

Riverine Identity: Investigating Whitewater Paddlers' Connectedness to Nature

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Abstract

The goal of this study was to determine if a whitewater paddler's connectedness to nature was impacted by their skill level. This study also sought to identify the emotional mechanisms associated with the relationship between skill level, days spent paddling, or years spent paddling and their connection to nature. Participants ($n=389$) answered demographic questions and responded to Susan Clayton's *Environmental Identity Scale* and three qualitative questions that focused on the emotional trends that paddlers experience. Beyond skill level, the demographics of years spent paddling and days spent paddling collected. Results showed that skill level did not impact connectedness to nature. The other variables were then analyzed to determine if they impacted connectedness to nature. Days spent paddling per year was found to positively impact connectedness to nature, as people who paddled more than 50 days a year scored higher on the *Environmental Identity Scale*. This suggests that paddlers who spent more time outside are more connected to nature. Feelings of well-being, flow state, and an affinity for nature were common emotional mechanisms reported by people who paddled more than 50 days a year. They were less likely to report experiencing adrenaline and thrill, increased anxiety, or engaging in activities other than paddling. This study further adds to the research of ecopsychology by supporting the premise that spending more time outside positively impacts someone's connectedness to nature. One unique contribution is the exploration of emotional mechanisms that are associated with paddlers' experiences, which can potentially help develop programs that connect more people to nature.

1. Introduction

Adventure recreation or outdoor recreation are nontraditional activities that are characterized by their inherent risk, physical challenge, and the need for an outdoor arena (Stuart, 2022). These activities have been around for centuries, but the production of films focusing on premier athletes from sports such as rock climbing or snowboarding has garnered academic interest from the fields of environmental psychology, sports medicine, and the sociology of risk in recent years (Mortimer & Lowell, 2018; Morgan & Rice, 2018; Bricker & Kerstetter, 2000; Wilson et al., 2013; Wexler, 2010). While there is some interest in whitewater paddling from these academic fields, most of it focuses specifically on whitewater kayakers or the experiences of commercial rafting guests (Ivester, 2017; Beckman et al., 2017). To date, however, there has been none, to the knowledge of this author, no investigation incorporating all whitewater paddlersⁱ to understand their connectedness to nature. Furthermore, most environmental psychology studies concerning whitewater kayakers have focused on a kayaker's place attachment or interaction with the river, rather than their overall connection to nature (Bricker & Kerstetter, 2000; Lepp & Herpy, 2015). For this reason, this study focused on whitewater paddlers' connectedness to nature, specifically to determine if their connectedness to nature was impacted by their skill level.

This study also investigated if a paddler's connectedness to nature was impacted by the number of days they spend paddling per year and the number of years they have paddled. The qualitative responses were analyzed to better understand the emotional trends associated with a higher connectedness to nature. This would then help identify the profile of individuals with a stronger connection to nature and what emotional mechanisms helped their growing connection. The analysis was based on what variable was found to have a significant impact on connectedness to nature. The quantitative and qualitative data allowed for a mixed methods approach which provided for a fuller picture of the phenomena (Wasti et al., 2022). This more descriptive picture of a whitewater paddler's connectedness to nature will help inform program developers on how to increase connectedness to nature for their participants.

1.1 Whitewater Paddling

Whitewater paddling can be described as a leisure activity, an action sport, and as an adventure recreation activity (Stuart, 2022). For this study, it will be primarily referred to as adventure recreation, as the focus is on the relationship between a paddler and nature, rather than whitewater races or demographics of the participants. Whitewater paddling describes the activity of using a boat to navigate down rivers that are interspersed with rapids. Whitewater rapids derive their name from the white, frothy,

ⁱ For the purposes of this study, the term paddlers will be used to describe any person who paddles a whitewater boat, including paddlers of hard and soft boats as well as recreational or professional paddlers. If a referenced study focuses only on one type of paddler, they will be specifically referred to by the type of boat, such as whitewater *kayaker* or whitewater *rafter*.

aerated water created when a river’s flow is altered due to gradient loss, constriction, or obstructions of the river’s bed.

These sections of churning water create rapids, which are rated from Class I-V on the International Scale of River Difficulty (American Whitewater, 2005). The difficulty of rapids is calculated based on the speed and predictability of the water current, the length of the rapid, and the obstacles in the river. As the classes increase, the probability of a paddler swimmingⁱⁱ, the risk involved with swimming, and the skill needed to avoid swimming increases, and possibility of a paddler self-rescuingⁱⁱⁱ decreases. For paddlers to navigate higher class rapids, they must dedicate a large amount of their time practicing specific skills and log several months a year worth of paddling time.

Whiting et al. (2011) found that engaging with the environment was a significant motivator for kayakers. One participant stated that the interaction between paddling and nature was “an interplay of the forces of nature with the [paddlers] ability to sort of dance between them” (pg. 10). This balance between the individual and their environment is similar to how Lyng (1990) described edgework. Edgework is a risk sociology concept where people engage in risky activities to find the boundary between order and disorder. Wexler (2010) explained how participating in whitewater kayaking is edgework as the voluntary risk takers see their desired to push the edge and find new experiences as a refinable skill, such as paddling higher class rapids to access a new relationship with nature as Whiting et al. (2011) found. There is a unique relationship, or dance, that a high-level paddler develops with nature in order to navigate the hazards that create their activity (Jones et al., 2000). They must find a sense of cognitive control within the uncontrollable water. This creates a sense of oneness with their environment, which contributes to an intense connection to nature. Paddling higher class rapids requires a tremendous time commitment where paddlers may spend years to feel comfortable paddling Class V. Spending more time outside has been found to positively impact someone’s connectedness to nature (Davis et al., 2009). For these reasons, skill level- understood as what rapid class someone was comfortable paddling- was identified as the primary variable to investigate if it had an impact on connectedness to nature. It was hypothesized that whitewater paddlers that paddle higher class rapids would feel more connected to nature.

Rapid Class	Basic Description	Risk Level	Skill and Time Commitment	Possibility of Self-Rescue
Class I	Fast moving water with riffles and small waves.	Very little risk.	None to very little training.	Easy.

ⁱⁱ Swimming, a swim, or taking a swim is when a paddler finds themselves out of the boat and facing the rapid with body and protective gear.

ⁱⁱⁱ A self-rescue is when a paddler is able to get themselves, their gear, and their boat to the side of the river after a swim without the help of others.

Class II	Wide and clear channels. Some maneuvering required.	Little risk. Swimming is seldom for everyone.	Is often the entry level rapid for learners.	Easy. Assistance is helpful but is rarely needed.
Class III	Moderate and difficult to avoid features. Maneuvering required. Hazards are present but avoidable.	Some risk. Less experienced paddlers may swim. Swim-related injuries are rare and often minimal.	At least a month's experience is suggested to paddle competently.	Usually easy, but group assistance is needed to avoid longer swims.
Class IV	Intense, powerful, but predictable rapids. Precise maneuvering required. Hazards are harder to avoid.	Moderate to high. Swimming is more common. Swim-related injuries are common and can be serious.	Several months of deliberate training is needed to paddle safely. Specific skill development is suggested.	Difficult. Group assistance with trained individuals is necessary.
Class V	Extremely long, obstructed, unpredictable, and violent rapids. Hazards are unavoidable.	Very high. Swimming is likely and will cause injury. Death is possible.	Proper equipment, specific skill development, and years of training are needed.	Almost impossible. Group safety plans are required due to the danger for paddlers and rescuers.

