CONNECTEDNESS TO NATURE

AND PLACE-BASED EDUCATION

A Thesis

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by

Guy Frederick Galante

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Abstract

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CONNECTEDNESS TO NATURE

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The author posits that an environmentally focused place-based pedagogy will lead to increased nature relatedness, inclusion of nature in self, and overall love and care for a regional park that borders a Northern Californian university. This study represents a basic tool kit to get the seeds of connection to germinate in a particular place.

Despite being literally just on the other side of the levee that separates the campus and the 23-mile park and river corridor, a considerable number of the university's students do not seem to know that a regional park exists. College level outdoor recreation courses and science-based experiments that lead students to the regional park are often times students' first ever, and maybe only, contact with it.

Connecting the university's students with the park more intentionally has the potential to foster environmental stewardship in a generation of young people who would then be equipped to handle the socio-political, socio-cultural, and environmental pressures that impact the park. Even if students do not engage in park policy matters in

the future, they may spend their lives living near it and still can become perpetually responsible users and protectors of the cultural, environmental and recreational resources of the regional park. Not to mention that the river supplies a generous portion of the region's water supply.

This study is designed to gain an understanding of students' connectedness to nature levels, and to get a sense of what they know about the regional park that borders their campus. The knowledge gained from the study will help guide the formulation of place-based curriculum to be offered to higher education students in the Sacramento, CA region.

_____, Committee Chair
Dr. David Rolloff

_____
Date

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Chapter I

INTRODUCTION

There is a need to cultivate a love of nature in our younger generations, as the future stewards and custodians of the Earth, because with the love of nature comes the desire to protect it. Without it, exploitation and destruction of the natural world will continue. To prevent this, we need to collectively and consciously become connected to nature. Fostering connectedness to nature in individuals also means fostering love and empathy for self, others and nature. There are numerous projects and programs aimed at increasing connectedness to nature, but how successful these programs are at increasing nature connection or in promoting environmentally sustainable behaviors is unclear (Bragg, Wood, Barton, & Pretty, 2013). A northern California university is primed to add clarity by successfully increasing both connectedness to nature and environmentally sustainable behaviors through repeated engagements with a local regional park.

Sacramento State University is located adjacent to the south bank of the American River with several nearby bicycle and pedestrian access points to the 23-mile, 5,000-acre regional park named The American River Parkway (Parkway). The Parkway is often referred to as "the crown jewel of the Sacramento Region" and it is considered to be Sacramento Region's greatest recreational civic amenity ("ARPF", 2019).

The American River Parkway is owned by Sacramento County, maintained by the Department of Regional Parks and hosts 8 million visitor days per year. The 23-mile section of river, known as the Lower American River, is designated as a Recreation River within state and federal Wild and Scenic River Systems. The County of Sacramento has

the principal responsibility for administration and management of the American River Parkway as guided by the American River Parkway Plan (County of Sacramento, 2008).

Connecting Sacramento State students with the Parkway has the potential to foster environmental stewardship in a generation of young people who would then be equipped to handle the socio-political, socio-cultural, and environmental pressures that impact the park. Numerous studies (e.g. Kaplan, 1995; Ward-Thompson, 2011; Keniger et al., 2013; Bratman et al., 2015) show that contact with nature (e.g. parks) leads to improved well-being and connectedness to nature, and that structured engagement with nature (e.g. educational courses and activities) may lead to pro-environmental behaviors that could translate to sustaining local open spaces. Even if students do not engage in park policy matters in the future, they may spend their lives in Sacramento and still can become perpetually responsible users and protectors of the cultural, environmental and recreational resources of the American River Parkway. Cultivating environmental stewards of a park adjacent to a university will benefit communities near and far because people who practice environmentally responsible behaviors locally may also do so with a global perspective. It's a win-win situation.

In 2018 the university's president, Robert Nelsen, proclaimed Sacramento State to be an Anchor University and stated, "It aims to connect its students, faculty, and staff with the community and, in turn, help build and often heal that community, achieving long-term solutions and improvements" (CSU, Sacramento, 2018). He added that an Anchor University is committed to community and place and that "it wants to see true, lasting change through civic engagement" (CSU, Sacramento, 2018). Sacramento State is

primed to become a leader in producing long-term stewards of the crown jewel of Sacramento while aligning with the overarching goals of an Anchor University. Through ongoing student engagement with the Parkway and relationships with the organizations and agencies that maintain it, the strands of connections will help weave the fabric of human-nature bonds.

Despite the Parkway being literally just on the other side of the levee that separates the campus and Parkway corridor, a considerable number of the university's students do not seem to know it exists. College level outdoor recreation courses and science experiments that lead students to the Parkway are often students' first ever, and only, contact with it.

Students entering higher education today are the products of public schools where instruction is grounded in standards-based reform and standardized tests that resulted from the No Child Left Behind Act of 2001. Instruction that "taught to the test" may have excluded these youth from participating in real-world experiences and contact with nature. As a consequence, they show signs that they are disconnected from their community and the natural world.

As current Parkway stakeholders, managers, and community members age out of their stewardship roles, a younger generation of stakeholders needs to be cultivated to ensure the Parkway is protected and preserved for future generations. Experiential learning and outdoor recreation can serve as strong foundations for a place-based pedagogy to achieve this.

The purpose of this study is to gain an understanding of students' connectedness to nature levels, and to get a sense of what they know about the American River Parkway. In addition, the author examines how a place-based pedagogy could be developed and implemented in higher education institutions in the Sacramento Region. Studies show that connectedness to nature is a predictor of pro-environmental behaviors and that it can increase subjective well-being. A general education course focused on the American River Parkway would not only benefit the field of recreation, parks, and tourism, it has the potential to foster a better quality of life for self, others, and the broader ecosystems that support life on Earth.

By diagnosing the causes of disconnection and developing strategies to enhance nature relatedness we may be able to promote human well-being and sustainable behavior concurrently (Nisbet & Zelenski, 2013). Measuring individual differences in connectedness to nature may be one strategy to do this- it will help inform and motivate actions and relationships that will deepen the attributes of nature connection. The concentric rings of connection to nature extend beyond connection with self, connections with others, and connection with a community. One will find it difficult to find research that proves otherwise.

Statement of the problem

Young people today are increasingly *disconnected* from nature and this means that young adults today may not have the skills or mindset necessary to mitigate current environmental crises on even a local level.

Evidence suggests that standards-based reform and K-12 textbooks designed for a national audience have limited student connection to local resources and knowledge (Smith, 2002), and this in turn may have contributed to a generation of young people who exhibit symptoms of what is referred to as Nature-deficit Disorder. Most incoming students to Sacramento State University are the products of standards-based education and may be among those disconnected from nature. As a consequence, the education system may be failing to cultivate future stewards of our local parks and open spaces because young people have limited opportunities to fall in love with them. Gruenewald (2003a) states, "the heavy emphasis in educational research on school and classroom practices reinforces institutional practices that keep teachers and students isolated from places outside of schools" (pg. 10). If not connected at a young age, what happens when they move to adulthood?

Initial findings indicate that Sacramento State courses and the campus outdoor education program Peak Adventures use the Parkway in some capacity, but in general, the university underutilizes its proximity to the American River Parkway's recreational and natural resources and misses opportunities for students and faculty to deepen their connection with themselves, each other, and the broader community. Also true is that the American River provides drinking water to the region. In this way, the American River is important to the survival of the communities that depend on it. Most of us are *dependent* on the river, but not so many are *connected* to the river.

Purpose of the study

The purpose of the study is to answer the following two questions:

1) What do three connectedness to nature measurements tell us about Sacramento State students' connectedness to nature level?
2) What do students at a university know about the regional park that borders their campus?

Hypothesis 1: Sacramento State University students will collectively score low on connectedness to nature measures.

Hypothesis 2: Sacramento State University students will have limited engagement with and limited knowledge of the American River Parkway.

Significance of the study

This study is important to the field of recreation, parks, & tourism and to the protection and preservation of natural spaces specifically in Sacramento County, CA. The study may serve as a guiding and inspiring document to educators who desire to use place-based education (PBE) to create action on environmental education agendas in their community. Research suggests that, when put into practice, PBE can enhance student learning, foster students' connection to place, and create vibrant partnerships between schools and communities. It boosts student achievement and improves environmental, social, and economic vitality (Place-based Education Evaluation Collaborative, 2010).

Place- and community-based learning can serve as one antidote to disconnection. It leads young people into neighborhoods, workplaces, agencies, and city council meetings where they can interact with other adults and see themselves as fellow citizens with shared responsibilities (Smith & Sobel, 2010). The benefits can extend not only to themselves but also to their own families and peers and the community as a whole.

The study is important to citizens of the Sacramento, California region because the American River Parkway is an integral component of the region's identity. This study is the beginnings of creating a foundation for providing a framework to engage young people in the long-term preservation of the park's natural and recreational resources.

A PBE model directed toward the regional park and enacted at Sacramento State University would support President Nelsen's anchor university goals in that "it marshals all the University's knowledge and expertise to solving real world problems." (CSU, Sacramento, 2018, p. 7). A PBE model like this would bring teachers, students and park management groups together to help solve environmental and socio-political challenges. If nothing else, PBE would foster the creation of life-long stewards of the natural world, thereby protecting it for future generations.

Definitions

Connectedness to nature **-** nature connectedness can be thought of as a love of nature (also referred to as emotional affinity toward nature). Recent research has found that nature exposure, and feeling connected to nature at a trait level, provides many benefits to humans such as well-being (Chen-Hsuan Cheng & Monroe, 2012).

Ecopsychology - Ecopsychology is often defined by the claim that human well-being is synergistically linked to the well-being of the planet (Fisher, 2016).

Biophilia -Wilson's (1984) *hypothesis* suggests that humans possess an innate tendency to seek connections with nature and other forms of life. It predicts that people's psychological health is associated with their relationship to nature. (Howell, Dopko, Passmore, & Buro, 2011). The term "biophilia" means love of life or living systems.

Pro-environmental behaviors - Pro-environmental behaviors are behaviors that consciously seeks to minimize the negative impact of one's actions on the natural and built world (Kollmuss & Agyeman, 2002). Some of these most basic behaviors may include carpooling, recycling, using reusable shopping bags, and limiting electricity use.

Mindfulness and well-being - Mindfulness is the psychological process of bringing one's attention to experiences occurring in the present moment. It can be developed through the practice of meditation and other training. Mindfulness is the name given to the moments when you are focused with your body mind and spirit in an experience (Humanatureconnect, 2013).

Place-based education - Placed-based education, or PBE, is a contemporary educational term which refers to those forms of pedagogy that seek to connect learning to the local ecological, cultural, and historical contexts in which schooling itself takes place (Elfer, 2011).

Standards-based education - The term standards-based refers to systems of instruction, assessment, grading, and academic reporting that are based on students demonstrating understanding or mastery of the knowledge and skills they are expected to learn as they progress through their education (Great Schools Partnership, 2017).

Experiential Learning - Experiential learning is a process through which students develop knowledge, skills, and values from direct experiences outside a traditional academic setting. (Experiential Learning Center, 2018).

Service-learning - a teaching and learning strategy that integrates meaningful community service with instruction and reflection to enrich the learning experience, teach civic responsibility and strengthen communities (Getting Smart, 2016).

Critical pedagogy - a teaching method that aims to help in challenging and actively struggling against any form of social oppression and the related customs and beliefs (Creative Commons, 2012).

Limitations

Much of the current research on connectedness to nature and place-based education is focused on K-12 education and children, without as much in-depth study on higher education. While studies linked to place-based education in higher education exist, the researcher believes that the content and strategies used among current studies conducted on K-12 curriculum are applicable to PBE designed for higher education.

Response rates to the online survey used for this study were lower than anticipated. The participant pool was 800 students, and the author strove for 400 respondents, yet only 146 students participated. Hence, the smaller than anticipated sample size is not likely to be representative of the university's student population.

More than a third of survey participants (35%) indicated that they are not aware that the Parkway exists. It is possible that some students may not have known that they used the Parkway. For instance, they may have ridden their bike or walked along the bike path to get to the campus but may not have known they were using the Parkway to do so.

Ethical considerations

This study has been deemed *exempt* for human subject research by the California State University, Sacramento's Internal Review Board.

Organization of the rest of the thesis

A review of the literature surrounding the topics of this study is presented in Chapter 2 which is organized by various subtopics. First, the subject of connectedness to nature and how it is measured will be discussed. Secondly, the factors leading to disconnection from nature will be identified. Lastly, the topic of place-based education will be discussed. Chapter 3 will detail the research design, methodology, procedures and data analysis. Chapter 4 presents the results, while Chapter 5 provides a discussion and recommendations based on the findings.

Chapter II

LITERATURE REVIEW SECTION I

The literature review is organized into two main sections. The first section focuses on aspects of connectedness to nature, why it is important, and how it is measured. The second section focuses on place-based education, a pedagogy that may foster attributes of connectedness to nature.

Connectedness to Nature

In recent years, environmental psychologists have shown interest in the notion of connection to nature, and considered it to have an important role in helping mitigate the environmental crises (Tam, 2013). The study of connectedness to nature is primarily concerned with understanding how people identify themselves with the natural environment and the relationships they form with nature (Restall & Conrad, 2015).

Trait connectedness to nature, or connection on an emotional level, is the focus of this study because it promises the fostering and practicing of intrinsic care and compassion for all living things. If connection with self, others, and nature is a goal, and conservation, stewardship, and subjective well-being are outcomes of connection, one must start at the beginning and examine works dedicated towards a deeper understanding of connectedness to nature and how it may positively contribute to responsible environmental behaviors and a deeper sense of awareness. Collectively, these attributes are at the core of connectedness to nature.

Connectedness to nature is sometimes referred to as nature connectedness (Mayer & Frantz (2004), nature relatedness (Nisbet, Zelenski, & Murphy, 2009), nature

connection (Young, Hass, & McGown, 2008), and inclusion of nature in self (Schultz, 2002). Other terms include connectivity to nature and connection to nature. This study will primarily reference connectedness to nature and nature relatedness. Because measures of connectedness converge to the same underlying construct, 'nature relatedness' and 'connectedness to nature' are generally used interchangeably (Lankenau, 2016). All of these phrases are used in the study, and they all refer to the same basic construct.

