings.

For qualitative data dissemination, there has been a large emphasis placed on direct quotes from the participants. This practice can help avoid over-interpretation by the researcher, which can also help communicate transferability, a concept referring to the extent research findings are useful to people in other settings (Lincoln & Guba, 1985). The results themselves do not have to necessarily be “generalizable” to another population, but the researcher aims to present results in a context that helps the reader understand how the results could potentially apply to others (Lincoln & Guba, 1985; Polit & Beck, 2009).

## **Chapter 4. Study One**

### **Motivators and Barriers for Green Physical Activity in the United States: Beyond the Psychometric Scales**

#### **4.1 Introduction**

Green physical activity (GPA), or any physical activity that takes place in natural spaces, may have health benefits above and beyond those of PA performed inside (Lahart et al., 2019; Thompson Coon et al., 2011) or in non-natural areas of the built environment (Wicks et al., 2022). The American Public Health Association (APHA, 2013) defines natural elements that encourage these benefits as trees, diverse vegetation, local biodiversity, water features, parks, natural playscapes, community gardens, and school gardens. The Outdoor Industry Association (OIA, 2021) and APHA (2013) advise the public about the benefits of participating in and increasing access to GPA, which was particularly prioritized during the COVID-19 pandemic (APHA, 2020). One step in achieving these goals is further understanding the motivations and barriers to GPA so motivations can be supported, while barriers can be minimized or removed.

Individuals are motivated to perform GPA for different reasons. Much of the GPA motivation-related research is focused in European countries, which may not be generalizable to other countries (Calogiuri & Elliott, 2017). Examples of popularly reported motivations for GPA in Norway include the convenience, the nature experience, and body-oriented beliefs (e.g., physical strength or prevent health problems) (Calogiuri & Elliott, 2017). Additionally, “because it makes me happy” was cited as a top motivator for a group of GPA participants in the United Kingdom (Fraser et al., 2019). A U.S.-based survey by The Outdoor Foundation (2018) highlights top barriers to GPA as being too busy with family responsibilities, equipment being too expensive, and not having anybody to participate with. There are likely

additional barriers not yet identified because methodology for exploring barriers to GPA is largely quantitative; combining qualitative and quantitative methods may generate richer data with more context (Bamberg et al., 2018). Motivations and barriers to GPA have been explored in primarily homogenous populations; samples with more racial/ethnic diversity and across the gender spectrum may further this area of research (Fraser et al., 2019).

Insight into motivators and barriers to GPA in a diverse sample is vital in the U.S., due to the historical context of who has been excluded from spaces to experience GPA. Throughout U.S. history, natural spaces have been more “off-limits” to female/transgender/genderqueer people; lesbian, gay, bisexual, queer, intersex, asexual, and more (LGBTQIA+) individuals; people with disabilities; and Black, Indigenous, and people of color (BIPOC) (Evans, 2002). This is attributable to both dominant-group generated stereotypes of historically excluded groups as “not belonging” in nature (e.g., women are too frail, passive, and emotionally unstable (Bialeschki, 1992)) and actual exclusion from nature (e.g., Indigenous tribes being forcibly removed from their land (Whitson, 2021)); National Parks and city parks barring or not welcoming BIPOC (Byrne, 2012; O’Brien & Njambi, 2012)). Even today, GPA participation rates skew towards white, cisgender males without disabilities (The Outdoor Foundation, 2021). Although the experience of all historically excluded groups will not be the same, it is important to capture diverse perspectives when evaluating motivators and barriers to GPA in the U.S.

In the present study, a mixed-methods approach was taken to further explore motivators and barriers to GPA in the U.S. Using both quantitative survey responses and open-ended qualitative free text, the aims of this study were twofold: (1) to explore motivations and barriers for GPA in a sample of adults in the U.S., and (2) to examine



potential differences by identity domain (i.e., gender, sexual identity, disability status, and race and ethnicity). It was hypothesized that motivations and barrier scale scores are suspected to be similar to previous literature (e.g., high enjoyment), but differences in motivations and increased barriers are expected for historically excluded groups (e.g., more structural barriers for historically excluded groups). It was hypothesized that unique motivators and barriers will emerge beyond those presented in validated scales based on identity domains.

## **4.2 Methods**

An online survey utilizing the platform Qualtrics was distributed in Spring-Summer 2022 to participants (N=205). This study was approved by the University of Minnesota Institutional Review Board (ID: STUDY00015389) and informed consent was obtained on the first page of the Qualtrics survey. The survey queried participants on sociodemographic information, motivators for GPA, and barriers to GPA. All participants were adults between the age of 18 and 64 who lived in the United States. Participants either had to currently participate in GPA or have an interest in participating in GPA. If those who had an interest in participation were excluded, an accurate representation of barriers to GPA may not be obtained. Recruitment took place digitally, specifically targeting spaces (e.g., Facebook Groups) used by individuals historically excluded from GPA (i.e., female/transgender/genderqueer users, LGBTQIA+ folks, spaces for individuals with disabilities, and individuals identifying as BIPOC) and non-profit organizations related to GPA.

### ***Measures***

#### *Sociodemographic Variables*

Participants responded to survey questions regarding their age, education, employment, and identity domain variables (specifically: gender, sexual identity, disability

status, race, and ethnicity). Age was calculated as a continuous variable by taking the birthdate on the day the participant took the survey in relation to the original analysis date. Participants were asked to identify their highest level of education, as well as whether they were currently working for pay or not working for pay. For analysis, identity domain variables were coded as either belonging to a historically excluded group or not (see Table 4-1 for all options). Gender was dichotomized as “female/transgender/genderqueer” and “cisgender male;” sexuality was dichotomized as “LGBTQIA+,” which includes the response option “none of the above,” and “heterosexual;” disability status was dichotomized as “disability” and “no disability;” and race and ethnicity variables were combined into “BIPOC” and “white.”

#### *Green Physical Activity Variables*

Motivators for Green Physical Activity were measured using the Physical Activity Leisure and Motivation Scale (PALMS), originally developed by Zach and colleagues (2012) and validated by Molanorouzi and colleagues (2014). The PALMS was modified for GPA in the current study by replacing “physical activity” with “green physical activity.” This 40-item scale contains eight sub-scales of motivation: competition/ego, appearance, others’ expectations, affiliation, physical condition, psychological condition, mastery, and enjoyment (see Appendix C). Possible responses were on a scale from 1 (strongly disagree) to 5 (strongly agree). There was also an open-ended response option for motivators for GPA that read, “Are there any other reasons *you* participate/want to participate in green physical activity that we missed? If so, what are they?”

Barriers for Green Physical Activity were measured using survey items based on previous outdoor recreation leisure constraint surveys (Hubbard & Mannell, 2001; Raymore et al., 1993; D. D. White, 2008). Eight items represented structural barriers (e.g., “I am unlikely to

do a new leisure activity if I don't have time), seven items represented interpersonal barriers (e.g., "The people I know usually don't have time to start a new GPA with me"), and thirteen items represented intrapersonal barriers (e.g., "I'm too shy to start a new GPA"). See Appendix C for the full scale. Possible responses were presented on a scale from 1 (not at all) to 5 (very much) and were recoded on a 0 to 4 scale for analysis. Higher scores indicate more of a barrier. There was also an open-ended response option for barriers to GPA that read, "Are there any other challenges or barriers *you* face that keep you from participating in green physical activity that we missed? If so, what are they?"

### ***Analysis***

Sociodemographic variables, overall and subscale motivation, and overall and subscale barrier scores were summarized using SAS 9.4 (SAS Institute Inc., 2013). One-way ANOVAs compared differences in motivations and barriers by identity domain variables. Open-ended responses for motivators were organized into themes by two independent raters (rater 1: female/transgender/genderqueer, LGBTQIA+, no disability, white; rater 2: female/transgender/genderqueer, heterosexual, no disability, white). Open-ended responses to barriers to GPA were organized into levels mirroring the barrier scales (i.e., structural, interpersonal, and intrapersonal) by the same two independent raters. Any discrepancy between raters for either motivators or barriers was resolved through consensus. All quotes are presented exactly as participants responded.

### **4.3 Results**

Specific sample characteristics (N=205) can be found in Table 4-1. The average age of participants was  $33.5 \pm 9.2$  years, 85.4% identified as female/transgender/genderqueer, 32.2% identified as LGBTQIA+, 10.7% were individuals with disabilities, and 34.1% identified as BIPOC. Summary variables for motivations for GPA, as measured by the

modified PALMS scale, and barriers to GPA, as measured by the outdoor recreation leisure constraint survey, can be found in Table 4-2. The overall sample had a moderate motivation score ( $3.4 \pm 0.5$  on a 1-5 scale), with enjoyment and psychological condition emerging as the highest classification of motivators. The sample had a lower barrier score ( $1.8 \pm 0.4$  on a 0-4 scale), with structural barriers cited as the highest type of barrier.

### ***Motivators for GPA: Differences by Identity Domain***

When examined by historically excluded identity domains (see Table 4-2), there were some differences in motivators. Female/transgender/genderqueer participants were significantly less motivated to do GPA for competition/ego ( $p < 0.0001$ ), appearance ( $p = 0.03$ ), or others' expectations ( $p = 0.03$ ) than cisgender males, though female/transgender/genderqueer people were significantly more motivated to perform GPA for their psychological condition ( $p = 0.01$ ) and enjoyment ( $p = 0.003$ ). LGBTQIA+ participants were overall significantly less motivated to do GPA as compared to heterosexual participants ( $p = 0.02$ ); specifically, they were significantly less motivated by competition/ego ( $p = 0.005$ ), appearance ( $p = 0.01$ ), others' expectations ( $p = 0.01$ ), and mastery ( $p = 0.01$ ). There were no differences in the overall motivation score or subscale scores by disability status or race and ethnicity (BIPOC and white).

### ***Qualitatively-Identified Motivators***

Seventy-eight of the 205 participants (38%) chose to further respond to the open-ended question regarding motivators beyond those mentioned in scales. Four overarching themes emerged from qualitative analysis: GPA integrated into daily life (e.g., transportation, a way to care for pets), active citizenship (e.g., activism, connection), mental health, and physical health (Figure 4-1).

#### ***Theme: GPA Integrated into Daily Life***

Thirty-eight responses combine to form this theme, which contains 4 sub-themes that enable GPA to be a part of a person's daily life, which motivates them to continue participating in GPA. These sub-themes include taking advantage of good infrastructure (e.g., access to high quality parks and trails), transportation, taking care of/spending time with pets, and hobbies. For example, participants noted:

“I have green space that is easily accessible to me in my current area. That accessibility motivates me to go out more often.” [female/transgender/genderqueer, LGBTQIA+, disability, BIPOC]

“To get from point A to point B. I walk or ride my bike to get anywhere I'm going.” [female/transgender/genderqueer, LGBTQIA+, no disability, white]

“To maintain my dog's wellbeing! I hike/jog/walk daily without fail because of her.” [female/transgender/genderqueer, LGBTQIA+, disability, white]

#### *Theme: Active Citizenship*

Thirty-seven responses categorized into four sub-themes combine to create the “active citizenship” theme: learning, activism, exploration, and connection. Connection is not necessarily to another individual person, but a connection to nature, a larger community, or a higher power (e.g., spirituality). For instance, participants stated:

“To get to know my neighborhood better.” [female/transgender/genderqueer, heterosexual, no disability, white]

“As a visible POC (and older/somewhat unfit-looking/seeming person), I want to increase visibility of people like me in the outdoors.”

[female/transgender/genderqueer, heterosexual, no disability, BIPOC]

“Because it benefits the planet (when I clean or advocate for green spaces) and because I can feel in community with beings other than humans.”

[female/transgender/genderqueer, heterosexual, no disability, BIPOC]

*Theme: Mental Health*

The theme of mental health also contains a sub-theme of sensory experiences (including quiet and enjoying good weather) as a motivator, because they were often mentioned in the same statement. Notably, mental health is already present in the PALMS as a motivator for GPA and called “psychological condition.” Open-ended responses (n=32) named enough factors not mentioned in PALMS to constitute a qualitative theme as well.

Participants specifically mentioned:

“I think fresh air is good for my mental health.” [female/transgender/genderqueer, heterosexual, no disability, white]

“Clear my mind, reset, gather my thoughts.” [female/transgender/genderqueer, heterosexual, no disability, BIPOC]

*Theme: Physical Health*

Physical health benefits that come along with doing physical activity comprise this theme; one subtheme under Physical Health is that GPA is “physical activity that works for me.” Similar to mental health, physical health as a motivator for GPA is also represented as “physical condition” in the PALMS. However, responses (n=11) reflect ideas outside of the PALMS. For example, participants shared:

“Practice/train for a specific activity or competition.”

[female/transgender/genderqueer, LGBTQIA+, disability, white]

“Because it simply feels better to go running in parks/nature than it does indoors or in highly urban areas.” [cisgender male, heterosexual, no disability, white]

### ***Barriers for GPA: Differences by Identity Domain***

There were fewer differences by historically excluded identity domains when barriers were explored. There were no differences in scale-measured barriers to GPA when comparing scores gender (female/transgender/genderqueer and cisgender male). Overall barrier scores were significantly higher for LGBTQIA+ participants when compared to heterosexual participants ( $p=0.01$ ) indicating they reported more barriers; structural barrier scores were specifically higher for LGBTQIA+ participants ( $p<0.001$ ). Participants with disabilities had a significantly higher overall barrier score compared to participants without disabilities ( $p=0.02$ ). However, no differences were found for barrier subscales for participants with disabilities. Finally, there were no differences in scale-measured barriers for race/ethnicity (BIPOC vs. white).

### ***Qualitatively-Identified Barriers***

Forty-nine participants (24%) chose to further respond to the open-ended question regarding barriers beyond those mentioned in scales. Their responses were coded into the same categories used in the quantitative scale: structural, interpersonal, and intrapersonal. The most commonly reported barriers (see Figure 4-2) were structural in nature (e.g., lack of gear availability), though interpersonal (e.g., not “fitting in” to groups outdoors) and intrapersonal (e.g., chronic illness or injury) barriers were also identified.

#### ***Theme: Structural Barriers***

Structural barriers, named by 21 participants, include lack of access to green space participants deem “good enough,” lack of gear, safety, insects, environmentalism (i.e., acting in a way to protect the environment), and weather conditions. Specific quotes from participants include:

“Ill-fitting or uncomfortable clothes/equipment for plus-size women.”

[female/transgender/genderqueer, heterosexual, no disability, white]

“The fact that the outdoors has been dominated by white folks – or maybe more specifically that white folks have claimed such ownership over the outdoors and green spaces despite who those lands originally belonged to.”

[female/transgender/genderqueer, heterosexual, no disability, BIPOC]

“The necessity of using fossil-fueled energy (i.e., cars) to transport to a place for green physical activity.” [female/transgender/genderqueer, LGBTQIA+, no disability, BIPOC]

#### *Theme: Interpersonal Barriers*

Ten participants cited interpersonal barriers outside of the scale options on the survey. These barriers include the idea of stigma against newcomers, groups that you do not fit into, childcare, and lack of ability to get help from somebody. As examples, participants stated:

“Knowing enough people who aren’t white males to do the activity with.”

[female/transgender/genderqueer, LGBTQIA+, no disability, BIPOC]

“Being nervous about how body positive vs. competitive an outdoor space or activity will be is something that is a barrier for me...sometimes I feel unsure or alone in deciding if an activity is going to be fun for me or too intense.”

[female/transgender/genderqueer, heterosexual, no disability, white]

#### *Theme: Intrapersonal Barriers*

Finally, 14 individuals expressed intrapersonal barriers. Some of these barriers have to do with mental health (e.g., anxiety, fear, depression). Additional barriers include fear, injury or sickness, lack of motivation, and imposter syndrome or embarrassment. Quotes from participants include:



“Depression – particularly in the wintertime.” [female/transgender/genderqueer, LGBTQIA+, no disability, white]

“Fear of embarrassment, not doing well.” [female/transgender/genderqueer, heterosexual, no disability, BIPOC]

“Chronic injuries, mental health ups and downs.” [cisgender male, heterosexual, no disability, white]

#### **4.4 Discussion**

This study identified motivators and barriers to GPA in a U.S.-based sample of adults through a mixed-methods approach consisting of established quantitative scales (PALMS and Outdoor Recreation Leisure Constraints, respectively) and open-ended qualitative responses that explored motivators and barriers not addressed by the scales. In the overall sample, enjoyment and psychological condition were the highest motivators for GPA, which are similar to motivators cited in U.K.-based research (Fraser et al., 2019). Structural barriers were the most common barriers to GPA in the present study, whereas other reports in the U.S. tend to more commonly cite interpersonal barriers to GPA (The Outdoor Foundation, 2021). Qualitative analysis revealed themes outside of the scales for motivators (i.e., GPA integrated into daily life, active citizenship, mental health, and physical activity benefits) and further barriers at all levels (i.e., structural, interpersonal, and intrapersonal), as hypothesized. Differences in motivators and barriers by identity domain were also explored; overall motivators and barriers with the highest scores did not differ from the overall sample, but more nuanced differences will be reiterated below.

##### ***Gender***

Competition/ego, appearance, and others’ expectations were significantly lower for female/transgender/genderqueer people compared to cisgender males, but the biggest difference was in competition/ego (1.9 vs. 2.8 on a scale of 1-5). Psychological condition and

enjoyment were high motivators sample-wide, but were higher motivators for GPA among female/transgender/genderqueer people as compared to cisgender males. This importance of intrinsic motivators (i.e., performing a behavior because of the way it “feels” (Lox et al., 2019)) has been found comparing GPA to other types of physical activity in Norway (Calogiuri & Elliott, 2017), but may call for further investigation among genders in future research prioritizing transgender men, transgender women, and non-binary individuals in the outdoors. There were no differences between female/transgender/genderqueer and cisgender males for barrier scores, but qualitative analysis revealed specific barriers based on gender. Lack of gear availability was a structural barrier identified, and the lack of availability for plus-sized women specifically was mentioned. This structural barrier might be missed by a quantitative scale, yet is a documented barrier that some Instagram users, for example, are trying to call attention to (Stanley, 2020). Additionally, children were mentioned as an interpersonal barrier to GPA, which has been a historically-cited reason for lower GPA participation rates among female/transgender/genderqueer people. This barrier has been reflected in the lack of representation of female/transgender/genderqueer individuals in outdoor spaces (Espiner et al., 2011; McNiel et al., 2012).

