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THE BENEFITS OF RECREATIONAL FISHING IN ADOLESCENCE

BY

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B.A Psychology, University of New Hampshire, 2009

THESIS

Submitted to the University of New Hampshire
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in
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ABSTRACT

THE BENEFITS OF RECREATIONAL FISHING IN ADOLESCENCE

By

Sarah Leonard

University of New Hampshire, May, 2015

Little attention has been given to how different leisure activities affect adolescents. The purpose of this study therefore was to investigate how one specific leisure activity, recreational fishing, can provide potential benefits to adolescents. Youth attending a one week fishing camp at the 4-H Barry Conservation Camp in July of 2014 were surveyed on multiple dimensions of well-being. Results indicate significant improvements in resilience, optimism, and self-esteem following the fishing camp experience. Youth reported that while fishing they engaged in a number of skillful activities (patience, self-discipline, etc.), many of which are beneficial to the positive development of youth. The findings suggest that recreational fishing may be beneficial to youth as they form identities and learn key life skills.

Introduction

It is estimated that 40 to 50% of youth's time is spent in discretionary activities outside of school (Larson & Verma, 1999). Therefore it is no surprise that research focusing on positive youth development has turned to what children and adolescents do in this time in order to determine how best to promote positive outcomes. Research on leisure time has found that participation in leisure activities can lead to positive outcomes in a variety of dimensions (Fletcher, Nickerson, & Wright, 2003; Trainor, Delfabbro, Anderson, & Winefield, 2010), including identity development in adolescence (Coatsworth et al., 2005; B. Garst, Scheider, & Baker, 2001; Palen & Coatsworth, 2007).

However different factors, such as breadth of participation, whether the activity is structured or unstructured, organized or unorganized, can affect how the activity promotes positive youth development (Sharp, Tucker, Baril, Van Gundy, & Rebellon, 2015). The vast majority of research has focused on how organized and structured activities affect children and youth, for example, sports participation in middle age children has been found to be linked to greater psychosocial maturity and social competence, and clubs participation has been linked to greater academic achievement and academic competence (Fletcher et al., 2003), but little attention has been given to how unstructured leisure time affects youth. While knowing what types of organized activities are beneficial, it is also equally, if not more important it to investigate what intrinsically motivating leisure activities youth participate in and how they affect development. It is predicted that youth spend half of their waking hours in leisure activities and positive benefits within the leisure context depend on how adolescents spend this time. Research suggests that many adolescents miss out on positive developmental opportunities in leisure because they are in unstructured environments or often in front of a television (Eccles,

Barber, Stone, & Hunt, 2003). It can be the minute differences between activities that can change how they affect youth. For example something as simple as setting can change the effectiveness of a program. This can be seen in research that shows that outdoors have a more positive effect than traditional indoor settings (Este, 2013; Gee, 2010; Louv, 2005; Mainella, Agate, & Clark, 2011; McKenzie, 2000; O'Brien & Murray, 2007; Pretty et al., 2007; Propst & Koesler, 1998; Sheard & Golby, 2006; Smith, 1987; Ungar, Dumond, & McDonald, 2005).

However different activities can have different effects on these developmental characteristics so it is important to examine these differences. For many reasons I believe that recreational fishing is unique in that it may provide distinct benefits to well-being. If my assertion is true, recreational fishing could be a positive outlet for many youth, particularly those in rural settings where other extracurricular activities are scarce and natural resources are plenty.

With the ever increasing trend of moving indoors and using technology, the amount of time youth spend outdoors is decreasing (Louv, 2005). This decrease in outdoor participation may have lasting effects on youth, including their mental and physical well-being. This nature-deficit has been suggested as the root for many issues in children and adolescents, ranging from depression to ADHD (Louv, 2005). Louv asserts that nature is very crucial to our development and functioning. Therefore when individuals are removed from a natural environment they experience disorder. If the nature-deficit theory is true, then we must do our best to engage youth more frequently in outdoor activities. I believe that fishing may be a promising pathway to nature for youth and a solution to the problem of nature-deficit in children and adolescents.