Note: Adapted from American Whitewater's International Scale of River Difficulty¹⁰

Figure 1. Basic definitions and variables impacting whitewater rapid classification. The variables are inherent risk, experience level and time commitment needed, and possibility of a swimmer being able to self-rescue.

1.2 Connection to Nature and Environmental Identity

Connectedness to nature is the conceptual understanding of how humans relate to and experience nature (Clayton, 2003). Shultz (2002) described it as the extent to which an individual experiences nature within their cognitive representation of self. The degree to which someone feels connected to nature is a reliable predictor of their willingness to perform ecologically sustainable behaviors, or behaviors that contribute to protecting the environment and its resources (Sierra-Barón et al., 2023; Vining et al., 2008; Davis et al., 2009). These behaviors can include but are not limited to turning off lights when not in use, using public transportation, recycling, and participating in trash clean ups (Davis et

al., 2009). Mayer and Frantz (2004) helped prove this concept with the development and verification of *the Connectedness to Nature Scale*, but the concept has existed for much longer. Aldo Leopold (1949) argued that fostering a connection with nature was a key motivation for performing ecologically sustainable behaviors.

Ecologically sustainable behaviors have become ever more important as climate change and unsustainable use of nonrenewable resources have damaged the environment. Unfortunately, frameworks such as connectedness to nature are promoted in Western Society, as an anthropogenic viewpoint has framed nature interactions with the environment (Shultz, 2002; Smout, 2009; Kellert, 2002). Nature is something separate from man. Man should conquer and overcome nature, rather than feel connected to it or have a relationship with it. Therefore, it is imperative to understand what can promote a deeper connection to nature. Nisbet et al. (2008) found that spending more time outside positively impacts someone's connectedness to nature. However, there is little understanding of if there are any compounding factors for the connection, such as skill level in an outdoor activity. Nor is there much research on the emotional trends behind the connection.

This study used the *Environmental Identity Scale* (EID) to measure the participants' connectedness to nature (Clayton, 2003). Environmental identity is a sense of connection to some part of the non-human natural world based on an individual's history, emotional affinity, and perceived similarity to nature that affects the way in which they view and act towards the world (Clayton, 2003). In short, environmental identity is a self-conception that is formed when the environment is important to an individual and is an important aspect of their perception of self. Connectedness with nature and environmental identity have a mutualistic relationship (Balundé et al., 2019; Lengieza & Swim, 2021). Those with a more concrete environmental identity feel a higher connectedness to nature and those who feel more connected to nature have a stronger environmental identity.

2. Methods

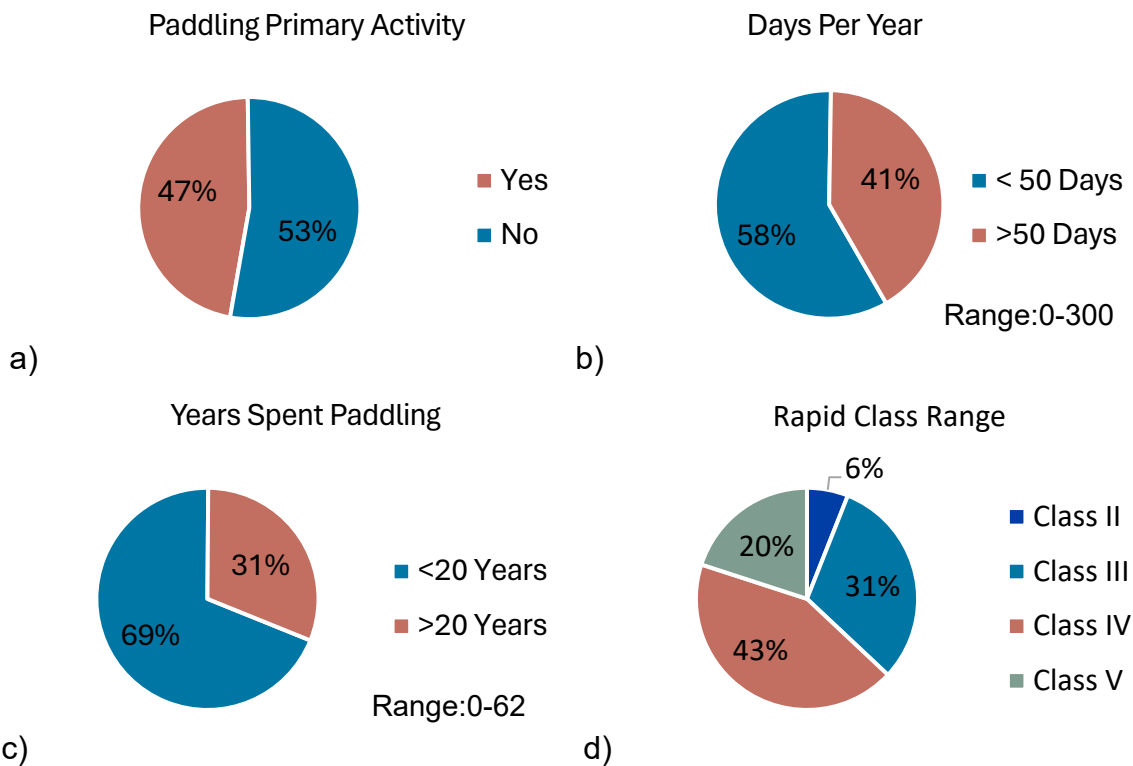
2.1 Participants

Anyone who described themselves as a 'whitewater paddler' was eligible to take the survey. This distinction was important as it required people to self-select if they were eligible, meaning that their connection to the activity was strong (Aquino & Reed II, 2002). From this inclusion material, a mix of recreational rafters and kayakers, professional kayakers, paddling instructors, raft guides, and stand-up-paddleboarders. Anyone who was younger than 18 years old was excluded from the survey. Participants were recruited using a combination of online and in-person advertising. An IRB approved advertisement was posted to several online whitewater groups. The Facebook groups were *WACKO*^{iv},

^{iv} West Asheville Canoe and Kayak Association.

Green (Narrows) Day^v, *Western NC Creek Visuals*^{vi}, and *Bad Whitewater Rafting Advice*^{vii}. The survey and advertisement was posted twice in the Reddit forum r/whitewater. The author posted the advertisement several times on their personal Instagram story, as well as requesting that several well-known whitewater paddlers^{viii} post the advertisement on their Instagram stories. The advertisement was also posted physically during the UNCA's Outdoor Programs Roll Sessions on five Wednesday nights to recruit paddlers who did not use online forums or groups.

The sample size was n=389 after leaving the survey open for five weeks. Participants were asked if paddling was their main way to be outside, how many days out of the year they paddled, how many years they had paddled, and the highest rapid class they felt comfortable paddling in (Figure 2). There was an almost equal split between those who reported that paddling was their main way to be outside and those who did not (Figure 2a). There were more people paddled less than 50 days a year, and the range was 0-300 days (Figure 2b). More people had been paddling for less than 20 years, and the range was 0-62 years (Figure 2c). The range of rapid class paddled was Class II-Class V. Class IV was most frequently reported and Class II was the least frequently reported (Figure 2d).



^v Group devoted to paddling the Narrows section of the Green River in Saluda, North Carolina.

^{vi} Group devoted to watching the water levels of popular paddling creeks in Western North Carolina.

^{vii} Meme group for whitewater paddlers.

^{viii} Follower count of 2000+.

