Implications of Nature Camp, Time Outdoors, Technology, and Gender on Generation Z's Nature Affinity

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Generation Z's decreased affinity for nature compared to previous generations is an important focus of study, as connections between children and the natural world have been shown to be a necessary component to the health of the child and their development. The aim of this study was to focus on the attributing aspects of 9-12 year old children's increased nature affinity based on attending a week-long nature camp. Results were assessed to determine if characteristics such as use of technology and time spent outdoors affected one's reported feelings of nature affinity, and comparisons were made by gender. I found that although campers reported an increased overall affinity to nature, these results were not statistically significant. Increased time spent outdoors was also shown to correlate positively with nature affinity. Discrepancies between genders in regards to involvement of technology were highlighted, with a notably higher rate of boys than girls reportedly spending more than nine hours a week in video game play. Additionally, increased involvement with video games correlated with lower levels of nature affinity. Results also indicated that on

average, boys spent more time outside and had a greater preference for engagement in sports while outside. I suggest that gender, technological involvement and time spent in nature are tied to feelings of environmental connection and tend to impact individuals' environmental consciousness and contribute to subsequent nature affinity.

Introduction

The western custom of categorizing generations into nomenclatures such as Gen-X, Gen-Y and Gen-Z allows for insight into the distinctions that emerge with each new generation. Generation Z is the first generation to have Internet technology so readily available, leading to stark differences in how their daily lives are structured and their future is viewed. While previous generations such as Millennials are viewed as tech savvy and focused on the present, Generation Z is viewed as technologically innate and focused on the future. The integral aspect technology plays in Generation Z's daily lives produces an entirely new element in which older generations have not previously needed to structure their environments.

The term "eco-fatigue" is used to describe a declining interest in environmental concerns among "Generation Z", those born between 1995 and 2012. A number of scholars have focused on this topic, conducting studies of environmental education programs' effects on affinity for nature (Wilson, 1996) and youth development (Henderson, Whitaker, Bialeschki, Scanlin & Thurber, 2007; Garst, Browne & Bialeschki, 2011), the effects of environmentally-focused camps on participants' sustainability rates (Evans, 2007; Henderson et al., 2007), and the effects of nature deprivation (Cairney, Joshi, Kwan, Hay, & Faught, 2015; Mainella, Agate & Clark, 2011), as well as factors that affect participants' results, including technology (Chavez & Fehr, 2009; Johnson, 2012) and demographics (Evans, 2007; Johnson, 2012).

"Biophilia" is a term used to describe an inherent passion for the natural world that all humans possess at an early age (Kellert & Wilson, 1993). However, without positive reinforcement, such as opportunities to engage in direct experiences with nature, this innate eco-affinity can diminish over time and lead to eco-fatigue (Larson et al., 2010). Eco-fatigue among Generation Z is seen as problematic since they are at the prime age of environmental development, as "children must develop a sense of respect and caring for the natural environment...or be at risk for never developing such attitudes…[and] that positive interactions with the natural environment is an important part of healthy child development" (Wilson, 1996). Early environmental education improves the development of a child "[into]... an environmentally concerned citizen that will relate to the earth in a... harmonious way" (Wilson, 1996) to contribute to a more environmentally conscious future generation.

Existing literature cites multiple ways in which natural environments are contexts for personal restoration, such as reduction in stress and anxiety (Garst et al., 2011). Nature education offers experiential learning opportunities that influence attitude development in young children in a myriad of ways (American Camp Association, 2005). One study showed growth in campers' sense of adventure and exploration, environmental awareness, and social comfort as a result of camp participation (American Camp Association, 2005). Additionally, following enrolling their children in a nature-related camp, at least 40% of parents believed their children showed an increase in social comfort and adventure/exploration (Henderson et al., 2007). Sustainability of the effects of camps were shown, as parents reported relatively stable effects on their children into the 6-month follow up (Henderson et al., 2007). Follow-up on effects of participation in nature camps showed that the increase of a positive influence, such as nature affinity, can have enduring consequences (Henderson et al., 2007). Childhood experiences

and meanings derived about their community at an early age, can have lasting effects on youth, in turn integrating those experiences into their future identities (Henderson et al., 2007).

Therefore, one major aim of this study is to examine if attendance at a week-long nature camp will sustain individuals' biophilia and increase their overall nature affinity. This will aid in an understanding if engagement in direct experiences with nature will be enough of a positive reinforcement to develop strengthened feelings of affinity towards nature which holds the potential to contribute to a future generation that is concerned with the environment and sustainability efforts.

Literature Review

Camp Participation and Nature Affinity

Early childhood development programs have been found to resonate with individuals into adolescence and affect individuals' sense of community as teenagers (Evans, 2007). Furthering sustainability efforts by Generation Z in their community and environment highlight the importance of emphasizing their generation's potential future power and influence.