### ***Sexual Identity***

There is a statistically significant difference in overall motivation score comparing LGBTQIA+ and heterosexual groups, however the scores are still meaningfully similar (3.3 vs. 3.5 on a scale of 1-5). Differences in motivators between LGBTQIA+ and heterosexual participants in this sample are similar to patterns seen between gender groups in the sample. Competition/ego, appearance, and others’ expectations were all lower motivators for LGBTQIA+ participants as compared to heterosexual participants. A sense of community and non-judgmental atmosphere have been cited as important qualities of “successful” time

outdoors in previous literature for LGBTQIA+ Girl Scouts (Argus, 2018) and these results reflect that. LGBTQIA+ participants had a higher average structural barrier score compared to heterosexual participants, which has not previously been documented in the literature. There has been an effort in the past decade to increase LGBTQIA+ representation in outdoor spaces through organizations and social media (Argus, 2018; E. B. Rogers & Rose, 2019; Whitson, 2021), though these data suggest a more in-depth exploration of what structural barriers may exist particularly for LGBTQIA+ individuals who want to engage in GPA.

### ***Disability Status***

There were no differences in motivators for GPA, but the overall barrier score was higher than the sample-wide average for people with disabilities versus people without a disability (2.0 vs 1.8 on a scale of 0-4). This is in line with existing literature; a 2007 phone survey indicated interest in visits to U.S. National Forests for outdoor recreation were similar between people with disabilities and people without, though fewer trips were actually made by people with disabilities (R. C. Burns & Graefe, 2007). A sample of 114 Canadian adults who are cancer survivors cited weather, timing and scheduling, health and energy levels, and the presence of others as barriers to an outdoor walking program (Lesser et al., 2021), though only 13 participants (around 11%) identified as having a disability. A call in the U.K. has been made to consider the varied experiences of people with disabilities to increase access to outdoor spaces (N. Burns et al., 2009), and the same should be considered in the U.S. This approach can be done on the side of outdoor spaces, but also considered for future research studies.

### ***Race and Ethnicity***

There were no significant differences in quantitatively-measured motivators or barriers when examined by BIPOC and white participants. However, qualitative themes

emerged around race and ethnicity. One idea under the theme of active citizenship is the motivation to participate in GPA to increase visibility of historically excluded identities (e.g., BIPOC, older individuals) in outdoor spaces and, on the other hand, a barrier around these spaces being dominated by white folks. Additionally, a feeling of not “fitting in” with white groups participating in GPA also emerged as a barrier. This idea of BIPOC individuals “not belonging” in outdoor spaces is not sample-specific, and is rather rooted in the history of GPA in the U.S. (Washburne, 1978; West, 1989), and stems from Indigenous people being removed from their land (Burnham, 2012; Spence, 1999), exclusion of BIPOC in parks and natural spaces (Byrne, 2012; Dorwart et al., 2019; O’Brien & Njambi, 2012; West, 1989), and safety as a barrier to outdoor physical activity for certain racial groups (Folk et al., 2021; Hornbuckle, 2021; Joseph et al., 2015). The presence of this barrier even today calls for more representation and more programming available in outdoor spaces to shift the narrative of who belongs in these spaces. If researchers are using quantitative scales to measure motivators and barriers to GPA in the U.S., these ideas may be missed.

### ***Other Considerations***

Qualitative results reveal other factors that were not explicitly explored in this study, but may be of further interest: body size and experience level. Lack of gear, extra cost of gear, and not fitting into groups are barriers that participants cite can be influenced by body size. There was also mention of a “newbie” stigma in outdoor spaces, as well as individual-level imposter syndrome and embarrassment that are barriers to participating in GPA based on experience level. There have been movements to make outdoor spaces more inclusive, particularly on social media (Stanley, 2020) that may offer inspiration for further research to look into these barriers and identities.

It is of note that physical and mental health both emerged as qualitatively-measured motivators for GPA after participants had already completed the PALMS questions, which specifically feature scale-items around about physical and psychological conditions as motivators (Zach et al., 2012). There are other questions regarding motivation for GPA that have been used in the literature, but were ultimately not used in the present study because of the more general operational definition of GPA as opposed to a specific outdoor activity (e.g., mountain biking) (Skår et al., 2008) or “adventure recreation activities” (Ewert et al., 2013). Perhaps an evaluation of the tools used to measure motivators for GPA is needed to re-examine, and potentially redefine, what physical and psychological condition entail.

### ***Strengths, Limitations and Future Directions***

Combining established physical activity motivation and barrier scales with qualitative inquiry allows for the ability to compare this sample to existing literature, as well as add context and potential additional factors to consider for professionals in the GPA realm. Additionally, the heterogeneity of this sample is a strength of the present study, particularly because of the opportunity to add motivators and barriers beyond commonly-used scales. This sample has an over-representation of female/transgender/genderqueer participants and LGBTQIA+ individuals which, while is not representative of the entire U.S. population (2022), adds perspective to the existing literature. Exploring motivators and barriers across the disability spectrum could be a focus in future research; 10.7% (the frequency in the present study) is more representation than present in the current literature, but is still an underrepresentation for the U.S. as measured by the Centers for Disease Control and Prevention (2022). The proportion of BIPOC individuals in the present study also adds to existing literature (Calogiuri & Elliott, 2017; Fraser et al., 2019), though it is an underrepresentation according to the U.S. Census (E. B. Jensen et al., 2020). A greater

representation of BIPOC and people with disabilities may be reached using different survey tools with filters (e.g., Prolific or mTurk) in the future, rather than just social media outreach. Future researchers are encouraged to report race and ethnicity identity summary statistics and, as sample diversity grows, analyze these groups separately rather than one group “BIPOC.”

Due to a smaller number of participants within identity domain groups in the present study (i.e., race/ethnicity), groups had to be combined for analyses to remain statistically appropriate (i.e., BIPOC and white instead of specific races as unique groups). As earlier stated, experiences of different identities, even those within the same identity domain, may not be the same. A larger sample size in the future will allow for these more nuanced analyses. Further, the present statistical analysis was not able to incorporate the idea of intersectionality (Collins & Bilge, 2020; Crenshaw, 2017), that is, a person may have more than one historically excluded identity that may affect their relationship with GPA differently. However, future research can use results from this study to select outcome variables related to GPA motivators and barriers appropriate to their sample (i.e., structural barriers in a sample centering participants with LGBTQIA+ identities) to perform a statistical analysis that attempts to capture the idea of intersectionality, such as the multiple hierarchy stratification perspective (Lee & Scott, 2011; Powers et al., 2020).

#### **4.5 Implications & Conclusion**

If park and recreation professionals and advocates want to work to increase the proportion of individuals in the U.S. that participate in GPA, understanding motivators and barriers are of utmost importance. Further, if efforts are to be concentrated on those who have been historically excluded from these activities, in order to encourage inclusion and equity of GPA participation specific attention should be paid to those groups’ motivators and barriers.

This study adds context of motivators and barriers in the U.S.; these can be compared to studies in different locations within the U.S. studies (R. C. Burns & Graefe, 2007; Larson et al., 2014; The Outdoor Foundation, 2021) and studies from other countries (Calogiuri & Elliott, 2017; Fraser et al., 2019). Using research to inform campaigns or programming for various outdoor spaces can allow for an informed effort to increase GPA in historically excluded groups and may allow comparison to see which efforts have been effective and which may inspire U.S.-based changes.

**Table 4-1.** Sociodemographics (N=205).

	n (%)
<b>Gender</b>	
Female	157 (76.59%)
Male	30 (14.63%)
Trans-male	2 (0.98%)
Genderqueer/Gender non-conforming	16 (7.80%)
<b>Sexual Identity</b>	
Lesbian	4 (2.0%)
Gay	7 (3.4%)
Bisexual	31 (15.1%)
Queer	17 (8.2%)
Asexual	3 (1.5%)
Heterosexual	139 (67.8%)
None of the above	4 (2.0%)
<b>Race</b>	
Black or African American	17 (8.3%)
Hispanic or Latinx	8 (3.9%)
Asian	21 (10.2%)
Native Hawaiian or Pacific Islander	1 (0.5%)
American Indian or Native American	2 (1.0%)
Mixed Race	21 (10.2%)
White	135 (65.8%)
<b>Identified Having a Disability</b>	
Yes	22 (10.7%)
No	183 (89.23%)
<b>Employment</b>	
Works full-time for pay	172 (83.9%)
Works part-time for pay	21 (10.2%)
Doesn't work for pay	7 (3.4%)
Other	5 (2.4%)
<b>Education</b>	
Attends or has completed high school	3 (1.5%)
Attends or has attended college or technical school	10 (4.9%)
Completed associate's degree or technical school	10 (4.9%)
Completed a bachelor's degree	92 (44.9%)
Attends or has attended graduate school	15 (7.3%)
Completed graduate school	75 (36.6%)
	<b>Mean <math>\pm</math> SD</b>
Age (years)	33.5 $\pm$ 9.2



**Table 4-2.** Motivation and barrier scale scores (both overall and subscales) sample-wide and ANOVA comparisons by identity domain.

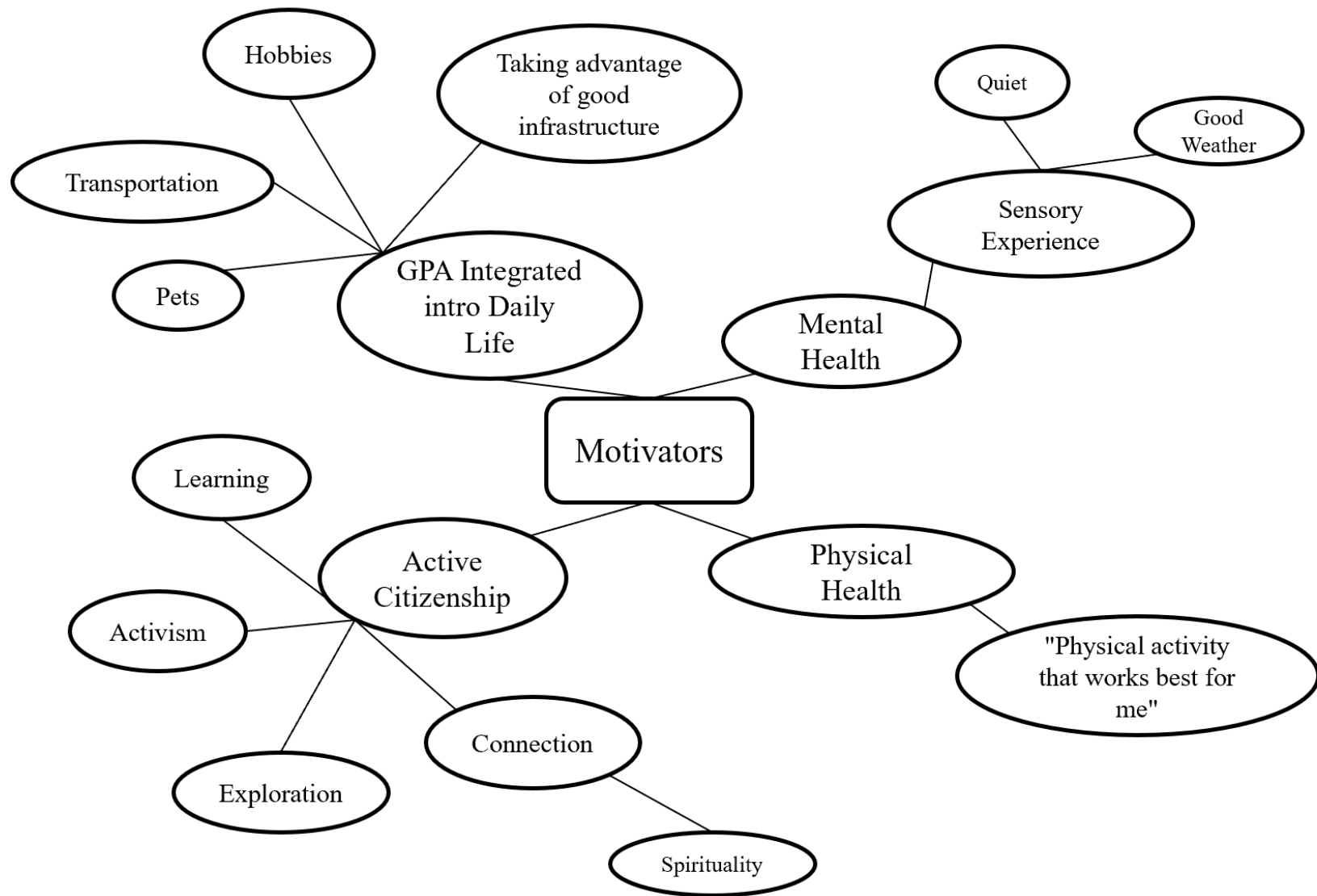
	Sample -Wide (N=205)	Gender		Sexual Identity		Disability		Race/Ethnicity	
		Female/Transgender/ Genderqueer (n=175)	Male (n=30)	LGBTQIA+ (n=66)	Heterosexual (n=139)	Yes (n=22)	No (n=163)	BIPOC (n=70)	White (n=135)
Overall Motivation Score <sup>1</sup>	3.4 ± 0.5	3.4 ± 0.5	3.5 ± 0.5	<b>3.3 ± 0.5*</b>	<b>3.5 ± 0.4*</b>	3.5 ± 0.4	3.4 ± 0.5	3.4 ± 0.6	3.4 ± 0.6
Competition/Ego	2.0 ± 1.0	<b>1.9 ± 0.9***</b>	<b>2.8 ± 1.0***</b>	<b>1.6 ± 0.8**</b>	<b>2.2 ± 1.1**</b>	1.9 ± 0.8	2.0 ± 1.0	2.0 ± 1.0	2.0 ± 1.0
Appearance	3.3 ± 0.9	<b>3.2 ± 0.9*</b>	<b>3.6 ± 0.8*</b>	<b>3.0 ± 1.0**</b>	<b>3.4 ± 0.9**</b>	3.2 ± 0.9	3.3 ± 0.9	3.3 ± 1.0	3.2 ± 0.9
Others' Expectations	3.3 ± 0.9	<b>3.2 ± 0.9*</b>	<b>3.6 ± 0.8*</b>	<b>3.0 ± 1.0**</b>	<b>3.4 ± 0.9**</b>	3.2 ± 0.9	3.3 ± 0.9	3.3 ± 1.0	3.2 ± 0.9
Affiliation	3.7 ± 0.9	3.7 ± 0.9	3.8 ± 0.9	3.5 ± 1.0	3.8 ± 0.9	3.7 ± 0.7	3.7 ± 0.9	3.8 ± 1.0	3.7 ± 0.9
Physical Condition	4.2 ± 0.6	4.3 ± 0.6	4.2 ± 0.7	4.2 ± 0.7	4.3 ± 0.6	4.2 ± 0.7	4.3 ± 0.6	4.3 ± 0.7	4.2 ± 0.6
Psychological Condition	4.3 ± 0.6	<b>4.4 ± 0.6**</b>	<b>4.0 ± 0.6**</b>	4.4 ± 0.6	4.3 ± 0.6	4.5 ± 0.5	3.5 ± 1.0	4.3 ± 0.6	4.3 ± 0.6
Mastery	3.5 ± 0.9	3.5 ± 0.9	3.7 ± 0.9	<b>3.3 ± 1.0**</b>	<b>3.6 ± 0.8**</b>	3.7 ± 0.6	4.4 ± 0.6	3.5 ± 1.1	3.5 ± 0.8
Enjoyment	4.4 ± 0.6	<b>4.5 ± 0.5**</b>	<b>4.2 ± 0.8**</b>	4.5 ± 0.6	4.4 ± 0.6	4.5 ± 0.4	3.4 ± 0.5	4.4 ± 0.7	4.4 ± 0.5
Overall Barrier Score <sup>2</sup>	1.8 ± 0.4	1.8 ± 0.4	1.8 ± 0.4	<b>1.9 ± 0.4*</b>	<b>1.8 ± 0.4*</b>	<b>2.0 ± 0.4**</b>	<b>1.8 ± 0.4**</b>	1.8 ± 0.5	1.8 ± 0.4
Structural	2.8 ± 0.6	2.8 ± 0.6	2.6 ± 0.6	<b>3.0 ± 0.6**</b>	<b>2.7 ± 0.6**</b>	2.9 ± 0.7	2.8 ± 0.6	2.8 ± 0.6	2.7 ± 0.6
Interpersonal	1.6 ± 0.6	1.6 ± 0.6	1.5 ± 0.7	1.6 ± 0.6	1.5 ± 0.6	1.8 ± 0.6	1.5 ± 0.6	1.5 ± 0.6	1.6 ± 0.6
Intrapersonal	1.4 ± 0.6	1.4 ± 0.6	1.4 ± 0.6	1.4 ± 0.6	1.4 ± 0.5	1.6 ± 0.5	1.4 ± 0.6	1.4 ± 0.6	1.4 ± 0.6

\*p<0.05; \*\*p<0.01; \*\*\*p<0.0001;