Figure 2. Pie charts representing the recoded groups for each variable, as well as the range on the relevant charts. Pie chart a) represents those who said that paddling was their main activity versus those who did not. Pie chart b) represents those who remarked that they paddled less than 50 days versus those who paddled more than 50 days. Pie chart c) represents those who had been paddling for less than 20 years and those who had been paddling for more than 20 years. Pie chart d) represents the splits between the count of what rapid class people were most comfortable in.

2.2 Materials

A copy of the materials is included in Appendix A.

2.2.1 *Environmental identity*

The 2003 *Environmental Identity Scale* (EID) was used to measure the participants' connectedness to nature. The EID is comprised of 24 statements where individuals must rate how much they agree to each statement using a 7-point Likert scale, where responses could range from 1=*not at all true of me* to 7=*completely true of me*. An example statement from the EID was "*Being part of the ecosystem is an important part of who I am.*" Cumulative scores were averaged to produce a mean score for each participant. This scale was chosen based on the range and number of statements, as they allowed for a wider range of scores and individual statement score analysis. Furthermore, the study drew inspiration from several papers discussing the identities of whitewater kayakers, so the EID was more apt to add to that line of research (Mayer, 2017).

The responses from two demographic questions were recoded to assess the impact of years spend paddling and days spent paddling per year. Years spent paddling were split into those that had paddled for less than 20 years and those that had paddled for more than 20 years. The days spent paddling per year were split into those that paddled for less than 50 days a year and those that had paddled for more than 50 days a year. The rapid classes were separated based on the International Scale of River Difficulty (Figure 1). SPSS was used to find the means, correlations, and ANOVA models for the EID responses and the demographic data.

2.2.2 *Qualitative questions*

Emotional trends were the most important factor for understanding why a person may feel connected to nature and why that connection may change. These trends were split into three categories: in-the-moment emotions while paddling, any emotional development experienced since they started paddling, and emotional development towards nature. Three qualitative questions were developed to target the emotional trends behind a paddler's experience while on the river and their relationship with nature: 1)

Describe your emotions when you paddle; 2) Have your emotions when you paddle changed as you have gotten more comfortable on the water? Describe the change if there has been one; 3) Have you always felt connected to nature or has the connection changed since you started paddling? The participants were also asked if they were comfortable being contacted for future studied on whitewater paddlers. Eighty-eight percent of respondents said they were comfortable ($n=346$).

The qualitative data was analyzed using a modified grounded theory approach proposed by Creswell (2020). This approach allowed for patterns and themes to emerge directly from an examination of the data. The “context-based” information draws directly from the participant’s subjective experiences. Using both open and axial coding processes, the participant’s responses were then coded and categorized (Corbin & Strauss, 2014). A constant-comparative method was used to create and refine themes as they emerged from the data (Glaser & Strauss, 1967). The identified themes were validated via pattern recognition software. A third part interrater coded approximately 20% of the responses after the initial rater completed their analysis. The interrater reliability was 83%. Finally, representative quotations were selected to provide exemplars of each theme.

3. Results

3.1 Quantitative Results

Figure 3 presents the means and standard deviations for Days per year, Years paddling, and Rapid Class.

Measure	<i>M</i>	<i>SD</i>	<i>n</i>
Days Per Year			
<50 Days	5.72	.74	205
>50 Days	5.91	.68	153
Years Paddling			
<20 Years	5.78	.75	267
>20 Years	5.91	.62	121
Rapid Class			
Class II	5.85	1.06	26
Class III	5.77	.73	122
Class IV	5.76	.75	169
Class V	5.88	.69	80

Figure 3. Mean (*M*), standard deviation (*SD*), sample size (*n*), and minimum and maximum EID scores for days paddling per year, years paddling, and rapid class comfort

Figure 4 displays correlations between these variables. There was a significant

relationship between mean EID scores and days per year; $r(356) = 0.13, p < 0.05$. This means that the more days someone spent paddling a year, the more likely they were to have a higher EID score. There was statistical significance found for years paddling and rapid class comfort, $r(388) = 1.03, p = 0.38$. There was also statistical significance found for days per year spent paddling and rapid class comfort, $r(381) = 0.37, p < 0.01$. These results indicate that if people had been paddling for longer or were paddling more frequently, they were more likely to feel comfortable in the higher-class rapids.

Measure	1	2	3	4
1. Mean EID Score	-			
2. Rapid Class Comfort	.01	-		
3. Years Paddling	.08	.18**	-	
4. Days Per Year Spent Paddling	.13*	.37**	-.10	-

Note. * $p < .05$. ** $p < .01$.

Figure 4. Correlations between mean EID score and rapid class comfort, years spent paddling, and day per year spent paddling.

A series of ANOVA models were run to assess differences in mean EID scores by 1) days per year, 2) years paddling, and 3) rapid class. There was no significant difference found for rapid classification on mean EID scores, $F(3, 388) = 1.03, p = .38$. There was also no significant difference found for years spent paddling on mean EID scores, $F(10, 381) = 2.67, p = 0.10$. There was, however, a significant difference found for days spent paddling per year on mean EID scores, $F(1, 357) = 5.74, p = 0.02$. In other words, those who paddled more than 50 days a year score higher ($M = 5.91$) than those who paddled less than 50 days a year ($M = 5.72$) on the EID.

Source	df	SS	MS	F	p	η^2
Between Groups	1	2.92	2.92	5.74	.02	.02
Within Groups	356	181.00	.51			
Total	357	183.92				

Figure 5. One-way analysis of variance summary table for the effects of days paddling per year on mean EID score. Between groups is understood as the mean EID scores for the group who paddled less than 50 days a year compared to the mean EID scores for those who paddled more than 50 days a year. Within groups is understood as the total variation in the individual in each group and the group mean.

3.2 Qualitative Results

3.2.1 Question One

“Describe your emotions when you paddle”

Ten themes were identified from Question One’s Responses (Figure 6). When asked how to describe how they felt in-the-moment when paddling, a majority of participants discussed feeling *joy*, *excitement*, and *liberation*. Paddling was both the source of these emotions and the remedy for bad days they had experienced before getting on the river. Paddling gave participants the chance to feel *at peace*. Many participants spoke of feeling *in-the-flow*, where their mind and body came together, and they reached a level of awareness that could not replicated in other environments. In addition, respondents discussed on feeling *appreciation* for their surroundings or circumstances that led them to paddling, a sense of *belonging* to the group they were with or something bigger than them, and *pride* and *accomplishment* for their ability to navigate the rapids. Both groups also noted how they felt *anxiety* while on river, but those that paddled less than 50 days reported feeling more primal reactions like *fear* (Figure 7). Those that paddled less than 50 days a year discussed feeling rushes of emotions. *Stoke*, *adrenaline*, and *thrill* were frequently mentioned in their responses.

Theme	Frequency	Representative Quote
1. Adrenaline and Thrill	32	“Numb skull no thoughts only stoke.”
2. Anxiety	53	“There’s some anxiety whenever I go through a rapid or something that feels out of my depth....”
3. Appreciation	35	“Carefree elation humbled by the power of the water and the mysteries of the mountains.”
4. Belongingness	25	“When I paddle (on a good day) I feel like I’m a part of something bigger. Sometimes that’s connection with my crew, other times that’s feeling connected to the river/location....”
5. Freedom/ Liberation	38	“When I am paddling, I feel relieved of the things that have been taking over my mind the past day or week or month.”
6. Fear	54	“Brief moments of terror.”
7. Happiness/Joy/ Excitement	218	“Usually I cannot suppress a smile, even when competing in paddling events....”