Although nature camps have reported an increase in nature awareness (American Camp Association, 2005), many children do not participate in environmental restoration efforts, alluding to their eco-fatigue due to the hopelessness they feel towards their impact on the environment (Evans, 2007). For example, one youth stated, "What's the use of cleaning it up if it is just going to go back the way it was?" (Evans, 2007, p.702) In response to statements like this from the younger generation, youth development programs (for instance, camps attributing to greater nature affinity, awareness, knowledge, and skills) allow the younger generation to have a greater opportunity to become agents of change (Evans, 2007). Youths' feelings of hopelessness have

been found to stem from the older generation's lack of acknowledgement of the capability of the younger generation to create environmental change. However, this contrasts with the depiction of child competency put forth by the United Nations Convention of the Rights of the Child, which recognizes that children are capable and have capacities for shaping their worlds (Davis & Elliott, 2014).

Furthermore, youth have been shown to seize opportunities to restore their environments when they participate in youth development programs, since these programs lead to contributions to the world around them (Lerner et al., 2005). A study conducted by Lerner, Dowling & Anderson (2003) illustrates how positive youth development and program participation are significantly related to this concept of contribution. Specifically, youths' contribution to one's self, family, community, and civil society was found to have a behavioral and ideological component. That is to say, when youth believe they have a responsibility to contribute to their surroundings, and act on those beliefs, they ultimately promote further positive progress in their development and the health of their social world (Lerner et al., 2003).

Institutional organizations also reinforce gender stereotype alignment in children's interaction in nature. Youth organizations are an example of this, in particular the sex-segregated youth organizations which are "potentially powerful socializing agents" (Furnham, Abramsky, and Gunter 1997, pg. 91). They portray more visible gender appropriate behavior, both intentionally and unintentionally, as there may be fewer restrictions on enactment of gender (Acker, 1999). A primary example of this is the differences between Boy Scouts and Girl Scouts. Outdoor skills and experience within nature are thought of as two main aspects producing one's masculinity, and both of these are highlighted in the Boy Scouts handbook (Hantover, 1982). However, these do not show up in the Girl Scouts code or handbook (Goerisch & Swanson, 2015).

Boy Scouts came about in 1908, when changes in work, family and adolescent life were occurring and those who supported the Scout movement believed these changes threatened the development of manliness (Hantover, 1982). The development of the Boy Scouts organization provided an environment in which boys could become virile men and counteract the new feminizing forces in their lives brought about by changes in society (Hantover, 1982). A goal of Boys Scouts was to develop boys differently from girls, specifically to "be a real boy, not too much like his sister" (Puffer, 1912, p. 157). The Scouts oath includes the phrase "To keep myself physically strong, mentally awake, and morally straight," which highlights the goal of developing a society where boys are encourage to develop into an 'ideal man' defined by the Scout code as "a master of both themselves and nature" (Hantover, 1982, p.190).

Contrastingly, the Girl Scout's oath declares "On my honor, I will try: To serve God and my country, to help people at all times" (Goerisch & Swanson, 2015). This notion of 'master of nature' is socialized as a masculine trait, while 'serving' and 'helping people' is characterized as a feminine quality. These types of programs prompt a further limitation and exclusion of girls from equal encouragement to engage in nature. This is based on the notion that children have been found to spend more time on and to prefer and perform better on tasks and in play that are considered appropriate for their gender (Liebert, McCall & Hanratty, 1971).

Time Spent Outdoors and Nature Affinity

Due to future environmentalism being predicted by a person's outdoor experiences during childhood, it is important to focus on the factors impacting involvement in nature-related activities from a young age (Larson et al. 2011; Wells & Lekies 2006). According to sociological gender theory, starting from an early age, girls and boys are socialized

to behave differently (Smith et al., 2016). This gender socialization is important, as it is the way in which individuals' structure and respond to social stimuli in their environment, which continues throughout their lifetime of interactions with others as well as continually within the environment (Spade, 2017).

As the primary agents of socialization, parents implement and shape gendered participation in their children's interaction with their environment. In regards to the freedom to explore and partake in injury-risk behaviors outside, parents make more risk-taking demands of their sons than their daughters (Morrongiello & Dawber, 2000). Sons receive more directives in performing such injury-risk tasks, while girls are discouraged from taking part in outdoor activities that could lead to injury (Morrongiello & Dawber, 2000). Additionally, parents expect their sons and daughters to have different levels of outdoor involvement. Sons are expected to be involved in higher intensity physical activity compared to girls their age (Cardon et al., 2008). Further, "boys will be boys" mentality is shown as boys are given more ability to engage in nature and the outdoor environment and are expected to explore more (Saegert & Hart, 1978). Consequences of this are outlined in a survey done by Larson et. al (2011), where boys reported a higher rate of injury from engaging in time outdoors and further, reported an increase in perceptions of outside play and outdoors sports as 'unsafe' than girls.

Socialization of young boys to participate in injury-risk behaviors while suppressing displays of pain is demonstrated in Tomkins's theory of scripts for affect (Tomkins & Karon, 1962). This theory ultimately describes boys' socialization of suppression of 'feminine' affects such as distress in the form of crying that translates this unrelieved distress by release of 'masculine' affects such as anger (Tomkins & Karon, 1962). Boys are socialized to mask their feelings in order to compete for control

and power, which results in isolating themselves and ignoring their own feelings (Connell, 2000; Messner, 1992; Pollack, 2000).