Fishing is a means of obtaining food that requires skill and self-discipline. Recreational fishing, while primarily not a means of obtaining food, may have a number of other benefits in addition to providing a food source. There are many factors and aspects about fishing that make

it unique. It is these unique qualities that allow one to argue that it may produce positive effects on well-being. First and foremost we can analyze fishing from its outermost level, the setting in which it takes place. A natural setting is necessary for effective fishing, but just as it is effective for fishing it may be beneficial for those participating.

Research has shown that participating in activities in a natural environment enhances well-being (Hartig, Mang, & Evans, 1991; Lambery, Segger, Staley, Spencer, & Nelson, 1978; Mainella et al., 2011; O'Brien & Murray, 2007; Pretty et al., 2007; Propst & Koesler, 1998; Schell, Cotton, & Luxmoore, 2012; Seaman et al., 2014; Smith, 1987; Stott & Hall, 2003; Wright, 1983). One such study examined the effects of “green exercise”, or plainly, any range of activities taking place in a natural setting, on mood and self-esteem. Interestingly, their findings showed significant improvements in general mood and self-esteem in healthy adults (Pretty et al., 2007). Natural environment has been found to be effective in healthy children as well. In a studying examining the effects of green space on the self-discipline of children, it was found that natural environment was associated with greater self-discipline (Taylor, Kuo, & Sullivan, 2002). Theories arising from such evidence have laid the foundation for many outdoor therapeutic programs, where instead of healthy adults and children, the effects of nature are examined on troubled youth. Studies examining such experiential outdoor programs have found that in comparison to non-natural setting comparable experiences, the natural environment participants actually had greater restorative effects (Hartig et al., 1991). The use of adventure therapy has increased and the positive effects of it are seen throughout its participants in many aspects.

For example, resilience is defined as a complex process by which individuals exhibit positive behavioral adaptation in the face of adversity or challenging life circumstances (Beightol, Jeverson, Carter, Gray, & Gass, 2012). Many other studies have looked into what intrapersonal

and interpersonal factors influence the engagement in certain behaviors and how they affect resiliency. Protective factors, such as strong family cohesion, are believed to interact with risk factors, such as low socio-economic status, to create protective mechanisms, or resilience (Rutter, 1987). Resilience has been found to be more influential in substance use than risk factors, indicating that an individual can have numerous risk factors for substance use, but abstain based on their resilience. Most research on resilience relies greatly on associating it with risk factors, but resilience itself can be seen as a result of protective factors. It is accepted that resiliency is a result of protective factors buffering negative influences from risk factors, but not much is actually known about the underlying dimensions of resiliency. Questions still emerge on what intrapersonal processes help to mediate between positive and negative factors.

Can resilience be enhanced by outdoor environments and potentially fishing? Would we see changes on a resilience scale score after participating in certain outdoor activities? Resilience is one aspect that has been examined as a potential positive effect of outdoor adventure therapies. Many studies have examined this effect and found resilience improvements following adventure therapy programs (Beightol et al., 2012; Este, 2013; Neill & Dias, 2001; Ungar et al., 2005). However we cannot assume that the effects of these studies simply due to natural environment. The increases in resilience could have originated in the other aspects of the program. Therefore we must investigate what other ways fishing can improve resilience. Perhaps resilience is a combination of other factors, such as self-efficacy and self-esteem. Therefore we must further examine these and other factors in the context of outdoors and fishing. Self-efficacy has been suggested to be enhanced by outdoor education (Propst & Koesler, 1998; Sheard & Golby, 2006) as well as self-esteem and self-identity (Kaly & Heesacker, 2003). All of these factors are very

important in fostering healthy development in youth. I believe that fishing is important to developing each of these concepts.

This abundance of research has led to one conclusion; participation in outdoor activities is more beneficial to our well-being and health than indoor activities. How can this be? What makes us so effected by our surrounding and what draws us to nature? Many have toiled with these questions and sought to understand why we are better off in nature. Simply put, could it be that we are just animals ourselves? Indoors are we just as captive as a wolf in a cage? Others have argued the same ideas in that biologically we are drawn to nature (Kahn Jr, 1997; Wilson, 1984). Edward O. Wilson is the leading force behind the biophilia hypothesis. He argues that we biologically driven creatures and due to these urges we act the way we do. It is our allure to natural and biologically based activities that guide our behaviors. He suggests in his work *Biophilia* that “each human mindscape is idiosyncratic and yet ultimately obedient to biological law”. Therefore, by increasingly spending less time outdoors, we are ultimately defying our natural urges and tendencies. Theoretically by defying these urges we exhibit unwanted emotions and behaviors. Much of this relates to Louv’s assertion of the nature-deficit theory. When our natural urges are not met, we experience deviations from our true self. That is, one might experience depression or anxiety in response to not taking part in nature. To alleviate this issue we need to spend more time in nature and connecting to our natural self.