8. Satisfaction/ Accomplishment	51	“On the sport side of it, I enjoy learning and mastering new skills and feeling myself grow and improve....”
9. Connection to Nature	50	“I feel as one with nature.”
10. Zen and Flow State	224	“When I paddle, I feel mentally present in the moment in a way I rarely feel otherwise.”

Figure 6. Listing of identified themes, their overall frequency, and representative quotes for Question One.

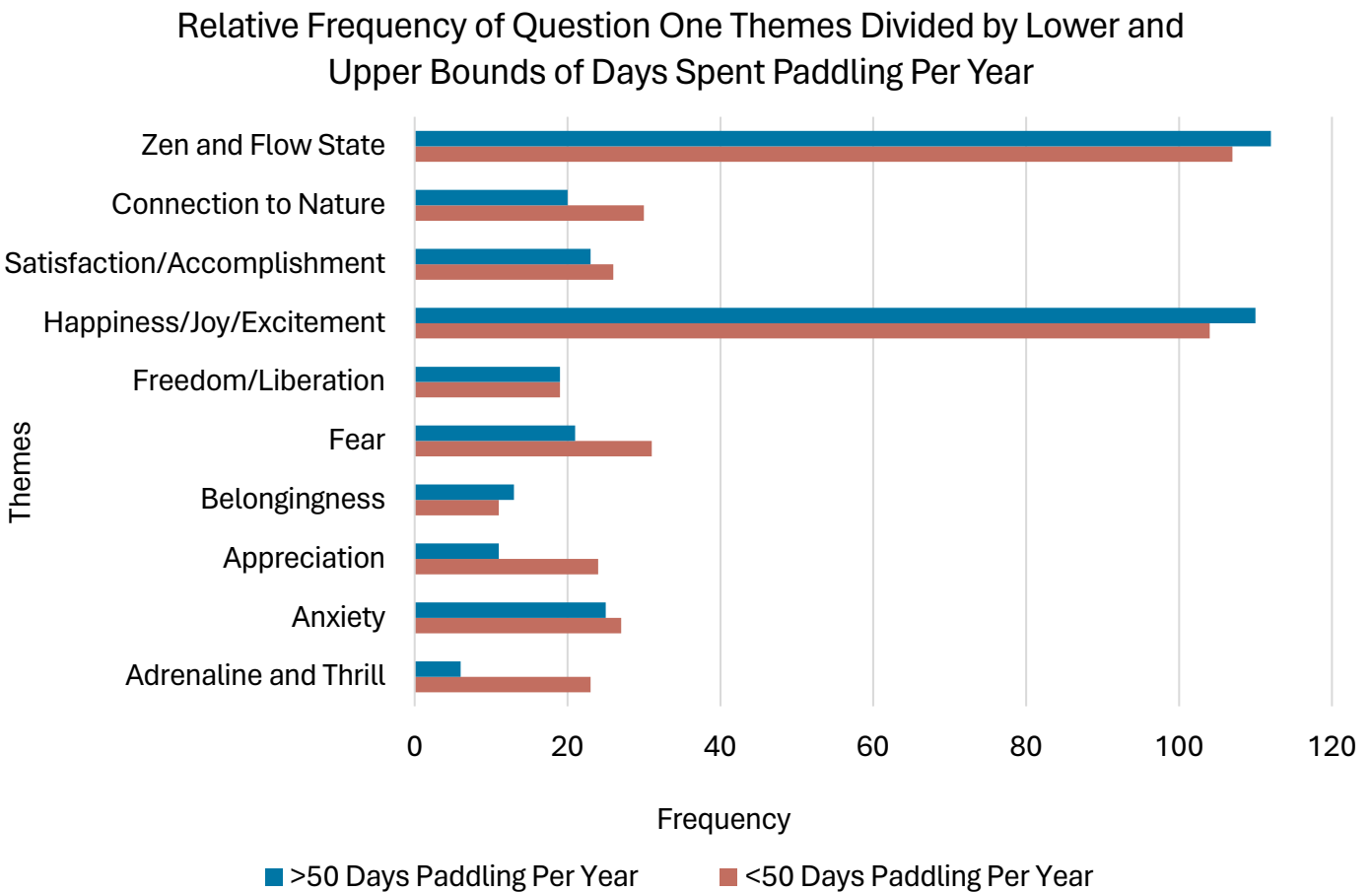


Figure 7. Bar graph showing the differences in question one theme frequency for the recoded days paddling per year variable.

3.2.2 Question Two

“Have your emotions when you paddle changed as you have gotten more comfortable on the water? Describe the change if there has been one.”

Ten themes were developed based on Question’s Two responses when participants discussed how their emotions had changed since they began paddling (Figure 8). Overwhelmingly, all paddlers remarked that when they started paddling, they felt *fear*, *anxiety*, and *worry*, but as they paddled more frequently, they felt *joy*, *comfort*, and a noticeable *lack of fear*. Participants also felt more *confident* in their abilities and even discussed how their self-confidence on the river had translated to activities off the river. Common phrases in adventure recreation also appeared, where participants felt less *gripped* and instead were able to reach a *flow state*. They remarked on feeling less like *adrenaline-junkies* or needing to overcome fear and more on finding the *fun* in paddling and wanting to *search for play* while outside. The group that paddled less than 50 days a year discussed how their emotions had *not remarkably changed* since they started paddling (Figure 9). The responses ranged from discussing on how they hadn’t been paddling long enough to experience a change or that they had been started paddling so young that their present emotions were the only ones they could remember. Those that paddled less than 50 days a year also described how their *attitude towards the river had changed from something to control to something to learn from and move with*.

Theme	Frequency	Representative Quote
1. Acceptance of Unease	26	“Yes, I used to be scared of flipping over, but now I’m comfortable with it.”
2. Cycles of Discomfort and Comfort	32	“Definitely, kind of a bell curve where I started out being nervous going out, then after a while got very comfortable then saw some things go wrong so it checked my confidence a little bit and I got a little less comfortable.”
3. Connection to Nature	34	“As I have gotten more experienced, I am able to enjoy my surroundings (cliffs, waterfalls, animals, etc.) more.”
4. Development of Flow State	71	“Absolutely, finding calm in the moments of chaos while dancing with the rapids in harmony brings great peace.”
5. Evolution of Attitude Towards River	20	“Instead of fearing the force of the water and rocks I have learned to relax and move with the water.”

6. Evolution of Unease to Well-Being	124	“Less fear, more joy.”
7. Increased Anxiety	14	“I feel like the more I learn about paddling the more cautious and anxious I became.”
8. Increased Confidence and Empowerment	67	“Yes, as I paddle more, I feel more confident in my ability to safely navigate through the features of the whitewater that might have previously intimidated me.”
9. No Remarkable Change	42	“I have been comfortable on the water since a teen. Can't remember a change.”
10. Transition from Adrenaline-Driven to Enjoyment	46	“Thrill seeking was a motivator when I was younger. It has become much more about the social experiences and connection to nature now.”

Figure 8. Listing of identified themes, as well as their definition, overall frequency, and representative quotes for Question Two.