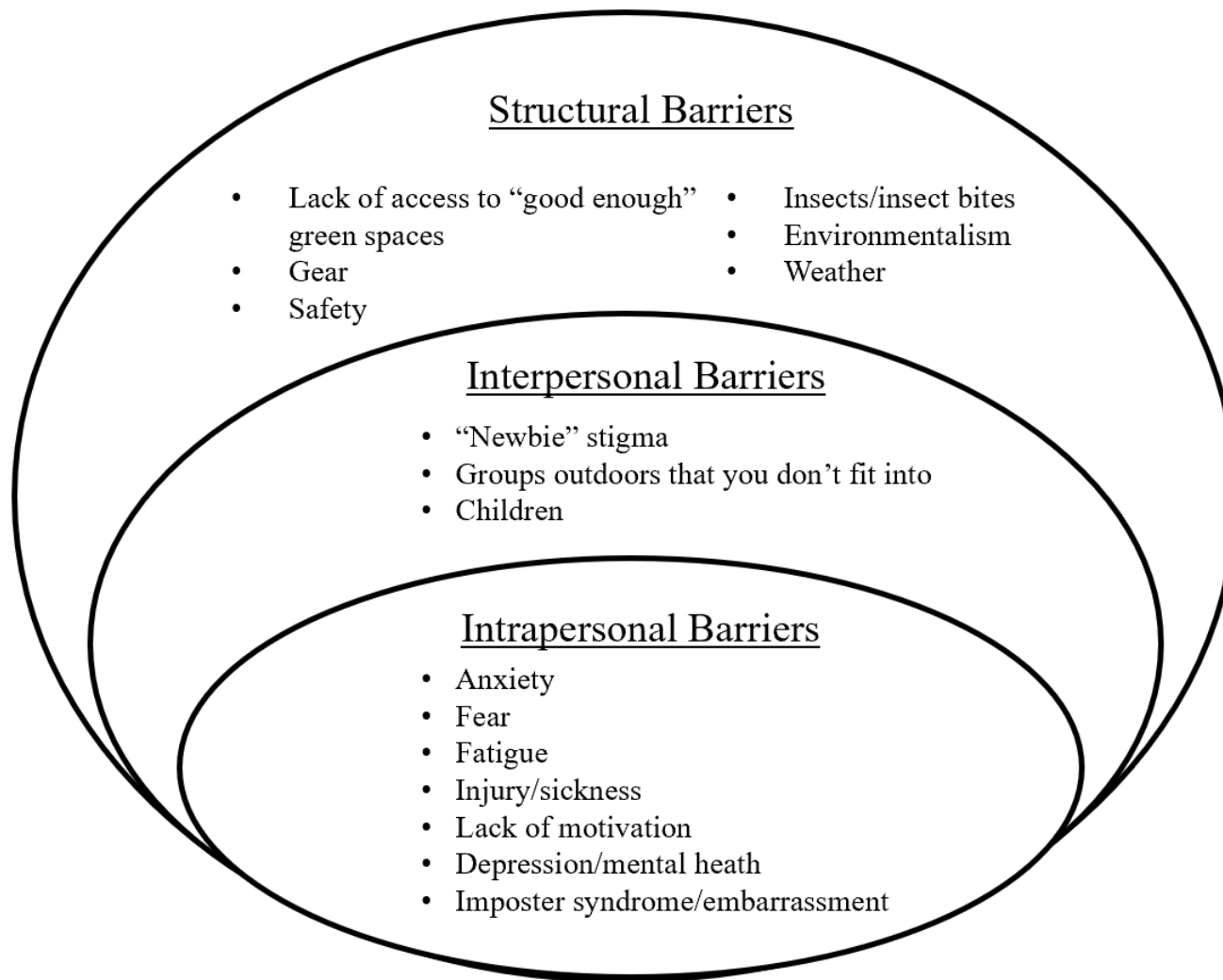
Note: Higher scores indicate higher motivation or more of a barrier, respectively;

<sup>1</sup>Motivation score scales: 1 (strongly disagree) to 5 (strongly agree);

<sup>2</sup>Barrier score scales: 0 (not at all) to 4 (very much)



**Figure 4-1.** Motivators for green physical activity identified qualitatively.



**Figure 4-2.** Barriers to green physical activity identified qualitatively.

## Chapter 5. Study Two

### Social Media: Potential Health Communication Tools to Get More People Active Outside

#### 5.1 Introduction

Social media have undoubtedly become a part of daily life for most people living in the U.S.; seven out of 10 people report ever using at least one social media site (Auxier & Anderson, 2021). Among the high rates of general use, social media platforms serve as a growing source of health information for many individuals. In 2013, 59% of U.S. adults searched online for health information in the past year (Fox & Duggan, 2013). In a more recent report surveying 1,700 adults in the U.S., 67% of the sample reported seeking healthcare information specifically on social media (Weber Shandwick & KRC Research, 2018). Physical activity is one specific health topic that a social media user has access to; 65% of adult participants in a study conducted during 2020 reported seeing physical activity information (e.g., weekly workout videos) on social media, a higher proportion than other health behavior information (i.e., diet or quality of life) (Goodyear, Boardley, Chiou, Fenton, Makopoulou, Stathi, Wallis, Veldhuijzen van Zanten, & Thompson, 2021). Further, 43% of that same participant pool indicated social media were a good source of physical activity information (Goodyear, Boardley, Chiou, Fenton, Makopoulou, Stathi, Wallis, Veldhuijzen van Zanten, Wood, et al., 2021). Physical activity information is often posted by a range of content creators, from personal trainers and athletes to “everyday” people (Raggatt et al., 2018), and in various formats including sharable and interactive memes, images, videos, and text (Goodyear, Boardley, Chiou, Fenton, Makopoulou, Stathi, Wallis, Veldhuijzen van Zanten, & Thompson, 2021).

The purpose of this paper is to describe social media use in a sample of U.S. adults interested in or currently participating in green physical activity (GPA), as well as explore associations between social media use and GPA. Findings indicate a small, but statistically significant, association between social media use and GPA; this relationship indicates the potential for social media to be used as a health communication tool for GPA behavior.

### ***A Specific Type of Health Behavior – Green Physical Activity***

GPA is a specific type of physical activity that takes place in a natural environment, defined as a location featuring trees, vegetation, local biodiversity, water features, parks, natural playscapes, community gardens, or school gardens (American Public Health Association (APHA), 2013). Benefits of GPA are still being explored but current evidence supports these benefits supersede benefits obtained with general physical activity (i.e., physical health, mental health and wellbeing (Eigenschenk et al., 2019; Thompson Coon et al., 2011)), and can lead to enhanced education and life-long learning, active citizenship, crime reduction, and social behavior (Eigenschenk et al., 2019). The APHA promotes the increase of GPA and has begun integrating GPA into discussions in healthcare settings because of the preponderance of evidence supporting its benefits on health (APHA, 2013).

A recommended amount of general physical activity is 150 minutes per week of moderate-to-vigorous intensity aerobic physical activity (e.g., brisk walking, bicycling) and two days of muscle strengthening physical activity (Physical Activity Guidelines Advisory Committee [PAGAC], 2018), however a “prescription” specific to GPA is still being explored (Jimenez et al., 2021; Koselka et al., 2019). It is unclear at this time whether a prescription would match physical activity recommendations for general physical activity in terms of intensity (i.e.,

moderate-to-vigorous) or be less intensity-based recommendation (i.e., total physical activity) (Koselka et al., 2019).

Regardless, in the U.S. disparities exist in the access to spaces to perform GPA, both in terms of physical access (Jennings et al., 2016; Kondo et al., 2018; Rigolon, 2017) and social (e.g., unwelcoming atmosphere) or emotional (e.g., feelings of “failure”) access (Das et al., 2017; Horton, 2017; Rishbeth et al., 2018). This difference in access leads to disparities in GPA behavior and health outcomes associated with it (Kondo et al., 2018; Twohig-Bennett & Jones, 2018). Despite disparities in this health behavior, statistics suggest a diverse population in the U.S. recreates outdoors (The Outdoor Foundation, 2022). However, a barrier to increasing GPA across identities is that classic print media perpetuates the idea of “outdoors” as a white, cisgender male space (Frazer & Anderson, 2018; Martin, 2004; McNiel et al., 2012).

Social media have emerged as tools for studying and increasing GPA for individuals with a variety of intersecting identities (Low et al., 2020). These online communities also provide a place where individuals can offer support to one another as they enter green spaces that were not inherently socialized as being “for them,” expanding their circle of social influence (Weatherby & Vidon, 2018). Further, social media may expose individuals to new types of activities. Indeed, during the COVID-19 pandemic, 22% of survey respondents discovered a new outdoor activity using social media (The Outdoor Foundation, 2021).

### ***Self-Efficacy for Green Physical Activity***

There is an established relationship between self-efficacy for outdoor recreation (a term used in the literature that is similar to GPA) and outdoor recreation participation (Mittelstaedt & Jones, 2009; Powell et al., 2023), as well as the ability to navigate barriers to this behavior

(Henderson et al., 1995; Hubbard & Mannell, 2001). Mittelstaedt and Jones (2009) were the first to create a self-efficacy scale with measures specific to outdoor recreation: the Outdoor Recreation Self-Efficacy scale. The main factors that seem to influence GPA behavior are affective: if the individual has fun/has a good time, feels excited and energized, feels involved, and feels a sense of enjoyment; all of these emotions seem to have a greater influence over skill-specific self-efficacy (Mittelstaedt & Jones, 2009). In a sample measuring Outdoor Recreation Self-Efficacy scale scores in 995 participants (mostly white females), self-efficacy was shown to be related to GPA both pre- and post-COVID-19 pandemic (Powell et al., 2023). While the Outdoor Recreation Self-Efficacy scale was developed in the context of an outdoor program (Mittelstaedt & Jones, 2009), social media too have been shown to influence self-efficacy for health behaviors and the Outdoor Recreation Self-Efficacy scale has yet to be applied in this context.

### ***Social Media, Self-Efficacy, & Health Behaviors***

Social media have emerged as relatively low-cost health promotion techniques for behavior changes (Korda & Itani, 2013; Moorhead et al., 2013) as they may support the four sources of self-efficacy (Kashian & Liu, 2020; Pope et al., 2019; Wang & Willis, 2018). To the authors' knowledge, no studies exploring self-efficacy and GPA have been conducted, but the effects of posting physical activity behavior on social media with self-efficacy for general physical activity behavior has been explored. One study found no statistically significant relationship between affective experiences expressed on social media and general physical activity self-efficacy (Kashian & Liu, 2020). However, the same study by Kashian and Liu (2020) found posting about exercise past performance/mastery experiences on social media is

positively related to general physical activity self-efficacy. Vicarious experiences' effects on general physical activity have been studied on physical activity-sharing specific platforms (i.e., MapMyRun); the size of the social network and amount of posting via that platform have shown to be associated with greater general physical activity (Carpenter & Amaravadi, 2019). Social persuasion on social media can be indicated by reactions to posts (e.g., liking) and supportive comments (Cavallo et al., 2014) and factors such as social support have been shown to affect self-efficacy on physical activity apps (Yang et al., 2015).

Overarchingly, the literature seems to largely focus on *posting* behavior, rather than exposure behavior regarding physical activity on social media. There is evidence that *viewing* social media content can affect self-efficacy specific to other health behaviors, such as decreasing self-efficacy for parenting (Ouvrein, 2022) and increasing self-efficacy for losing weight (Pan & Peña, 2021). This potential relationship between viewing social media, self-efficacy, and health behaviors has not been explored for GPA.

### ***Specific Aims***

Social media have emerged as health communication tools associated with GPA but use statistics in this context remain largely unreported in a diverse sample. Additionally, there is evidence that social media can affect self-efficacy for other health behaviors (Carpenter & Amaravadi, 2019; Cavallo et al., 2014; Kashian & Liu, 2020; Ouvrein, 2022; Pan & Peña, 2021; Yang et al., 2015) and evidence that self-efficacy affects GPA behaviors (Henderson et al., 1995; Hubbard & Mannell, 2001; Mittelstaedt & Jones, 2009; Powell et al., 2023). However, the relationships between social media, self-efficacy and, ultimately, behavior specifically in the context of GPA has yet to be explored. The present project serves to add to the body of research



by (1) describing social media use in a sample of people interested or currently participating in GPA, and (2) exploring associations between social media use, self-efficacy for GPA, and GPA behavior. It is hypothesized that social media use statistics will be similar to previous literature and there will be positive associations between social media use, self-efficacy for GPA, and GPA at both total and moderate-to-vigorous intensities.

## **5.2 Methods**

A Qualtrics-supported online survey was distributed in Spring-Summer 2022 to adults between the ages of 18 and 64 who lived in the U.S. To be included in the study, respondents had to currently participate in GPA or have an interest in participating. Any interested participants were excluded if they self-reported a condition or injury preventing them from being physically active. The present analysis only includes participants who reported following GPA-related social media (N=169; 82% of the full sample). This study was approved by the authors' Institutional Review Board and informed consent was obtained prior to the start of the Qualtrics survey.

### ***Sociodemographic Variables***

Participants responded to survey questions regarding their gender, sexual identity, disabilities as defined by the Centers for Disease Control (CDC, 2019), race and ethnicity, and highest level of education and employment. Age was calculated as a continuous variable by subtracting the birthdate reported on the survey from the date of the original analysis.

### ***Social Media Use***

Social Media Use (hours/week) was self-reported by participants in response to the question, "In the past week, on average, approximately how many total minutes per day have you spent using

social media (e.g., Facebook, Twitter, Instagram, Reddit, Pinterest, TikTok, or Snapchat?)”

Response options were: “less than 10 minutes a day,” “10-30 minutes a day,” “31-60 minutes a day,” “1-2 hours a day,” “2-3 hours a day,” and “3+ hours a day” coded as 5, 20, 45, 90, 150, and 225 minutes, respectively. Values were multiplied by 7 days in a week and divided by 60 minutes to calculate average hours/week of social media use so the units match GPA measures below.

Social Media Use Integration Scale (SMUIS) is a 10-item scale originally written to measure the integration of Facebook into ones’ life (Jenkins-Guarnieri et al., 2012), but was created with the intention of replacing “Facebook” with the most relevant definition of social media (e.g., specific platform) (Jenkins-Guarnieri et al., 2012). It was modified for this study by changing “Facebook” to “social media (e.g., Facebook, Twitter, Instagram, Reddit, Pinterest, TikTok, or Snapchat)” for all scale statements. Response options ranged from 1 (“strongly disagree”) to 6 (“strongly agree”). Per the scale’s scoring criteria, one statement was reverse-coded. Item responses were combined to calculate the mean of the overall scale.

### ***Green Physical Activity***

General and Green Physical Activity (hours/week) were measured using the Godin-Shepard Leisure Time Exercise Questionnaire (Godin, 2011). The Godin-Shepard Leisure Time Exercise Questionnaire contains 3 questions to assess time spent engaging in mild, moderate, and strenuous exercise during a normal 7-day period. Response options included “none,” “less than 1/2 hour a week,” “1/2 – 2 hours a week,” “2 1/2 – 4 hours a week,” “4 1/2 – 6 hours a week,” and “6+ hours a week” coded as 0, 0.25, 1.25, 3.25, 5.25, and 8 hours, respectively, in each intensity category. Total general physical activity is the sum of mild, moderate, and strenuous (or

vigorous) general physical activity. Moderate-to-vigorous general physical activity is the sum of moderate and strenuous general physical activity. Participants in the present study were also asked to specify how much of that exercise occurred outdoors where nature is central (defined as essential and important) to the experience (Lawton et al., 2017) to capture GPA. The response options and coding were the same as described above. Total GPA is the sum of mild, moderate, and strenuous GPA. Moderate-to-vigorous GPA is the sum of moderate and strenuous GPA. Outdoor Recreation Self-Efficacy Scale scores were used for GPA-specific self-efficacy. The Outdoor Recreation Self-Efficacy scale is a 17-item scale developed to understand factors that contribute most to self-efficacy of outdoor recreation activities (Mittelstaedt & Jones, 2009). Because outdoor recreation activities are included under the operational definition of “green physical activity” in this study, the term “outdoor recreation” was replaced with “green physical activity” in the survey. Ten items relate specifically to enjoyment (e.g., “When I do green physical activity I have a good time.”) and 7 items relate specifically to skills (e.g., “When I do green physical activity I believe I can succeed.”). Response options ranged from 0 (“Not at all true”) to 10 (“Very true”), with higher scores indicating higher self-efficacy. The average of all 17 items was taken to calculate a total Outdoor Recreation Self-Efficacy score. An average of the 10 affective items and 7 skill-related items was calculated to represent the Outdoor Recreation Self-Efficacy Enjoyment and Skills subscales, respectively.

### ***Analysis***

Sociodemographic variables, GPA variables, and social media variables were summarized using SAS 9.4 (SAS Institute Inc., 2013). Multiple linear regression models were used to examine associations between social media use and GPA; one model explored total GPA

and one model explored moderate-to-vigorous GPA. The models were run with or without Outdoor Recreation Self-Efficacy scores to examine differences in  $R^2$ , and thus examine which model was a better fit. For both total and moderate-to-vigorous GPA, total Outdoor Recreation Self-Efficacy scale scores (i.e., an average of all 17 items) are presented in the models (see Tables 5-3 and 5-4) because there was a higher  $R^2$  value for both GPA intensity models with Outdoor Recreation Self-Efficacy scale scores compared to the models without Outdoor Recreation Self-Efficacy scale scores ( $R^2=0.43$  vs  $0.37$ , respectively, for total GPA;  $R^2=0.39$  vs  $0.34$ , respectively, for moderate-to-vigorous GPA).

All models controlled for gender, sexual identity, disability status, race and ethnicity, education, and employment due to documented differences in GPA participation rates (The Outdoor Foundation, 2022). For analysis, gender was dichotomized as “female/transgender/genderqueer” and “cisgender male,” sexuality was dichotomized as “LGBTQIA+,” (inclusive of the response option “none of the above”) and “heterosexual,” disability status was dichotomized as “disability” and “no disability,” and race and ethnicity variables were combined into “BIPOC” and “white” categories. These distinctions were made based on groups that have been historically excluded from spaces to perform GPA and those who have not been historically excluded (Evans, 2002). The multiple linear regression analysis method also allowed for comparisons to be made between gender, sexual identity, disability status, race and ethnicity, education, and employment. Average SMUIS scores were added into both models because it is a relatively stable measure of social media use (unlike subjective hours/week) and controls for how integrated social media are in a participant’s life (Jenkins-Guarnieri et al., 2012). Additionally, percentage of total and moderate-to-vigorous physical

activity that is green was entered into the respective models to control for general physical activity behavior and more specifically isolate GPA as the outcome health behavior of interest. Percent GPA was calculated by dividing total GPA (hours/week) by total general physical activity (hours/week). This same calculation was done for moderate-to-vigorous GPA. Results were considered statistically significant if  $p < 0.05$ .

### **5.3 Findings**

Sample demographics can be found in Table 5-1. The sample ( $N=169$ ) was an average of  $33.2 \pm 9.0$  years old, 87.0% female/transgender/genderqueer, 64.5% white, 94.6% employed (at least part-time), and 90.6% had completed a bachelor's degree or higher. Descriptive GPA and social media variables can be found in Table 5-2. The average total GPA was  $5.3 \pm 4.2$  hours/week; average moderate-to-vigorous GPA specifically was  $3.8 \pm 3.1$  hours/week. The sample had mean Outdoor Recreation Self-Efficacy scores of  $8.4 \pm 1.2$  on the enjoyment subscale and  $7.9 \pm 1.5$  on the skills subscale. Finally, there was a sample-wide average of  $13.7 \pm 8.5$  hours/week of social media, with participants averaging a  $3.6 \pm 1.0$  on a scale of 1-6 for the SMUIS.