Another agent producing a gender socialization of nature at a young age is one's peers. Boys and girls monitor their peers' engagement in nature by participating in or avoiding certain activities. Additionally, children remain with peers of their same gender during activities in their physical environment (Spade & Valentine, 2017). Studies on gender differences of physical interaction with nature have shown boys made models in the dirt, manipulated streams with dams and channels and made/managed gardens therefore making a mark on their natural environment more than girls (Saegert & Hart, 1978). When it comes to spending time outdoors, girls preferred to be involved in 'water based activities' such as swimming or kayaking, while boys preferred 'land-based sports' (biking, jogging, walking) and 'nature based activities' (hiking, camping, fishing) (Larson et al., 2011). One explanation for boys spending more time outdoors on both weekends and weekdays could be attributed to the prevalence of more 'boy-gendered' activities such as team sports, land-based sports and riding outdoor terrain vehicles (such as ATV's and dirt bikes) for boys to partake in outdoors. (Larson et al., 2011). Boys modify the landscape more frequently and effectively while playing with their peers, while girls are more likely to use their imaginations to create spaces and objects (Saegert & Hart, 1978). Another reason could be attributed to their gender differences in reasons for remaining indoors. Among boys in Generation Z, video games and not feeling safe/fears of injury were common reasons given, while girls attributed more reasons for preferring being indoors such as indoor sports, going to the mall, texting, and reading (Larson et al., 2011).

Gender socialization describes how an individual learns gender across a multitude of daily interactions including their parents, peers and mass media consumption (Spade & Valentine, 2017). This social

construction aspect of what it means to 'do gender', or demonstrate and enact behaviors of socially acquired patterns of femininity or masculinity (Spade & Valentine, 2017), occurs through a process of enculturation which continues to evoke a 'hypermasculine' approach to socialization (Mosher & Tomkins, 1987). These interactions attribute to children's navigation of 'acceptable' participation in things such as sports, type of play, and technological involvement, since they are motivated by the successes and discouraged by observations of perceived failures of their peers (Bandura, 2001). Interaction in areas such as technology, specifically television and video games are seen as masculinized, due to their rational, unemotional engagement (Mosher & Tomkins, 1987). Additionally, the majority of sports are still seen as masculinized, due to their arduous and physical involvement (Spade & Valentine, 2017).

In order to explore the reasons behind these gender discrepancies, it is important to note the concepts of gender socialization (Coltrane, 1998) and modern enculturation of a 'hypermasculine' approach to socialization (Mosher & Tomkins, 1987). This concept of 'hypermasculinity' emphasizes masculinity specifically in the arenas of entitlement to callous sex, violence as manly, and danger as exciting (Mosher & Tomkins, 1987). Gender socialization theory (Chodorow, 1978) argues that boys and girls acquire different values and learn different social expectations from society's dominant culture through early childhood socialization. In the United States, boys learn to become competitive, independent, and unemotional as their gender-acceptable traits (Denny, 2011). Girls learn to become compassionate, cooperative, and empathetic, as their gender-acceptable traits and the social expectation of their role to be nurturing and a caregiver when they grow up (Denny, 2011). These differences allude to gender differences in environmental concern (Denny, 2011). When these expectations of gender are internalized, it leads to 'motherhood

mentality' which extends to protective attitudes towards nature since girls see themselves as embedded in their community and larger world (Blocker & Eckberg, 1997). Males, on the other hand, internalize gender expectations that stress an 'economic provider role' which evokes a more separatist, controlling role extending to the objectification and control of the environment and sense of self that is separate from the world (Chodorow, 1978). Male expectation to fill the provider role leads to their un-ecological attitudes that prioritize economic growth, technical mastery of the earth, and exploitation of resources, regardless of environmental destruction (Merchant, 1979).

Sports, organized sports in particular, provide an example of how socialization of gender in children and enculturation of hypermasculinity also contribute to institutional support of the continued gendered nature of sports (Buysse & Embeser-Herbert, 2004). The male motivational aspect of achievement can be used to explain motivation of boys to participate in sports, as boys are socialized through involvements in sports to value competition and success and over-emphasis of winning (Messner, 1992).

Although boys are found to spend more time outdoors on both weekends and weekdays than girls (Larson et al., 2011), this can be attributed to greater time spent in activities such as organized sports rather than just overall time spent in nature (Buysee & Ember-Herbert, 2004). Tomkins's theory of scripts can be used to validate expression of boy's emotion through anger if they are hurt while participating in sports. As a result, boys stated fears of injury as a reason to stay indoors (Larson et al., 2011). This expression of distress and fear of injuries in nature would not be interpreted as socially-acceptable 'masculine' affects and therefore boys may not reveal their fears easily (Tomkins & Karon, 1962). These 'masculine' affects are portrayed by society's expectations for all men called the 'Act-Like-a-Man' Box which depicts how society expects men to be tough and most importantly, not cry

(Kivel, 1984). Moreover, this analogy of a box alludes to the repercussions of stepping out of the 'boundaries' (such as reporting any fears) and being met with negative social consequences that force them back into this box (Kivel, 1984). This further demonstrates the constraints that the rigid set of expectations have on boys to always act tough and unemotional (Kivel, 1984).