Chen-Hsuan Cheng and Monroe (2012) use the following as their over-arching framework for defining connection to nature: enjoyment of nature; having empathy for creatures; having a sense of oneness with nature; and having a sense of responsibility for the environment. In this way, connection to nature is about long-held attitudes and beliefs, rather than the kind of short-term, warm feeling we experience after a day outdoors (Bragg, Wood, Barton, & Pretty, 2013). An individual can go out and experience an amazing day in nature (state) without embodying the experience (trait). A nature connected individual is one that embodies the feelings of being connected- it is part of who they are. It is something that is experienced and felt over time.

Schultz (2002) has explained that connectedness to nature is the extent to which individuals include nature as part of their identity. He describes three components that make up the nature connectedness construct. The cognitive component is the core of nature connectedness and refers to how integrated one feels with nature. The affective component is an individual's sense of care for nature. The behavioral component is an individual's commitment to protect the natural environment (Schultz, 2002). He posits

that if a person experiences inclusion with nature, he or she should care about nature and be committed to protecting it. But, if an individual experiences exclusion from nature, that person will protect himself or herself over nature (Schultz, 2002). This means that an individual will engage in a dysfunctional way with the natural world in order to preserve him/herself. In doing so, an individual will likely do more harm than good.

Connectedness to nature and associated outcomes are defined in various ways. According to Zylstra (2014), connectedness to nature is a sustained awareness of the interrelation between one's self and the rest of nature reflected in consistent attitudes and behaviors. Characteristics of nature connectedness are similar to those of a personality trait in the sense that nature connectedness is stable over time and across various situations (Nisbet, Zelenski, & Murphy, 2009). The 8 Shields Institute, an organization dedicated to fostering connectedness to nature, created a model that "incorporates traditional mentoring and deep nature connection practice, fully supported through our neurological, emotional and physical connection to the natural world" (8 Shields Institute, 2018). Their core mission and vison is to help others live with the benefits of connection. They define connectedness to nature traits as attributes, and their model includes "The 8 Attributes of Connection". These attributes include happiness of a child, vitality and abundance of energy, unconditional listening and mentoring, empathy, being truly helpful, feeling fully alive, unconditional love and forgiveness, and a quiet mind. The eight attributes are the metric that help them know they are succeeding (8 Shields Institute, 2018).

Synonymous with connectedness to nature is nature relatedness. The construct of nature relatedness (NR; and the self-report scale by the same name) captures individual differences in the way people view their relationship with the natural world (Nisbet, Zelenski, & Murphy, 2009) According to Nisbet, et al. (2009), NR has three aspects: affective, cognitive, and experiential. They posit that it encompasses one's appreciation for and understanding of our interconnectedness with all other living things on the earth. NR captures people's identification with nature, nature-related worldviews, familiarity with nature, comfort with nature, and desire to be in nature (Tam, 2013).

Nature relatedness variables as originally explained by Nisbet et al. (2009) include Self- an internalized identification with nature, and reflective feelings and thoughts about one's personal connection to nature. Other variables include Perspective- an externalized nature-related worldview concerning individuals' actions and their impact on all living things (Restall & Conrad, 2015), even those that are not aesthetically appealing to humans (e.g., spiders and snakes) (Nisbet, Zelenski, & Murphy, 2009). The last variable is Experience- which captures people's ongoing experiences in nature.

Overall NR predicts love for animals, membership in environmental organizations, self- identification as an environmentalist, preference for green products (Nisbet et al., 2009), and a number of indicators of well-being (Howell et al., 2011; Nisbet et al., 2011; Tam, 2013).

To further deepen one's understanding of connectedness to nature and its associated benefits, the following terms appear as common themes within the empirical research conducted to date and are explicitly defined below. These terms include:

ecopsychology, biophilia, pro-environmental behaviors, mindfulness, and nature-deficit disorder.

Ecopsychology

Connectedness to nature is a core theme in ecopsychology (Tam, 2013), and ecologists and ecopsychologists have long theorized about humans' psychological relationship with the natural world (Mayer & Frantz, 2004). Ecopsychology studies the relationship between human beings and the natural world through ecological and psychological principles. The field seeks to develop and understand ways of expanding the emotional connection between individuals and the natural world, thereby assisting individuals with developing sustainable lifestyles and remedying alienation from nature (Ecopsychology, n.d.). Ecopsychologists argue that modern life, in Western culture, has led to a greatly decreased self-nature overlap and that this fundamental change in our relationship to nature partly explains our slow response to the modern environmental crisis (Mayer & Frantz, 2004). The principles of ecopsychology would suggest that nature relatedness is linked to environmentally responsible behavior, and that the stronger the connection to nature, the more environmentally people will behave (Nisbet, Zelenski, & Murphy, 2009).

Biophilia hypothesis

The biophilia hypothesis helps to explain our connection (and the consequences of disconnection) with the natural world (Nisbet & Zelenski, 2013). The term "biophilia" means love of life or living systems. It was first used by Erich Fromm to describe a psychological orientation of being attracted to all that is alive and vital. Edward O.

Wilson popularized the biophilia hypothesis in his book, *Biophilia* (1984) which proposed that the tendency of humans to focus on and to affiliate with nature and other life-forms has, in part, a genetic basis (Rogers, 2019). Wilson's (1984) *hypothesis* (Kellert S. R., 1997) suggests that humans possess an innate tendency to seek connections with nature and other forms of life. It predicts that people's psychological health is associated with their relationship to nature. (Howell, Dopko, Passmore, & Buro, 2011). Wilson (1984) argues that people have a biologically based need to affiliate with and feel connected to the broader natural world (Kellert & Wilson, 1995). Kellert (1997) has expanded on the biophilia hypothesis, suggesting that our biophilic tendencies drawing us to natural diversity are important for optimal emotional and psychological development.

Embracing our connection to nature makes our lives richer and more meaningful. Becoming more nature related may even make us happier. As individuals become more related to nature, they may feel more positive emotions. This sense of well-being they experience could then result in more pro-environmental behaviors. If people feel good about their natural environment, value and care about it, they might behave in ways that respect and protect it (Schultz P. W., 2002).

Pro-environmental behaviors (PEBs)

Connectedness to nature is an important predictor of environmentally responsible behavior (Frantz & Mayer, 2013). Environmentally responsible behaviors (ERBs) are more commonly referred to as pro-environmental behaviors (PEBs) and they essentially mean the same thing. Pro-environmental behaviors are behaviors that consciously seek to minimize the negative impact of one's actions on the natural and built world. Some of

these most basic behaviors may include carpooling, recycling, using reusable shopping bags, and limiting electricity use.

Pro-environmental behaviors are defined by Kollmuss and Agyeman (2002) as "behavior that consciously seeks to minimize the negative impact of one's actions on the natural and built world". Most cases of environmental behavior can be, based on the knowledge of environmental science or ecology, judged according to their impact on the environment, and labeled as environmentally friendly or unfriendly (Krajhanzl, 2010). Krajhanzl (2010) defines pro-environmental behavior as behavior which is generally (or according to knowledge of environmental science) judged in the context of the considered society as a protective way of environmental behavior or a tribute to a healthy environment.

Schultz (2002) posits the degree to which a person's cognitive self-concept includes nature also predicts the strength and closeness of the relationship with nature, and is associated with pro-environmental values and pro-environmental behavior. People likely find it difficult to value and care for the environment if they feel separated from nature and it is not part of their experience (Nisbet & Zelenski, 2013). But humans will engage in effortful and inconvenient behavior for people and causes they care about. Theory and research suggests that feeling connected to someone or something motivates protective and self-sacrificing behavior (Frantz & Mayer, 2013). To the extent that connectedness to nature represents the same sense of caring, it should also reliably lead to environmentally responsible behaviors (Frantz & Mayer, 2013).

Some methods for measuring an individuals' level of pro-environmental behaviors are found in Tam (2013) and include Environmental Movement Activism from Environmental Attitudes Inventory (Milfont & Duckitt, 2010) and Whitemarsh and O'Neill's (2010) Pro-environmental behavior 24-item scale. Tam (2013) also used a self-reported ecological behavior scale to measure how frequently individuals performed 12 behaviors adopted from past studies (e.g. Kaiser, Doka, Hofstetter, & Ranney, 2003, Schultz & Zelezney, 1998). Measures like these correlate with, and have helped shape, connectedness to nature measures.

Mindfulness and well-being

Mindfulness is the psychological process of bringing one's attention to experiences occurring in the present moment. It can be developed through the practice of meditation and other training. Mindfulness is the name given to the moments when you are focused with your body mind and spirit in an experience (Humanatureconnect, 2013). Large population-based research studies have indicated that the practice of mindfulness is strongly correlated with greater well-being and perceived health (Newlon, 2016).

Diener (1984) coined the expression subjective well-being (SWB). SWB is defined as "a person's cognitive and affective evaluations of his or her life" (Diener, Lucas, & Oishi, 2002, p. 63). The cognitive element of this construct refers to what one thinks about his or her life satisfaction. The affective element refers to emotions, moods and feelings. In basic terms, subjective well-being is felt when a person perceives themselves leading a happy life.

Some instruments used to measure well-being and mindfulness include: Keyes' (2005) 40-item measure of emotional, psychological, and social well-being. Brown and Ryan's (2003) 15-item Mindful Attention Awareness Scale (MAAS), and Cardaciotto's (2008) 20-item Philadelphia Mindfulness Scale with Awareness and Acceptance subscales (Howell, Dopko, Passmore, & Buro, 2011). Other measures include Baer, et al.'s (2006) five facets of mindfulness questionnaire (FFMQ)- a 39-item scale measured on a 5-point Likert scale (Barbaro & Pickett, 2016).

Studies have suggested that facets of well-being beyond positive affect and life satisfaction may be most associated with trait nature connectedness. For example, Howell, Dopko, Passmore and Buro (2011) conducted studies that examined associations among nature connectedness, well-being, and mindfulness. They used emotional well-being, psychological and social well-being scales to examine whether trait nature connectedness was associated with feeling well. They also examined relations among nature connectedness, mental health and mindfullness (Howell, Dopko, Passmore, & Buro, 2011). Their study revealed that nature connectedness, well-being, and mindfulness were significantly inter-related such that, "higher degrees of connectedness to nature were associated with greater well-being and greater mindfulness" (Howell, Dopko, Passmore, & Buro, 2011, p. 167)**.**

Barbaro and Pickett (2016) posited that mindfulness is related to pro-environmental behaviors through the process of enhancing experiences with nature, and that it creates a greater self-world connection that motivates said behaviors. Their 2016 study confirmed their hypothesis- mindfulness was positively correlated with greater

engagement in pro-environmental behavior (Barbaro & Pickett, 2016). They found that more mindful individuals self-report more engagement in daily pro-environmental behaviors.

Mindfulness increases awareness to pro-environmental behavior choices through the intensification of experiences with natural environments (Barbaro & Pickett, 2016). The intensification of experiences with natural environments is self-determined and can be self-guided. One may chose to engage with the natural world without prompting. Yet, structured processes can be beneficial. For example, a workshop on studying bird language can serve as a guided experience that generates an intesified experience. Intensified experiences with nature can strenthen one's connection with nature (Barbaro & Pickett, 2016).

Nature-deficit disorder

For the last decade, disconnectedness from nature has commonly been referred to as nature-deficit disorder. Nature-deficit disorder (NDD) is a term credited to Richard Louv who authored a book called *Last Child in the Woods* (2008). Although it is not officially recognized by any medical coding schemes, Louv's work draws on the theory that exposure to the natural environment can be cognitively restorative, reduces stress, and promotes a sense of place, especially among children (Warber, DeHudy, Bialko, Marselle, & Irvine, 2015). It is a term labeled to address the increasing cost to children as they are increasingly deprived of direct contact with nature and the experience of unstructured free play in the out-of-doors (Driessnack, 2009). Louv coined the phrase to characterize "the human costs of alienation from nature, among them: diminished use of

the senses, attention difficulties, and higher rates of physical and emotional illnesses (Weilbacher, 2009).

We face significant environmental challenges today (e.g., climate change, pollution, over population, and accelerating extinctions). Although the causes and solutions are obviously multifaceted and complex, many have suggested that modern lifestyles contribute to environmental destruction not only via excessive consumption, but also by disconnecting people from nature (Zelenski, Dopko, & Capaldi, 2015). Evans and McCoy (1998) estimate that we spend 90% of our lives within buildings, and that increasing amounts of indoor times leads to a decrease in individuals' feeling a sense of connection to nature (Mayer & Frantz, 2004). Many people may have lost their connection to the natural world (Conn, as cited by Nisbet & Zelenski, 2013), and these damaged human-nature relationships may be contributing to environmentally destructive behavior as well as unhappiness.

Because of our technological advancements and more time spent inside buildings and cars, it is argued that the lack of biophilic activities and time spent in nature may be strengthening the disconnect of humans from nature. The concern for a lack of connection with the rest of nature outside of us, is that a stronger disregard for other plants, animals and less appealing wild areas could lead to further ecosystem degradation and species loss (Rogers, 2019).

Beatley (2009) posits that the concerns associated with NDD represent an even more dire prospect of future generations of adults who don't viscerally or passionately care about nature. They will miss out on the deeper life experiences that natural

experiences and connections can provide. If a young person's natural attraction to nature is not given opportunities to flourish during their early years, biophobia, an aversion to nature, may develop (White & Stoeklin, 2008).

Importance of connectedness to nature

When considering how to combat the current environmental crisis, the need to reconnect human beings to nature has often been proposed (Tam, 2013), and it can reasonably be argued that we need connectedness to nature now more than ever. Mayer and Frantz (2004) posit that connection to nature is a key component of fostering ecological behavior. Restoring damaged human-nature relationships and encouraging connectedness seem more likely to foster caring and protective behavior, and possibly happiness as well (Nisbet & Zelenski, 2013). Direct contact with nature during nature-based leisure experiences has been argued to generate an increased sense of emotional interconnectedness and love for nature (Kaplan & Kaplan, Rolston, Wilson, as cited by Perkins, 2010).