Relative Frequency of Question Two Themes Divided by Lower and Upper Bounds of Days Spent Paddling Per Year

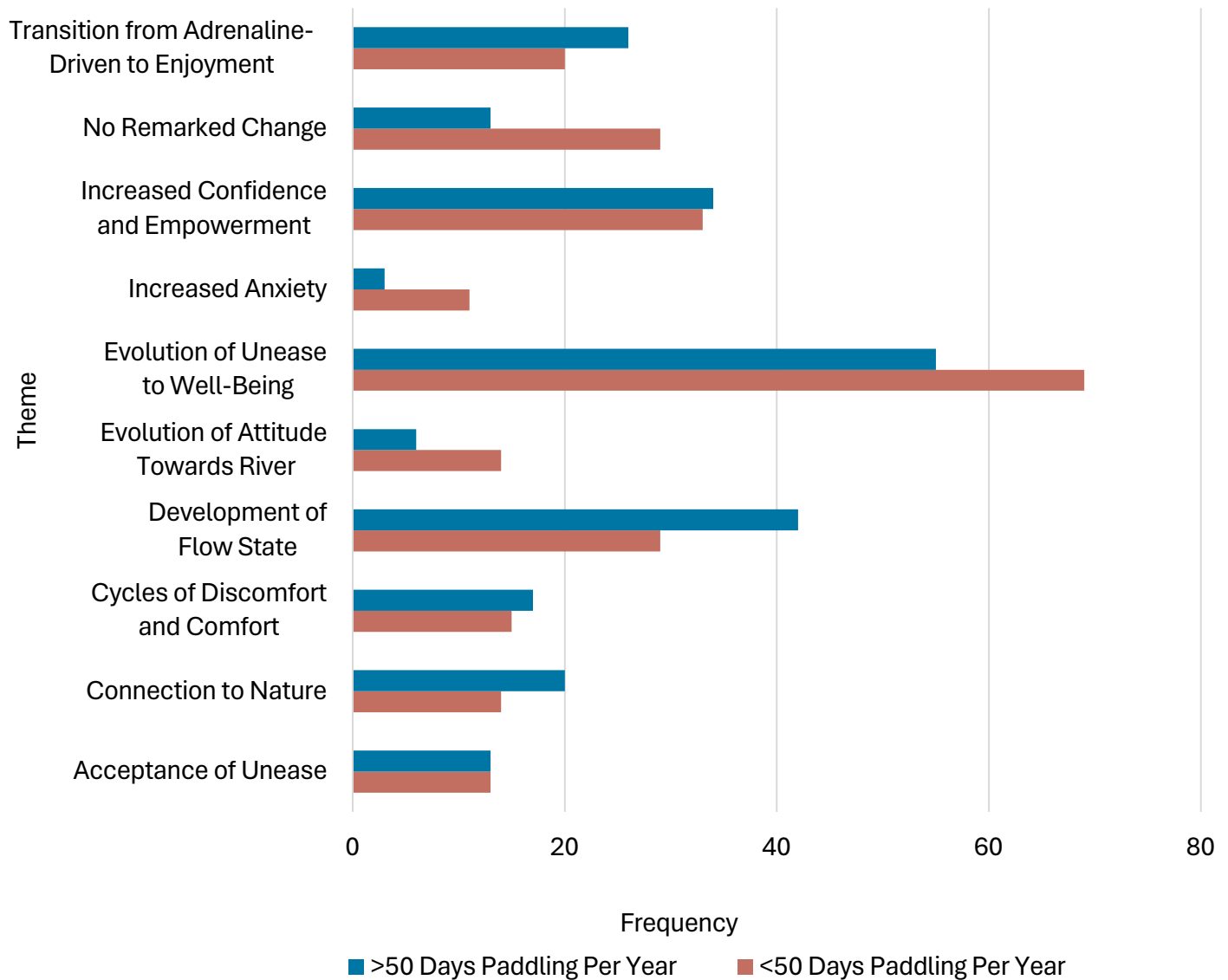


Figure 9. Bar graph showing the differences in question two theme frequency for the recorded days paddling per year variable.

3.3.3 Question Three

Have you always felt connected to nature or has the connection changed since you started paddling?

Six themes were identified from Questions Three's responses (Figure 10). When asked to describe their connection to nature and if that connection had changed since they started paddling, participants explained how they had *always felt connected to nature* but when they started paddling more frequently, they felt *more connected* and had developed a *special connection to the water*. This trend was especially apparent in the group that paddled more than 50 days a year (Figure 11). They were also some mentions of how they felt connected, but *other activities* helped them explore that connection more than paddling did. Some participants remarked that while they felt an affinity for nature, they *didn't conceptualize it as a connection to nature*. Though few in number, other participants described how they felt *less connected* to nature since they started paddling.

Theme	Frequency	Representative Quote
1. Consistent and Inherent Connection to Nature	296	"Yes, since I can remember as a child, I've felt connected to nature."
2. Decrease in Connection	2	"I've always felt connected with nature since I was young, if anything paddling has challenged my connection, instead of only being positive, it makes remember the people I've lost on the river, makes me confront my negative traits as well, it's not always rainbows and sunshine"
3. Difference in Experience	8	"The phrase "connected to nature" doesn't exactly match how I feel. I think nature is very important and I love spending time in nature, but I don't feel any spiritual "connection to nature", I just feel lucky to be around to enjoy/ admire it. I don't think this feeling has changed for me."
4. Other Activities	23	"I've been skiing longer and that formed my connection."
5. Strengthened Connection Through Paddling	142	"Paddling has deepened my connection with nature".

6. Unique Connection to Water	40	“I’m definitely more connected to water and rocks than other elements”.
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Figure 10. Listing of identified themes, as well as their definition, overall frequency, and representative quotes for Question Three.