Multiple linear regression model results for total GPA and moderate-to-vigorous GPA can be found in Tables 5-3 and 5-4, respectively. In both models there was a statistically significant effect of self-efficacy for GPA on GPA in hours/week ( $p < 0.001$ ). There is a statistically significant, but small, effect of social media use on total GPA ( $p < 0.01$ ); on average, for every additional hour of reported social media use per week, participants report about 7 minutes more total GPA per week. There is also a small effect of social media use on moderate-to-vigorous GPA ( $p = 0.01$ ). For every additional hour of reported social media use per week

participants report about 5 minutes more moderate-to-vigorous GPA per week, on average. Differences in GPA were seen between gender groups; the female/transgender/genderqueer group reported participating in less GPA for both total ( $p < 0.01$ ) and moderate-to-vigorous intensities ( $p = 0.05$ , trending towards significance). There were no differences in GPA between sexual identity, disability status, or race and ethnicity groups.

#### **5.4 Discussion**

The purpose of the present study was to describe social media use in a sample of people interested or currently participating in GPA, as well as explore associations between social media use, self-efficacy for GPA, and GPA behavior (both total and moderate-to-vigorous intensity). Multiple linear regression models were used to examine these associations while controlling for sociodemographic variables (i.e., gender, sexual identity, race and ethnicity, disability status, education, and employment), SMUIS scale scores, and percentage of physical activity that is green. This paper adds to the literature by presenting descriptive statistics regarding social media use, self-efficacy for GPA, and GPA in a diverse sample of adults in the U.S. Additionally, this study used a distinct approach to provide a foundation connecting social media use, self-efficacy for GPA, and GPA.

This sample was highly active in natural spaces; their average moderate-to-vigorous GPA was  $3.8 \pm 3.1$  hours/week, which is over 150% of the recommended amount of general moderate-to-vigorous physical activity for adults on a weekly basis (PAGAC, 2018). Less than half of adults in the U.S. (47.9%) meet this general physical activity recommendation for aerobic physical activity (Elgaddal, 2022), let alone exceed it with GPA specifically. The average overall Outdoor Recreation Self-Efficacy scale score, about an 8 on a 0-10 scale, was similar to a sample

of 915 participants, who were majority white female (Powell et al., 2023). Average amount of time spent on social media in peer review literature is sparse, but the present study's average of 13.6 hours per week is on par, if not lower than consumer reports that claim adults in the U.S. spend about 2.1 hours per day on social media (GWI, 2022a). Overall SMUIS scores in the present study were similar compared to a nationally representative sample in the U.S.; on average participants reported a 3 on a scale from 1-6 (Bekalu et al., 2019). This level of routine use was positively associated with social well-being, mental health, and self-rated health in the same representative sample (Bekalu et al., 2019), which may be of interest to explore further alongside GPA in future studies.

This study found that across the sample, for every additional reported hour of social media use per week participants report about 7 minutes more total GPA per week, on average. For the same amount of reported social media use, participants report about 5 minutes more moderate-to-vigorous GPA per week, on average. While these are relatively small effects that may be written off as clinically insignificant, it is important to point out that a general social media use measure was used and not specifically GPA-related social media content use which may have tempered the findings. Additionally, it is unlikely to see a large effect on GPA solely for social media; individuals have a variety of influences on health behaviors, media-related and otherwise (de Vreese & Neijens, 2016). Nevertheless, the statistically significant results indicate further examination of GPA-specific content on social media and its effect on self-efficacy and GPA is warranted. Perhaps replicating this research in a sample with a wider range of GPA behavior (hours/week) would be helpful. Additionally, the multiple linear regression model for both total and moderate-to-vigorous GPA with Outdoor Recreation Self-Efficacy scale scores

included explained more of the variation in GPA (Eberly, 2007). While this is expected because of the documented relationship between self-efficacy for GPA and GPA (Mittelstaedt & Jones, 2009; Powell et al., 2023), the statistical significance of the relationship between social media use and GPA did not change with or without Outdoor Recreation Self-Efficacy scale scores in the multiple linear regression model. While the present analysis does not allow for causal pathways to be established, this is promising support to continue examining social media use, self-efficacy for GPA, and GPA together and potentially establish that pathway.

Differences in GPA were seen between female/transgender/genderqueer and male participants. Female/transgender/genderqueer individuals, on average, participated in 2 hours and 20 minutes less total GPA compared to cisgender males. This pattern existed for moderate-to-vigorous GPA as well; female/transgender/genderqueer participants on average participated in just under 1 hour and 15 minutes less moderate-to-vigorous GPA as compared to cisgender males. While this specific example represented high levels of GPA, these differences are clinically significant. Cisgender males are more likely to meet general physical activity guidelines (Elgaddal, 2022), but the prevalence of GPA participation is more commonly reported in the literature than total time engaging in GPA (Calogiuri et al., 2016; Elliott et al., 2018; The Outdoor Foundation, 2022). Though a similar proportion of males and females (as defined by The Outdoor Foundation (2022)) participate in GPA, time spent doing these activities may be vastly different. In this sample, female/transgender/genderqueer individuals performed less moderate-to-vigorous and total GPA in a week compared to cisgender males (3.6 hours vs. 5.2 hours and 5.0 hours vs. 7.7 hours, respectively). Time is an important component of a



prescription for GPA (Barton & Pretty, 2010), so more research is needed to investigate differences.

### ***Strengths and Limitations***

A strength of the present study is that it is rooted in a behavior change theory, specifically self-efficacy theory. Self-efficacy is a component in many behavior change theories used in health communication research (Yzer & Nagler, 2021), so this was a foundational step in the realm of social media and GPA use that can be further built upon. Secondly, it is necessary for research in this field to be conducted in diverse samples. In comparison to other studies around social media, self-efficacy for GPA, and GPA, this study was fairly diverse in terms of sexual identity, disability status, and race and ethnicity. Future research should continue to increase this diversity; some of the unexpected lack of differences in these groups may have been due to the sample size of each individual group not being large enough to elucidate differences. For example, Asian American and Black and/or African American were combined into the same “BIPOC” group and should be analyzed in separate groups if possible, as they are different identities. While there were no differences in GPA in terms of sexual identity, disability status, or race and ethnicity in this sample, this was unexpected. Overall, the larger sample of this study was a part of had low barriers to GPA (see Chapter 4: Study One) and so perhaps that is why no differences emerged. This research can be replicated in different samples of GPA participants to further explore these comparisons.

Measuring social media exposure or use is challenging; the self-report nature of the hours/week measure used in the present study lends itself to recall bias and typically inaccurately quantify time spent on social media and they tend to under-report this behavior (Andrews et al.,

2015; Lin et al., 2015). However, in addition to frequency of use, which most likely fluctuates widely over time, the present study also used SMUIS. SMUIS is seen as a more stable measure of social media use because it measures participant perceptions of the importance of and emotional connection to social media, which likely do not change as widely as frequency of use (Jenkins-Guarnieri et al., 2012). Using both self-reported social media use and SMUIS scale score in conjunction is a strength of the study because it allows for ease of interpretation of results (i.e., hours/week is more easily interpretable than a scale score) while controlling with a less volatile measure of social media use. At this time, there is a lack of a validated survey measure for general physical activity-specific exposure at the disposal of social scientists (DiBisceglie & Arigo, 2021; Liu et al., 2021; Stieglitz et al., 2018), but researchers may look to design studies to measure effects of specific examples of GPA-related social media on self-efficacy for GPA and GPA behavior. For example, they may explore more specific measures designed for a study (e.g., *how many times per day do you view GPA-related content?*) (DiBisceglie & Arigo, 2021), use ecological momentary assessment techniques to capture participants' behaviors and thoughts in the moment rather than retroactively (Bennett et al., 2020; Smyth & Stone, 2003), or may want to conduct a content analysis to understand the diffusion of ideas around GPA on social media platforms (Hornik, 2016). Additionally, as GPA prescriptions are developed and this research line continues, an objective measure of GPA (e.g., a combination of accelerometry and GPS (Maddison & Mhurchu, 2009; Rodríguez et al., 2005; Saelens et al., 2003)) may be more accurate and meaningful than a subjective measurement of GPA, which has a tendency to overreport physical activity behavior (Sallis & Saelens, 2000).

## **5.5 Conclusions and Further Research**

This study provides evidence of the role of social media and self-efficacy for GPA in total and moderate-to-vigorous GPA. Future research should seek to establish causal pathways between social media, self-efficacy for GPA, and GPA behavior. A self-efficacy measure specific to GPA that captures the four sources of self-efficacy may be beneficial, as well as exploring self-efficacy over time. While quantitative topic-specific social media measures are established, qualitative or mixed methodologies may give researchers insight as to what specific GPA-related social media content is being viewed and how it might affect self-efficacy for GPA and GPA behavior.

As prescriptions regarding GPA for health benefits develop, these results suggest health communication of all intensities of GPA is appropriate. There was a difference in GPA between gender groups; female/transgender/genderqueer individuals are performing less total and moderate-to-vigorous GPA than cisgender males. This difference in behavior must be considered and addressed as for-profit companies, non-profit organizations, or public health professionals create social media messages and campaigns to increase GPA.

**Table 5-1.** Sociodemographics (N=169).

	n (%)
<b>Gender</b>	
Cisgender Female	131 (77.5%)
Cisgender Male	22 (13.0%)
Transgender Male	2 (1.2%)
Genderqueer/Gender non-conforming	14 (8.3%)
<b>Sexual Identity</b>	
Lesbian	3 (1.8%)
Gay	5 (3.0%)
Bisexual	27 (16.0%)
Queer	16 (9.5%)
Asexual	2 (1.2%)
Heterosexual	113 (66.9%)
None of the above	3 (1.8%)
<b>Race and Ethnicity</b>	
Black or African American	13 (7.7%)
Hispanic or Latinx	8 (4.7%)
Asian	17 (10.1%)
Native Hawaiian or Pacific Islander	1 (0.6%)
American Indian or Native American	2 (1.2%)
Mixed Race	19 (11.2%)
White	109 (64.5%)
<b>Disabled</b>	
Yes	19 (11.2%)
No	150 (88.8%)
<b>Employment</b>	
Works full-time for pay	141 (83.4%)
Works part-time for pay	19 (11.2%)
Doesn't work for pay	5 (3.0%)
Other	4 (2.4%)
<b>Education</b>	
Completed high school or GED	2 (1.2%)
Attends or has attended college or technical school	8 (4.7%)
Completed associate's degree or technical school	6 (3.6%)
Completed a bachelor's degree	76 (45.0%)
Attends or has attended graduate school	13 (7.7%)
Completed graduate school	64 (37.9%)
	Mean $\pm$ SD
Age (years)	33.2 $\pm$ 9.0

**Table 5-2.** Green physical activity (GPA) and social media variables.

	Mean $\pm$ SD
General Physical Activity (hours/week)	
Moderate-to-Vigorous Physical Activity	5.8 $\pm$ 3.4
Total Physical Activity	8.2 $\pm$ 4.6
GPA (hours/week)	
Moderate-to-Vigorous GPA	3.8 $\pm$ 3.1
Total GPA	5.3 $\pm$ 4.2
% Physical Activity that is GPA	
Moderate-to-Vigorous	65.8 $\pm$ 30.4
Total	65.3 $\pm$ 27.5
GPA Self-Efficacy Overall Scale Score <sup>1</sup>	8.2 $\pm$ 1.2
Enjoyment Subscale Score <sup>1</sup>	8.4 $\pm$ 1.2
Skills Subscale Score <sup>1</sup>	7.9 $\pm$ 1.5
Social Media Use (hours/week)	13.7 $\pm$ 8.5
Social Media Use Integration Overall Scale Score <sup>2</sup>	3.6 $\pm$ 1.0

<sup>1</sup>On a scale from 0-10, with higher scores indicating greater self-efficacy;

<sup>2</sup>On a scale from 1-6, with higher scores indicating greater integration.

**Table 5-3.** Regression model results for total green physical activity (GPA).

Parameter	Beta Estimate	SE	t-value	p-value
Social Media Use	0.11	0.04	2.99	<b>&lt;0.01</b>
GPA Self-Efficacy	0.81	0.21	3.78	<b>&lt;0.001</b>
Gender <sup>1</sup>	-2.32	0.80	-2.88	<b>&lt;0.01</b>

Note: model controlled for identity variables (i.e., gender, sexual identity, race/ethnicity, disability status, education, and employment), % of general physical activity that was GPA, and social media use integration scale score;

<sup>1</sup>Reference value is cisgender male.

**Table 5-4.** Regression model results for moderate-to-vigorous green physical activity (GPA).

Parameter	Beta Estimate	SE	t-value	p-value
Social Media Use	0.08	0.03	2.51	<b>0.01</b>
GPA Self-Efficacy	0.60	0.17	3.42	<b>&lt;0.001</b>
Gender <sup>1</sup>	-1.23	0.62	-1.97	0.05

Note: model controlled for identity variables (i.e., gender, sexual identity, race/ethnicity, disability status, education, and employment), % of general physical activity that was GPA, and social media use integration scale score;

<sup>1</sup>Reference value is cisgender male.

## Chapter 6: Study Three

### “I Can Do That Too”: Green Physical Activity on Social Media

#### 6.1 Introduction

Largely white, cisgender men culturally and socially developed natural spaces as places where they could participate in outdoor recreation (Espiner et al., 2011; McNiel et al., 2012). Anybody outside of those identities participating in green physical activity (GPA), or physical activity taking place in natural spaces, is challenging that mold (Martin, 2004; McNiel et al., 2012). Throughout U.S. history, these men and the systems that uphold their “superiority” have made natural spaces more “off-limits” to female, transgender, and genderqueer individuals; the lesbian, gay, bisexual, queer, intersex, asexual, and more (LGBTQIA+) community; people with disabilities; and Black, Indigenous, and people of color (BIPOC) (Evans, 2002). This is attributable to both dominant group-generated stereotypes of historically excluded groups as “not belonging” in nature (e.g., females are too frail, passive, and emotionally unstable (Bialeschki, 1992)) and actual exclusion from nature (e.g., Indigenous tribes being forcibly removed from their land (Whitson, 2021) and National Parks and city parks barring or not welcoming BIPOC (Byrne, 2012; O’Brien & Njambi, 2012)). Despite this history, a diverse group of individuals are performing GPA, though white males remain the largest reported demographic group (The Outdoor Foundation, 2022)

Media, and advertisements in particular, are powerful tools in upholding societal stereotypes because they depict what people interpret as “reality” and show people what to expect in these spaces (McNiel et al., 2012). Advertising reflects upon images and themes found in society and can influence how viewers of those images perceive the world around them



(Martin, 2004). Thus, media serve as a gateway into shifting representation of who engages in GPA and can work to decrease the disparities that are seen in GPA participation rates by broadening the scope of examples of who engages in GPA (Martin, 2004; McNiel et al., 2012). However, the current state of GPA-related media does not move to a less white or less masculine outdoors and, rather, further these disparities. Few studies have examined GPA-related media, but those studies that have find disparities in who is represented in terms of gender, race, and ability status (Frazer & Anderson, 2018; Martin, 2004; McNiel et al., 2012); representation in media does not match participation demographics for GPA (The Outdoor Foundation, 2022).

Social media serve as platforms for communication activities and examples include online social networks such as Facebook and Instagram (Williams et al., 2014). A Pew Research Center (2021) study found that seven in ten people in the U.S. report use of at least one social media site. There seems to be no significant difference in proportion of the population that uses social media based on race or ethnicity or binary gender categories; those with higher education levels, higher household income, and urban residents tend to have higher proportions that use social media, though usage at all levels are on the rise (Perrin, 2015). Social media and users may hold power to change the narrative of the outdoors being a white, masculine space. Instagram photos and captions give historically excluded individuals the power to tell their own stories, photograph themselves in power poses (i.e., promoting dominant body language) to increase power recognition in a space where they stereotypically have none, and increase visibility in outdoor spaces (Weatherby & Vidon, 2018). A thematic analysis across 568 Instagram posts containing #womenoutdoors, #womeninadventure, or #shewentwild found this

content creates a space to construct the idea of the outdoors being a space for women to do, grow, be, and wait (Low et al., 2022). Additionally, these online communities also offer a place where individuals can offer support to one another as they enter spaces that were not inherently socialized as being “for them,” expanding their circle of social influence (Weatherby & Vidon, 2018). For example, organizations centering historically excluded identities, such as Latino Outdoors, have utilized Facebook Groups as part of their mission to bring Latino families and youth to nature (Flores & Kuhn, 2018).

### *Purpose*

Facebook and Instagram have been social media platforms that show promise in building community for historically excluded individuals from GPA. However, user-based experiences around GPA remain largely unexplored in the literature. This study addressed the following research questions:

- (1) What are participants’ experiences with GPA-related social media content they see on Facebook and/or Instagram?
- (2) How do participants use or want to use GPA-related content?

## **6.2 Methods**

### *Research Design*

An exploratory qualitative methodological orientation was used in this study (Creswell & Creswell, 2018). Qualitative methodologies allow for exploration and understanding of the meaning individuals assign to a problem through words or pictures, rather than quantitative data (Creswell & Creswell, 2018; Denzin & Lincoln, 2017). Virtual focus groups were used as the data collection method. Focus groups are a methodology that feature interaction in a group

discussion as the source of data and in which the researcher takes an active role in facilitating the group discussion (Morgan, 1996). Virtual focus groups have grown in popularity as a qualitative research tool for health-related topics (Kite & Phongsavan, 2017; Rupert et al., 2017) and are both cost-effective (Janghorban et al., 2014) and a way to bring a group of geographically diverse participants together (Halliday et al., 2021). Importantly, this method can offer a relatively safe research environment for those who may be marginalized from qualitative research (James & Busher, 2009).

### *Purposive Sampling*

Purposive sampling is used to select participants who meet specific characteristics of the population of interest and discuss a similar phenomenon (Miles & Huberman, 1994). This study's population is adults in the U.S. who experience GPA-related content on Facebook and/or Instagram. Selected individuals were all English speakers to ensure the ability to fully participate in the group discussion. Eligible participants were categorized by which platform they indicated using (Facebook, Instagram, or both Facebook and Instagram) so features potentially discussed in an individual focus group (e.g., Facebook groups; Instagram Reels) were familiar to the whole group. Participants were then grouped into "low," "moderate," and "high" levels of reported GPA, defined by sample-based tertiles of reported hours/week of GPA. Final focus group participants were randomly selected evenly across these six categories, though no focus group took place for the "low" Facebook category due to lack of interest from participants.

### *Participants*

Participants included 31 adults (age range: 21-62 years) comprised of 19 female, 7 male, and 5 genderqueer or gender non-conforming participants. Additionally, 12 participants

identified as LGBTQIA+ and 14 participants identified as BIPOC (n=2 Black and/or African American, n=3 Hispanic, n=6 Asian, n=1 Native Hawaiian or Pacific Islander, n=2 American Indian or Native American). All participants reported viewing GPA-related content on Facebook and/or Instagram and currently participate or wish to participate in GPA.