Connectedness to nature brings one to inner peace, presence and creativity. It inspires the happiness of a child, fills one with vitality, and activates inquisitive focus. It brings empathy and respect, awe and reverence, and nurtures feelings of love and forgiveness (Young, Hass, & McGown, 2008).

Humannatureconnect (2013) describes the feelings of nature connection as follows:

> There is a range of feeling associated with connectedness to nature: mutual respect, understanding, love, awe, empathy, belonging, fascination,

> need, happiness, joy and on the flip side may be discomfort, pain, sadness, guilt, longing, and expectation. These in balance are also the components of well-being.

Observations and physiological responses like these have the ability to lead individuals towards a path of deeper compassion for and commitment to the natural world.

There is a growing body of empirical research that supports the concept of feeling connected to nature because, caring about nature is a fundamental key in having people adopt positive environmental and ecological behaviors (Mayer & Frantz, 2004). Mayer and Frantz (2004) also suggest that personal well-being is linked to a sense of feeling connected to nature and that if people feel connected to nature, they will be less likely to harm it, "for harming it would in essence be harming their very self (p. 512)".

Research consistently shows a reliable relationship between connectedness to nature and self-reported environmentally responsible behavior (Frantz & Mayer, 2013). Connectedness to nature can motivate individuals to engage in pro-environmental behaviors that have minimal negative impacts on the natural environment, and cognitively, themselves (Barbaro & Pickett, 2016). Teisl and O'Brien (2003) conducted a study that showed that participation in outdoor recreation is positively associated with environmental concern/behavior.

High nature relatedness, or a strong subjective connection with nature, is typically associated with greater happiness and environmental concern. Disconnection likely has harmful consequences for both human and environmental health, yet is a regular

consequence of the modern lifestyles that often separate people (physically and psychologically) from the natural world (Nisbet & Zelenski, 2013).

Nature-related people reported spending more time outdoors and in the natural environment. Those higher in NR reported more environmental concern and endorsement of pro-environmental attitudes as well as more self-reported environmental behavior. Higher levels of NR were predictive of ecological perspective, as well as strong views about the seriousness of ecological problems and human treatment of the environment (Nisbet, Zelenski, & Murphy, 2009)

If people fully understand their connection to nature they may develop more empathy for all living creatures and the planet and we may also be able to restore or improve human mental health.

Clearly, connectedness to nature is important because it is more likely to lead to pro-environmental behaviors and can lead to an overall better sense of self. Jon Young, founder of the 8 Shields Institute summed it up well when he said, “Imagine how different the world would be if all of your neighbors had all the attributes of deep nature connection” (Young, 2014).

Connectedness to nature is important because in the absence of it, biophilia never takes root, leading to a generation of citizens whose concern for preserving nature is less, precisely when the Earth needs it to be more (Allred, 2011). In the environmentally-pivotal decades to come, children will grow into policy-influencing adults who lack the love of and commitment to the natural world necessary to ensure its survival (Allred, 2011). If people do not spend time in truly natural settings, they will become more and

more desensitized until they will forget and no longer understand what it is they are missing and why it needs to be saved (Sandry, 2013). For these and other health-related reasons, understanding our connectedness to nature is important, and addressing nature-deficit disorder may be critical to the sustainability of our regional parks and more so, the survival of life on Earth.

How connectedness to nature is measured

The emotions of love, awe, wonder, and deep reverence for nature have received little attention from psychological researchers (Klinger, 1998, as cited by Perkins, 2010), especially with regard to measurement (Perkins, 2010). Yet, there is a growing body of research since 2002 evidenced by this review of literature. Tam (2013) empirically examines nine published assessment tools that measure connectedness to nature or something highly conceptually related, and examines their similarities and differences. More recently, Restall & Conrad (2015) provide a comprehensive list of 21 measures of connectedness to nature including a brief description of the dimensions identified and variables measured. Three of the twenty-one measures were chosen for this study: The Nature Relatedness Scale (short version) (Nisbet & Zelenski, 2013), Inclusion of Nature in Self (Schultz, 2002), and Love and Care for Nature (Perkins, 2010). Refer to the Appendix to review the measures used in this study.

Nature Relatedness Scale (NR)

Tam (2013) describes the 21-item measure named the Nature Relatedness scale as an "explicitly multidimensional concept" (p. 66). It captures people's identification with nature, nature-related worldviews, familiarity with nature, comfort with nature, and desire

to be in nature (Tam, 2013). The measure predicts love for animals, membership in environmental organizations, self-identification as an environmentalist, preference for green products (Nisbet, et al., 2011), and a number of indicators of well-being (Howell, et al., 2011, Nisbet, et al., 2011).

Nisbet and Zelenski (2013) developed a short form version of the nature relatedness scale comprised of six items from the original 21-item scale. The New Brief Measure of Nature Relatedness Scale (NR-6) has four items that assess "Self" and two items that capture "Experience". The Self subscale measures "an internalized identification with nature, reflecting feelings and thoughts about one's personal connection to nature" (Nisbet, Zelenski, & Murphy, 2009, p. 724). The Experience subscale measures "a physical familiarity with the natural world and the level of comfort with and desire to be out in nature" (Nisbet, Zelenski, & Murphy, 2009, p. 725)

Nisbet and Zelenski (2013) used archival findings to compare the new short form scoring to the full scale data used to initially validate the full scale. They also examined correlations with thirteen other conceptually related scales that assessed environmental attitudes and subjective well-being. The NR-6 correlated with all the environmental measures and most of the well-being indicators.

Additionally, the NR-6 was strongly correlated with the full scale. The six nature relatedness items combined to provide a reliable assessment of individual differences in nature relatedness. It demonstrated good internal consistency, temporal stability, and predicted happiness, environmental concern, and nature contact similar to the full scale without compromising the construct validity (Nisbet & Zelenski, 2013). This new brief

measure of connectedness may have advantages where time and space are limited and the research context requires an assessment of connectedness elements rather than environmental attitudes (Nisbet & Zelenski, 2013).

Inclusion of Nature in Self Scale (INS)

Inclusion of nature in self refers to the extent to which people have a schema that includes the knowledge structure about the natural world into one's self-concept (Tam, 2013). Schultz (2002) developed The Inclusion of Nature in Self Scale (INS) to assesses participants' feelings of closeness to the natural world. It is a single item adopted from Aron, Aron and Smollan (1992) and a technique used to assess emotional closeness in human-nature relationships (Frantz & Mayer, 2013). It consists of seven pairs of circles each with labels "Self" and "Nature" with varying degrees of overlap. Participants choose which image represents their inclusion with nature with image "A" (scored as a 1) being least inclusive and image "G" (scored as a 7) being the most inclusive. Schultz (2002) used scores from the *New Ecological Paradigm* (Dunlap, Van Liere, Mertig, & Jones, 2000), the *Environmental Attitudes Scale* (Thompson & Barton, 1994), and *Environmental Motives* (Schultz, 2000) to directly assess inclusion. With regard to Environmental Motives, Schultz (2002) identified that environmental concern has three correlated factors: egoistic (concern for environmental effects on one's own well-being), altruistic (concern for environmental effects on other humans), and biosperic (concern for the impact of environmental problems on all other living things). He found that biospheric concerns to be a good predictor of self-reported environmental behavior (p. 71-72). Schultz (2002) has argued that biospheric attitudes reflect a greater level of

inclusion with nature, while egoistic attitudes reflect a separateness from nature (p. 72). He found the INS to correlate positively with biospheric attitudes, scores on the NEP, ecocentrism, and self-reported behavior (Schultz, 2002, Mayer & Frantz, 2004; Schultz, Shriver, Tabanico, & Khazian, 2004; Restall & Conrad, 2015).

Additionally, Schultz (2002) posits that inclusion with nature has three core components: connectedness (cognitive), caring (affective), and commitment (behavioral). Therefore, if individuals have higher levels of biospheric concern and include nature within their cognitive representation of self, they will then more likely care about nature and be committed to protecting it. If inclusion with nature is low, an individual likely cares more about self than nature, and any commitment to act would be focused on benefiting the self.

Mayer and Frantz (2004) contend that in order to complete the scale, participants must have, or form an abstract representation of their relationship with nature, and that people may not be able to accurately report their connection to nature in this abstract form. Hence, they see challenges in using the INS as a means to measure connection. Nonetheless, the INS is often used in studies to help validate new connectedness to nature instruments. Based on the literature reviewed for this study, it is widely used as an industry standard in the study of connectedness to nature.

Love and Care for Nature Scale (LCN)

Perkins (2010) introduced Love and Care for Nature (LCN), which refers to people's personal and explicitly emotional relationship with nature (Tam, 2013). Past investigations had tended to focus on the cognitive aspect only (Tam, 2013), so Perkins

(2010) developed the LCN, an emotional concept aimed to develop a reliable and valid measure of the explicitly affective or emotional aspects of the human-nature relationship and to examine its contribution to environmental altruism. She developed LCN which measures an individual's personal and emotional connectedness with nature, and his/her underlying construct of love and deep care for nature (Restall & Conrad, 2015). Perkins (2010) defines the construct of love and care for nature as a deep love and caring for nature which includes a clear recognition of nature's intrinsic value as well as a personal sense of responsibility to protect it from harm (p. 456). In developing the measure, Perkins (2010) focused on three theoretical dimensions: 1) feelings of awe, wonder and interest in nature, which are sustained emotions said to invoke feelings of care; 2) feelings of love, emotional closeness and interconnectedness to nature, including a spiritual aspect; 3) feelings of care, responsibility, and commitment to protect nature. The LCN was developed in response to researches believing that the other measures (e.g. Mayer and Frantz's (2004) Connectedness to Nature Scale) were not accurately depicting emotional connection, but rather, cognitive beliefs.

The 15-item (BIV) developed by Stern et al. (1998) was administered to measure core value types and test the validity of the LCN, as an indicator of pro-environmental orientation (Perkins, 2010). Additionally, two items were used to assess respondents' willingness to make personal sacrifices for environmental conservation and protection. Other items were included to measure self-reported pro-environmental behavior, and respondents also indicated whether or not they belonged to an environmental organization. Schultz's (2002) single item measure (INS) was included in the pilot

survey instrument as a validating item as was the Connectedness to Nature Scale (Mayer and Frantz, 2004) and the New Ecological Paradigm Scale (Dunlap et al., 2000). Perkins (2010) showed that LCN is strongly correlated with INS (r = .57). The validation tests resulted in creating a final 15-item version of LCN.

One aspect that set it apart from the ISN was that it was the most important predictor of willingness to make personal sacrifices in order to protect the environment (Perkins, 2010). This means that the LCN alone may be useful for empirical research into the differentiated effect of various psychological determinants of environmental altruism across a range of contexts (Perkins, 2010). The LCN strongly predicts support for environmental causes and ecological behavior (Tam, 2013). Perkins (2010) has suggested that as environmental protection becomes increasingly important, and more effort and sacrifice is required of us in terms of protecting it, love and care may be the defining issue.

Summary

Connectedness to nature is not just about feeling good, it is also about doing good. Those that score higher on connectedness to nature measures generally self-report more pro-environmental behaviors. Nature connected individuals recognize that harming the natural world also harms themselves.

While Nature Deficit Disorder may not be clinically recognized, the theory brings to light a number of social, cultural, and health topics that demand society's attention. Whether one buys into the theory or not, many researchers agree that health and happiness can be achieved through direct contact with green spaces. There are hundreds

of studies linking personal health and well-being to exposure to and connection with nature. But because of our technological advancements and more time spent inside buildings and cars, it is argued that the lack of biophilic activities and time spent in nature may be strengthening the disconnect of humans from nature. The concern for a lack of connection with the rest of nature outside of us, is that a stronger disregard for other plants, animals and wild areas could lead to further ecosystem degradation and species loss.

If people fully understand their connection to nature they may develop more empathy for all living creatures and the planet and we may also be able to restore or improve human mental health. Researchers have developed a number of instruments designed to capture cognitive, affective, and behavioral aspects of connectedness to nature, and these measures can be used to gauge connectedness levels over time. But what is also important is to engage individuals in experiences to boost trait connectedness to nature. This concept will be examined in the next literature review section.

LITERATURE REVIEW SECTION II

This section focuses on place-based education, a pedagogy that may foster attributes of connectedness to nature. Researchers note that frequent contact with nature can boost well-being and nature relatedness. Teisl and O'Brien (2003) suggest that if participating in various outdoor recreational activities significantly impacts environmental concern and behavior, then policies and programs promoting these activities may be effective in furthering environmental education agendas.

Some students and educators engage in place-based education (PBE) in order to improve their sense(s) of place as well as to use various aspects of place as educational tools in general. Place-based education has the potential to enhance connectedness to nature and promote pro-environmental behaviors in a place. To better understand place-based education defining "place" first is essential.

Place attachment

Sense of place is a combination of place attachment, place identity, and place dependence and defined as a personal identification with a location or landscape on an emotional level as an individual or as a member of a community (Wolf, Krueger, & Flora, 2014). Sense of place is sometimes used interchangeably with place attachment. Place attachment arises when settings (e.g., local parks) are imbued with meanings that create or enhance one's emotional tie to a natural resource (Cuba and Hummon, as cited by Vaske & Kobrin, 2001).

Place attachment studies have shown that more exposure to a place is associated with stronger identity to and dependence on the place. For instance, Ryan, as cited by Tam (2013) found that active use of urban natural areas significantly predicts attachment to these areas. Research shows that residents who are attached to their place of residence are more likely to engage in pro-environmental behavior and, consequently, place attachment has been prescribed as a pro-environmental policy (Song, 2019).