Time with Technology and Nature Affinity

  Research conducted on why the younger generation has a dramatically decreased affinity to nature in comparison to older generations indicates that it is linked to a 50% decline in the amount of time spent outside by children age 9-12 (Goldstein, Vatalaro, & Yair, 2017). This reduction in nature affinity has led to an alternate term 'nature deficit disorder' being used to describe the phenomenon. This 'nature deficit disorder' can be described as "disconnection with environment that stems from the current generation's tendency to focus on built and engineered entertainment rather than the natural world" (Mainella et al., 2011, p. 90-91). One example of this is documented in Richard Louv's book *Last Child in the Woods* (2006) where he researched the connection between children and nature. His findings included children's reported reasons for enjoying playing indoors as opposed to outdoors, such as one fifth grader who stated, "that is where all the electrical outlets are" (Louv, 2006). Responses such as these demonstrate the younger generation's shift in interest from the outdoor environment to technology and indoor play. Competition from television and computers, more homework and time pressures, lack of access to natural areas, fears of traffic, crime, stranger-danger and nature itself are reasons parents report their children are spending less time in nature than they did when they were younger (Louv, 2006).

  Generation Z is also referred to as the I-generation, net-gen, and digital natives, all of which emphasizes the new generation's focus on

technology, which helps explain some of the main reasons for the decrease in nature affinity and 'nature deficit disorder' (Tuner, 2015). This disconnect Gen Z feels in nature due to an increase in technology-based entertainment is shown in a study by U.S.D.A Forest Service (Chavez & Fehr, 2009) which found that the most common reasons for not spending time outdoors for this generation, Generation Z, across all demographics were due to reading, watching TV/DVD/video games, and engaging in texting/internet (Larson, Green & Cordell, 2011).

The concepts of gender socialization and enculturation translate to explanations of gender differences in technology through social cognitive theory (Bandura, 2001) and cultivation theory (Gerbner, Gross, Morgan, Signorielli & Shanahan 2002). Social cognitive theory extends these concepts by providing a more active view of social knowledge acquisition during childhood being directly related to observing others through social media interaction, experiences, and outside media influences (Bandura, 2001). According to reports by the Kaiser Family Foundation, children 'media multitask,' or use more than one medium of media at a time, resulting in findings of Generation Z devoting an average of 10 hours and 45 minutes on a typical day (Hinchliff, 2008).

Further, the 'action' of social cognitive theory is reinforced and engrained through cultivation theory, which states that reality is constructed, altered and reconstructed by information present in consumed media (Gerbner et al., 2002). Evident here is the notion that media is both an originating and reinforcing influential agent of socialization (Bandura, 2001). A gender study explored the reason behind the motivational factors for boys' video game use and found that boys use violent video games for means of expressing fantasies of power and glory (Olson, Kutner, & Warner, 2008). Gender stereotypes are shown through studies which find most boys engage in more active and aggressive behaviors, maintaining hegemonic masculinity by the

focus of power and control of others. This is done through 'attention processes' (Bandura, 2001) of modeled hypermasculine views of their social dominance (Spade & Valentine, 2017). In other words, boys are socialized to maintain their social positions by achieving power and control through manipulation, which can be done through video game play.

Regarding girls' motivational factors for video game play, desires for 'immersion' and 'escapism' can be seen as ways girls attempt to "enact new definitions of the gendered self" (Royse, Joon, Undrahbuyan, Hopson, & Consalvo, 2007, p. 565). While some physical and institutional barriers still exist for girls entering the 'boy world', making it more difficult to navigate, girls can now more easily engage in 'unlady-like' expressions of aggression, more anonymously to decrease possibilities of social repercussions (Royse et al., 2007). Additionally, girls are socialized to desire interaction and building of meaningful relationships with people they can confide in, which alludes to a relationship motivational factor for girls' involvement in video games (Royse et al., 2007).

Although these motivational factors alone do not explain the difference in video game usage between genders, research has supported the idea that boys play video games more than girls (Bonanno & Kommers, 2005; Ogletree & Drake, 2007; Winn & Heeter, 2009; Padilla-Walker, Nelson, Carroll, & Jensen, 2010). The difference rises from the characters, goals, and settings of games which can be explained by the fact that video games are produced by males, for the intention of male audiences, by incorporating 'boy-gendered' themes and motivations for fulfillment of achievement and manipulation factors (Kafai, Cook & Fields 1996; Dietz, 1998).