### *Focus Group Guide*

A semi-structured focus group guide was used and approached with an emergent design, allowing the moderator to slightly change questions depending on the responses of the focus group (Saldaña, 2003). The focus group guide (see Appendix B) consisted of three sections: (1) participants' histories with GPA (e.g., *Tell me about your experience with GPA.; What are some green physical activities that you want to participate in but do not currently?*), (2) GPA-related social media (e.g., *How are you using this content?; How does this content make you feel?*), and (3) what participants feel is missing from GPA-related social media (e.g., *In an ideal world, what would GPA on social media look like?*).

### *Data Collection*

The first author, trained in qualitative methodology, had extensive familiarity with the project and thus conducted the focus groups using the semi-structured focus group guide. Eight focus groups ranging in size from 2 (lower number due to scheduling challenges) to 6 participants were conducted. Focus groups took place virtually using Zoom (Zoom Video Communications, Inc., 2020) and were between 45 and 60 minutes in length. Upon focus group completion, participants were incentivized with a \$25 Tango gift card. All participants provided consent and this study was approved by the University Institutional Review Board.

### *Data Analysis*

All focus groups were transcribed using Zoom's transcription feature, edited for correctness, and then saved in word-processing documents by a research assistant. Transcripts were then imported into NVivo 12 (QSR International Pty Ltd., 2020), a qualitative data management and analysis software package. The data were subjected to inductive content analysis; two researchers categorized participant's raw quotes into lower-order and then higher-order categories (see Table 6-1), according to Patton's (2014) guidelines. The researchers immersed themselves in the data independently. When codes were misaligned, they consulted with each other to resolve conflicts and reached consensus to reduce experimenter bias and to more accurately represent participant perceptions and experiences (Patton, 2014).

Researchers attempted to increase the trustworthiness of these qualitative data through a variety of practices. Firstly, the researchers practiced reflexivity at many points throughout the research process. Reflexivity is a process of identifying and describing intersecting relationships between the participants and the researchers (Dodgson, 2019). The research questions asked and methods chosen to answer those questions were shaped by the researchers (Sparkes & Smith, 2009). Many focus group participants had one or more identities that have not only been historically excluded from GPA in the U.S. (Evans, 2002) but also excluded from research experiences (George et al., 2014). The moderator (A.L.F.) and researchers who categorized quotes (A.L.F. and S.M.G.) are white females in academia who do not understand the experiences of many of these identities. Both researchers are health communication and public health scholars who aim to decrease health disparities, increase inclusion in spaces where physical activity is performed, and dismantle structural systems that exclude and have harmed certain identity groups. Thus, their perspective in this study involves physical activity promotion

and social justice lenses. To decrease overinterpretation from the researchers and increase transferability, many direct quotes are presented in the results section (Lincoln & Guba, 1985).

Additionally, member checking, a process of checking in with participants as data were analyzed, was performed in the hopes of increasing credibility and confirmability (Lincoln & Guba, 1985). After categories were established, a summary document (see Figure 6-1) including the themes and interpretations/definitions of those themes was sent to all focus group participants. The participants were given two weeks to provide feedback on whether the interpretations were true to their experiences (Sparkes & Smith, 2009). No participants provided changes or reported feeling misinterpreted, which may indicate accuracy in interpretations. However, complete trustworthiness cannot be achieved in qualitative research (Sparkes & Smith, 2009); the lack of feedback may indicate a situation where participants were too busy, too uncomfortable, or some other experience to provide feedback. Overall, the researchers have attempted to increase objectivity and trustworthiness, but results are ultimately subjective and shaped by researcher interpretation and should be read as such (Randall & Phoenix, 2009).

### **6.3 Results and Discussion**

The data were organized into three main themes around participant (1) feelings (i.e., emotions) when viewing GPA-related content, (2) thoughts (i.e., perspectives, opinions) about the GPA-related content, and (3) perceived behaviors (i.e., actions) around using social media or influenced by GPA-related content. All three themes are further reduced into second- and third-level subthemes, presented in *italics* and *underlined italics*, respectively (see Table 6-1 for list of

themes and subthemes). All quotes are presented as seen in the transcripts and the participants' self-reported identities are presented in brackets after the quote.

## Theme 1: Feelings

### *1-1 Feelings of Inspiration*

Participants said GPA-related content gave them the feeling of inspiration; they reported feeling like they want to go do a specific GPA or go to a certain location to do their GPA. It is important to note that this feeling of inspiration is not necessarily connected to *doing* that activity, this idea only refers to feeling inspired to do so. Regardless, this feeling of inspiration has been cited in the literature as being a result of spending time in nature (Fredrickson & Anderson, 1999; Keniger et al., 2013), but focus group participants indicate that these feelings may also be invoked from viewing natural spaces on social media. Quotes that represent this second-level theme include:

“But it's kind of fun to just dream and think up like ‘Oh, if I ever go to this location, this is some place that I could go hiking’ or maybe then it turns into something on the top of my list of oh, this is now a bucket list item.” [female/transgender/genderqueer, heterosexual, no disability, white]

“I see a lot of videos with like influencers and I'm influenced by them. I see a lot of people who are like, ‘This is my trip and this how I did it,’ and I'm like, ‘Oh, I can do that too.’” [female/transgender/genderqueer, heterosexual, no disability, BIPOC]

### *1-2 Feeling Responsible for the Outdoors*

Viewing GPA-related content goes beyond making participants feel a certain way about the activity itself, and further promotes feelings of responsibility for protecting natural places where those activities take place. The literature shows GPA participation encourage sentiments of connectedness to nature (Gladwell et al., 2013), but the fact that viewing it on social media

can also cause these feelings is a powerful statement in the mission of protecting natural spaces. Participants take it a step further, though, and want to see information on *how* to be caretakers of the land in a way that is welcoming for beginners and inclusive of Indigenous people, the original inhabitants of the land (Cordell, 1990). For example:

“So I think kind of maintaining the positive attitude...the welcoming attitude can really go a long way to continue to educate others about how they can pretty easily show up and take part in green physical activity, but how they can do it in a way that's like respectful and knowledgeable and safe for everyone in the environment.”

[female/transgender/genderqueer, LGBTQIA+, no disability, white]

“Also thinking about the way that indigenous people have a tie to the land as well, and how like conversations around public lands, even parks in the city are kind of complicated and nuanced when it comes to indigenous perspectives and like what public land means, so I think I'd like to see a little more of that versus like the, like I don't know like influencer goals kind of content as well, which can kind of feel a little superficial and also doesn't quite capture maybe all of the baggage that comes with some of these activities and acknowledge people who've been left out of these spaces.”

[female/transgender/genderqueer, LGBTQIA+, no disability, BIPOC]

There are hesitations in the field around increased GPA leading to environmental degradation and greater need for search and rescue teams due to lack of knowledge (Nagle & Vidon, 2021), but participants in the present study offer these suggestions for GPA-related content creators to combat these worries.

### *1-3 Feelings of Competition & Comparison*

Feelings of competition are a common in the physical activity literature (Frederick-Recascino & Schuster-Smith, 2003; Zhang et al., 2016) and social media research is rife with social comparison effects, many of which are rooted in body image (Burke & Rains, 2019; Tiggemann & Anderberg, 2020; Zhang et al., 2016). It is unsurprising, then, that GPA-related content on social media evoked feelings of competition and comparison for participants in these



focus groups, though these feelings were based in body image, but also gear and athleticism. One participant explains it as follows:

“So I think that's kind of relative to any social media that is, because we're so involved. And just start comparing yourself like she was saying, to what clothes you're wearing, or what your body looks like, or how you perform athletically. Um, especially because a lot of outdoorsy things take a lot of physical toll, and so I think that's been a thing. It's just more the comparative side.” [female/transgender/genderqueer, heterosexual, no disability, BIPOC]

While competition in the GPA realm may have more positive effects to some extent or for certain individuals (Calogiuri & Elliott, 2017; Fraser et al., 2019; Chapter 4), some participants in these focus groups cautioned that these feelings actually dissuade them from engaging with GPA. A participant had a specific example they shared around this:

“I've seen a post about winter hiking or anything they are geared to the teeth, you know, and I just don't have that gear. So, so yeah that does have a real big impact. We were going to try snowshoeing last year and I, you know kind of flaked out because I was afraid it would be too hard and I don't think it would have been.”  
[female/transgender/genderqueer, heterosexual, no disability, white]

#### *1-4 Feeling Connected*

Social media can offer a source of community and connectedness (T. Ryan et al., 2017), and participants of these focus groups reiterated this feeling. GPA is associated with feelings of connection to others and nature (Eigenschenk et al., 2019; Gladwell et al., 2013) and this finding further supports the idea that this connectedness can be gained through social media as well (Stanley, 2020). Indeed, a rhetorical discourse analysis on three U.S. National Park Facebook accounts (Acadia National Park, Rocky Mountain National Park, and Great Smoky Mountains National Park) found that social media presentations of those parks can enhance public connectedness to them (Marcotte & Stokowski, 2021). Participants in the present study also

mentioned that GPA-related content on social media helped them connect with other people with similar historically excluded identities, as well as feel connected to the larger area and community where they saw the content take place. Two quotes reflecting this feeling are:

“And so, there's been a lot of, I would say, as far as BIPOC related outdoor content, I would argue that that's been a huge resource for lots of folks to get connected so that's a huge social media win to that that portion. I don't even know if you can get that -- those connection opportunities outside of the Facebook group.” [cisgender male, heterosexual, no disability, BIPOC]

“A couple years ago Philadelphia did something like...four outside, like almost cross country courses that were made around the city and it was almost like a challenge to do all four some time on your own over the course of an extended period...and that was like really powerful -- so that was, we did that during the pandemic and it was like a really powerful way to see other sights and really cool parts of the city that like outdoor spaces of the city that we otherwise wouldn't.” [cisgender male, heterosexual, no disability, white]

### *1-5 Feelings of Anonymity*

Whereas many participants spoke about GPA-related social media in a way that made them feel more involved, a subset of participants also brought up the feeling of anonymity around viewing GPA-related social media. They liked the idea of browsing this content, but not necessarily feeling pressured to participate in these communities on- or offline. This may make someone who feels this way using social media feel less stressed or pressured to participate, rather than the comparison discussed above, and thus increase their enjoyment of using social media. For example:

“For me when I'm on an email list I feel seen, so I feel like I have to commit to it but versus with social media, I can resume somewhat of an anonymity if I want to sign up for or not, so I like that flexibility of committing to it or not, committing to it.” [cisgender male, LGBTQIA+, no disability, BIPOC]

### Theme 2: Thoughts

The present sample of participants was very supportive of the idea that social media content is something the user must think critically about. Social media literacy (i.e., competences required to access, analyze, evaluate, and/or create social media content (Polanco-Levicán & Salvo-Garrido, 2022)) was not explicitly measured in this study, but the emergence of two higher-level subthemes indicate high social media literacy in these focus groups: (1) the process of evaluating information and (2) thinking critically about representation on social media.

### *2-1 Thoughts About Evaluating Information*

#### 2-1-1 Is it True?

One component of information evaluation important to this sample was if it is “true” or not. A large aspect of “truth” to the participants was around the idea of credible information; they were looking at a piece of content and wondering who the authority on GPA-related topics is and who might be “safe” or “trustworthy” to believe without any guidelines to who can post something on social media platforms. Some participant thoughts include:

“I’ve definitely stumbled upon videos on YouTube where someone was teaching a certain skate move and then I’ll read the comments and they’ll be like you can’t do like that, like you’re really prone to injury, blah blah. So I’ve definitely have felt that, like, ‘Oh no like who’s credible here, how do I learn this safely? Like how do I know this is the right way to do it?’” [female/transgender/genderqueer, heterosexual, no disability, white]

“So I think like there’s a lot of good that can come from this, but how do we know who to trust, when to trust, how do we know who has the right credibility, or enough credibility...right now, it just feels like the Internet is like the Wild West. Anybody could post whatever they want and yeah it could be fake but it’s on you as the consumer to look it up and like I’m sorry I’m lazy if I see it, on the Internet - I’m going to believe it until someone else tells me it’s not true, and then maybe I’ll do one Google search.” – [female/transgender/genderqueer, LGBTQIA+, disability, white]

In a study investigating the impacts of information sharers (e.g., person or figure) and sources (e.g., news outlet, website) on trust in pieces of news information found that the sharer has a large and consistent impact on trust (Sterrett et al., 2019). More research is needed on how trust is developed on social media platforms specifically regarding health information due to the wide range of sharers of content, ranging from celebrities and influencers to official health organizations (Goodyear, Boardley, Chiou, Fenton, Makopoulou, Stathi, Wallis, Veldhuijzen van Zanten, Wood, et al., 2021). A specific solution provided in the focus groups was to see more information from content creators with certifications around physical activity. But a larger idea was around providing content that explains why they should be trusted as a content creator around GPA. One quote combining both ideas is as follows:

“I would personally like to see more people with like more certifications and sharing why they're qualified that again like build that trust, so I can know like, why I should trust them or follow them or like what's their credibility.” [female/transgender/genderqueer, heterosexual, no disability, BIPOC]

### 2-1-2 Is it Relatable?

Another facet of information evaluation is if the pieces of GPA-related social media are relatable to the user, less-so in terms of identity and more-so in terms of if they could relate to a sharer's journey. Participants in the present study were interested in seeing more than just a picture of somebody participating in a GPA. They wanted to see context – including struggles, other facets of life, and the growth of a GPA journey. For example:

“But what has been personally very helpful is when they share more than just their like training, when they share like a little bit of their life -- like one of them is a mom of two and she's near the end of her running career. And just, in those moments when she places fourth or doesn't have a great race it -- not comparing myself, but it just like helps to

know that everyone has bad days.” – [female/transgender/genderqueer, heterosexual, no disability, white]

“I want to see the behind the scenes stuff you know, like. It's hard, you don't just do something awesome the first time it, you know you takes practice and you mess up a lot, and you get lost, and you get dirty.” [female/transgender/genderqueer, heterosexual, no disability, white]

Image-based social media content, much of the content on Instagram and Facebook, can provide motivation for adults to be physically active (Johnston & Davis, 2019), but a qualitative study in young adults has shown viewing selfies of general physical activity (i.e., physical activity taking place anywhere, not specifically GPA) were not viewed in a favorable light (Vaterlaus et al., 2015). The idea in the present study around wanting to see GPA in the context of “real life” can be an important aspect to explore around information evaluation and effects on behavior change in future studies.

## *2-2 Thoughts about Representation*

### *2-2-1 Be Real...That's Fake!*

Focus group participants wanted to see an accurate representation of green physical activities on social media. One component of inaccurate representation was heavy editing of the content they were seeing. Overall, the focus group participants had an awareness of the filtered reality on social media:

“I would agree because with my Facebook I follow mostly just close friends and people that I actually know in person so when they're posting things, even if it's edited I can trust that they're showing it authentically versus Instagram it's a bunch of people, strangers I follow and oftentimes like, you know what I'm saying, it's glamorized, it's hyped up, it's all overly filtered.” [cisgender male, LGBTQIA+, no disability, BIPOC]

There has been extant research on the associations between edited content on social media, peer comparison, and body satisfaction (Chua & Chang, 2016; Tiggemann et al., 2020;

Tiggemann & Anderberg, 2020) but the present findings indicate that perhaps this process of editing/filtering may have other psychological effects too. The editing (and, as participants describe it, misrepresentation) of the way a GPA looks can result in a different emotional state (e.g., disappointment) if the participants choose to engage in that GPA. This resulting emotional state has unknown effects on future GPA behavior. A specific example is presented below:

“There are a few different trails I've gone to at state parks where it's like “This is what the trail looks like!” and of course it's like when its peak fall color and the sun is shining and I'll go on a day, where it's like cloudy and gray, and maybe not as scenic or the trees aren't as nice and it's like. If I hadn't seen the picture of it before I may have still felt my experience was special or not having that bias going in I start to notice different special things around me that weren't necessarily like the most scenic shot in the place, but maybe I saw like a really cool plant or I got to see some wildlife that I wasn't expecting to see. So I think, maybe the bias that those expectations can have on what we actually perceive when we're outside” [female/transgender/genderqueer, LGBTQIA+, no disability, BIPOC]

### 2-2-2 Overcomplicating

Supporting the subtheme of representation is the idea of overcomplicating GPA on social media. Participants spoke about how GPA-related content was presented on social media; many times, they said the content made them think they could not do a specific GPA because of how it was represented. One quote that represents this idea is:

“I think a lot of times, it makes people feel like they need the really nice hiking shoes or the really nice pack or the really nice every this and that to be able to just like go out on a hike or go out on a run and enjoy the space. So I feel like I would just love to see like a little bit more of like the reality of it is you don't need all this stuff we could just like go out and find any of these trails just to make it a little bit more accessible for people.” [female/transgender/genderqueer, heterosexual, no disability, white]

This acknowledgement that GPA is often made more complicated on social media was important to the participants particularly because they thought it may prevent participation in GPA. One participant specifically expressed concern for beginners to GPA:

“People or groups that act like there's one way to bike - you have to have all this particular gear, you have to you know...just be a certain kind of person. And it doesn't feel very welcoming to beginners or to people who are just casual you know about it, or just. Any - they're not welcoming, it doesn't feel welcoming to pretty much everybody.”  
[female/transgender/genderqueer, LGBTQIA+, no disability, BIPOC]

One barrier to participation in GPA in general is not having enough information (The Outdoor Foundation, 2018), yet social media have been shown to be effective at exposing individuals to new green physical activities (Outdoor Industry Association, 2021). However, if these activities are not being represented as accessible, social media users are likely not benefiting from this content. This effect could be especially harmful as individuals with historically excluded identities show interest in engaging in GPA.

### 2-2-3 Dismantling White Supremacist Structures

White, cisgender men and the systems that uphold their “superiority” (e.g., classic print media) have historically excluded certain identities (e.g., gender minorities, people of color) from outdoor spaces (Evans, 2002). Social media are tools that can expand the definition of who is somebody who engages in GPA (Low et al., 2020; Stanley, 2020; Whitson, 2021). Participants in the present study agreed with this idea that social media can be used in the fight to dismantle these structures rooted in white supremacy:

“I also like to see the intersection of like body positivity, like I've seen people who are, who might consider themselves plus-sized like being really experts at mountain biking and launching their old clothing lines and that's pretty cool. And also like being more

inclusive of, kind of like you mentioned Climbing in Color groups, seeing those influencers who are kind of reshaping or not reshaping, but like expanding the stereotype of what of the kind of people who do physical exercise.”