Place identity is important to define because it is predicted to directly influence specific ERB (e.g., packing out trash, respecting wildlife, staying on designates trails) at a

particular setting (Williams & Patterson, as cited by Vaske and Kobrin, 2001). Place identity concerns the meaning and significance of places for their inhabitants and users, and how these meanings contribute to individuals' conceptualizations of self. The physical landscape or place becomes part of a person's self-identity (Proshansky, as cited by Wolf, Krueger, & Flora, 2014).

Place dependence is an attachment based on function and an ongoing relationship with a particular setting. Local natural resource areas (e.g., community open space) are ideal for establishing this functional attachment (Vaske & Kobrin, 2001). The value of a specific place depends on its ability to satisfy the needs or behavioral goals of an individual or group as compared to other place alternatives (Stokol and Shumaker, as cited by Wolf, Krueger, & Flora, 2014) and the potential of a place to satisfy an individual's needs by providing settings for his or her preferred activities (Krasny & Delia, 2015).

Sense of place could be summed by using the following hypothetical scenario: "I feel at home when I visit this particular beach (place attachment). I have so many memories made at this beach with family and friends, and I am reminded of them when I visit it (place identity). This beach is the only beach in my area where one can find elephant seal colonies. I enjoy watching and photographing them so much, and I come here as often as possible (place dependence)."

Both place identity and place dependence are components of place attachment, but place identity may have a more direct impact on environmental behaviors (Vaske & Kobrin, 2001). In a study by Lawrence (2012) found that visiting campus and nearby

natural areas as part of a structured course or workshop was associated with greater place identity among students. She found that structured experiences in these areas may lead to greater identification with the natural area that in turn may motivate environmental responsibility.

Place-based education has the potential to create greater identification with the regional park near Sacramento State University while cultivating connectedness to nature in students who may then act in more environmentally responsible ways.

Sobel (1996) concludes:

> What's important is that children have an opportunity to bond with the natural world, to learn to love it, before being asked to heal its wounds. If we want children to flourish, to become truly empowered, then let us allow them to love the earth before we ask them to save it".

Place-based education

This section of the literature review will address three areas related to place-based education. The first section briefly examines theories that are at the core of PBE. The next section address standards-based education reform and its impact on K-12 teaching and learning practices since 2001. The author argues that there are multiple historical factors that contribute to students' disconnection from place, and posits that standards-based reform is just one of them. The third section more explicitly defines place-based education. These first two sections help build a case for PBE as a means to promote connectedness to nature since there is overlap in the outcomes associated with each. Finally, the third section will discuss research related to the benefits and challenges of

PBE, steps to incorporating it into curriculum, and current practices in higher education. Collectively, the third chapter will provide the context that connectedness to nature and place-based education are synergistic, and they are defining constructs that will shape the future of environmental education unique to different locales and levels of academic instruction.

Theory and framework

Three theories help ground the framework for this study of place-based education: service learning theory, experiential learning theory, and nature-deficit disorder theory.

Service learning theory. Service learning is a teaching and learning strategy that integrates meaningful community service with instruction and reflection to enrich the learning experience, teach civic responsibility and strengthen communities. It is an educational approach that combines learning objectives with community service in order to provide a pragmatic, progressive learning experience while meeting societal needs. It involves students in service projects to apply classroom learning for local agencies that exist to effect positive change in the community (Knapp & Fisher, 2010). It is often structured by the needs of adults in the community who leverage young people's time and talent to support a solution. Most public and private high schools have a service learning component. (Getting Smart, 2016). Service learning is sometimes coupled with civic learning. Civic learning encourages students to become active citizens by engaging them with issues in their communities and beyond (Getting Smart, 2016).

Experiential learning theory. Experiential learning is often used synonymously with the term "experiential education", but while experiential education is a

broader philosophy of education, experiential learning considers the individual learning process. Compared to experiential education, experiential learning is concerned with more concrete issues related to the learner and the learning context.

Experiential education (EE), as defined by the Association of Experiential Education, may be understood to be "A philosophy that informs many methodologies in which educators purposefully engage with learners in direct experience and focused reflection in order to increase knowledge, develop skills, clarify values, and develop people's capacity to contribute to their communities" (Association of Experiential Education, n.d.). EE instills a sense of personal responsibility and empathy in students, thereby encouraging them to seek and enact innovative solutions to environmental problems and to work toward environmental sustainability (Howley, Howley, Camper, & Heike, 2011).

Dewey (1938) advocated that education should be based on the principle of learning through doing and believed that "all genuine education comes about through experience" (p. 7). Dewey's (1938) Model of Experiential Learning depicts learning as a process integrating experiences, concepts, observations, and action (Bowan, 2016). Dewey's writings were formative in the development of the Experiential Learning Cycle as outlined by Kolb (1984) in *Experiential Learning: Experience as the Source of Learning and Development.* Hands-on learning opportunities connect academic content to the students' lives. A guiding principle of experiential education is that learning opportunities are best when they are relevant and occur within an authentic context (Bowan, 2016). Emphasizing hands-on, real-world learning experiences, this approach to

education increases academic achievement, helps students develop stronger ties to their community, enhances students' appreciation for the natural world, and creates a heightened commitment to serving as active, contributing citizens (Sobel, 2004).

Nature-deficit disorder theory. Nature-deficit disorder (NDD) is a term credited to Richard Louv who authored a book called *Last Child in the Woods* (2008). Although it is not officially recognized by any medical coding schemes, Louv's work draws on the theory that exposure to the natural environment can be cognitively restorative, reduces stress, and promotes a sense of place, especially among children (Warber, DeHudy, Bialko, Marselle, & Irvine, 2015). It is a term labeled to address the increasing cost to children as they are increasingly deprived of direct contact with nature and the experience of unstructured free play in the out-of-doors (Driessnack, 2009). Young people have become disconnected not only from human communities but also from the natural communities that surround them (Smith & Sobel, Bring it on home, 2010). Growing up indoors is having on effect on children's physical and psychological health. More so, their disconnection from the natural world threatens to reduce their desire to invest in the conservation and preservation of the ecosystem. that support life on Earth (Smith & Sobel, Bring it on home, 2010).

Why are these theories often neglected in the U.S. education system? Why are students leaving secondary school with symptoms of nature-deficit disorder? There are a number of factors that contribute to nature deficit disorder, but the next section focuses on one possible root cause: standards-based reform.

Impacts of standards-based curriculum

Most of today's college students in the U.S. that attended public schools are products of standards-based reform and this means that the public education system may have contributed to those students becoming disconnected from place. The *No Child Left Behind Act of 2001(NCLB)* was a U.S. Act of Congress that reauthorized the Elementary and Secondary Education Act. It supported standards-based education reform based on the premise that setting high standards and establishing measurable goals could improve individual outcomes in education. The Act required states to develop assessments in basic skills. As a former public school teacher, the author of this study understands the concept well. To receive federal school funding, states had to give these assessments to all students at select grade levels. Critics argue that the focus on standardized testing (all students in a state take the same test under the same conditions) encourages teachers to teach a narrow subset of skills that the school believes increases test performance, rather than achieve in-depth understanding of the overall curriculum ("I.R.A.", n.d.).

Standards-based reforms stand in conflict to place-based education because standards require a curriculum that is purposefully decontextualized (Jennings, Swidler, & Koliba, 2005). Standards and their accompanying tests may diminish incentives for teachers to teach content that is not tested and encourage direct instruction over experiential or student-centered learning opportunities that make use of local settings (Jennings, Swidler, & Koliba, 2005). In place of actual experience with the phenomenal world, educators are handed, and largely accept, the mandates of a standardized,

"placeless" curriculum and settle for the abstractions and simulations of classroom learning (Gruenwald, 2003a).

In schools, children have experienced a growing disconnect between their lives in communities and what they encounter in their classrooms (Smith & Sobel, Bring it on home, 2010). One result of new federal mandates for accountability is an increasing emphasis on standards, testing, and classroom pedagogies that "teach to the test" while denying students and teachers opportunities to experience critical or place-based education. (Gruenwald, 2003a). The disconnection between children's lived experience and school learning has only been exacerbated by our national preoccupation with standardized test scores (Smith, 2002, pg. 586).

Teachers direct children's attention away from their own circumstances and ways of knowing and toward knowledge from other places that has been developed by strangers they most likely will never meet, especially in the early elementary grades. Learning becomes something gained through reading texts, listening to lectures, or viewing videos rather than through full-bodied encounters with the world (Smith, 2002).

The curriculum ignores the great local teaching resources. Instead, geography is taught using pretty pictures of faraway places (Sobel, 2004), and education that consists only of the abstract and faraway won't sustain the interest of the students (Smith & Sobel, Bring it on home, 2010).

Current educational discourses seek to standardize the experience of students from diverse geographical and cultural places so that they may compete in the global economy (Gruenwald, 2003a). How might the negative impacts associated with

standards-based curriculum be mitigated? The author of this study agrees with Sobel (2004) in that place-based education is the antidote to the not-thinking about the Earth common in many schools.

Place-based education defined

The Place-based Education Evaluation Collaborative (2003) provides this definition of PBE:

> Place-based education offers a fundamentally different approach to both environmental education and community development. It bucks the trends toward standardization and high-stakes testing of mass-produced, mass-consumed, one-size-fits-all knowledge by immersing students in local heritage, regional cultures and landscapes and the rich diversity of local opportunities and experiences, using these as the springboard for of regional, national and global issues, of increasing complexity. (p. 2-3)

Gruenwald (2003a) provides this description of PBE:

> Its practices and purposes can be connected to experiential learning, contextual learning, problem-based learning, constructivism, outdoor education, indigenous education, environmental and ecological education, bioregional education, democratic education, multicultural education, community-based education, critical pedagogy itself, as well as other approaches that are concerned with context and the value of learning from and nurturing specific places, communities, or regions. (p. 3)

Woodhouse and Knapp (2000) describe several distinctive characteristics to this

field of practice: (a) it emerges from the particular attributes of place, (b) it is inherently multidisciplinary, (c) it is inherently experiential, (d) it is reflective of an educational philosophy that is broader than "learning to earn", and (e) it connects place with self and community.

Place-based education is a progressive form of education in which students use their own communities as the source of issues to investigate the location for learning, and, indeed, as an important motivation for learning. The aim of place-based education is to increase students' appreciation of their local environments with an ultimate end of helping students learn ways to sustain their local environments (Jennings, Swidler, & Koliba, 2005). It promotes students' understanding of the interdependence of their lives with those of others in their communities (Howley, Howley, Camper, & Heike, 2011).

PBE offers opportunities for students to explore the geography, ecology, sociology, and politics of their communities as well as to draw on their communities' multigenerational and multicultural resources (Woodhouse & Knapp, 2000). It builds upon the foundation provided by experiential education and puts these ideas to action. It makes environmental education relevant anywhere, to anyone, because local people shape it to respond to their issues (Place-based Education Evaluation Collaborative, 2003).

Howley et al. (2011) have written that, in general, both PBE and experiential education support inquiry as a mode of authentic learning that is active and experiential. Place-based education extends experiential education and prescribes an approach to curriculum development that addresses content (Bowan, 2016). Howley et al (2001) posit

that emphasis on learning by doing and learning through service-oriented projects aims to promote investigation of relevant issues and application of problem-solving strategies in a meaningful way. By creating a structure for students to actively participate in a tangible local experience, as the author of this study aims to justify, the benefits associated with PBE could be realized in higher education students.

Smith (2002) identified five thematic patterns of PBE that can be adapted to different settings: (a) cultural studies, (b) nature studies, (c) real-world problem solving, (d) internships and entrepreneurial opportunities, and (e) induction into community processes (p. 587-590). Deringer (2017) posits that these themes provide a framework for understanding PBE even as it transforms to meet the needs of diverse communities and that a definition of PBE must be adaptable enough to fit any community but specific enough to have meaning. This concept is supported by PEEC (2003). They posit that PBE is inherently tailored to diverse local populations and situations.

With standards and testing dominating today's educational discourse, the suggestion that educators should create curricula designed to foster empathy and allow for the exploration of local places challenges current policy and practice (Gruenwald, 2003a). This discourse is often directed toward primary and secondary institutions, and the same emphasis can apply to tertiary institutions. Place-based education challenges all educators to think about how the exploration of places can become part of how curriculum is organized and conceived (Gruenwald, 2003a). Teachers must become the creators of curriculum rather than the dispensers of curriculum developed by others (Smith, 2002) but this does not mean replacing all of conventional education with critical,

place-based pedagogy (Gruenwald, 2003a). Nonetheless, it calls on educators and students to learn from the immediate world around them, to engage in the now, to embody learned concepts, and to apply lessons learned in the context of the lived community.

Place-based education themes

Several themes emerged from the literature reviewed for this study. When put into practice, the research shows PBE naturally draws upon themes related to social and environmental justice, mindfulness, critical thinking, community engagement, and outdoor education that is ecologically focused.

Critical pedagogy. Gruenewald and Smith (2008) argue that PBE is a form of critical pedagogy and that, for this reason, teachers who use it must require their students to confront issues of race, gender, class, and culture (as cited by Howley, Howley, Camper, & Heike, 2011). Gruenewald (2003a) established PBE's connection to critical pedagogy in his article "The Best of Both Worlds: A Critical Pedagogy of Place." He posits that PBE and critical pedagogy are mutually supportive and argues for a conscious synthesis of the two. Critical pedagogy is primarily concerned with the power structures surrounding education. It examines schooling in historical and social contexts, in terms of class divisions, and in terms of the capitalist society in which it exists in America (Deringer, 2017). Place-based educators advocate for a pedagogy that relates directly to student experience of the world, and that improves the quality of life for people and communities (Gruenwald, 2003a). Place-based pedagogies are needed so that the education of citizens might have some direct bearing on the well-being of the social and

ecological places people actually inhabit. Critical pedagogies are needed to challenge the assumptions, practices, and outcomes taken for granted in dominant culture and in conventional education (Gruenwald, 2003a).