Hypothesis

The research articles previously discussed examined nature affinity resulting from camp participation and its subsequent effects on child development, sustainability of positive effects of nature-related camps and education, and time spent outdoors effects of nature deprivation on youth, as well as technological and demographic effects on children's nature affinity. This study will specifically focus on characteristics associated with increased nature affinity in 9-12 year olds attending a week-long nature camp. Results will be used to assess if time spent outdoors and time spent with technology are associated with an increase in nature affinity and to highlight differences among gender. From this review of literature and camp surveys, I expect to find that: participation in a nature-related camp will result in a camper's increased reported feelings of nature affinity; more time spent outdoors will result in increased nature affinity; more time spent using technology will result in decreased feelings of nature affinity.

Methods

The purpose of this research study is to assess the initial 'eco-fatigue' of campers and the impact of environmentally focused camps on a participants' subsequent affinity for nature. This data is used to facilitate a better understanding of how being in nature is tied to feelings of environmental connection and impact on one's environmental consciousness. Therefore, the focus of this research was to look at: the effect of an environmentally-oriented summer camp, reported time spent outdoors, and reported involvement in technologies on the child's affinity for nature. Additionally, comparisons were made across gender.

The population used in this study were the campers aged 9-12 (Generation Z) participating in Illinois River Watershed Partnership summer art and nature day-camps from the weeks of July 10-14 and

July 24-28, 2017. The study site was the Illinois River Watershed Partnership facilities in Cave Springs, AR. The camp was advertised to the local community and cost $40 per camper per week.

The process of recruitment involved contacting all parents with children aged 9-12 that signed up for the Illinois River Watershed Partnerships' camps for these particular weeks and obtaining a signed parent-consent form, allowing their child to participate in the study. The parent also received an informational letter on the camp activities and process of the survey. In addition to this, for a camper to be a participant in the study, the camper needed to have given permission themselves, by signing an assent form, agreeing to participate. IRB approval was granted.

The materials used for the data collection involve a pre- and post-survey. In addition to being a researcher at the camp, I was a camp counselor, helping to facilitate and teach camp activities to the campers. The research design involved participants coming to the first day of camp on Monday and, after obtaining both an assent from the child and signed permission from the parent, filling out a survey that served as their pre-test. The stimuli of this research were the camp activities that came in-between the pre- and post-survey collection. Such camp activities included educational seminars on the local watersheds, local wildlife and landscape photography, canoeing, fishing, archery, hiking, water-quality-testing, educational games, guest speakers on the water conservation and landfill pollution, visits to local art/nature facilities such as Crystal Bridges Museum of American Art outdoor trails and the Museum of Native American History as well as free time in nature at the Illinois River Watershed Partnership. At Crystal Bridges, campers participated in nature hikes on the outdoor trails and an arrow head scavenger hunt at the Museum of Native American History. These activities occurred over five eight-hour days. In addition to a survey relating to the child's affinity for nature, a background questionnaire

was included in the pre-survey, through which demographic information was obtained. Each participant took a post-test survey on the end of the day on Friday, to see if the participant's affinity for nature increased or decreased. This post-survey was later paired with each participant's pre-survey by means of ID number, in order to be cross-analyzed.

Dependent Variable

The dependent variable was the camper's affinity for nature. Campers were asked to rank statements such as "I like to be in nature", "I want to spend more time outdoors", "I enjoy the freedom of being outdoors", "I am comfortable in the outdoors", and "I feel connected with the outdoor environment". Responses were on a 6-point likert scale ranging from 6, a strong feeling of affinity, to 1, weaker levels of nature affinity. To test the camp experience effect on the participant's affinity for nature, a pre and post-test was given.

Independent Variables

Independent variables included lifestyle behaviors of campers. Lifestyle behaviors of campers were assessed through ascribing the amount of hours spent playing video games, watching TV, on the computer, and using a cellphone.

Questions on indoor vs. outdoor play, include: the amount of hours spent indoors and outdoors per week, the participant's favorite subsequent activities in each setting, and a reason if they answered that they would 'rather be indoors than outdoors.' Questions included: "During a normal week, how many hours do you spend outside?" and "What is your favorite activity to do outdoors?" with answer choices as follows: "Play a sport, run, bike, using electronic media outside, play with friends, swimming/going to the lake, I do not like going outside." An additional write-in answer choice is available to answer "What is a

reason you would rather be indoors or outdoors?" with the option to write-in "I would rather be outdoors" if applicable.

Control Variables

Control variables included gender, age, and race/ethnicity. Gender was asked as "Are you a boy or girl?" Age was ascertained by asking "How old are you?" Race was determined by subject's self-report by answering "What is your race?"

My research instruments were two questionnaires, or surveys. My contact method was by personal distribution and collection of these surveys, whereby each camper filled out their own surveys individually. My sample included 34 campers total, between two camp sessions.

Statistical Methods

After collection of the data, SPSS was used to analyze the data. Chi-squared tests are utilized in order to compare time spent outdoors, participation in particular activities and reasons for and against choosing to spend time outdoors. Analysis of the questions referring to nature affinity on the 6-point likert scale can be statistically assessed between the pre and post surveys. Additionally, a paired t-test and regression analysis can be analyzed to determine effects of gender on the variables in the study.