[female/transgender/genderqueer, LGBTQIA+, no disability, white]

There has been some literature which suggests social media are working to increase representation of one group in particular: young and conventionally attractive white women (Castro & Pini, 2022; Marcotte & Stokowski, 2021; Stanley, 2020). It is important moving forward to create more space on these platforms for LGBTQIA+ people, people with disabilities, and BIPOC individuals. Additionally, the focus group participants also grappled with the realities of trying to dismantle such a structure on a social platform where racism and hate speech are prevalent (Matamoros-Fernández & Farkas, 2021). One participant is heavily involved in community building on social media and shared this specific example:

“For...communities that we're trying to engage and based on sometimes the delicate nature of those conversations based on race and accessibility and anti-blackness and all the type of delicate conversations that it's -- I sometimes wish I could, it's almost like a I want to grow the Community, but I also don't want it to necessarily be accessible to everybody to just put in their hot takes on, on things, and then spend mental energy having to then like moderate really difficult conversations and, and deal with educating people who are probably by largest trolling or just looking to cause trouble.” [cisgender male, heterosexual, no disability, BIPOC]

While it is promising that participants think social media can work against the white supremacist thought that the outdoors and GPA “belong” to white, cisgender men (Espiner et al., 2011; Evans, 2002), this focus group result emphasizes the need for historically excluded groups to be able to do it in a way that protects their safety. Despite racism present in these spaces, there is evidence of Instagram being used as a platform to create advocacy and political agitation for Indigenous people in Australia (Carlson, 2021), however the onus of creating safer spaces should



not be placed on the user and could perhaps be a more structural change to social media platforms themselves.

### Theme 3: Perceived Behaviors

The final theme is around the behaviors participants perceive to take place as part of their GPA-related experience on social media. No behaviors were explicitly measured as a part of the study, so are presented as “perceived” behaviors although the participants spoke about their own behavioral experiences. Five groups of behaviors emerged under this overarching theme, including (1) actively following GPA-related content, (2) using social media for information, (3) behaviors being socially influenced, (4) GPA-related content in general working to remove gatekeeping, and (5) creating content.

#### *3-1 Actively following Green Physical Activity-Related Content*

##### *3-1-1 Curating Social Media Experience*

Most focus group participants talked about the process of actively choosing to follow GPA-related content, rather than just happening upon it on their feeds. They spoke about shaping their social media feeds to match their interests, almost in contrast to the feeling of not having control over obscure social media algorithms (Gillespie, 2014; Hunter et al., 2018). In shaping their social media experience to match their interests, they experience the added benefit of being reminded of those interests in their day-to-day life, when they may not be able to engage in a GPA. In turn, these reminders actually may mirror some of the benefits of engaging in the activity itself which may be of large benefit to those who may have less access to GPA in their everyday lives, for reasons ranging from challenges such as lack of time (The Outdoor

Foundation, 2021) or systemic barriers around availability of natural spaces (Byrne, 2012; O'Brien & Njambi, 2012; Whitson, 2021). One participant put it this way:

“I'd say for me, though it was more about like filling my social feeds with very intentionally, with like things that I enjoy as opposed to maybe a following - I don't know. Maybe like more generic stuff. So for me it's more about like the stress relief of um. Yeah, being reminded of green physical activity, like even in my week, when I'm, I might not be getting outside as much.” [female/transgender/genderqueer, LGBTQIA+, no disability, white]

Beyond solely activity interest, participants choose to curate the messaging surrounding GPA-related content as well. Participants spoke of curating their feeds through controls to mute chosen material (e.g., Pages, topics) on Instagram (Meta, n.d.-c) and Facebook (Meta, n.d.-b) to ensure their feeds are spaces that protect their mental health. For example:

“You can put in specific phrases that you can block, I think it's supposed to like limit the amount of content that you're fed in theory about that specific topic. So that's something that I've like definitely actively done and then also making sure that I am like adding in people who are like trying to break those narratives that sometimes I'll get sucked back into.” [female/transgender/genderqueer, heterosexual, no disability, white]

### 3-1-2 Seeking Diverse Accounts

Focus group participants also focus on *who* is sharing GPA-related content on social media, beyond just what and how they are sharing that content. Participants wanted to see content creators that shared some aspect of their own identity participating in GPA. In a country where the media has largely perpetuated the idea that GPA is an activity “belonging” to white, cisgender men (Frazer & Anderson, 2018; Martin, 2004; McNiel et al., 2012) the idea that participants could actively follow content creators on social media that fall outside of that stereotype was crucial. Two quotes that display this idea are below:

“I think one thing I didn't mention before is like in terms of accounts I follow like I try to follow accounts revolving around like queer people outdoors and people of color outdoors as well, because I feel like, especially in the US, the predominant like outdoorsy culture kind of portrays like this very like white skinny person, usually cis like out in nature, or even like for other activities like biking, for example, is very much like a cis-white male culture.” [female/transgender/genderqueer, LGBTQIA+, no disability, BIPOC]

“Especially trying to find athletes and people of underrepresented -- historically underrepresented marginalized identities, I think has been really important to me, to make sure I'm like filling my feed with people I'm not necessarily talking to every day and that's been really exciting and cool to get to know people.”  
[female/transgender/genderqueer, heterosexual, no disability, white]

It is important to note that this behavior is not exclusive to people with a historically excluded identity seeking out content creators that share that piece of their identity. This behavior was also true for participants that did not share those same historically excluded identities with content creators. Participants acknowledged how hard they had to work to achieve this representation on their feed, though, and wished this were a more mainstream process supported by social media platforms, speaking once again to how Instagram and Facebook were not supporting representation to focus group participants' expectations. One participant spoke about their experience seeking more diverse accounts and said:

“And I think that summer of 2020 like a lot of racial justice pieces came onto my feed from people I was already following and I realized like how not diverse my feed was. And I talked with some teammates, and some friends, and some people I went to grad school with that work in DEI [*ed: Diversity Equity and Inclusion*] spaces and I was like, “Okay, I think this is a problem.” That like I'm working in conservation education and trying to increase diversity, equity, and inclusion in the outdoors but I don't follow half of these creators that I'm talking about like I am part of this problem. So I really made a conscious effort when we weren't allowed to do anything else to diversify my feed, even if it didn't have to do with outdoor recreation.” [female/transgender/genderqueer, LGBTQIA+, disability, white]

### *3-2 Using Social Media for Information*

Social media is widely used in the U.S. and internationally (GWI, 2022a), so ready access to GPA-related information can be a powerful tool for historically excluded populations who may not have had exposure to this information otherwise. Participants in this study spoke about three ways they sought information on social media: (1) being exposed to new activities, (2) learning about them, and (3) planning to do them.

#### *3-2-1 Exposure to New Activities*

The most passive way participants spoke about GPA-related information on social media was exposure to a new GPA. Participants in the present study may have already been part of a group or have already been using some of the practices around shaping their social media experience, as described above, so more exploration is needed into how this exposure may affect a social media user who is not already thinking about GPA (Korda & Itani, 2013). Regardless, participants shared examples of how they were exposed to activities (e.g., foraging, birdwatching) they had not even considered:

“It helps a lot in knowing more about the green activities, for sure definitely opens our eyes.” [cisgender male, heterosexual, no disability, BIPOC]

“So yeah it was just it was just kind of you know stumbled upon this group, it turned out to be a great group and I've learned about different things mostly from their posts.” [female/transgender/genderqueer, LGBTQIA+, no disability, BIPOC]

#### *3-2-2 Learning*

Content on social media can serve as a way to learn about health behaviors one is already interested in (Fox & Duggan, 2013; Goodyear, Boardley, Chiou, Fenton, Makopoulou, Stathi, Wallis, Veldhuijzen van Zanten, & Thompson, 2021), and the present study indicates that the

same is true for GPA. One barrier to GPA is that there are oftentimes specialized equipment or skills involved (Shores et al., 2007) and participants cited social media as a way to learn about them. For example:

“I would rather for me to try something new, be by myself and so like if there was like if the page has like links to like here's like how to learn how to do it, or like areas, you can go to or where you can buy stuff. Or like videos on how to do it, that that would to me would be most beneficial.” [cisgender male, LGBTQIA+, no disability, white]

“The first thing I thought of was like foraging accounts. I think, just a couple that I follow. One of them, I took some foraging classes from last year in the cities. But I like to learn new plants so I enjoy seeing like what's edible and learning to identify new plants while I'm just looking at my phone.” [female/transgender/genderqueer, LGBTQIA+, no disability, BIPOC]

An important caveat to the idea of learning green physical activities on social media is that not all participants agreed that would be a comfortable starting point for them. Some participants spoke to the value of an original experience offline and then following up with more learning on social media for a next step. One participant put it this way:

“And so, if I ever were to visit her, I think then I would just kind of pick up what I needed, and then, you know, have all her friends or family, or whoever kind of just teach me and learn. And then I could probably go back on social media be like, okay. So I got the basics. Now, what's next? So I think that's how I look at it.”  
[female/transgender/genderqueer, heterosexual, no disability, BIPOC]

### 3-2-3 Planning

Beyond learning about how to do a GPA on social media, participants also spoke to the resources available on social media that helped them plan a GPA. Planning is an important aspect that can take GPA from a thought to a completed behavior, so participants were

encouraged that GPA-related content can help fill in some of those gaps and lead to them completing GPA. Some specific ways they use social media include:

“And I think at least once a week I'm always trying to find something on Facebook for the following the upcoming weekend to see, to do you know, because I like to have my Saturday or Sunday doing something that's a bit more constructed and in a group.”  
[cisgender male, LGBTQIA+, no disability, BIPOC]

“I think that that has been really incredibly helpful as I, you know a rookie hiker and enjoying hearing people's feedback and it's helped me decide like what trails to do and how to change, you know, my choices for the day based off of, you know, what the conditions are liking what how things are looking that day.”  
[female/transgender/genderqueer, heterosexual, no disability, white]

### *3-3 Experiencing Social Influence*

#### *3-3-1 Creating Social Connections*

The social aspect of social media held particular weight for participants when they were discussing GPA-related content. Social media are designed for interactivity between users centered around user-generated content (Carr & Hayes, 2015) and can create communities (Stanley, 2020). Participants indicated that these ideas were present in GPA-related spaces on social media. For example:

“I follow specifically Geek Girl Strong, who is a fitness instructor and then she organizes like monthly walks among other things, so that -- her content, a lot of it is outdoors but by yeah joining her Patreon and then her Discord I now follow like a lot of the other people that follow her because we kind of are a little online community.”  
[female/transgender/genderqueer, LGBTQIA+, no disability, white]

“So on social media, definitely, you know it's the place where you kind of like you know meet different kind of like-minded people, people who love what you love to do as well, so when, when it comes to social media you're, we can actually you know meet different kinds of people who are like minded, so you all can like you know just form a little bit of

group and you just go on that path that you love, so I think it's a pretty good platform for me.” [cisgender male, heterosexual, no disability, white]

### 3-3-2 Modeling

Modeling is the idea that individuals can observe somebody they see as a role model completing an activity and, in turn, have increased self-efficacy (i.e., situation specific self-confidence (Bandura, 1986)) that they can also complete that activity (Lox et al., 2019). This term is one the researchers applied to participant explanations, but participants were giving examples of modeling without explicitly using that language. Two participant quotes that reflect this are:

“When I see one of my friends do something I'm like ‘Oh, can I like, I could do that too.’ Like that's achievable for me. Whereas sometimes where I see professional accounts I'm like -- I don't have the money for that, I don't have the transit for that, and I'm not, I don't have the time. Like, I can't plan all this,” [female/transgender/genderqueer, heterosexual, no disability, BIPOC]

“I find it to be very inspiring because it's usually like someone doing this like badass track at the skate park and then I'll like try to like learn it because I'm so inspired by it.” [female/transgender/genderqueer, heterosexual, no disability, white]

Modeling has different effects based on how connected a person feels to the “role model” (Yzer & Nagler, 2021), so further exploration as to how this relationship changes based on different content creators may be of interest. This is especially important when thinking about how historically excluded populations are experiencing modeling for GPA-related social media.

### 3-3-3 Taking Activities Offline

Beyond the social media platforms working as they have been designed to create social connections and view other people participating in GPA, participants took social influence to the next level of being influenced to actually participate in GPA. One way this was achieved is

through social connections coming together offline to do GPA together in a way that influenced the focus group participants to join. Participants gave examples of communities gathering in person:

“For me, mostly like I'm part of a biking group, and so you know I like. I like to find out about rides and stuff and you know, try and join those when I can - group rides.”  
[female/transgender/genderqueer, LGBTQIA+, no disability, BIPOC]

“So there's a queer surf group that will have like a local meetup and it's like okay we're meeting up in Santa Barbara or in San Diego or San Francisco and we're going to have surf lessons and we're gonna, kind of like bringing community together and also offering kind of entry points.” [female/transgender/genderqueer, heterosexual, no disability, white]

### 3-3-4 Motivation to Do Green Physical Activity

Many participants spoke about the ability of GPA-related content to motivate them to participate in GPA. It is important to note that this subtheme is different from the feeling of inspiration introduced earlier in this paper; to be included in this subtheme participants had to feel inspired or motivated and then actually report they followed up by participating in GPA. There is a myriad of motivators for participating in GPA (Calogiuri & Elliott, 2017; Fraser et al., 2019; Chapter 4), so further exploration as to what specific role social media can play in motivation may be of interest. For example, what are the specific sources of motivation? The answer may shape the effect on motivation and, ultimately, GPA behavior. Some ways participants were motivated to do GPA include:

“I was just gonna say I think I use it in the Instagram feed like as motivation to do my regular workouts by not following a lot of professionals.”  
[female/transgender/genderqueer, LGBTQIA+, no disability, white]

“Well, I think it's motivating. I think it reminds me to like get out and do things and it encourages me to try and seek it out more. Especially if it's like a cool vacation or



someone's in a National Park.” [female/transgender/genderqueer, heterosexual, no disability, white]

“It motivates me to try new green physical activities too.”

[female/transgender/genderqueer, heterosexual, no disability, white]

### *3-4 Removing Gatekeeping*

Access to GPA has been gatekept in several ways throughout history. Historically excluded groups have been socially and/or physically kept from spaces to participate in GPA (Bialeschki, 1992; N. Burns et al., 2013; Washburne, 1978; West, 1989), and partly as a result of this there are many knowledge and access barriers to GPA that exist to this day (The Outdoor Foundation, 2018). Focus group participants identified ways that GPA-related social media content can work to amend this gatekeeping, including spreading informational content, expanding physical access to resources, and creating inclusive spaces for people who have one or more of these historically excluded identities to exist in community around GPA.

#### *3-4-1 Informational Content*

The first way social media can take steps to remove gatekeeping around GPA is by providing informational content. As discussed earlier, participants use social media for information-seeking to either learn about GPA or help create plans for GPA. They believe that informational content can actively work to remove gatekeeping in a number of ways, one of which is to share events and information (e.g., advice). Overall, participants agreed that it would be best to present GPA-related informational content in a way that is relatable, accessible, and realistic. Two participant examples include:

“Sometimes I use Facebook and just like go on their events page and specifically type in like outdoor fitness event type things. And that's where I found a trail run at Lebanon Hills not too long ago to go on, so that is one avenue that I actually use for more like very

localized to find like actual things to do in the very near future.”  
[female/transgender/genderqueer, heterosexual, no disability, white]

“I’m on a couple groups for gardening and it’s more informational, it’s what other people are doing some sometimes there’s experts in the groups that can give you information that you didn’t know you needed until you read it.” [female/transgender/genderqueer, LGBTQIA+, no disability, white]

Another specific example of how informational content on social media can remove gatekeeping is through gear recommendations. GPA can be costly and the expense around gear is a major documented barrier to participation (The Outdoor Foundation, 2021). Earlier, it was presented that participants wish there was less overcomplication of GPA on social media; they have experienced specific examples of the way they would like this information presented on social media. For example:

“These people that feel like real people and they’re giving genuine reactions of products, whether it’s positive or negative. Like I will say I think this lady that I’m thinking of [*ed: @immrsspacecadet*] she’s only had one pair of shorts that doesn’t ride up in the crotch and then they’re like \$75 Lululemon shorts and I’m like okay. I will pay 75 bucks if, like that is true. I’m glad she posts the negative stuff of like yeah Nike sent me these for free. Let’s go on a run and see how long they last and she didn’t even leave the driveway and they were already riding up and I was like okay good I’m not gonna spend 50 bucks on Nike shorts that don’t work.” [female/transgender/genderqueer, LGBTQIA+, disability, white]

“Miranda in the Wild - I love her so much, and she’s so fun, and so it can kind of get like more tutorial based so like she’ll tag a lot of gear and talk about it, what it’s good for, what you could opt for.” [female/transgender/genderqueer, heterosexual, no disability, BIPOC]

### 3-4-2 Sharing Physical Resources

Participants stressed that an even more effective way of removing gatekeeping is by sharing physical resources to do a GPA because they are another contributor to the cost barrier of GPA (The Outdoor Foundation, 2021). This is hard to do solely on social media, but participants

had examples of how they have seen social media as part of the strategy to remove this barrier to GPA. Not only were participants learning about group meetups, like explained above, but non-profit organizations and other groups were using social media to advertise events with a specific focus on sharing equipment that participants would have otherwise missed. Beyond just the event, participants liked to see content (or continuation of the discussion) regarding where equipment could be purchased with budgetary considerations in mind. Two participant quotes are presented below:

“Or they provide the equipment, I know I did a fat tire biking event and they had the fat tire bikes right there, so you could just get them free and you know follow the loop, they have a guide to help you out, so I like that.” [female/transgender/genderqueer, heterosexual, no disability, white]

“But again, also it's just the, for me is the accessibility and exposure to it because I want to try something, but I want to drop a grand on a canoe that I'm just gonna use once. So like that, BIPOC Outdoors is supplying the materials for, and so you can kind of like just going to taste of it if you want more. then you know they can hook you up with like places to go to like buy things at, on a budget or something.” [cisgender male, LGBTQIA+, no disability, BIPOC]

### 3-4-3 Inclusive Spaces

Complementary to the earlier-explored idea of social media being used to form community around GPA, participants specifically mentioned the benefits of inclusive spaces (i.e., spaces where an identity is shared *or* beginner status is welcomed) to remove gatekeeping around GPA. There were examples participants shared around Instagram, but they largely agreed that Facebook makes these spaces more tangible because the platform has a specific layout for them (i.e., Facebook Groups). Participants liked the idea of not only sharing identities with members of the group, but also that those groups were beginner-friendly to remove gatekeeping in GPA. One participant stated:

“So yeah. I mean this this, this biking group that I'm part of they're...like you know it's for this, um, it's mostly femme, trans, BIPOC people and they're like super welcoming they - if you have just like the question that you might think is really kind of dumb? They don't make you feel like, ‘Well that's kind of a dumb question, man. That's a simple dumb question.’ Versus some groups might kind of, you might give people chiming and make you feel like, ‘Well that's a basic question, you should know the answer to that. That it shouldn't be something you should be having to ask about.’ You know?”  
[female/transgender/genderqueer, LGBTQIA+, no disability, BIPOC]

While participants agreed that these spaces do already exist on social media as it is today, they also brought up the point that these spaces can be difficult to find if you are not already familiar with them or connected with a member. Participants would like to be able to take a more active role in finding these spaces, as described below:

“I don't want to go to a group that only has men and it's me and only men or you don't see that many fat people doing it like this is cool so I'm not really like considered in this space, so I think being able to do it with people who I connect with would be really cool and if there is a way to have that kind of organized so that you could find those a little bit easier, because I've mostly just kind of stumbled on them like through other people, I think that would be cool.” [female/transgender/genderqueer, heterosexual, no disability, white]

### *3-5 Creating Content*

Many of the higher- and lower-level subthemes under the theme of perceived behaviors have to do with behaviors during or after viewing GPA-related content. However, focus group participants also spoke about behaviors surrounding adding their own GPA-related content. Participants explained they liked to add their own content for two main reasons: (1) to add representation to GPA-related social media and (2) to use social media as a memory of past GPA. Participant quotes explaining these ideas are presented below:

“I'm also trying to show people that - at least those in Minneapolis that we have access here and like this is a trailer like to go to look, you can come here and run this beautiful trail and it's right in the middle of the city or anything like that, so I also do it for

promotional efforts as well.” [female/transgender/genderqueer, heterosexual, no disability, white]

“I also like posting like me on my bike or me going for bike rides and talking about my experience. Because again like the bike community here too is very cis white male and so I have had people reach out to me to connect about like being a femme biker, queer biker through doing that, and so I like being like ‘Hi I am here, I do this thing.’”