Social justice. The problem-posing format of PBE allows students to question authority and construct their own realities (Deringer, 2017). PBE is an opportunity for formal education to create a more humanizing and generative society through identifying injustices and promoting compassion at a local level (Deringer, 2017). PBE draws much of its social justice emphasis from work done in critical pedagogy (Gruenwald, 2003a). This (the current) era requires more people who believe they have the capacity to make a difference and who step forward to do so (Smith & Sobel, 2010). Reading one's local context involves a recognition of racial, class, and cultural divisions that can create challenges (Lowenstein & Smith, 2017). Overcoming such barriers requires educators to help students find common ground, learn together, and care for one another (Lowenstein & Smith, 2017). Place- and community-based educators create learning environments in which this can happen, proving to students that they can exercise leadership and address dilemmas, if not globally, then within the sphere of their own influence (Smith & Sobel, Bring it on home, 2010). Social justice is applicable to this study in that student engagement with the American River Parkway will certainly expose them to challenges associated with a growing population of people experiencing homelessness in the park.

Environmental justice. According to Gruenewald (2003b), a more intimate connection with the local environment creates a heightened awareness of environmental issues. He said, "…places such as ecosystems, oak trees, and wilderness have other

qualities that transcend the often place-destructive purposes of human beings" (p. 626). When students learn about constructing their places and take responsibility as place-makers, they are able to connect place-making with environmental responsibility (Deringer, 2017). Gruenewald (2003b) argues that we must embrace the experience of being human in connection with the others and with the world of nature, and the responsibility to conserve and restore our shared environments for future generations.

Mindfulness. Deringer (2007) found that place-based education and mindfulness are closely linked, and that a mindful place-based pedagogy may help teachers and students experience place in a deeper way and think more critically about the societal norms and power structures that surround them. Outdoor educators should use mindful place-based education to help deepen student and teacher experiences of place with the intent of encouraging students to critically examine power structures and strive for deeper learning experiences (Deringer, 2017). PBE can further strengthen the bond between mindfulness and connectedness to nature.

Engagement through community connection. Engagement with community is an important concern of both place-based and environmental educators. Both approaches seek to equip students with transferable knowledge and skills that will enable them to make contributions to and assume responsibility for the health of their communities (Howley, Howley, Camper, & Heike, 2011). A teacher can use cultural knowledge, held by the community, to make new information more accessible for students. PBE also emphasizes the engagement of the community through community and school partnerships (Deringer, 2017). Park rangers, non-profit staff members, park directors, and

community members with knowledge and attachments to places can all be incorporated into the curriculum of place-based education. Collectively, they can provide different points of view and spawn inquiry in students' minds. Experiences and interactions like these may lead to student involvement with these groups, and may lead to future job interests.

Outdoor PBE. Outdoor education is a broad term that describes a method of learning that is experiential, occurs in the outdoors, requires the use of all senses and domains, is based on interdisciplinary curriculum matter, and is a matter of relationships involving people and natural resources (Priest, as cited by Leather & Nicholls, 2016). As society becomes increasingly urban and globalized, outdoor educators have begun to recognize the importance of grounding lessons and experiences in the context of their places (Leather & Nicholls, 2016). In order to develop an intense consciousness of places that can lead to ecological understanding and informed political action, place-based educators insist that teachers and children must regularly spend time out-of-doors building long-term relationships with familiar, everyday places (Gruenwald, 2003a; Dewey, 1959).

Outdoor PBE deepens student relationships with places and enhances outdoor learning experiences (Leather & Nicholls, 2016). Introducing outdoor PBE is a natural step in formalizing a pedagogy of place within outdoor education.

Ecological PBE. Engaging students in local problem solving can play a crucial role in the development of environmental stewards (Lowenstein & Smith, 2017). Lowenstein and Smith (2017) believe that students need abundant opportunities to play in

and explore the places where they live to develop an affection for them. These experiences should be coupled with projects that are environmentally beneficial, like planting native species on the campus, picking up litter, developing recycling programs, or eventually participating on local civic committees aimed at reducing human impacts on parks. This way, students will gain a sense of their own capacity to affect positive change (Lowenstein & Smith, 2017).

People tend to care for what they know. Without much experience of the world beyond humanity, children will become less likely to support policy measures aimed at protecting the health of essential natural systems (Smith & Sobel, Bring it on home, 2010). Learning outside their classrooms can help (students) gain the insights needed to make the wide range of difficult decisions regarding the environment likely to face them as they grow into (older) adults (Smith & Sobel, Bring it on home, 2010). The implication here is that the values of ecologically literate and politically motivated adults are shaped by significant life experiences that foster connection- in this case connection with the natural world (Gruenewald, 2003b).

Benefits of PBE

Involving students in local problem solving and action can bring significant benefits. PBE challenges students to think critically about their places and consider the diversity of their place and the people within it. Where PBE is well established, students are challenged to inquire into local concerns, and engage to solve real community problems (Deringer, 2017).

Research and evaluation on place-based education efforts show that a focus on local issues coupled with opportunities for local action that can lead to increased academic performance, environmental literacy, and civic capacity (Lowenstein & Smith, 2017). Students often find this kind of learning to be more engaging and meaningful, especially when they see their efforts lead to socially or environmentally beneficial results (Lowenstein & Smith, 2017).

According to Leather and Nicholls (2016), grounding outdoor education experiences in place can have a variety of benefits for the student: (a) deeper connection with the community, (b) higher academic performance, and (c) deeper connection with other students.

Fly (2010) posits that some benefits of PBE include a greater rapport between students and teachers, lower absenteeism, greater community involvement and community attachment, and improved health through more outdoor time. The Place-based Education Evaluation Collaborative (2013) posits that PBE leads to enhanced civic participation and a greater attachment to place. A bulk of the research on PBE's benefits is directed towards K-12 education, but the benefits are transferable to a higher education model.

Examples of PBE in higher education

Today's teachers are inventing a wide range of experiences that allows students to connect what they are learning to their own lives, communities, and regions (Smith G. A., 2002) and some higher education institutions are succeeding at making place-based education central to their identity.

Students at Humboldt State University in California are using the nearby Klamath River as a focal point for a science program that goes beyond the lab. The aim of the Klamath Connection is to boost the success of science, technology, engineering and math (STEM) majors by connecting science, communities and cultural perspectives. The program helps students understand relationships between science and traditional ecological knowledge, the environment, and communities all through the lens of California's second largest river, the Klamath (Yoo, 2017). It was created by Wildlife Professor Matt Johnson and Biological Sciences Professor Amy Sprowles and launched in fall 2015 (Yoo, 2017).

Temple University is an example of a four-year institution fully embracing place-based pedagogy. Philadelphia Experience, or PEX, brings the city into general education courses, so that local schools, neighborhoods, markets, museums and concert halls become an extension of the regular classroom (Partridge, 2016).

Guttman Community College, the newest City University of New York (CUNY) campus in midtown Manhattan, requires all students to take two semesters of City Seminar, a multi-disciplinary course that launches students into the communities of New York City to conduct inquiry-based research and place-based writing assignments (Partridge, 2016).

In 2008, Cornell University in New York established Friends of the Gorge (FOG), a student organization that works to promote environmental stewardship, recreation and safety around Cornell's gorge areas. FOG stewardship activities include trail improvement, tree planting, and gorge cleanups (Krasny & Delia, 2015).

Colleges and universities are eager to offer students off-campus internships and service learning opportunities, but the implementation of place-based pedagogy is often left to individual educators. Unless a college makes a concerted effort to extend these opportunities, learning that is contextualized in the local community or environment is available to only a small percentage of students (Partridge, 2016).

Despite making educational and institutional sense, place-based pedagogy is still underutilized in mainstream higher education (Partridge, 2016). This is partly due to the typical "lone-wolf nature" of higher education instruction. Individual faculty members spend an enormous amount of time mastering and keeping abreast of developments in their areas of specialization and creating a curriculum to convey their subject to students (Partridge, 2016). Inviting faculty to add place-based methods to their teaching can feel like asking them to do additional work (Partridge, 2016). Formal learning experiences that leverage the power of place remain the exception and not the rule (Getting Smart, 2016).

Summary

Place-based education helps students learn to take care of the world by understanding where they live and taking action in their own backyards and communities (Place-based Education Evaluation Collaborative, 2010)**.** A PBE program for higher education that is focused on a local regional park in Sacramento, CA has the potential to cultivate a generation of young people who can "carry the torch" passed on by the mentors, elders, and ancestors of yesterday and today. Community vitality and environmental quality can be improved through the active engagement of local citizens,

community organizations, and environmental resources in the life of the school (Sobel, 2004).

The content of this literature review section presents information that clearly justifies place-based education as a curricular model that would indeed foster connectedness to nature, as well as connectedness to self and others through engagement with the human and nature community. The information presented here provides more than adequate support for developing PBE curriculum, and the concept is certainly applicable to higher education coursework.

PBE is not merely a way to make the curriculum more relevant to students' lives; it is also a way to connect the project of schooling to the survival of a particular place (Howley, Howley, Camper, & Heike, 2011). If this is true, PBE is an obvious method to accomplishing the researcher's goals as indicated by the research questions under study.

Chapter III

METHODOLOGY

Research design

This exploratory study included a mixed-methods design in that both quantitative and qualitative data were collected to address the research questions and hypotheses. Quantitative data were analyzed in accordance with the original and past studies. General guidelines for analyzing qualitative data were followed to categorize data into meaningful categories when necessary.

Participants

One hundred forty-six college students (40% men, n = 58; 59% women, n = 86; 1% non-binary, n = 2) from California State University, Sacramento participated in this research. The sample consisted of 6 freshmen, 7 sophomores, 59 juniors, 72 seniors, and 2 graduate students. Participants were 43.9 % Caucasian (n = 64), 24% Latina/Latino/Hispanic (n = 35), 21.2% Asian American (n = 31), 3.4% Black/African American (N = 5), 2% Native Hawaiian (N = 3), <1% American Indian or Alaska Native (N = 1). Four percent (N = 6) indicated “Other” and one person indicated “Prefer not to state”.

Comparatively, the student population reported by the university is nearly 31,000 students; 56% female and 44% male with 31% Caucasian, 27% Latina/Latino/Hispanic, 21%, Asian American, 7% Black/African American, 11% Other/Multiracial, and 1% each for Pacific Islander, American Indian, and Foreign (CSU, Sacramento, 2018).

The author solicited 13 instructors who teach a combined 30 general education recreation courses and religious studies courses to disseminate an anonymous online survey to their students. These general education classes were chosen because the total number of students enrolled in the combined 30 courses was roughly 800 students who were deemed to be a sample of the university's population and majors.

Measurement instruments

A 49-item survey was created using Qualtrics Online Survey Software and included 5 sections. The first section of the survey recorded subject's consent and demographic data. The next three sections included connectedness to nature scales: The Nature Relatedness Scale short form (NR-6) (Nisbet & Zelenski (2013), the Inclusion with Nature in Self (Schultz P. W., 2002), and the Love and Care for Nature Scale (Perkins, 2010). The final section was comprised of 10 questions designed to capture a baseline understanding of students' knowledge and behaviors relative to the American River Parkway. Eight of the 10 "Yes or No" questions led to a text box where subjects could elaborate on a "yes" answer.

The New Brief Measure of Nature Relatedness Scale, short form (NR-6). The NR-6 is a short version of the original 21-item scale. The purpose of the shorter scale is to measure how connected an individual feels to nature but in a shorter way and with no sub-scales. Four items assess self-identification with nature, a sense of connectedness that may be reflected in spirituality, awareness, or subjective knowledge about the environment, and feelings of oneness with nature. Two additional items capture individual differences in the need for nature and comfort with wilderness, as well as

awareness of local wildlife or nearby nature. The NR-6 uses a 5-point Likert scale ranging from 1 (disagree strongly) to 5 (agree strongly). In general, a mean score of 1-3 indicates lower nature relatedness, whereas 3.01-5 indicates higher levels of nature relatedness.

Developing the NR-6 measure included three studies found in Nisbet and Zelenski (2013). Study 1 included one-hundred eighty-four undergraduate psychology students. The majority were female (67.4%; n = 124; n = 60 males). The mean score was 3.00, SD = 0.83. Study 2 extracted data from the original 21-item measure that was taken by 145 Canadian middle managers (87 men; 56 women) as reported by Nisbet et al., 2009, 2011. The NR-6 score, derived from scoring the 6 items found in the original scale, produced a mean of 3.39, SD = 0.84. Study 3 involved 354 students in psychology, biology, geography, and natural history courses (59.9% female; n = 212; 41.1% male; n = 142. The mean NR-6 score in this study was 3.34, SD = 0.86. The mean score for the three studies combined was 3.24 with a mean standard deviation of 0.84. Mean scores from all the other studies which used NR-6 in adults is 3.30 (Bragg, Wood, Barton, & Pretty, 2013). Those who were more nature related (higher scores) indicated greater intention to behave environmentally, and also reported more commitment and action.

The new NR-6 scale demonstrated good internal consistency, temporal stability, and predicted happiness, environmental concern, and nature contact (Nisbet & Zelenski, 2013). The short form NR-6 scale displays a similar pattern of correlations with subjective well-being and environmental variables as the full 21-item scale (Nisbet &

Zelenski, 2013). This scale also shows good reliability (alpha = .87) and test-retest stability six months later, r = .88 (Nisbet, Zelenski, & Murphy, 2009).

The Inclusion of Nature in Self Scale. The Inclusion of Nature in Self is a single-item question designed to measure the extent that individuals include nature as part of their identity. The INS adopts the same format as Aron, Aron, & Smollan's (1992) Inclusion of Other in Self measure.

Participants select from seven diagrams which degree of overlap of circles best described their relationship with the natural environment (1 = least overlap, 7 = greatest overlap. In each pair, one of the circles is labelled "self" and the other circle is labelled "nature". Individuals who are very connected to nature (high inclusion) choose the pair of circles that completely overlap (scored as a 7) while individuals who are not connected to nature (low inclusion) choose circles that are non-overlapping (scored as a 1), thus scores can range from 1 to 7. Results from previous studies showed INS to be positively correlated with self-reported environmental behavior, and to be correlated with other measures of general environmental attitudes.