Findings

Table 1 presents descriptive statistics for all variables used in the study. Gender discrepancies in the findings include the differences between time spent outdoors, time with technology, favorite activities both inside and outside, and reasons for preferring being indoors to outdoors. Boys reported spending an average of 4-5 hours outside (and 6-7 hours inside) a week while girls reported spending 2-3 hours outdoors (and 8-9 hours inside) a week. Boys also reported spending more time on average with every form of technology assessed (video

games, TV, computer) except for cell phone time usage. Additionally, videogames were the favorite indoor activity for 41.7% of boys (only 20% of girls). Girls preferred reading and using their cell phone/social media equally as their favorite activity (26.7% of girls for each activity, while only 5.9% boys reported reading as their favorite indoors activity and no boys selected using their cell phone/social media as their favorite indoors activity). One of the largest disparities was between the preferred outdoor activities with 50% of boys saying sports is their favorite outdoor activity (while only 6.7% of girls) and 40% of girls name swimming/going to the lake as their favorite outdoor activity (no boys selected this). Both boys and girls reported about equal preference for being outdoors over indoors (55.6% of boys and 56.3% of girls), while bugs were the most common reason for boys preferring to stay inside (22.2%) and air conditioning was the most common reason for girls (18.8%).

TABLE 1. Descriptive Statistics.

	Males			M	Females		
		n	SD			n	SD
Nature affinity before camp	4.35	19	1.15		5.18	16	
0.60							
Nature affinity after camp	4.75	11	1.11		5.22	13	
0.52							
Variables with time spent outdoors or indoors a week							
Hours per week outside	3.53	19	1.87		3.20	15	
1.78							
Hours per week indoors	4.05	19	1.84		4.53	15	
1.73							
Variables with time spent with technology a week							
Hours playing video games	2.84	19	2.06		2.25	16	
1.65							
Hours watching TV	2.84	19	1.74		2.81	16	
1.76							
Hours on computer	2.16	19	1.74		1.81	16	
1.68							
Hours on cell phone	2.11	19	1.59		2.69	16	
1.78							

	Males			Females	
	%	n		%	n
Favorite activity outside					
Play a sport	50.0	9		6.7	1
Run	5.6	1		6.7	1
Bike	11.1	2		26.7	4
Using electronics outside	5.6	1		0.0	0
Play with friends	11.1	2		6.7	1
Swimming/going to the lake	0.0	0		40.0	6
Do not like going outdoors	5.6	1		0.0	0
Favorite activity indoors					
Play video games	47.1	8		20.0	3
Play on computer	5.9	1		6.7	0
Read	5.9	1		26.7	4
Cell phone/social media	0.0	0		26.7	4
Watch TV/movies	17.6	3		6.7	1
Play with toys	5.9	1		0.0	0
Reasons rather be inside than outside					
Read	0.0	0		12.5	2
Safe	0.0	0		6.3	1
Air conditioning	5.6	1		18.8	3
Video Games	5.6	1		6.3	1
Bugs	22.2	4		0.0	0
Sleep	5.6	1		0.0	0
TV	5.6	1		0.0	0
Rather be outside	55.6	10		56.3	9

Note: SD refers to standard deviation. Percentages reported only for nominal-level variables.

Table 2 presents the difference in pre- and post- test results for both boys and girls. While both boys and girls report an increase in nature affinity following attending a week long nature camp, these findings are not statistically significant.

TABLE 2. Paired T-Test of Nature Affinity by Gender

	Male				Female			
	M(SD)	t	p	d	M(SD)	t	p	d
Nature Affinity Pre-Test	4.35(1.15)	1.08	0.31	0.40	5.18(0.60)	0.21	0.84	0.03
Nature Affinity Post-Test	4.75(1.11)				5.22(0.52)			

Note: ***p<.001, **p<.01, *p<.05. t refers to t-value of paired t-test. p refers to p-value of t-test. d refers to cohen d.

Table 3 shows the nuances of the overall nature affinity results, as it expands to show results for each nature affinity question. While these results also show many increased affinity to nature in pre- and post- test results, only one is statistically significant. Girls report a statistically significant increase in liking to be in nature, following attending the week-long nature camp.

TABLE 3. Paired T-Test of Nature Affinity Variables by Gender

	Pre-test		Post-test		Paired t-test		Cohen
	M	SD	M	SD	t	p	d
Males							
Like to be in nature	2.36	.50	2.55	.52	1.49	0.17	.182
Want to spend time outdoors	2.27	.65	2.45	.69	0.69	0.51	.182
Enjoy the freedom of outdoors	2.45	.69	2.64	.50	1.50	0.17	.182
Comfortable in the outdoors	2.73	.65	2.64	.50	-0.36	0.72	-.091
Feel connected with the outdoors	2.09	.70	2.45	.52	1.80	0.10	.364
Females							
Like to be in nature	2.69	.48	3.00	.00	2.31	0.04*	.308
Want to spend time outdoors	2.85	.38	2.85	.38	0.00	1.00	.000
Enjoy the freedom of outdoors	3.00	.00	2.92	.28	-1.00	0.34	-.077
Comfortable in the outdoors	2.92	.28	2.62	.65	-1.76	0.10	-.308
Feel connected with the outdoors	2.62	.65	2.69	.48	0.56	0.58	.077

Note: ***p<.001, **p<.01, *p<.05

In table 4, regression analysis showed that boy's nature affinity was more influenced by their use of technology than girls. Additionally, boy's engagement in video game play correlated strongly with lower levels of nature affinity, while computer time had a stronger technological influence on girl's lower levels of nature affinity.