[female/transgender/genderqueer, LGBTQIA+, no disability, BIPOC]

Posting content to add representation is one solution to combat the earlier-explained thoughts around wanting to see more representation in GPA-related content. Additionally, using social media as a record of times people have participated in GPA in the past may have its own behavioral implications. Past performance is a source of self-efficacy (Bandura, 1977) and having a record of this past performance readily accessible to an individual on social media may impact self-efficacy (Kashian & Liu, 2020). For example:

“Social media can be used as a way to like preserve your memories of physical activity you done or like a wonderful time in nature and like I often find myself, looking back at old posts of mine like, ‘Oh, I remember that!’ And like feeling the joy come back up so it's definitely like a memory photo booth, digital photo booth, which is nice – a photo album.” [female/transgender/genderqueer, heterosexual, no disability, white]

However, one thought around GPA-related content creation is important for all, but particularly for the safety of historically excluded groups. Participants spoke about concern for their safety about posting GPA – a particular challenge of location-based social media content (Haffner et al., 2018). One participant explained it as follows:

“So I don't really want people knowing like where I'm hiking all the time, especially when you know, I always post things after the fact, but um you know, like I find some cool stuff from my house like I'm not posting that exact location, because I don't want people to know where I live. And I guess this fear of personal safety does dominate a lot of what I do and where I go.” [female/transgender/genderqueer, heterosexual, no disability, white]

## 6.4 Summary

The present study aimed to answer (1) what are participants' experiences with GPA-related social media content on Facebook and/or Instagram and (2) how they use (or want to use) GPA-related content. Results indicate that GPA-related social media content seems to elicit some of the same feelings as GPA itself (e.g., responsibility for the outdoors, connectedness) (Gladwell et al., 2013). Participants supported the idea that GPA-related social media content can teach people both *about* green physical activities and *how* to do them in a way to protect natural spaces, a concern in the industry (Nagle & Vidon, 2021). This is a powerful use of social media, particularly for groups that have been historically excluded from GPA. Participants stated that creating communities for beginners and historically excluded groups can also help facilitate this learning behavior. However, participants stress that this is not something that is necessarily facilitated by social media platforms and instead they must work to shape their social media experience, dismantle white supremacist behaviors and structures perpetuated on social media, and remove gatekeeping around GPA. There are examples of these sentiments succeeding on social media generally (Daniels, 2009; Robertson, 2021) and inside GPA-related spaces (Flores & Kuhn, 2018; Stanley, 2020) and social media platforms should work to make this content more readily accessible.

### *Strengths, Limitations, and Future Directions*

There are many strengths of the present study. Firstly, this study used a distinct approach to explore participant experiences around viewing GPA-related social media content. The use of a qualitative methodology allowed for exploration and understanding around this type of content in participants' own words. The recruitment of historically excluded identities (i.e., gender

minority, non-heterosexual, and BIPOC participants) from the GPA realm was prioritized in order to work towards a more even balance both in who is being represented in GPA, but also who is being represented in GPA-related research. The researcher in charge of recruitment for this study (A.L.F.) spent time building relationships with social media-based and in-person groups for historically excluded identities (e.g., chatting with moderators/organizers, belonging to the groups) instead of just posting a flyer for recruitment. However, there were time constraints on how long the researchers were able to spend time with the groups where recruitment occurred for the study; future researchers should continue to prioritize this relationship-building process.

This study also has limitations. All participants in the present study had to already participate or at least be interested in GPA. These findings may not be generalizable to individuals who are not interested in GPA. Regardless, GPA-related content on social media and the present study's results *may* have the ability to help increase a sense of responsibility about the environment which may be an area of future exploration, particularly as our world learns to adapt to climate change. Another limitation of the present study was that participants had a relatively high social media literacy, that is, competencies required to access, analyze, evaluate, and/or create social media content (Polanco-Levicán & Salvo-Garrido, 2022). Participants were well aware of algorithms shaping their social media feeds, different intent around monetized content, and the vast array of types of content creators on social media. Thus, these results may not be generalizable to those who do not have experience with critically thinking about social media content.

Future studies may work to address some of the listed limitations, namely exploring the topic of GPA-related social media content in participants who do not currently participate or want to participate in GPA. It is crucial to understand how GPA-related social media can act as a health communication tool in order to increase diversity in GPA participants. In addition, it is important to note that these results may change depending on community specifics (e.g., participants mentioned Facebook groups available in the Pacific Northwest area, but not areas on the East Coast). The present study provides a U.S.-based foundation of experiences with GPA-related social media content, which is important as many laws and public health efforts can affect GPA and social media content. This study can also provide a framework for state- (e.g., state park social media accounts) and local-level (e.g., a non-profit working with a specific group in a local community) research that may also benefit historically excluded groups' GPA experiences on social media. By examining nationwide and more local communities simultaneously, researchers may enact changes on both levels to ultimately increase GPA.

## **6.5 Conclusion**

Study results provide evidence that social media content offers to be a promising tool to increase GPA behavior, but participants also seem to support the idea that just posting GPA-related social media content cannot be the only tool. Multiple groups can work together to make GPA more equitable, both on and off social media. Organizations using social media to promote GPA can use the results of the present study to inform their social media campaigns (e.g., provide “how-to” content, prioritize creators with historically excluded identities). At the same time, media scholars can use qualitative findings to inform quantitative, behavior change studies to further explore how GPA-related social media content can influence GPA (e.g., increasing



self-efficacy, the role of behavior change readiness in this relationship). Finally, social media platforms should continue to improve policies and social media features that prioritize historically excluded group safety (e.g., location-sharing, eliminating hate speech) and be more transparent and critical about their algorithms, particularly how they may perpetuate white supremacist structures.

**Table 6-1.** Themes and subthemes regarding green physical activity (GPA) related social media.

Overarching Theme
Higher-level Subtheme
Lower-level Subtheme
Theme 1: Feelings
1-1 Feelings of Inspiration
1-2 Feeling Responsible for the Outdoors
1-3 Feelings of Competition and Comparison
1-4 Feeling Connected
1-5 Feelings of Anonymity
Theme 2: Thoughts
2-1 Thoughts about Evaluating Information
2-1-1 Is it True?
2-1-2 Is it Relatable?
2-2 Thoughts about Representation
2-2-1 Be Real... That's Fake!
2-2-2 Overcomplicating
2-2-3 Dismantling White Supremacist Structures
Theme 3: Perceived Behaviors
3-1 Actively Following GPA-Related Content
3-1-1 Curating Social Media Experience
3-1-2 Seeking Diverse Accounts
3-2 Using Social Media for Information
3-2-1 Exposure to New Activities
3-2-2 Learning
3-2-3 Planning
3-3 Experiencing Social Influence
3-3-1 Creating Social Connections
3-3-2 Modeling
3-3-3 Taking Activities Offline
3-3-4 Motivation to do GPA
3-4 Removing Gatekeeping
3-4-1 Informational Content
3-4-2 Sharing Physical Resources
3-4-3 Inclusive Spaces
3-5 Creating Content

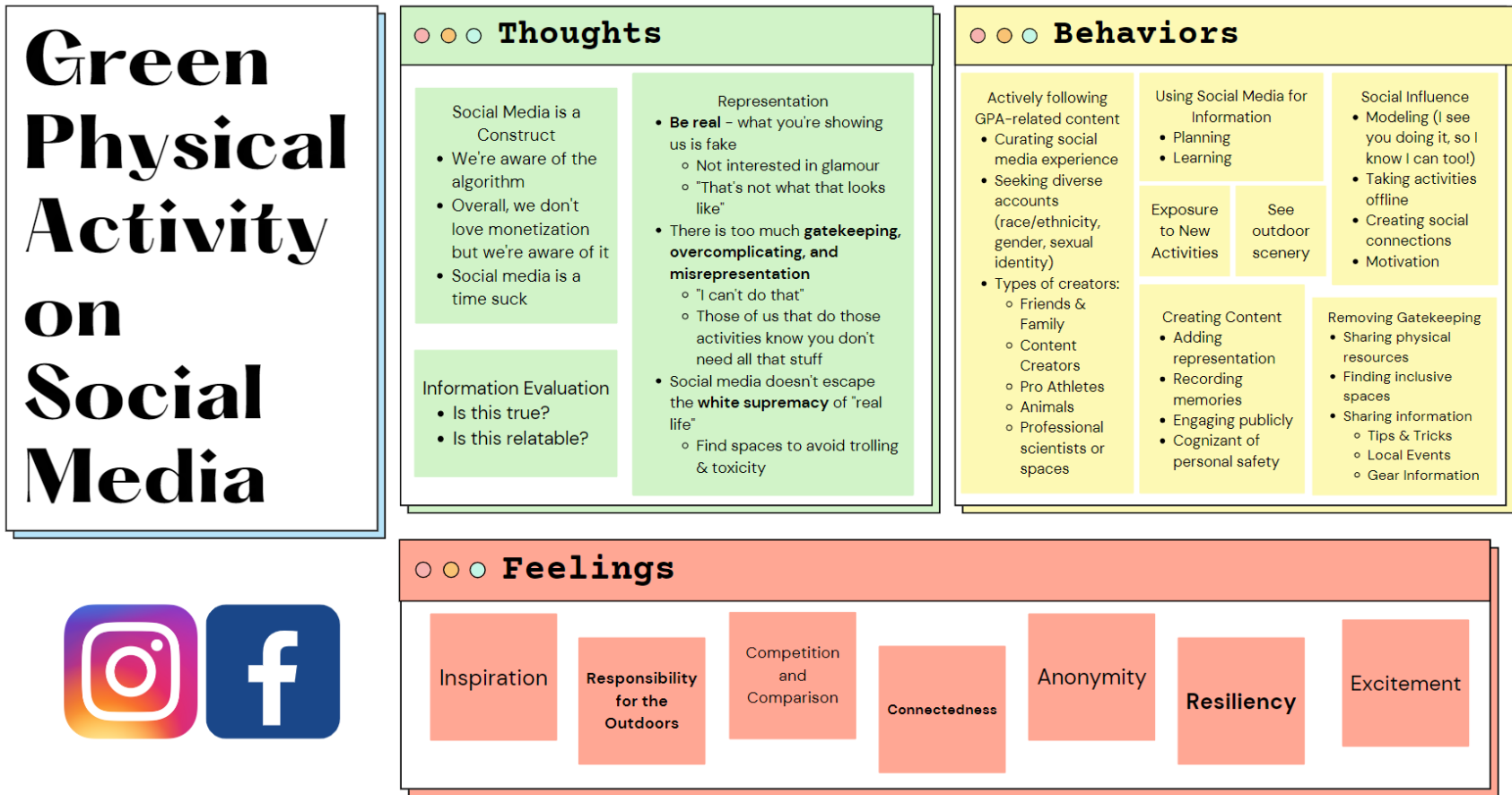


Figure 6-1. Member checking document sent to focus group participants.

## Chapter 7. Conclusion

The current dissertation aimed to add to the literature regarding green physical activity (GPA), social media use, and GPA-related social media content featuring a diverse U.S.-based sample of adults. **First**, cross-sectional survey data were collected from participants to quantify their GPA behavior, motivations for GPA, barriers to GPA, and social media use behaviors. **Second**, semi-structured qualitative focus groups were conducted in a subsample of participants to give participants the opportunity to discuss their experiences with GPA-related social media content on Facebook and/or Instagram. This chapter will outline three minor changes that occurred during the research process; highlight results across Specific Aims 1, 2, and 3; and end with an overall conclusion for the dissertation.

### 7.1 Minor Changes to Dissertation

Before discussing the results of each specific aim of the dissertation project, it is important to note minor changes that were made from the original proposal aims and methodology, which have been updated in Chapters 2 and 3 of this dissertation. These changes were based on (1) lessons learned during the research process and (2) an effort to make the research experience better for participants.

**First**, the original dissertation proposal suggested the use of The Outdoor Foundation's (2022) participation statistics to serve as recruitment benchmarks in order to ensure recruitment of diverse populations. Historically excluded identities were still oversampled (i.e., female/transgender/genderqueer, LGBTQIA+, people with disabilities, and BIPOC) but no official "quotas" were established a priori after a discussion of the importance of intersectional feminism influence in this dissertation study. Other intersectionality scholars have discussed the

shortcoming of using quotas in intersectional research – multiple facets of an individuals' identity rather than one shape a person's experience (Celis et al., 2014; Hancock, 2007; Mügge & Erzeel, 2016), so basing quotas off of one identity domain (in the proposed case, race and ethnicity) went against this concept.

**Second**, based on previous literature (Fraser et al., 2019), a combination of two measures were originally proposed to query participant motivation for GPA: the Physical Activity and Leisure Motivations Scale (PALMS) (Molanorouzi et al., 2014) and an additional seven questions developed around motivation specific to mountain biking (Skår et al., 2008). Ultimately, only the PALMS was used for increased ease of interpretation (i.e., one measure for motivation versus multiple measures) and to ease participant burden slightly, as the PALMS is already 40 questions. Using PALMS allowed for an overall understanding of multiple types of motivation for GPA (as opposed to what the 7 items would have offered) but was already long enough without the 7 additional items.

**Third** and finally, it was proposed that phase two focus groups would be grouped by identity domain (i.e., gender, sexual identity, disability status, and/or race and ethnicity). However, they were instead grouped based on two criteria: (1) which social media platform with which they view GPA-related content (i.e., Facebook, Instagram, and both platforms) and (2) how much GPA they reported participating in relative to other participants (i.e., separated into “low,” “medium,” and “high” participation tertiles based on sample-wide statistics). These two classifications allowed for familiarity of social media platform features (e.g., Facebook Groups, Instagram Reels) among focus group participants, as well as grouping participants by the level of

their GPA participation to better stimulate discussion and equally involve participants based on more similar life experiences (Krueger & Casey, 2000).

## **7.2 Summary of Specific Aims**

Specific Aims 1, 2, and 3 were addressed in Chapters 4, 5, and 6 respectively. Specific Aims are presented below, along with a summary of results.

***Specific Aim 1: a) Assess sample-wide motivations and barriers for GPA using validated scales and open-ended responses, and b) examine potential differences in motivations and barriers by identity domain.***

The hypotheses attached to Specific Aim 1 were tested by summarizing sociodemographic variables, motivation scale scores (overall and subscale), and barrier scale scores (overall and subscale). One-way ANOVAs compared differences in motivation and barrier scale scores by identity domain variables (i.e., gender, sexual identity, disability status, and race and ethnicity). Open-ended motivation and barriers were organized into themes. The results and answers were provided in Chapter 4 (Study One). Study findings provided evidence that motivations and barriers may differ by some, but not all, identity domains.

Female/transgender/genderqueer participants and LGBTQIA+ participants reported being less motivated by competition and ego compared to cisgender males and heterosexual participants, respectively. Additionally, LGBTQIA+ participants reported higher structural barriers (i.e., facilities are too crowded) than heterosexual participants and people with disabilities reported higher overall barrier scores compared to people without disabilities. Outside of quantitative scales, participants identified four motivators (i.e., GPA integrated into daily life, active citizenship, mental health, and physical health) and barriers at each level (i.e.,

structural, interpersonal, and intrapersonal), indicating that validated scales may be missing motivators and barriers experienced by historically excluded groups.

***Specific Aim 2:* a) Describe social media use in a sample of people interested or currently participating in GPA, and b) explore associations between social media use, self-efficacy for GPA, and GPA behavior.**

The hypotheses attached to Specific Aim 2 were tested by first summarizing sociodemographic variables, GPA variables, and social media variables for a subsample who follow GPA-related content on social media. Multiple linear regression models were used to examine associations between social media use and GPA (both total and moderate-to-vigorous), while controlling for % of general physical activity that was green, identity domains, education, and employment. Self-efficacy for GPA and Social Media Use and Integration Scale (SMUIS) scores were also included in models to examine associations with GPA. The results and answers were provided in Chapter 5 (Study Two). Study findings provide evidence that, when taking into account self-efficacy for GPA and SMUIS scale score, there is a small but statistically significant effect of social media use (hours/week) on both total and moderate-to-vigorous GPA (about 7 and 5 minutes more GPA per additional hour of social media use).