As this is a single-item scale, internal validity cannot be measured using Cronbach's alpha, but Schultz (2001) examined the validity of the INS scale by examining correlations with other measures. INS was found to be significantly correlated with subscales of the Environmental Motives Scale, Biospheric concern, ($r = .31$, $p < .01$) and Altruistic concern, ($r = .18$, $p < .05$). In addition, INS was significantly correlated to the New Ecological Paradigm Revised Scale, ($r = .20$, $p < .01$) and the Interpersonal

Reactivity Index Subscale Perspective Taking ($r = .30$, $p < .01$) (Schultz, Shriver, Tabanico, & Khazian, 2004).

A number of studies reviewed in this research have used the INS. The Inclusion of Nature in Self scale was used in a study by Schultz where data were obtained from 100 undergraduate students (40 males, 60 females) recruited from the Psychology Department's Human Participant Pool at a California State University ($M = 3:74$; $SD = 1.32$). A study by Davis (2009) surveyed seventy-one undergraduate students (26 males, 45 females) recruited from Soka University in Southern California who completed the INS ($M = 4.30$, SD not available). Perkins (2010) conducted a study that included 261 tourists (42% males and 58% females) in the Gold Coast tourism region in Australia and used INS was part of the study ($M = 4.14$, $SD = 1.46$). Davis (2011) incorporated the INS into their study that included 248 undergraduate students (106 men, 142 women) from Virginia Commonwealth University ($M = 4.19$, SD not available). Collectively, these studies produced a mean of 4.09. Nisbet and Zelenski (2013) found the INS is highly correlated with the NR-6 ($r = 0.70$). and Perkins (2010) found it strongly correlated with the LCN ($r = 0.57$).

Love and Care for Nature Scale. The Love and Care for Nature Scale (LCN), a 15-item measure, refers to people's personal and explicitly emotional relationship with nature (e.g., "I feel a personal sense of inter- connectedness with the rest of nature"). Perkins (2010) developed LCN, an emotional concept, because they identified that most of the past investigations had tended to focus on the cognitive aspect only. It mainly captures the attachment and sense of interdependence dimension, or the emotional

dimension (Tam, 2013). Tam (2015) found LCN strongly predicts support for environmental causes and ecological behavior and that it was consistently incrementally important for both subjective well-being and environmental behavior. LCN uses a 7-point Likert scale. Scores ranging from 1-3 indicate lower levels of love and care for nature, a score of 4 is neutral, and a score of 5-7 indicates higher levels of love and care for nature. Perkins (2010) conducted a field trial of the LCN that included 261 tourists (42% males and 58% females) in the Gold Coast tourism region in Australia. Results of the original field trial showed the mean of the LCN was 5.36, SD = 1.10 (on a 7-point scale) and Cronbach's alpha was ✔ = .97.

American River Parkway Survey. Park-related questions were developed by applying the researcher's15 years of teaching environmental education programs in the park to youth and adults in both the public and private sectors. Questions were designed to assess participants baseline knowledge of the park and asked about things such as park use, volunteer engagement, and environmental issues that affect the park.

The American River Parkway items were sent to 25 individuals who are part of the American River Parkway Coalition, a group of stakeholders that meets every month to share and discuss various park topics and issues. Ten individuals reviewed the questions for content and made recommendations before the survey was disseminated to the actual subjects. The respondents represented the American River Natural History Association, Save the American River Association, Friends of the River, Friends of the Riverbanks, Friends of Lakes Folsom and Natoma, the California Native Plant Society, and a Sacramento County Park Ranger. Collectively, they provided a thorough edit of

grammar and spelling, and made suggestions for modifying or adding additional questions. All respondents were supportive of the subject matter and indicated that the survey questions were “pertinent” “adequate” “thorough” and “perfectly acceptable”.

Procedure

Data collection occurred over a two-week period beginning in March 2019. The link to the online survey was sent by email to 12 general education recreation course instructors in February 2019 to ask for their support in disseminating it in early March 2019. The instructors had the ability to preview the 10-12-minute survey before data collection commenced. It was recommended that the survey be given during class time with the option to have students complete it outside of class. Five of the twelve instructors responded positively that they would help distribute the survey and seven instructors did not respond.

A thirteenth instructor in another department was asked to help boost return rates by disseminating the survey to their three religious studies general education courses. According to that instructor, those classes matched the demographics of the other general education classes; a diverse mix of students and majors. This added approximately 40 additional participants. March 15, 2019 was the last day that data was collected since the campus closed the following week for spring recess. In all, 146 students responded.

Data analysis

The analysis is focused on answering two questions: What do three connectedness to nature measurements tell us about the sample population’s connectedness to nature

level? What do students at a university know about the regional park that borders their campus?

The author anticipated several hundred survey respondents and opted to create an online survey using Qualtrics Online Survey software (Qualtrics) to minimize paper and printing costs. A laptop, tablet or smart phone could be used to take the survey. All survey data was downloaded from Qualtrics in three formats: Comma Separated Values (.csv), Statistical Package for the Social Sciences (SPSS) data file (.sav) and a Microsoft Office document (.docx). The Comma Separated Values file was viewed using Microsoft Excel 2016 and the SPSS data file was viewed with SPSS 25.

Initial examination of the data revealed some anomalies that were eventually corrected directly through Qualtrics. The author found that all survey preview data were recorded during the survey testing period (n = 10) and several student surveys were incomplete beyond the demographic section (n = 8). The combined preview and incomplete survey data (n = 18) were deleted from the original data in Qualtrics and the data was downloaded again.

Survey data were uploaded into SPSS 25. Results of the quantitative data were analyzed using descriptive statistics. Frequencies for each of the three connectedness to nature scales were computed in SPSS for each subject and for the total sample population by using the Compute Variable function and Crosstabs. Next, a One-way ANOVA was conducted for each of the connectedness to nature measures to determine if the means were statistically significantly different from each other.

An internal consistency reliability analysis was conducted through Cronbach's alpha to determine the reliability of the New Brief Measure of Nature Relatedness Scale, short form (NR-6) and the Love and Care for Nature Scale (LCN). Because the Inclusion of Nature in Self Scale (INS) was only one item, Cronbach's alpha could not be conducted. Lastly, Pearson's r was used to measure the relationships among the three connectedness to nature scales.

The American River Parkway section of the survey was analyzed using Microsoft Word and Microsoft Excel 2016 to address the research question "What do students at a university know about the regional park that borders their campus?" SPSS was used to run descriptive statistics for all of the multiple-choice questions in this section of the survey for each gender category and for the entire sample population.

All written survey responses were copied from a Qualtrics survey data report that was downloaded as a Word document. The written responses were then copied into Excel and categorized.

Chapter IV

RESULTS

The results presented in this section contributed to answering two questions: What do three connectedness to nature measurements tell us about the sample population's connectedness to nature level? What do students at a university know about the regional park that borders their campus? The questions will be addressed independently and discussed collectively in Chapter Five.

Subjects for this study were college students recruited from general education courses in recreation and religious and humanities studies at Sacramento State University in California. Students received an email invitation from their instructor that included a survey link and an informed consent letter. One hundred forty-six college students (58 male, 86 female, 2 non-binary) anonymously volunteered to participate in this research. Eighty-eight percent attended public school, less than 10% attended private school, and less than 3% were home schooled. The sample consisted of 6 freshmen, 7 sophomores, 59 juniors, 72 seniors, and 2 graduate students. Participants were 43.8 % Caucasian (N = 64), 24% Latina/Latino/Hispanic (N = 35), 21.2% Asian American (n = 31), 3.4% Black/African American (n = 5), 2% Native Hawaiian (n = 3), <1% American Indian or Alaska Native (n = 1). Four percent (4.1%; n = 6) indicated "Other" and one person indicated "Prefer not to state".

The New Brief Measure of Nature Relatedness Scale, short form (NR-6)

The NR-6 captures people's identification with nature, nature-related worldviews, familiarity with nature, comfort with nature, and desire to be in nature (Tam, 2013). The

measure predicts love for animals, membership in environmental organizations, self-identification as an environmentalist, preference for green products (Nisbet, et al., 2011), and a number of indicators of well-being (Howell, et al., 2011, Nisbet, et al., 2011). The original study of this scale by Nisbet et al. (2013) showed good reliability, $\alpha = .87$ (Nisbet, Zelenski, & Murphy, 2009). Those who were more nature related (higher scores) indicated greater intention to behave environmentally, and also reported more commitment and action.

All 146 subjects in this study completed the NR-6, a six-item measure that uses a 5-point Likert scale. The NR-6 score is calculated by averaging all 6 items and scores can range from 1 to 5. In general, a mean score below 3 indicates low nature relatedness, while a score above 3 indicates higher nature relatedness.

The mean score in this study was 3.74, SD = 0.77 (M= 3.75 males, M = 3.71 females, M = 4.75 non-binary/other). The mean was 0.5 higher than the average means of the original studies (M = 3.24) and 0.44 higher than the mean score cited by "RSBP". The results of this study produced an alpha level of .81 ($\alpha = .81$) and showed the NR-6 correlated strongly with both the INS (r = .57) and the LCN (r = .73). Refer to Table 1 for descriptive statistics and Table 2 for NR-6 score distributions.

The Inclusion of Nature in Self Scale (INS)

Inclusion of nature in self refers to the extent to which people have a schema that includes the knowledge structure about the natural world into one's self-concept (Schultz, Shriver, Tabanico, & Khazian, 2004)

This research found the INS positively correlated with both the NR-6 ($r = .57$, $p<.01$) and the LCN ($r = .62$, $p< .01$). The mean INS score in the present research was 3.96, SD = 1.39 (M = 3.86- males, M = 3.99- females, and 5.50-non-binary/others).

The mean score of the sample population for this study (M = 3.96) places it in the direction of higher inclusion and suggests that the population somewhat includes nature in self. Refer to Table 1 for descriptive statistics and Table 3 for INS score distributions.

The Love and Care for Nature Scale (LCN)

Perkins (2010) defines the construct of love and care for nature as a deep love and caring for nature which includes a clear recognition of nature's intrinsic value as well as a personal sense of responsibility to protect it from harm (p. 456). Love and care for nature may be an important predictor of the sample population's willingness to make personal sacrifices in order to protect the environment.

One hundred forty-one subjects (54 men; 85 women; 2 non-binary) completed the LCN in the present study. The mean, derived from a 7-point Likert scale, was 5.36, SD = 1.03 (M = 5.17 males, 5.44 females, 6.83 non-binary/other) with an alpha of .95 (α = .95). The measure had a strong correlation with both the NR-6 ($r =.73$, $p<.01$) and the INS ($r = .62$, $p<.01$). Refer to Table 1 for descriptive statistics and Table 5 for LCN score distributions.

Table 1

Descriptive statistics for the NR-6, INS and LCN

						95% Confidence Level for Mean			
		N	Mean	SD	SE	Lower	Upper	Min.	Max.
NR-6	Male	58	3.75	.77	.10	3.55	3.95	1.83	5.00
	Female	86	3.71	.77	.08	3.56	3.87	1.50	5.00
	Non-binary	2	4.75	.35	.25	1.57	7.93	4.50	5.00
	Total	146	3.74	.77	.06	3.62	3.87	1.50	5.00
INS	Male	58	3.86	1.50	.197	3.47	4.26	1	7
	Female	86	3.99	1.32	.142	3.71	4.27	1	7
	Non-binary	2	5.50	.707	.500	-.85	11.85	5	6
	Total	146	3.96	1.39	.12	3.73	4.19	1	7
LCN	Male	54	5.17	1.21	.16	4.84	5.50	2.07	7.00
	Female	85	5.44	.87	.09	5.25	5.63	3.60	7.00
	Non-binary	2	6.83	.24	.17	4.72	8.95	6.67	7.00
	Total	141	5.36	1.03	.09	5.19	5.53	2.07	7.00

Table 2

Score Frequencies for the NR-6.

Gender	Score Range	Frequency	Percent	Valid Percent	Cumulative Percent
Male	1-2	1	1.7	1.7	1.7
	2-3	9	15.5	15.5	17.2
	3-4	20	34.5	34.5	51.7
	4-5	28	48.3	48.3	100.0
	Total	58	100.0	100.0	
Female	1-2	2	2.3	2.3	2.3
	2-3	11	12.8	12.8	15.1
	3-4	38	44.2	44.2	59.3
	4-5	35	40.7	40.7	100.0
	Total	86	100.0	100.0	
Non-binary	4-5	2	100.0	100.0	100.0

Table 3

Score Frequencies for the INS

Gender	Score Range	Frequency	Percent	Valid Percent	Cumulative Percent
Male	1-2	3	5.2	5.2	5.2
	2-3	7	12.1	12.1	17.2
	3-4	16	27.6	27.6	44.8
	4-5	12	20.7	20.7	65.5
	5-6	12	20.7	20.7	86.2
	6-7	5	8.6	8.6	94.8
	7	3	5.2	5.2	100.0
	Total	58	100.0	100.0	
Female	1-2	2	2.3	2.3	2.3
	2-3	4	4.7	4.7	7.0
	3-4	28	32.6	32.6	39.5
	4-5	28	32.6	32.6	72.1
	5-6	12	14.0	14.0	86.0
	6-7	7	8.1	8.1	94.2
	7	5	5.8	5.8	100.0
	Total	86	100.0	100.0	
Non-binary	5-6	1	50.0	50.0	50.0
	6-7	1	50.0	50.0	100.0
	Total	2	100.0	100.0	

Table 4

Score Frequencies for the LCN

Gender	Score Range	Frequency	Percent	Valid Percent	Cumulative Percent
Male	2-3	2	3.7	3.7	3.7
	3-4	7	13.0	13.0	16.7
	4-5	16	29.6	29.6	46.3
	5-6	12	22.2	22.2	68.5
	6-7	17	31.5	31.5	100.0
	Total	54	100.0	100.0	
Female	3-4	3	3.5	3.5	3.5
	4-5	29	34.1	34.1	37.6
	5-6	26	30.6	30.6	68.2
	6-7	27	31.8	31.8	100.0
	Total	85	100.0	100.0	
Non-binary	6-7	2	100.0	100.0	100.0

Table 5

Analysis of Variance

		Sum of Squares	df	Mean Square	F	Sig.
NR-6	Between Groups	2.12	2	1.060	1.819	.166
	Within Groups	83.33	143	.583		
	Total	85.45	145			
INS	Between Groups	5.37	2	2.68	1.39	.253
	Within Groups	276.39	143	1.93		
	Total	281.75	145			
LCN	Between Groups	6.88	2	3.44	3.37	.037
	Within Groups	140.63	138	1.02		
	Total	147.51	140			

American River Parkway survey

One hundred-forty students (54 males, 85 females, 2 non-binary) of the original sample population participated in the American River Parkway section of the survey. The first item posed a yes or no statement: "I am aware of a Sacramento regional park called the American River Parkway." A "yes" answer moved the subject forward to the next question. A "no" response terminated the survey since it did not make sense to ask additional questions about a park of which the subjects were not aware. Ninety-one subjects (65% of the original sample) answered yes, while 49 subjects (35%) answered no. Thus, the sample size was reduced to 91 subjects. The reduced sample consisted of 3 freshmen, 6 sophomores, 35 juniors, 46 seniors, and 2 graduate students. Participants were 39 % Caucasian (N = 39), 27% Latina/Latino/Hispanic (N = 25), 16% Asian American (N = 15), 4% Black/African American (N = 4), and 2% Native Hawaiian (N = 3). Five percent (N = 5) indicated "Other" and one person indicated "Prefer not to state". Each question/statement of the Parkway survey section is evaluated below.