TABLE 4. Regressions of Nature Affinity for Samples of All Respondents, Males, and Females

Independent Variable	All	Males	Females
Video Games	-0.29[a]	-0.56[a]	-0.21[a]
	-0.59[b]	-1.06[b]	-0.57[b]
	(-3.23)[c]*	(-3.80)[c]*	(-1.86)[c]
TV	0.06[a]	0.72[a]	0.50[a]
	0.10[b]	0.12[b]	0.15[b]
	(0.59)[c]	(0.53)[c]	(0.48)[c]

Computer	-0.18[a]	0.22[a]	-0.47[a]
	-0.30[b]	0.35[b]	-1.00[b]
	(-1.88)[c]	(1.30)[c]	(-3.34)[c]*
Cell Phone	0.02[a]	-0.13[a]	0.70[a]
	0.04[b]	-0.19[b]	0.21[b]
	(0.02)[c]	(-0.99)[c]	(0.84)[c]
Time Outside	0.04[a]	0.13[a]	0.21[a]
	0.09[b]	0.23[b]	0.62[b]
	(0.58)[c]	(1.25)[c]	(2.19)[c]
Time Inside	0.09[a]	0.20[a]	-0.00[a]
	0.17[b]	0.34[b]	-0.01[b]
	(1.11)[c]	(1.83)[c]	(-0.05)[c]
R^2 (adjusted)	0.37	0.52	0.44
SSError	0.74	0.75	0.46
(N)	34	19	15

Note: ***$p < .001$, **$p < .01$, *$p < .05$

[a] Unstandardized regression coefficient

[b] Standardized regression coefficient

[c] t-ratio

Discussion

Although campers reported higher levels of affinity for nature following a week-long summer camp, this was not a statistically significant finding. Therefore, my first hypothesis was not supported. This finding was surprising because nature camps have previously been shown to produce a greater nature awareness and desire to engage in further nature-related activities (American Camp Association, 2005). I speculate that this is because Generation Z demonstrated a shift in lifestyle behaviors with their increased involvement in technology. Therefore, unlike studies conducted in previous research on earlier cohorts, Generation Z's participation in nature camp without consideration of technological involvement does not alone allow for an increase in nature affinity.

The findings of this research support the literature in that boys, on average, spend more hours outside per week than girls. This could be due to several socialization factors they encounter while growing up, since sons are more likely to receive more encouragement to engage in nature and the outdoor environment and are expected to explore more, while girls are discouraged from taking part in outdoor activities that could lead to injury (Morrongiello & Dawber, 2000). This was an interesting finding because while there were no boys who reported fears of injury, one girl did indicate that as her reason for preferring to be indoors rather than outdoors. This perception of the outdoors as 'dangerous' may be a ramification of the discouragement girls receive for engaging in activities outside since they could potentially lead to injury. Since this survey question was open-ended, I presume a factor in the lack of boys reporting this as a reason could be attributed to fear being a socially 'unacceptable' emotion for males to report feeling. This illustrates how expression of distress and fear from injuries in non-dangerous activities (such as in nature) would not be interpreted as socially-acceptable 'masculine' affects (Tomkins & Karon, 1962).

My findings did not support my second hypothesis that an increase in time outside will lead to an increase in one's nature affinity. Although this correlation was positive for both genders, neither demonstrated a statistically significant effect in relation to nature affinity.

For boys, this may have to do with the fact that although boys are found to spend more time outdoors, it is often in organized activities such as sports, rather than direct interaction with nature (Buysee & Ember-Herbert, 2004). One of the largest disparities in this research's findings between the preferred outdoor activities with 50% of boys saying sports is their favorite outdoor activity, while this was only true for 6.7% of girls. Once again, this disparity between genders can be considered in part by the gender socialization of 'acceptable' gendered activities the child experiences growing up, since the majority of sports are still seen as masculinized, due to their rugged and physical involvement (Spade & Valentine, 2017).

For girls, the reasoning for their decreased involvement may be due to parents allowing boys to spend more time farther from home and more overall time outdoors unsupervised compared to girls (Hart, 1979). This exemplifies constraints on girls' time outdoors from a young age, since they are socialized differently in regards to risk-taking behavior and precautions. This further places limitations and exclusions of girls from equal encouragement to engage in nature. Important to note is the finding that participation in a nature-related camp improved girls' perception of nature. Girls reported liking to be in nature after camp, which may be due to girls finding more enjoyment being in nature when given equal opportunity to spend time engaged with their environment.