The biophilia hypothesis not only provides evidence for why outdoor education is beneficial, but also links to fishing as well. Fishing at its roots is a means of obtaining food. One of our most natural urges to obtain food to conquer hunger. This may be a reason why fishing is so alluring to many of us. In a sense, people who fish are satisfying one of their natural urges as well as fostering a healthy relationship with nature. Such ideas are closely related to Maslow’s

hierarchy of needs. In Maslow's pyramid, the bottom tier consist of basic physiological urges, such as hunger. At the top rests a self-actualized individual. He argues that in order to reach self-actualization the lower needs must be met (Maslow, 1943). The other needs consist of belongingness, safety, and self-esteem. In many ways fishing may have the potential for one to lead an individual to self-actualization. For one it meets the bottom physiological need, but it may also meet some of the others. Belongingness can be viewed in two ways as it relates to fishing. Fishing can be a community or family event and therefore can result in a feeling of belongingness if structured appropriately. It can also give a spiritual sense of belonging with nature. These two factors combined in addition to hunger satiation, lead me to assert that fishing meets many of the needs presented in Maslow's hierarchy.

The evidence presented leads me to believe that activities taking place in nature are beneficial to us. Therefore logic tells us that fishing can help us achieve the benefits of nature in a relatively low cost way. However there are other unique qualities that characterize fishing that make it beneficial to well-being. Mastery is an important concept in the development of self-esteem. Fishing inherently provides numerous opportunities for mastery. For example, being able to target different species of fish and effectively mastering each type of fishing skill. Fishing provides rewards for learning to manipulate situations and the surrounding environment. The reward is simply catching a fish and we learn that we can achieve our goals through our own actions. It is my hope that these abilities can generalize to other situations in which we must achieve a goal. Through mastery one can develop a greater sense of self-esteem. It is this sense of self-esteem that can be generalized and used in other situations.

In addition to self-esteem, locus of control may also be affected by fishing. Locus of control is the extent to which we believe outcomes in life are influenced by ourselves or by

others. Greater internal locus of control means that an individual believes that they are in control of their outcomes in life. Greater external locus of control means that an individual believes that their outcomes are controlled by an external force. While fishing, one learns that they can manipulate their surroundings to achieve a goal. The goal in this case would be catching a fish. By learning that through our own manipulations we can create desired outcomes, our locus of control may shift from more external to more internal. Why is this important? High internal locus of control has been associated with a number of health and psychological benefits (Nowicki & Segal, 1974; Parkes, 1984; Strudler Wallston & Wallston, 1978). Those with higher internal locus of control have been found to show more adaptive patterns of coping (Parkes, 1984) as well as higher rates of achievement and social connectedness (Nowicki & Segal, 1974). Therefore, if fishing can provide individuals with an understanding that their influences impact goal achievement, then it is logical to assume that those that engage in fishing have a higher internal locus of control.

Not only is recreational fishing unique in that it can provide numerous opportunities for mastery, self-esteem and internal locus of control enhancement but it also enables the participant to gain patience and self-discipline. Patience and self-discipline (or self-control) is key to good anglers if they are motivated to catch a fish, but it may also be important developmentally as well (Baumeister & Exline, 2000). As Baumeister suggests, self-control is key to adaptive success and central to virtuous behavior. Individuals need to use self-control and patience in a variety of settings, whether it be in a classroom or during an outdoor activity such as fishing.

Recreational fishing is unique in that it can occur in multiple settings, structured and unstructured. In fact, it is likely that because of its adaptability to different situations, it can have different effects on children and youth based on its properties. For example, a camp setting in

which fishing is the main theme can have different impacts than a fishing trip with one's family. It is also likely that SES can have an effect on impact of recreational fishing as well. An expensive chartered fishing trip will therefore have different impacts than a trip to the pond in one's neighborhood. It is important to realize these differences as we examine the potential impact of fishing. The purpose of the fishing trip may also effect the outcomes it produces. I predict that someone fishing for food compared to someone fishing for fun will have different effects and experiences with fishing.