***Specific Aim 3:* Explore experiences with GPA-related social media content on Facebook and/or Instagram and how participants use/want to use GPA-related social media content.**

The hypotheses attached to Specific Aim 3 were explored using qualitative data collection to describe participant experiences with GPA-related content on social media. The results and answers were provided in Chapter 6 (Study Three). Participants reported several thoughts, feelings, and perceived behaviors around viewing GPA-related social media content.

Results provide evidence that GPA-related social media content may elicit some of the same feelings as GPA (e.g., responsibility for the outdoors (Gladwell et al., 2013)), can teach users about green physical activities (and, further, *how* to do them), and create community for historically excluded groups.

### **7.3 Conclusion**

This dissertation builds on previous research, adds foundational evidence, and offers several opportunities for further research. Results from this dissertation build on previous literature assessing motivators and barriers for GPA (Calogiuri & Elliott, 2017; Fraser et al., 2019; The Outdoor Foundation, 2018, 2022) by providing sample-wide motivators and barriers for a relatively diverse sample in the U.S. and highlighting the need to understand differences in both by identity domain to increase GPA behavior. It also provides foundational evidence that GPA-related content on social media may play a role in GPA participation in a way that can include and prioritize historically excluded populations. This work was conducted in individuals who already participated in GPA or wanted to do so; it can be replicated in a sample uninterested in GPA to evaluate if these results are consistent among that population.

Further analysis of differing motivations and barriers or experiences with GPA-related social media by identity domain would benefit from a larger overall sample size to allow for identity-specific differences to emerge. For example, the relationship Indigenous people have with GPA is likely shaped by a longer and different history with natural spaces in the U.S. compared to Black and/or African Americans (Dorwart et al., 2019; Whitson, 2021); however, due to small group size within identity domain, both of these races were combined into a “BIPOC” group, which loses nuance of these relationships. A larger overall sample, as well as



recruiting with tools such as Prolific or mTurk, which allow for more targeted recruitment as compared to social media may be useful. This variety in sample may also allow for an analysis centered in intersectionality (Collins & Bilge, 2020; Crenshaw, 2017; Hancock, 2007); perhaps a participant that has one historically excluded identity has a different relationship with GPA compared to somebody with two or more historically excluded identities. Using a multiple hierarchy stratification perspective, for example, aims to quantify intersectionality effects (Powers et al., 2020), which would also benefit from a larger sample size.

In addition to a larger sample size, the next steps in this line of research would benefit from a more thorough investigation of what “GPA-related social media content” is. Future research directions include conducting a content analysis informed by present focus group findings to understand what specific GPA-related content users are seeing on a social media platform like Instagram. A better identification of content would be of value to corporations, non-profit organizations, and public health efforts that center GPA. The small, but statistically significant quantitative association between social media use, self-efficacy for GPA, and GPA behavior itself can be further explored through a theory-based, quantitative project also informed by the present focus group results to delve deeper into this relationship. Instead of depending on participant recall, perhaps an ecological momentary assessment technique can be used (Bennett et al., 2020) to better capture thoughts, feelings, and behaviors around GPA in the moment.

In conclusion, this dissertation provides a foundation for an interdisciplinary team to increase GPA participation in and representation of historically excluded identities. This dissertation and identified further directions can be implemented on a nationwide scale to

support efforts to increase GPA (American Public Health Association, 2013) in a way that prioritizes historically excluded groups. Similar research approaches can simultaneously guide more community-level (e.g., a more local non-profit or state parks) focus on increasing GPA in their own communities. Social media content creators at both levels can (e.g., National Parks, local GPA-related organizations) use this dissertation's results to effectively shape their messaging and content to ensure each community in the U.S. is being represented and supported in their efforts to increase GPA.

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## Chapter 9. Appendices

### Appendix A

Measurement scales and items included in quantitative survey

<i>Measure</i>	<i>Items</i>	<i>Scoring</i>
<b>Sociodemographic Variables</b>		
Age	What is your birth date? (MM-DD-YYYY)	
Socioeconomic Status	<p>1. What is the highest level of education you have completed?</p> <p>a) Attends or has attended high school  b) Completed high school or GED  c) Attends or has attended college or technical school  d) Completed an associate’s degree in college or completed technical school  e) Completed a bachelor’s degree in college  f) Attends or has attended graduate school  g) Completed graduate school</p> <p>2. Do you:</p> <p>a) Work full-time for pay  b) Work part-time for pay  c) Not work for pay  d) Other</p>	
Gender and Sexual Identities	<p>1. What is your current gender identity?</p> <p>a) Male  b) Female  c) Trans male/trans man  d) Trans female/trans woman  e) Genderqueer/Gender non-conforming  f) Different identity (please specify):</p> <p>2. Do you identify as:</p> <p>a) Lesbian  b) Gay  c) Bisexual  d) Asexual  e) Two-Spirit  f) Queer  g) Straight or heterosexual  h) none of the above</p>	
Ability (CDC, 2019)	1. Are you deaf, or do you have serious difficulty hearing?	

	<p>a) Yes b) No</p> <p>2. Are you blind, or do you have serious difficulty seeing, even when wearing glasses? a) Yes b) No</p> <p>3. Because of a physical, mental, or emotional condition, do you have serious difficulty concentrating, remembering, or making decisions? a) Yes b) No</p> <p>4. Do you have serious difficulty walking or climbing stairs? a) Yes b) No</p> <p>5. Do you have difficulty dressing or bathing? a) Yes b) No</p> <p>6. Because of a physical, mental, or emotional condition, do you have difficulty doing errands alone such as visiting a doctor's office or shopping? a) Yes b) No</p>	
Race/Ethnicity	<p>1. Do you think of yourself as: a) White b) Black or African American c) Hispanic or Latinx d) Asian American e) Native Hawaiian or other Pacific Islander f) American Indian or Native American g) Other</p>	
<b>GPA Variables</b>		
Godin-Shepard Leisure Time Exercise Questionnaire	1, 3, 5. Considering a 7-day period (a week), how many times on the average do you do	G-S two-week test-retest



<p>(Godin &amp; Shephard, 1985)</p>	<p>the following kinds of exercise for more than 15 minutes during your free time?</p> <p>a) Strenuous exercise (heart beats rapidly) (i.e., running, jogging, hockey, football...)</p> <p>b) Moderate exercise (not exhausting) (i.e., fast walking, baseball, tennis, easy bicycling...)</p> <p>c) Mild exercise (minimal effort) (i.e., yoga, archery, fishing from riverbank...)</p> <p>2, 4, 6. Of those times you did that type of exercise, how many of them were in natural spaces?</p>	<p>reliability coefficient = 0.74</p>
<p>Physical Activity Leisure and Motivation Scale (PALMS) (Molanorouzi et al., 2014; Zach et al., 2012)</p> <p>*Modified for GPA</p>	<p>Why do you currently participate in or want to participate in GPA?</p> <ol style="list-style-type: none"> <li>1. To earn a living</li> <li>2. Because it helps me relax</li> <li>3. Because it's interesting</li> <li>4. Because I enjoy spending time with others</li> <li>5. To get better at an activity</li> <li>6. Because I perform better than others</li> <li>7. Because I get paid to do it</li> <li>8. To do activity with others</li> <li>9. To better cope with stress</li> <li>10. Because it helps maintain a healthy body</li> <li>11. To define muscle, look better</li> <li>12. To be physically fit</li> <li>13. Because it makes me happy</li> <li>14. To get away from pressures</li> <li>15. To maintain physical health</li> <li>16. To improve existing skills</li> <li>17. To be best in the group</li> <li>18. To manage medical condition</li> <li>19. To do my personal best</li> <li>20. To do something in common with friends</li> <li>21. Because people tell me I need to</li> <li>22. Because it acts as a stress release</li> <li>23. To improve body shape</li> </ol>	<p>1 (strongly disagree) 2 3 4 5 (strongly agree)</p> <p>Cronbach's <math>\alpha</math> = 0.79</p>

	24. To obtain new skills/activities 25. Because it's fun 26. Because it was prescribed by my doctor 27. To work harder than others 28. Because it keeps me healthy 29. To compete with others around me 30. To talk with friends exercising 31. To keep current skill level 32. To improve appearance 33. To improve cardiovascular fitness 34. Because I enjoy exercising 35. To take mind off other things 36. To lose weight, look better 37. Because I have a good time 38. To be with friends 39. To be fitter than others 40. To maintain trim, toned body	
Outdoor Recreation Self-Efficacy Scale (Mittelstaedt & Jones, 2009)	When I do outdoor recreation activities... 1. I have a good time 2. I get excited 3. I have fun 4. I feel energized 5. I am really involved in what I am doing 6. I have a sense of enjoyment 7. I feel a sense of accomplishment 8. I feel a sense of achievement 9. I feel a sense of challenge 10. I am able to choose the activity 11. I feel competent 12. I feel skilled 13. I feel confident 14. I feel capable 15. I feel that I am successful 16. I feel adequate 17. I believe I can succeed	0 (Not at all true) 1 2 3 4 5 6 7 8 9 10 (Very true)  Cronbach's $\alpha$ 's = 0.95 1-10; 0.94 11-17
Outdoor Recreation Leisure Constraint Survey (Hubbard & Mannell, 2001; Raymore et al., 1993; D. D. White, 2008)	<u>Intrapersonal</u> 1. I'm too shy to start a new leisure activity 2. I am more likely to do a new leisure activity that my family would think is alright 3. I am unlikely to do a new leisure activity that makes me feel uncomfortable 4. I am more likely to do a new leisure activity that my friends thought was alright	1 (Not at all) 2 3 4 5 (Very Much)  Cronbach's $\alpha$ = 0.89

	<p>5. I am more likely to do a new leisure activity that is in keeping with my religious beliefs</p> <p>6. I am more likely to do a new leisure activity that doesn't make me feel self-conscious</p> <p>7. I am more likely to do a new leisure activity that doesn't require a lot of skill</p> <p>8. I am afraid of getting hurt by animals</p> <p>9. I have a lack of interest</p> <p>10. I don't feel welcome</p> <p>11. I am afraid of getting hurt by other people</p> <p>12. I have a lack of information</p> <p>13. I don't have the skills or physical ability</p> <p><u>Interpersonal</u></p> <p>1. The people I know live too far away to start a new leisure activity with me</p> <p>2. The people I know usually don't have time to start a new leisure activity with me</p> <p>3. The people I know usually have enough money to begin a new leisure activity with me</p> <p>4. The people I know usually have too many family obligations to start a new leisure activity with me</p> <p>5. The people I know usually know what new leisure activities they could do with me</p> <p>6. The people I know usually don't have enough skills to start a new leisure activity with me</p> <p>7. The people I know usually don't have transportation to get to a new leisure activity with me</p> <p><u>Structural</u></p> <p>1. I am more likely to do a new leisure activity if the facilities I need to do the activity are not crowded</p> <p>2. I am unlikely to do a new leisure activity if I have other commitments</p> <p>3. I am more likely to do a new leisure activity if I have transportation</p>	
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	<p>4. I am more likely to do a new leisure activity if I know what is available</p> <p>5. I am unlikely to do a new leisure activity if the facilities I need to do the activity aren't convenient</p> <p>6. I am unlikely to do a new leisure activity if I don't have time</p> <p>7. I am more likely to do a new leisure activity if I have money</p> <p>8. It is too expensive</p>	
<b>Social Media Variables</b>		
<p>Social Media Use Integration Scale (Jenkins-Guarnieri et al., 2012)</p>	<p>1. I enjoy checking my social media.</p> <p>2. I feel disconnected from friends when I have not logged into social media.</p> <p>3. I would like it if everyone used social media to communicate</p> <p>4. I would be disappointed if I could not use social media at all</p> <p>5. I get upset when I can't log on to social media</p> <p>6. I prefer to communicate with others mainly through social media</p> <p>7. I don't like to use social media*</p> <p>8. Social media plays an important role in my social relationships</p> <p>9. Using social media is part of my everyday routine</p> <p>10. I respond to content that others share using social media</p> <p>*reverse coded</p>	<p>1 (Strongly disagree)</p> <p>2</p> <p>3</p> <p>4</p> <p>5</p> <p>6 (Strongly agree)</p> <p>Cronbach's <math>\alpha = 0.914</math></p>
<p>Following GPA-Related Content</p>	<p>1. Do you follow GPA-related content on the following social media platforms:</p> <p>a) Facebook</p> <p>b) Instagram</p> <p>c) Other</p>	

## **Appendix B**

Aim 3 focus group guide.

### **Introduction:**

Thanks for agreeing to participate in this discussion today. My name is Amanda and I'm a PhD student at the University of Minnesota. This discussion is part of my dissertation study to better understand how social media plays a role in your green physical activity (GPA). Today, I'll ask you questions about GPA and social media to hear your experiences and perspectives.

Our discussion will last about 60 minutes. We will not take a formal break, but if you need to leave the session for a few moments, please feel free to do so at any time.

I will be recording the session because I don't want to miss anything you say. All of the comments will be confidential and no one will hear the recording except for myself and a member of the research staff transcribing this discussion. Please raise your hand if you are not okay with the audio recording of this conversation. Also, because we are recording, please speak one at a time. You will have a participant ID number and we won't use any names in any reports.

Before we get started let's go around and get to know everyone a bit. When I call your name, please share one thing that you currently like to do outside! I'll start; my name is Amanda and I like to paddle board on the lakes in Minnesota.

[We will take turns and let you introduce yourself.]

Thanks for sharing a little about yourself.... now let's get started with the discussion, keeping just a few guidelines in mind:

There is no right or wrong answer to these questions.

I am interested in how you feel and think, so please feel free to share your point of view, even if it differs from what others have said. Whatever is mentioned in this room must not leave this room so that everyone may feel they can speak freely.

One thing to remember is though I am going to be asking questions, please don't feel like you have to only respond directly to me. If you want to follow-up on what someone else has said, go ahead. I am hoping the questions that I ask will lead to a conversation between everyone in the call.

### **Main Content:**

Before we get started talking about specifics I would like to ask, what activities do you consider green physical activity – regardless of if you currently participate in them or not?

## History with GPA

Tell me about your experience with GPA.

*Prompting example: Was GPA a part of your life growing up? In what ways?*

What are some activities, if any, you WANT to participate in but don't right now?

*Follow-up: Why you don't participate in them now? What would increase your likelihood to participate in them?*

## GPA-related Social Media Content

In the survey, you indicated that you experience GPA-related social media on either Facebook or Instagram – what are you seeing or how are you using this content? Share some examples.

*Prompting example: Facebook group, REI's account, etc*

How does it make you feel?

How did you get involved with GPA on social media?

*Follow-up: If you actively seek out GPA-related social media content, why?*

## What is Missing from GPA-Related Social Media

In an ideal world, what would GPA on social media look like?

*Prompting Examples: who would be posting the content or resources? What would the content and/or resources focus on, what or who would they include, etc.? What would be the purpose of the content and/or resources?*

How would you use GPA social media if it were presented in the ways noted in the previous question?

## **Closing Matter:**

Okay. I am finished with the questions that I had to ask you. Think about everything that we had talked about today – green physical activity, social media, etc. – is there anything you'd like to add that we might have missed?

Thanks for your help! You'll hear from me again after all of my group discussions are finished with a summary of what everybody talked about. You'll also hear from me at the email you provided me for a \$25 gift card specifically for this group discussion, in addition to what you already received for the survey you filled out. Thank you so much for helping me with this research!

## Appendix C

Subscale details for modified Physical Activity and Leisure Motivation Scale (PALMS) and modified Outdoor Recreation Leisure Constraint Survey.

Motivations Scale – Modified Physical Activity and Leisure Motivation Scale (PALMS)	Competition/Ego	Because I perform better than others.
		To be the best in the group.
		To work harder than others.
		To compete with others around me.
		To be fitter than others.
	Appearance	To define muscle, look better.
		To improve body shape.
		To improve appearance.
		To lose weight, look better.
		To maintain a trim, toned body.
	Others' Expectations	To earn a living.
		Because I get paid to do it.
		To manage medical condition.
		Because people tell me I need to.
	Affiliation	Because it was prescribed by my doctor.
		Because I enjoy spending time with others.
		To do activity with others.
		To do something in common with friends.
		To talk with friends exercising.
	Physical Condition	To be with friends.
		Because it helps maintain a healthy body.
		To be physically fit.
		To maintain physical health.
		Because it keeps me healthy.
	Psychological Condition	To improve cardiovascular fitness.
		Because it helps me relax.
		To better cope with stress.
		To get away from pressures.
		Because it acts as a stress release.
	Mastery	To take my mind off other things.
To get better at an activity.		
To improve existing skills.		
To do my personal best.		
To obtain new skills/activities.		
Enjoyment	To keep current skill level.	
	Because it's interesting.	
	Because it makes me happy.	

		Because it's fun.
		Because I enjoy exercising.
		Because I have a good time.
Barriers Scale – Modified Outdoor Recreation Leisure Constraint Survey	Intrapersonal	I'm too shy to start a new green physical activity.
		I am more likely to do a new green physical activity that my family would think is alright.
		I am unlikely to do a new green physical activity that makes me feel uncomfortable.
		I am more likely to do a new green physical activity that my friends thought was alright.
		I am more likely to do a new green physical activity that is in keeping with my religious beliefs.
		I am more likely to do a new green physical activity that doesn't make me feel self-conscious.
		I am more likely to do a new green physical activity that doesn't require a lot of skill.
		I am afraid of getting hurt by animals.
		I have a lack of interest.
		I don't feel welcome.
		I am afraid of getting hurt by other people.
		I have a lack of information.
		I don't have all the skills or physical ability.
	Interpersonal	The people I know live too far away to start a new green physical activity with me.
		The people I know usually don't have time to start a new green physical activity with me.
		The people I know usually have enough money to begin a new green physical activity with me.
		The people I know usually have too many family obligations to start a new green physical activity with me.
		The people I know usually know what new green physical activities they could do with me.
		The people I know usually don't have enough skills to start a new green physical activity with me.



		The people I know usually don't have transportation to get to a new leisure activity with me.
	Structural	I am more likely to do a new green physical activity if the facilities I need to do the activity are not crowded.
		I am unlikely to do a new green physical activity if I have other commitments.
		I am more likely to do a new green physical activity if I have transportation.
		I am more likely to do a new green physical activity if I know what is available.
		I am unlikely to do a new green physical activity if the facilities I need to do the activity aren't convenient.
		I am unlikely to do a new green physical activity if I don't have time.
		I am more likely to do a new green physical activity if I have money.
		Green physical activity is too expensive.