The third hypothesis was supported through this research as both boys and girls displayed a statistically significant negative relationship between technology use and nature affinity. Gender facets

to this include both boys' higher involvement in video games and stronger negative association between hours of video game play with levels of nature affinity. Interestingly, although boys spent a greater average time on computers, girls' time spent on computers was more strongly negatively correlated with their affinity for nature. In regard to 'gendered' technological use, besides parental and peer gender-role socialization, the aspect of the majority of game developers being males who develop games for the intention of male audiences, by incorporating 'boy-gendered' themes and motivations, leads this technology to be 'gendered' as masculine and therefore primarily dominated by boys (Kafai, Cook & Fields 1996; Dietz, 1998). Although reasons for using a computer was not asked in my study, girls' statistically significant relationship in regards to computer use and lower levels of nature affinity can be speculated to be attributed to several factors. Girls are socialized to desire interaction and building of meaningful relationships with people they can confide in, which may contribute to reasons for girls' computer use (Royse et al., 2007). Moreover, according to my study, using social media was tied as one of the favorite reported activities for girls to partake in inside (26.7%). Due to their ages (9-12), many of these girls may not own cell phones and instead use computers to use social media.

Conclusion

This study demonstrated how characteristics, such as one's gender and use of technology, affected one's reported feelings of nature affinity. One of the overall findings included that following a week-long nature summer day camp, although campers reported an increase in overall rate of nature affinity, this finding was not statistically significant. The finding that nature affinity correlated positively with higher reported hours spent outdoors, was also not statistically significant.

Discrepancies between genders illustrate the need for further involvement of girls in nature since they reported liking to be outside more after camp, where they were given equal opportunity to participate in it. Moreover, girls are likely to see themselves as embedded in their community and larger world, which extends to their protective attitudes towards nature and calls for a need to socialize girls in a way that encourages their active participation outdoors. This socialization could allow them to act on their eco-concern and benefit both themselves and the restoration of the environment overall.

Further gender differences regard involvement of technology. Boys reported spending more time engaged in video games, which had the greatest overall effect on their lower levels of nature affinity, while girls' lower affinity to nature was more significantly tied to computer time. Due to these findings, future research should explore ways in which to incorporate technology in the great outdoors.

These findings suggest that the implications of gender and technological involvement have an impact on one's environmental consciousness and contribute to one's subsequent nature affinity. Since Generation Z is at the prime age of environmental development, a decrease in negative reinforcements such as indoor technological engagements. In addition, strategies to determine new positive reinforcements for this cohort shift is important for all children in order to preserve their biophilia and allow them to contribute to a more environmentally conscious future generation, albeit in different ways.

Limitations, Future Research, and Implications

Limitations of my study include the small sample size assessed and time constraints. Time allowed for this research project (one summer of studying campers) and length of nature camp participation (one week) were both time constraints on this research. To further assess if participation in a nature camp results in any statistically significant

increase in nature affinity, a study of a nature camp lasting a longer time span should be conducted for Generation Z. Since this paper is primarily quantitative reporting of statistical findings, there is a limitation in its incorporation of qualitative components.

This study demonstrates a need for a new area of study, as increased time outside and participation in a nature camp were not found to result in statistically significant positive correlations with nature affinity, while technology was found to negatively impact one's nature affinity. More research should be done on facets of this technology factor, especially in relation to gender discrepancies. Moreover, ways in which technology can be utilized to increase nature affinity instead of decrease it, should be further studied.

Perhaps Generation Z's use of technology does not have to hinder their involvement in nature and time spent outdoors, as parks and recreation professionals can learn to integrate these children's passion for electronics with their affinity for outdoors through technology-centered activities. An example of this is geocaching, which is "a worldwide game of hiding and seeking…A geocacher can place a cache anywhere in the world, pinpoint its location using GPS technology, and then share the geocache's existence and location online." (Jewett, 2011, p.341). In an exploratory study with children aged 6-17, technology-based outdoor activities (notably geocaching) received the most positive response in comparison to non-technology based outdoor activities (Chavez & Fehr, 2009).

Technology-involved environmental movements include technologically-based corporations engaging in socially responsible acts that encourage youth development through eco-education. Disney Channel launched "Friends for Change: Project Green" (Johnson, 2012). This program involves recycling and waste reduction projects as well as encouraging viewers to 'live greener' through popular channel stars' example and influence (Johnson, 2012). Apps for smartphones are

another technological implementation aimed at improving youths' affinity for nature, without engrossing children in augmented-reality too much, to the point of decreasing affinity for nature. Examples include games such as "Plum's Photo Hunt" which encourages kids to go outside and explore, as well as "Sesame's Street Family Play" app that provides offline games that parents can play with their children (Johnson, 2012).

Programs and technology-involved outdoor activities such as these could allow for a new opportunity to involve Generation Z in their outdoor environments as well as potentially increase their nature affinity when other initiatives do not show to be positive reinforcements for this generation's affinity for nature.

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