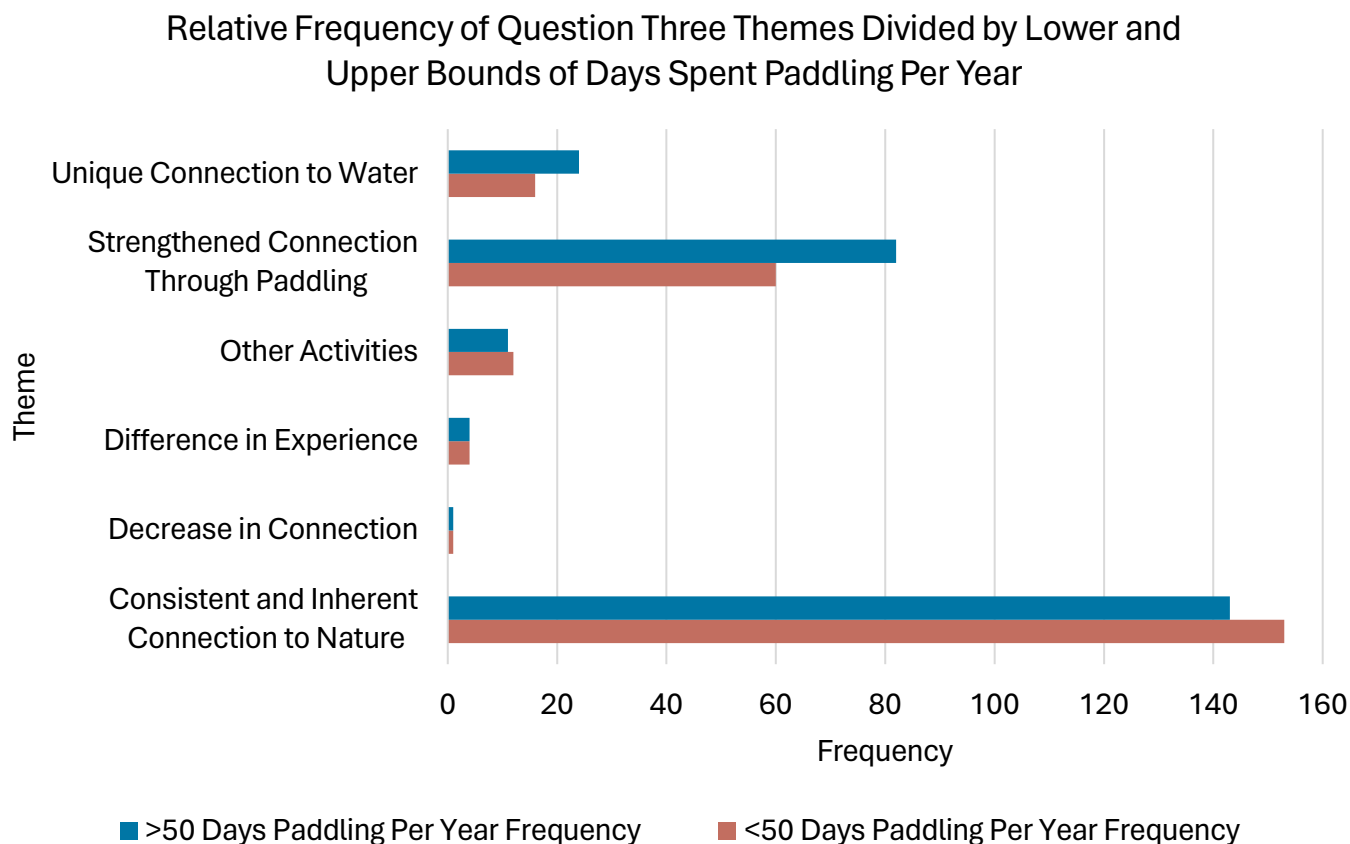


Figure 11. Bar graph showing the differences in question three theme frequency for the recorded days paddling per year variable.

4. Discussion

The premise of this study was to determine if skill level had an impact on whitewater paddlers’ connectedness to nature. It was found that skill level does not impact connectedness to nature for whitewater paddlers. However, days spent paddling per year was identified as a positively impacting variable. Those that spent more than 50 days paddling per year had higher EID scores, meaning that they were more connected to nature.

This study also sought to determine the emotional trends that are associated with a paddler's experience while in nature to develop the profile of someone with a higher connectedness to nature. All paddler's reported feeling a sense of joy, happiness, and peace while paddling. Those feelings were developed through the emotional mechanism of feeling unease and apprehension when they first started paddling to feeling a sense of well-being as they spent more time paddling. They also reported feeling consistent connected to nature and building that connection through paddling. Those that paddled more than 50 days a year reported feeling calmer while on the water, and they developed those feelings through finding enjoyment and play while paddling. Those that paddled less than 50 days a year felt more rushes of emotions and described paddling as a way to access that adrenaline and thrill, which included a sense of heightened anxiety. Those that paddled more than 50 days felt that they had grown their existing connection to nature. Those that paddled less than 50 days a year felt that they had always been connected and the connection had not wavered.

4.1 Quantitative Data

Days paddling per year was the only variable that impacted a paddler's EID score. They felt more connected to nature if they spent more time outside. Nisbet et al. (2008) reported similar findings when examining the concept of nature relatedness. However, this study suggests that spending time outside is not compounded with skill level of years spent recreating. In short, feeling more connected to nature is more dependent on how many days a person can spend outside, not how skilled they are in an outdoor recreation activity or how many years they've been able to be outside recreating. Despite this significant finding, it must be noted that paddlers, in general, have a higher-than-average score. When compared with three other studies that used the 24-item EID scale, a paddler's average score ($M=5.81$) was higher than each group in the studies ($M=4.73$; 4.87 ; 4.71)^{ix} (Moreira et al., 2021; Olivos & Aragones, 2011; Brügger et al., 2011). These studies' participants were from a more general population, with Moreira et al. (2021) being the only one to draw from a pool of students in environmental classes. This may suggest that being outside purposefully, such as engaging in an activity is important for feeling more connected to nature. Paddler's having a higher-than-average score aligns well with other studies that have examined the motivations and profiles of whitewater kayakers. Mayer (2017) discussed that whitewater kayakers report profound experiences with nature, which increased their appreciation and love for the environment. Bricker and Kerstetter (2000) found that paddlers move to certain places to increase their access to nature. Experiencing nature is a motivator for participating in whitewater paddling, meaning that a cycle of motivation and appreciation builds a stronger and stronger connection over time (Whiting et al., 2011).

One of the more interesting quantitative data findings comes from analyzing the average scores for the EID statements. The 24th statement "*I keep mementos from the*

^{ix} Please note that these scores were converted from a 5-point Likert Scale to a 7-point Likert scale for comparison.

outdoors in my room, like shells or rocks or feathers” had the second lowest average score ($M=4.75$). This could be attributed to Leave No Trace (LNT). Leave No Trace is a set of outdoors ethics that provide a framework for how to minimally impact nature when recreating outdoors. Ethic four state “*Leave only footprints, take only pictures*” which is contradictory to taking mementos from the outdoors (Leave No Trace, 2021). Vagias et al. (2013) argued that the effectiveness of LNT, while based somewhat on a participant’s knowledge of the principles, is largely based on the perceived effectiveness of performing behaviors suggested by LNT. Whitewater paddlers may believe that leaving things how they found them (not taking mementos) is better for the environment. The low score on this statement lends credit to the effectiveness of LNT education and the environmental responsibility of whitewater paddlers. A future scale may want to incorporate a statement asking participants if they leave things behind for others to enjoy, or reverse score a statement similar to the 24th EID statement.

4.2 Qualitative Data

Identifying in-the-moment emotions is important for understanding the emotional profile of a person who is connected to nature. Equally important is the development of those emotions to understanding if there is a pathway that paddlers undertake as they grow more connected to nature. This pathway can inform program developers on how to better connect participants to nature and thus foster an interest in performing ecologically sustainable behaviors.

All paddlers, no matter how often they paddled, expressed feelings of happiness, joy, and excitement. They recognized that these feelings were not present from day one, but rather was a mechanism that developed over time. This increase in well-being from spending more time outside is noted in many studies that focus on the benefits of nature (Balundé et al., 2019; Brügger et al., 2011; Nisbet et al., 2008). Spending more time outside is correlated with higher reports of well-being, emotional regulation, and reduced stress (Irkhin, 2020; Zwart, 2022). MacIntyre et al. (2019) found this apparent even for participants in extreme sports like whitewater kayaking, where participants felt an increase in positive emotions despite the inherent risk of the activity. However, it is important to note that all paddlers also felt anxiety and fear while on the river. Their understanding of the risk did not decrease; instead, they felt more capable of handling it. Lyng (1990) and Wexler (2010) argue that feeling anxiety or fear does not detract from the experience, and at times can even enhance it because of sense of accomplishment when the risk is successfully negotiated.

This complex array of emotions was identified in Question Two, where participants remarked on moving both between discomfort and comfort as well as accepting the unease. These emotional mechanisms are similar to Mayer’s (2017) proposal of stages that paddlers move in and out of as they spend more time within the community. He argued that there is no linear movement for paddlers, where there is a penultimate stage, but rather a cycle of initiation, a deepening of understanding, imagining the potential, and appreciating the experience. This is not an uncommon emotional cycle in paddlers as Jones et al. (2000) discussed how a movement between anxiety and flow was a common

mechanism for whitewater paddlers. This mechanism for all paddlers suggests that the appearance of negative emotions such as anxiety or fear do not detract from someone's ability to connect to nature. In fact, being capable of accepting the anxiety and overcoming the fear may be key in them developing a deeper connection to nature.