I have visited the American River Parkway in the last 12 months. Thirty-seven subjects (41%) indicated that they have visited the American River Parkway in the last 12 months and fifty-three students (59%) have not. Those that indicated they have visited the park in the last 12 months were then asked how many times they visited in that period and what they did on their visit. Twelve subjects had visited the park 1-4 times, five subjects visited 5-10 times, and 12 people indicated they had visited 11 or more times. Some subjects who visited 11 or more times indicated "weekly", "everyday", and "too many times to count".

Table 6

Known recreation and leisure activities

Category	Activity (number of mentions)
Water sports	Kayaking (15), rafting (13), swimming (13), boating (7), canoeing (5), sailing (1), paddle boarding (2)
Hiking/walking	Hiking/walking (33)
Biking	Biking (26)
Running/jogging	Running (18)
Fishing	Fishing (18)
Land sports	Horseback riding (3), soccer (2), archery (1), Corn hole (1), Frisbee (1), horse shoes (1), Kan Jam (1), obstacle course (1), Pokémon Go (1), rollerblade (1), slackline (1), play catch (1)
Observation	Birding (5), observing (4), ecology (1), fish hatchery (1), sightseeing (1), wildlife (1), guided tours (1), star gazing (1)
Eating	Picnics (8), barbeque (3), sitting and eating (1)
Leisure	Beach (1), bonfire (1), gathering with friends (1), hammocking (1), mingling with friends (1), skipping rocks (1), enjoying nature (1), listening to music (1), reading (1), dog walking (1), tree climbing (1), drinking alcohol (1)

Users of the park indicated the activities in which they engaged in the last 12 months. The most common activities were hiking/walking, biking and running. Other uses included swimming, rafting/kayaking, dog walking, picnicking and relaxing. Some subjects indicated that their frequent visits to the park were due to travel to and from the campus by foot or by bicycle. One subject wrote, “Almost daily. I often walk

along the American River Trail to get to campus from my apartment." Other frequent users of the park indicated that their activities were purely recreational. One subject wrote, "Kayaking, hiking, swimming, lounging on the beach while reading...I can't count how many times I've visited, it's very frequent especially over the summer." A subject who had only visited the park once wrote, "Once for a walk. Unfortunately, the river was brown and dirty and there were homeless, underwear, and trash everywhere- it was upsetting to see."

The 53 subjects who indicated that they had not visited the park in the last 12 months were asked if they had visited the park ever in their lifetime. Twenty-five subjects have visited the Parkway at least once in their lifetime, while 28 have never visited the park.

List all the recreation and leisure activities you know are possible in the American River Parkway (whether you do them or not). Seventy-one subjects responded to the prompt, and a total of 48 different activities were reported. The reported activities were categorized into eight groups. Water sports were the most frequently mentioned activity. The next most known activity was a combination of walking and hiking. Biking, running, and fishing, were also among the most reported activities and each remained in a category on their own. All other activities were categorized as land sports, observation, leisure, and eating. See Table 6 for the activities and frequencies of reports.

I know the rules for the general public who use the American River Parkway. This item did not include a written response section. The responses were

recorded using a 5-point Likert scale (1 disagree strongly, 5 agree strongly). Nine subjects agreed strongly, 27 agreed a little, 32 neither agreed nor disagreed, 10 disagreed a little, and 13 disagreed strongly. Essentially, more than half (55%) of the sample population indicated that they do not know the rules for the general public when using the park. This is not too surprising given that 31% of the sample has never used the park and only 41% have used the park in the last 12 months. The sample doesn't know the rules of the park because they mostly do not use the park.

I have participated in an environmental educational experience (class field trip, workshop, etc.) in the American River Parkway. Sixteen subjects (17.6%) have participated in a Parkway environmental education (EE) experience and 75 subjects indicated they have not. Most of those that have had an EE experience in the Parkway indicated it was connected to a class at the university identified in this study. Five subjects participated with their recreation class (hiking and biking), two participated in biology labs, two conducted geological surveys, two engaged in Humanities and Religious Studies activities (in Alumni Grove), one participated in a class ecology experiment, and one subject recalled a visit to the Effie Yeaw Nature Center in grade school.

I am familiar with environmental issues that affect the American River Parkway. Eighteen of the 91 subjects indicated familiarity with environmental issues but only 14 subjects explained the issues with which they are aware. Ten subjects mentioned littering, five mentioned water quality, four mentioned things relative to threats to habitat and wildlife. Four subjects mentioned homelessness, 3 mentioned air pollution and 2

mentioned fires. Other issues included trail degradation, erosion, graffiti, and stray animals.

I can name several different plants and animals that live in the Parkway. Sixteen subjects were able to name plants and animals that inhabit the Parkway, but only 10 reported the plants and animals they knew. Collectively, the 10 subjects entered 37 different plant and animal species with a range of 2-10 and a mean of 6.8. The species were categorized by mammals, fish, birds, reptiles/amphibians, crustaceans, and plants. Table 7 shows how many of each category were listed as well as the species named.

Table 7

Plants and animals named by participants

Category	Species (number of mentions)
Mammals	Jack rabbit (4), squirrels (3), deer (2), coyote (2), field mouse (1), raccoon (1), homeless man (1), beaver (1), sea lion (1), otter (1)
Fish	Salmon (4), bass (1), sturgeon (1), rainbow trout (2), shad (1), "fish" (2)
Birds	Wild turkey (2), mallard (1), geese (2), teal (1), widgeon (1), red-winged blackbird (1), CA quail (1), woodpeckers (1), hawks (1), cranes (1)
Reptiles/amphibians	Garter snake (1), rattlesnake (2), turtles (1), frogs (1)
Crustaceans	Crayfish (1)
Plants	Valley oak (1), "oaks" (1) CA poppy (1), wild grape (1), blackberry brambles (1), vetch (1), star thistle (1)

I can name specific non-profit organizations and/or government agencies that support the American River Parkway. Six subjects (6.6%) indicated they could name organizations and agencies, yet only four subjects entered information.

Collectively, the 4 respondents entered: Friends of the River, Sacramento County Park Rangers, Roots of Connection, American River Parkway Foundation, and American River Preservation Society.

I have volunteered in the American River Parkway. Eighty-seven subjects (96.7%) reported that they have never volunteered in the American Parkway and three (3.3%) answered positively. Two of the subjects participated in a trash cleanup activity; one with the campus Recreation Majors Association and the other with Peak Adventures, an outdoor recreation program of Associated Students, Inc. at Sacramento State. The other responded only with "Friends of the River" which is an active regional river systems advocacy group.

I would be interested in taking a college course that focuses on aspects of the American River Parkway. Fifty-two (57.1%) responded that they would not be interested and they were asked to explain why. Thirty-four responses were recorded in this section and they fit into 3 distinct categories: Conflict, General disinterest, and Other.

The main conflicts that were expressed were "I'm graduating", "conflict with major classes", and "won't help with future job". One subject wrote, "It's appealing to me but unrealistic with my other courses." Another wrote, "Too many other classes to focus on. If it were, say, a writing-intensive course or one that satisfied a GE requirement for upper-division GE studies, it might be worth it."

The general disinterest comments were fairly straight forward. Responses included "not interested", "rather get information from other resources", and "not worth

an entire class". One subject wrote, "I don't need a course for me to appreciate the scenic views of the Parkway."

The Other category contained only three responses. One subject thought focusing on the San Juaquin River delta would be a better focus, another thought the class would be "too specific", and the third contributed "I'm building an empire right now".

One female responded with the following:

> While the American River Parkway itself might be a fun getaway or place to enjoy various activities, a class concerned solely with the Parkway would be very narrow in scope and would likely teach very little of lasting benefit. Also, there would be no guarantee that a class revolving around learning about the parkway would in any way allow any interaction with the Parkway within the confines of the class (i.e. it seems unlikely that the class would actually make field trips to enjoy the subject of their study), although if regular trips down to the Parkway were part of the class, it would certainly be much more appealing to me as a course.

Thirty-nine subjects (42.9%) of the sample indicated that they would be interested in a general education course focused on aspects of the American River Parkway. Those that indicated they were interested were asked to list the topics they would want the course to include. Analyses of the 27 responses were categorized by themes: Activities, Flora and fauna, Conservation, and Environmental issues. Four subjects expressed a desire to learn about things to do in the Parkway; "leisure activities" and "things to do". Twelve respondents indicated they would want the course to emphasize "plants and

animals", "wildlife", and "native species". Eight subjects provided responses that fit into the Environmental category and included "current conditions and issues", "ecology", "environmental protection" and "water issues". Six responses fit into the Conservation category including; "volunteerism", "ways to keep it clean", and "care for the river and wildlife".

Chapter V

DISCUSSION

The goal of this study was to answer two research questions:

1) What do three connectedness to nature measurements tell us about Sacramento State students' connectedness to nature level?
2) What do students at a university know about the regional park that borders their campus?

Connectedness to nature discussion

The author hypothesized that the sample population for this study would score low on the connectedness to nature scales. The author has rejected the null hypothesis because the participants scored similarly to the scores in the studies used in comparison, and 2 of the 3 scales (the NR-6 and LCN) placed the sample population in the "higher connectedness" end of the spectrum. The score for the INS was more neutral than inclusive but the outcome was similar to other studies.

New Brief Measure of Nature Relatedness Scale, short form (NR-6)

The mean score for the sample population (M = 3.74) placed them in the "more nature related" category. Another way to express the relatedness level would be to assess the score using the Likert scale terms. If the mean is evaluated in terms of the Likert scale, one could say that it falls close to the "agree a little" rank. Regardless, with the mean indicating more nature related, one could predict that the sample population is more likely than not to engage in environmental conservation, have higher levels of subjective well-being, and self-report more commitment and action as a result.

The NR-6 has been shown to correlate with aggregated assessments of time in nature. Repeated exposure to natural environments may help to increase or maintain nature relatedness.

Inclusion of Nature in Self Scale

If one uses a 7-point Likert scale schema to evaluate the INS score, one could posit that they neither agree nor disagree that the sample population has strong inclusion of nature in self levels. The sample population may be more egoistic than biospheric when it comes to environmental behavior and actions. People low in inclusion can still care about the environment, and they can be concerned about flora and fauna, and they may still take pro-environmental action, but only if they perceive a benefit for self. Nonetheless, the mean INS score in this study is within the range of scores of the comparable studies. Future studies should seek to include practices that raise the INS score over time.

Love and Care for Nature Scale

The mean score of the sample population (M = 5.36) was identical to the field trial mean and suggests that students have higher feelings of love and care for nature. To alternatively define the love and care for nature level using terms from the Likert scale rankings, we "somewhat agree" that the population has a high level of love and care for nature. The Love and Care for Nature score found in the current study may be an important predictor of the sample population's willingness to make personal sacrifices in order to protect the environment. It is logical to strive to give and receive more love and care for nature.

Overall, determining individuals' connectedness to nature opens new opportunities to examine, and to go deeper into this topic of study. Connectedness to nature is an important variable to assess when evaluating environmental education programming, particularly if long-term behavior is a stated goal (Frantz & Mayer, 2013). But a valid measure, or measures, of individual differences is not the end but the beginning of an empirical quest investigating the origins of the psychological process behind a person's connection to nature (Brugger, Kaiser, & Roczen, 2011). Measures decribed here would best be used as pre/post assessments to evaluate the effectiveness of treatments designed to increase nature connection because nature connections likely develop over time. A single exposure to nature will probably not permanently change a person's attitudes or behavior, but it may induce state levels of connection. It is plausible to believe that momentary feelings of connectedness with nature do not cause sustainable choices in the same way that a more stable sense of a nature related self does (Zelenski, Dopko, & Capaldi, 2015). Repeat exposure to nature is more likely to induce trait (sustained) connectedness to nature. Howell, et al. (2011) has suggest that greater involvement in nature, may compliment other intentional activities conducive to well-being, too.

Overall, the scores indicate that the sample population is more connected to nature than not. The challenge then is to determine how to create more frequent structured contact with nature that fits into the current higher education system, and to determine if more frequent nature contact leads to any lasting changes in connectedness to nature levels. More specifically, the challenge is to determine how to create more

frequent structured contact with the American River Parkway for college students.

American River Parkway discussion

This section is focused on answering the question "What do students at a university know about the regional park that borders their campus?"

Research shows that parks promote and support healthy lifestyles. Gies (2006) explained that parks encourage people to exercise, that exposure to nature improves psychological and social health, and that they help build healthy and stable communities. The health benefits of parks combined with the positive outcomes of connectedness to nature naturally make it logical to go deeper into this research, especially since students at Sacramento State study, and many likely live, near the nationally recognized regional park.

It is important to note that the author is heavily engaged with the American River Parkway and tracks the organizations that help to sustain it. The author has personally observed that: 1) Young people are noticeably absent from the socio-political and socio-cultural conversations involving the Parkway, 2) Young people are noticeably absent from community meetings and gatherings held by stakeholder groups (e.g. Save the American River Association, Sacramento Audubon, and the American River Natural History Association), and 3) The natural features of the American River Parkway have been seriously compromised by historic mining, streambed and bank alterations, wildland fires, vandalism, misuse, and people experiencing homelessness. Nature connection mentor and cultural repair specialist Jon Young has said that if one can see degenerative aspects of a community and see that regenerative practices are not in play, then that same

person can become an agent of regenerative force (personal communication April 10, 2015). In this context, the degenerative aspects are that future stewards of the American River Parkway are not being cultivated in the community at a time when the park's resources are being compromised. This study is meant to move towards aspects of regenerative practices.

The sample size in this study was reduced from 140 to 91 participants when 49 participants (35%) indicated that they were unaware of the American River Parkway's existence. Therefore, results from a sample size this small cannot be generalized to the entire student population, but the data are telling nonetheless. The short answer to what they know about the park is "not much". Of course, the discussion extends well beyond the short answer. In essence, we failed to reject the null hypothesis: Sacramento State University students have limited engagement with and limited knowledge of the American River Parkway. Failing to reject the null hypothesis was to be expected given that only 44% (n = 62) of the survey participants have ever visited the Parkway in their lifetime and only 26% (n = 37) have visited it in the last 12 months. Twenty percent of the sample (n = 28) have presumably never set foot in the Parkway. These are key statistics when considering that the Parkway literally borders the campus. Yet, it is understandable that the participants know little about something with which they rarely contact.

For those who do contact the Parkway from the campus, they may only observe a small part of the 23-mile corridor, a half mile stretch of the south bank of the river. The section of the park nearest the university leaves much to be desired and is unattractive

and it is not particularly welcoming. It is bookended by two major thoroughfares: The H Street Bridge and the Howe Avenue Bridge. Between these bridges, the band of the altered riparian habitat is quite narrow. Most of the river bank is inaccessible because of flood control modifications. A large human-built feature, a water intake facility, dominates the landscape, and numerous homeless camps are in and around the area. Native vegetation and wildlife can be found in the area. But overall it may be regarded as less than appealing, especially in comparison to other habitat rich areas of the river corridor.

Only a few students have participated in environmental education (EE) experiences in the Parkway and this suggests two things: 1) It is not known if the sample spent their primary and secondary years in Sacramento. The fact that only one subject reported an EE experience "in grade school" is surprising. 2) College students have not had opportunities to engage in environmental education opportunities in the American River Parkway because they do not know about the availability of them outside of the campus or they are generally just disinterested.

More than 80% of the sample is unfamiliar with environmental issues that affect the park which suggests that students rate low on environmental concern in this context. It seems as though those that listed issues have some semblance of some of the actual issues (e.g. water quality, homelessness, littering, and fires).

Cultivating future stewards of the American River Parkway is an issue that should be addressed because the Parkway as a whole is vital to the region's inhabitants. Given its proximity to the regional park, Sacramento State University is positioned to be a leader in

accomplishing this goal. The State of California actually owns part of the American River Parkway, Alumni Grove, though the space is governed by Sacramento County's American River Parkway Plan. Alumni Grove is considered part of the university and can be accessed by traversing the levee that is between campus and the American River.

The American River Parkway Plan (2008) is a policy and action document. It is written to ensure preservation of the naturalistic environment while providing limited developments to facilitate human enjoyment of the Parkway (County of Sacramento, 2008). The Parkway Plan also acts as the management plan for the federal and state Wild and Scenic Rivers Acts.

The County of Sacramento's (2008) Parkway Plan describes Alumni Grove as follows:

> The left bank (south side) of the river is adjacent to the California State University, Sacramento (CSUS) campus. The dominant feature in this section is Alumni Grove which is maintained by the CSUS Alumni Association. It provides a spot for meeting and quiet study. Development in the Alumni Grove includes a concrete pad, barbecues, lights, and turf under the trees. (pg. 166).

Alumni Grove could be "developed" as a gateway for students to access "the crown jewel of the Sacramento Region". It could be re-landscaped as a native plant garden, maintained by Sacramento State students, and serve as an aesthetically pleasing entry point to the Parkway for students. Even if the space remains unchanged, it still serves as an entry point for students to the regional park and should be a destination.

Given what was learned about place-based education in the literature review, Alumni Grove could be a key component in a place-based curriculum at the university.

Recommendations

The author recommends that this study be repeated to include a larger sample size. The current study has provided meaningful data, but a more comprehensive data set would better represent the university's population and would help guide development of the program proposed below.

The author recommends developing and implementing a pilot general education course at Sacramento State University that would engage students with the recreational, ecological, socio-political and socio-cultural, aspects the American River Parkway. The plan should consider responses categorized in the qualitative analysis of this study: activities, flora and fauna, conservation, and environmental issues. Activities should lead students to a variety of outdoor experiences across the 23-mile Parkway. These experiences include hiking, biking, and canoeing and exploring the various park accesses on both sides and ends of the park. Participation in these activities could lead participants towards life-long sustainable uses of parks and expose them to people and topics that impact the park both positively and negatively.

Flora and fauna should be learned through direct observation, field guides and photographic studies. Direct observation could come in the form of sit spots and studying bird language. Local field guides and species-specific journaling would enhance flora and fauna research. Conservation efforts could be enhanced by encouraging volunteerism with a Parkway stakeholder organization. Volunteerism is often centered on picking up

trash. But so many other opportunities await. Students could help out at annual fundraisers, work alongside County and City officials, and help maintain native plant restoration projects. By engaging with stakeholder groups, students could become informed about pertinent environmental issues (e.g. water quality, littering, fire ecology, human impacts across the landscape, or other pressing issues) that mission statements might bring to light.

A number of place-based education themes were highlighted in the literature section of this study: critical pedagogy, social justice, environmental justice, engagement through community connection, mindfulness, and outdoor/ecological PBE. Here we briefly look at how each of the themes are applicable to this discussion.

Critical pedagogy examines schooling in historical and social contexts, in terms of class divisions, and in terms of the capitalist society in which it exists in America (Deringer, 2017). The proposed pilot class could look at historical and social contexts that helped shape the Parkway and this should certainly include indigenous cultures.

Social justice is applicable to this study in that student engagement with the American River Parkway will likely expose students to social challenges associated with local issues (e.g. the growing population of people experiencing homelessness in the park and the accessibility to the park, or lack thereof.) A representative from a local youth organization in an underserved community could address the participants about ways to engage disadvantaged youth with the outdoors and may even inspire individuals to study social justice more deeply.

Environmental justice is addressed when students learn about constructing their

places and take responsibility as place-makers. Then they are able to connect place-making with environmental responsibility (Deringer, 2017). A more intimate connection with the local environment creates a heightened awareness of environmental issues (Gruenwald, 2003a). A general education course would introduce students to this broader concept. For example, a representative from the Water Forum could inspire individuals to learn more about water policy and where our water comes from. By learning to coexist with wildlife in peri-urban areas, biophilia could flourish.

The proposed pilot class should provide engagement through community connections and allow for students to hear first-hand knowledge from the people that work to sustain the Parkway and from those who conduct research or conservation activities. For example, a representative from Friends of the River Banks (FORB), a community organization that is based just downstream from Sacramento State at Sutter's Landing Park, could meet with students to share how their program has suppressed illegal camping and reduced criminal activity along the bank of the river they protect. Students could then in turn be encouraged to attend FORB's monthly gatherings. A Sacramento County Regional Parks ranger could share various aspects of their job and reinforce practices park users could take to keep themselves and the park safer. These individuals could be met in the field, give classroom presentations, or present via video conferencing technology.

Guest speakers should also include representatives from the university departments that already engage students with Parkway related activities. For example, the Biology department at Sacramento State conducts a program called SIRIUS which is

an acronym for Sustainable Interdisciplinary Research to Inspire Undergraduate Success. The overarching goal of the SIRIUS project is to provide students with an opportunity to study a local and relevant problem- human impacts on the American River. Essentially, they conduct American River water quality and sediment tests. Other departments that utilize the Parkway include Environmental Studies (Bushy Lake Project) Recreation, Parks, & Tourism Administration (hiking and biking in the park), Geology (geologic surveys) and Kinesiology (biking in the park). Other campus groups include Peak Adventures and Sac Sustainability who provide opportunities to volunteer in the park, to mountain bike in designated areas, and to identify issues with water runoff from the campus. The point here is, the proposed general education class focused on the Parkway could not only foster connectedness to nature, it could steer undeclared undergraduates towards majors they may find appealing *and* foster long-term stewardship of the regional park.

Another recommendation is to hold an event in Alumni Grove where various Parkway stakeholder groups would provide information about their organization, similarly to how student organizations do so at the onset of a new semester. The event would be marketed towards Sacramento State students and encourage them to visit Alumni Grove where they could meet people who run the organizations and learn ways to become involved. Students who met with a particular organization as part of an assigned activity prior to the event could help coordinate the event and represent their chosen organization. Community engagements like these could lead participants to possible career opportunities, or at least towards realizing the needs of the community.

With regard to outdoor and ecological PBE, learning outside their classrooms can help (students) gain the insights needed to make the wide range of difficult decisions regarding the environment likely to face them as they grow into (older) adults (Smith & Sobel, 2010). A Parkway-focused curriculum would intentionally provide numerous outdoor experiences that place students in direct contact with the natural world and the broader community. The curriculum would be academic, solution-oriented, and action-oriented.

Wrapping the bundle

Numerous studies show that contact with nature leads to improved well-being and connectedness to nature, and that structured engagement with nature (e.g. educational courses and activities) may lead to pro-environmental behaviors that could translate to sustaining local open spaces. Connecting higher education students with the Parkway has the potential to foster environmental stewardship in a generation of young people who would then be equipped to handle the socio-political, socio-cultural, and environmental pressures that impact the park. Even if students do not directly engage in park policy matters in the future, they may spend their lives in Sacramento and can still become perpetually responsible users and protectors of the cultural, environmental and recreational resources of the American River Parkway. Based on the research for this study, the author argues that an environmentally focused place-based pedagogy will lead to increased nature relatedness, inclusion of nature in self, and overall love and care for the American River Parkway. Sacramento State University and other higher education institutions in the region can and should be an intregal part of this process.

Appendix

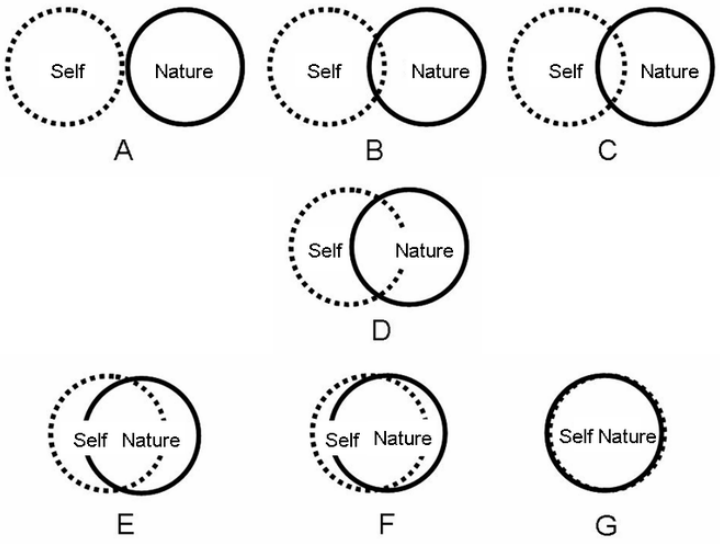
Connectedness to Nature Measurements

New Brief Measure of Nature Relatedness (NR-6) (Nisbet & Zelenski, 2013)
Instructions: For each of the following, please rate the extent to which you agree with each statement, using the scale from 1 to 5 as shown below. Please respond as you really feel, rather than how you think "most people" feel.

1- Disagree strongly 2- Disagree a little, 3- Neither agree nor disagree, 4- Agree, 5-Agree strongly

1. ____ My ideal vacation spot would be a remote, wilderness area.
2. ____ I always think about how my actions affect the environment.
3. ____ My connection to nature and the environment is a part of my spirituality.
4. ____ I take notice of wildlife wherever I am.
5. ____ My relationship to nature is an important part of who I am.
6. ____ I feel very connected to all living things and the earth.

Inclusion of Nature in Self Scale (Schultz P. W., 2002)
Please choose the picture below that best describes your relationship with the natural environment. How interconnected are you with nature?



Love and Care for Nature Scale (Perkins, 2010)
Please rate the items on a 7-point Likert scale from 1 (strongly disagree) to 7 (strongly agree).
1. I feel joy just being in nature.
2. I feel that closeness to nature is important for my wellbeing.
3. When I am close to nature, I feel a real sense of oneness with nature.
4. I feel content and somehow at home when I am in unspoiled nature.
5. I feel a deep love for nature
6. I often feel emotionally close to nature
7. When I spend time in unspoiled nature I feel that my day to-day worries seem to dwindle away in the face of the wonder of nature
8. Protecting the wellbeing of nature for its own sake is important to me.
9. I feel spiritually bound to the rest of nature.
10. I feel a personal sense of interconnectedness with the rest of nature.
11. I often feel a sense of awe and wonder when I am in unspoiled nature.
12. I often feel a strong sense of care towards the natural environment.
13. I need to have as much of the natural environment around me as possible.
14. When in natural settings I feel emotionally close to nature.
15. I enjoy learning about nature.

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