All paddlers expressed feeling *Zen* and *flow*. All paddlers, no matter how often they paddled, were able to access a feeling of mindfulness, body and mind melding, and complete immersion in their environment. Whiting et al. (2011) described this psychological interaction between the boater and their environment where paddlers sought out whitewater to immerse themselves in this mental flow. However, those that paddled more than 50 days a year more frequently discussed the development of their ability to access this state. It was both easier and more common for them to feel in flow with their surroundings. This development of feeling more in flow with more time spent practicing is consistent with Jones et al. (2000) where one must have the necessary level of skill to access a flow state, as an overwhelming feeling of the anticipation of failure produces a high level of anxiety that is difficult to overcome. Furthermore, Jones et al. (2000) points out that more accomplished paddlers are more capable of experiencing flow, which is apparent with the strong positive correlation in this study that those who paddle more often are more likely to paddle higher class rapids. This development of flow implies that negative emotions will always be present when outside, but it is the fear of failure that can be the catalyst for a person returning to the indoors.

An affinity for nature and the development of that affinity independent of questions specifically inquiring on this connection was apparent in several themes. It is clear through this that nature is important to whitewater paddlers. The group that paddled less than 50 days remarked slightly more frequently that their affinity for nature was an in-the-moment emotion, whereas those that paddled more than 50 days discussed the development of their connection. Whiting et al. (2011) described how experiencing nature is at first a motivator to paddle. As someone paddles more, they find that nature and paddling become inseparable. They cannot experience paddling without nature, and they cannot appreciate nature to the same degree without paddling. There is a deeper appreciation for their surroundings when they paddle more than 50 days a year. Those that paddled more than 50 days a year also reported feeling a strengthened connection to specific parts of the river and experience. Factors like the natural elements of the river, the community they paddled with, and to concepts larger than them like religion or spirituality were mentioned. They did not mention specific rivers that they felt connected to. This type of attachment, where it is more dependent on the elements rather than the area was also found by Bricker & Kerstetter (2000) and Lepp & Herpy (2015). Paddler's attachment even developed into feeling as though they belonged to the river, where they depended on it for their community, their activity, and their sense of self.

This type of belongingness was also mentioned by Whiting et al. (2011), where they described how interpersonal relationships were an important motivator for people to paddle. The social relationships they formed with each other were deeper, richer, and more supportive than relationships formed with non-paddlers. The idea of paddling as a religious experience was consistent with Sanford's (2007) argument that the sacred was the experience of the water and the body working together. Mayer (2017) expands upon this idea of belongingness and spirituality when paddling in his analysis of *Bombflow* media's "Go to CHURCH" episode:

Later in the episode, a kayaker mentions praising Jah by running a stout on Easter Sunday. A stout refers to a big waterfall, and Jah appears to be a reference to a higher power. When the kayaker uses the term, he looks toward the sky and holds his hand in the air. The message is clear. They are going to the river to kayak to participate in a form of spirituality. (p. 117)

These spiritual and deeper emotions were not as common in those that paddled less than 50 days a year. They more were likely to express feeling *adrenaline* and *thrill* as compared to those that paddled more than 50 days and remarked how those were motivations for paddling as well. Sensation seeking has been theorized as a reason for participation in outdoor recreation before. Brymer (2010) uses feelings of challenge, adrenaline, and domination as proof that participation in extreme sports such as whitewater paddling results from an “inherent need for novel experiences and intense sensations obtained by taking physical risk” (pg. 4.) Ivester (2017) found that 60% of a sample size of 409 whitewater paddlers were ‘high sensation seekers’ where they continuously sought out rushes of emotions. Of the four subscales within the sensation-seeking scale employed by Ivester, thrill and adventure had the highest frequency at 78%. While this study also shows that adrenaline and thrill were frequent in-the-moment emotions for many paddlers, it also implies that those who spent more than 50 days outside experienced a significant emotional mechanism. They moved from seeking out adrenaline to seeking out enjoyment. Several participants described this evolution as seeking out *play*: “Rivers that used to keep me on edge are now a comfortable playground.”

Nachmanovitch (2009) describes play as a framework of behavior, where it a communication between the player and the object of play. It becomes sacred to some. He even describes interplay, with two parties interacting, as some form of peace where they are capable of harming each other, but do not. This echoes the idea of flow being important to paddlers. Paddlers describe their relationship with nature as something to commune with, where they feel connected to it beyond it being something where they practice their craft. Mayer (2017) described this change as “paddling towards the ecofeminism perspective”. Ecofeminism is a social movement that argues that the domination femininity and women and the degradation of the environment are intertwined and consequences of patriarchy and capitalism. Ecofeminism approaches environmental issues by emphasizing the interdependence between nature and human society, similar to the dependence between women and femininity and human society (Gaard, 2015). The experience of paddlers seems to be much less about dominion and conquest over nature and more about belonging, spirituality, and connection. There is a development that paddlers experience the more time they spend outside, where they begin to cherish nature more, and view it as something to commune with rather than dominate. People who paddle more frequently move from the masculine approach of adrenaline and ‘conquering a rapid to enjoyment of the river and appreciation for nature (Kerns & Whiteside, 2020; Stuart, 2022). Sanford (2007) also broaches this by writing “it is telling that whitewater paddlers rarely talk of ‘conquering’ or ‘beating’ the river” (p.833). This development from adrenaline to a sense of play and communing seems to be instrumental in paddlers developing a deeper connectedness to nature. They begin to feel as though they belong to the river and the river belongs to them.

It could be argued that this development does not come from the amount of time spent outside, but rather a natural course that paddlers take as they spend more time in the community. This study suggests that days spent outside is key to this development though. Paddlers who spent less than 50 days a year were more likely to report feeling no change to their emotions while paddling. Even if they had been paddling for as long as they could remember or if they hadn't been paddling long enough to feel a change, they were less connected to nature than those who paddled more than 50 days a year. There is an emotional development that paddlers go through as they spend more time outside that allows them to begin to view the river differently and become more connected to nature. They begin to see the river as something that provides for them, and that they must provide for. They move from wanting to conquer the river to wanting to commune and play. It becomes a place to practice their religion. As Mayer (2017) suggests, paddlers move towards an ecofeminist paradigm. This study suggests that this is built not from their experience level or how long they have been paddling, but rather the amount of time they spend outside.

4.3 Implications

This discussion leads to several important implications. There is the overarching implication that spending more time outside results in a higher connectedness to nature, which in turn, makes someone more likely to perform ecologically sustainable behaviors. In paddlers, this may appear in ways such as willingness to follow Leave No Trace principles. This study also suggests that there are no compounding factors for time spent outside. Someone does not need to be more skilled as they spend more time outside nor do they need to be engaging in the outdoors for years to feel more connected. However, they may need to be outside purposefully, as paddlers have higher scores than other groups surveyed. Being outside promotes a mindset change of one from sensation seeking to one of communing with nature. Using promotional campaigns about ecologically sustainable behaviors may be more impactful if they emphasize society's relationship with nature. Those that spend more time outside also feel joy and more at peace. Spending more time outside leads to a continuing cycle of progressively feeling more connected to it, as they feel a sense of oneness with nature, and feel unique connections to nature. This unique connection brings forth an ecofeminism paradigm. This ethical framework promotes viewing nature as something to commune with rather than use. Using ecofeminism may be important to promoting and guiding people to performing more ecologically sustainable behaviors.

4.4 Limitations

There were several limitations within this study. First was the sampling technique, as online advertising was the most common. This potentially excluded paddlers who do not use the online social groups to connect with other paddlers. The online advertising method also limited the study, as posting in online social groups helped attract a larger sample, it also drew in people who felt comfortable describing themselves as whitewater

paddlers. This could have contributed to the over saturation of people who stated they felt comfortable paddling in Class IV rapids. People who paddle this much would feel comfortable perusing those groups as compared to someone who just started and may only feel comfortable in Class II. There was also no way to verify that the participants were answering accurately for the rapid class they felt comfortable in, how often they paddled, or how long they had been paddling. Future research should attempt to validate someone's self-ranking in some manner. The phrasing of some of the demographic questions contributed to some responses having to be excluded. For example, when asked how long someone had been paddling, they may list "too long to remember" or when asked how often they paddle, they may list "enough to fit in several Grand Canyon trips". These responses had to be marked as irrelevant and thrown out. Finally, much of the available research on whitewater paddlers focuses mainly on whitewater kayakers. This may inhibit some of the applications of the data.

4.5 Recommendations

The broad goal of this study was to use the significant results and the emotional trends behind them to inform program developers on ways to promote connectedness to nature in order to increase the inclination for people to protect nature through performing ecologically sustainable behaviors. The overall recommendation is to go outside more with a purpose. Engaging often in the outdoors is important, as seen by the overall higher score that paddlers had, and that those that spent more time outside had a higher score. When programs that are meant to connect more people to nature, they should give extra consideration to the framework in which they are presenting nature. Specifically for paddling programs, using words such as 'dominating the river' or 'getting beat down by the rapid' may not promote connectedness as much as focusing on explanations of the flow state, that nature is something to commune with, and emphasizing activities that result in joy or excitement. Presenting motivations for being outside using an ecofeminist paradigm is also important, as describing the motivations as seeking challenge, adventure, and adrenaline continues the idea that nature is something to dominate, and thus not care for. Additionally, ensuring that participants feel like they belong to the program or activity is important. Social, spiritual, or emotional belonging is important for someone to feel connected enough to experience a growth in themselves and their connection to nature. Finally, program developers should support participants in their attempts to move past their fear or discomfort of new activities or environments, and to emphasize that being outside is sometimes uncomfortable, but that it does not mean that the experience is any less meaningful. This support can look like emphasizing Type Two Fun, where participants recognize the joy of the experience after reflection (Johnson, 2021). For paddling programs, this can look like rewriting what a failure looks like. Instead of swimming being a failure which does not help someone develop a flow state, it should be presented as a learning opportunity and a way to experience water differently. These recommendations are made through careful review of literature and analysis of this study. No matter what, get outside and enjoy it.

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7. Appendix A

7.1 Demographic Questions

1. Is paddling your main way of getting outside?
 - a. Yes
 - b. No
2. How long have you been paddling?
 - a. *Short Answer Response*
3. How many days out of the year do you spend paddling?
 - a. *Short Answer Response*
4. What type of whitewater craft do you use most often?
 - a. *Short Answer Response*
5. What rapid class are you comfortable paddling in?
 - a. *Class I*
 - b. *Class II*
 - c. *Class III*
 - d. *Class IV*
 - e. *Class V*

7.2 Ecological Identity Scale

1. I spend a lot of time in natural settings (woods, mountains, desert, lakes, and ocean).

	1	2	3	4	5	6	7	
<i>Not at all true of me</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<i>Completely true of me</i>
2. Engaging in environmental behaviors is important to me.

	1	2	3	4	5	6	7	
<i>Not at all true of me</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<i>Completely true of me</i>
3. I think of myself as a part of nature, not separate from it.

	1	2	3	4	5	6	7	
<i>Not at all true of me</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<i>Completely true of me</i>
4. If I had enough time or money, I would certainly devote some of it to working for environmental causes.

	1	2	3	4	5	6	7	
<i>Not at all true of me</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<i>Completely true of me</i>
5. When I am upset or stressed, I can feel better by spending some time outdoors "communing with nature."

	1	2	3	4	5	6	7	
--	---	---	---	---	---	---	---	--

Not at all true of me *Completely true of me*

6. Living near wildlife is important to me; I would not want to live in the city all the time.

1 2 3 4 5 6 7
Not at all true of me *Completely true of me*

7. I have a lot in common with environmentalists as a group.

1 2 3 4 5 6 7
Not at all true of me *Completely true of me*

8. I believe that some of today's social problems could be cured by returning to a more rural lifestyle in which people live in harmony with the land.

1 2 3 4 5 6 7
Not at all true of me *Completely true of me*

9. I feel that I have a lot in common with other species.

1 2 3 4 5 6 7
Not at all true of me *Completely true of me*

10. I like to garden.

1 2 3 4 5 6 7
Not at all true of me *Completely true of me*

11. Being a part of the ecosystem is an important part of who I am.

1 2 3 4 5 6 7
Not at all true of me *Completely true of me*

12. I feel that I have roots to a participant geographical location that had a specific impact on my development.

1 2 3 4 5 6 7
Not at all true of me *Completely true of me*

13. Behaving responsibly toward the earth- living a sustainable lifestyle- is part of my moral code.

1 2 3 4 5 6 7

Not at all true of me *Completely true of me*

14. Learning about the natural world should be an important part of every child's upbringing.

1 2 3 4 5 6 7
Not at all true of me *Completely true of me*

15. In general, being part of the natural world is an important part of my self-image.

1 2 3 4 5 6 7
Not at all true of me *Completely true of me*

16. I would rather live in a small room or house with a nice view than a bigger room or house with a view of other buildings.

1 2 3 4 5 6 7
Not at all true of me *Completely true of me*

17. I really enjoy camping and hiking outdoors.

1 2 3 4 5 6 7
Not at all true of me *Completely true of me*

18. Sometimes I feel like parts of nature- certain trees, or storms, or mountains- have a personality of their own.

1 2 3 4 5 6 7
Not at all true of me *Completely true of me*

19. I would feel that an important part of my life was missing if I was not able to get out and enjoy nature from time to time.

1 2 3 4 5 6 7
Not at all true of me *Completely true of me*

20. I take pride in the fact that I could survive outdoors on my own for a few days.

1 2 3 4 5 6 7
Not at all true of me *Completely true of me*

21. I have never seen a work of art that is as beautiful as a work of nature, like a sunset or a mountain range.

1 2 3 4 5 6 7

Not at all true of me *Completely true of me*

22. My own interests usually seem to coincide with the position advocated by environmentalists.

1 2 3 4 5 6 7
Not at all true of me *Completely true of me*

23. I feel that I receive spiritual sustenance from experiences with nature.

1 2 3 4 5 6 7
Not at all true of me *Completely true of me*

24. I keep mementos from the outdoors in my room, like shells or rocks or feathers.

1 2 3 4 5 6 7
Not at all true of me *Completely true of me*

7.6 Qualitative Questions

1. Describe your emotions when you paddle.
 - a. *Long Answer Response*
2. Have your emotions when you paddle changed as you have gotten more comfortable on the water? Describe the change if there has been one.
 - a. *Long Answer Response*
3. Have you always felt connected to nature or has the connection changed since you started paddling?
 - a. *Long Answer Response*