Up until this point, much of the argument presented has been theoretical. The abundance of empirical and philosophical evidence presented bolsters the argument that fishing may be a beneficial recreational activity. Now that the theoretical background has been set, the next step in determining the health and well-being benefits of recreational fishing is to look at research that examines anglers themselves. In perusing the available research on fishing, I have come to the realization that there is not that much on the topic. However, in the scarcity of data that exists, the findings speak millions.

Literature Review

Recreational fishing is a sport enjoyed by many of all ages. It has been found to be moderately popular in comparison to other outdoor activities, with 16% of Americans ages six and up participating in fishing. Furthermore it ranks number two in the top five most popular outdoor activities with forty-six million participants (Outdoor Foundation, 2013). Fishing can be characterized as a life-long activity, with participation in childhood and adolescence predicting participation as an adult (McManus, Hunt, Storey, & White, 2011). This is one potential reason to involve adolescents and children in fishing. Much like we see the nature-deficit in children and teens, adults experience the negative consequences of being constantly indoors. If getting

youth to participate outdoors through fishing can predict later participation, then we have alleviated a future dilemma in adulthood.

When examining the potential benefits of recreational fishing one approach is to survey the motivations of anglers themselves. This self-reported approach provides a breadth of information regarding the reasons people fish. Most of the studies (Frijlink & Lyle, 2010; McManus et al., 2011; Sutton, 2006) examining these features have found the highest motivation to go fishing is to relax, unwind, and be in the outdoors. These incentives were followed by social motivations and for food. The leading research on recreational fishing is being conducted at Curtin University by professor McManus. In examining the potential benefits of recreation fishing she has surveyed anglers in Australia. Interestingly a great proportion (77%) of surveyed fisherman reported being satisfied with their life or rated their life as good (McManus et al., 2011). It would be interesting to see how this compares to the general population. If found that the 77% is significantly higher than the general population, it would provide more beginning evidence for the therapeutics of fishing.

With top motivators for fishing including being able to relax and be outdoors, it is obvious that fishing is alluring to people. However, less obvious is the social motivations that encourage anglers to fish. Multiple studies on fishing have identified that one of the motivators to fish is for social reasons (Frijlink & Lyle, 2010; McManus et al., 2011; Sutton, 2006). It has been found that up to 90% of anglers typically fish with a friend or with family (Sutton, 2006). Social connectedness or feelings of belongingness are very important to a healthy development as suggested by both Baumeister and Maslow. Baumeister asserts that one of our deepest motivations for our behaviors is to have a sense of belongingness. This need for belongingness also sits in Maslow's pyramid of needs. It is believed that if belongingness along with the needs

are met, a self-actualized individual will exist. If fishing can provide the belongingness component of the pyramid then we are one step closer to achieving self-actualization.

So why should youth engage in fishing activities, particularly adolescents? Adolescents for many reasons can benefit greatly from engaging in recreational fishing. It is during adolescence that individuals begin to assert independence and autonomy (Russell & Bakken, 2002; L. Steinberg & Silverberg, 1986). It is also a time of developing meaningful social connections (Lerner & Steinberg, 2009; Laurence Steinberg & Morris, 2001). Since fishing provides a context for belongingness and provides a setting to build social connections, adolescents may benefit from recreational fishing. I'm sure many of us can remember the trying times of adolescence and the need to feel like one belongs. Fishing not only provides time for youth to relax and unwind, but make lasting social connections with those that they are fishing with. In addition to social connections, fishing may provide or promote meditative time for youth. This may be an important dimension for adolescent identity development.

Additional research on recreational fishing in adolescence has shown that such activities may be beneficial to youth because they increase environmental awareness and concern (Siemer & Knuth, 2001). Having a healthy relationship with nature includes responsible and ethical treatment of the environment. It is my hope that these responsible and ethical behavior will transfer to other situations in everyday life. If so, then the skills learned from recreational fishing should generalize to other situations and aid in dealing with other everyday dilemmas.

The basis of my theory of why recreational fishing is beneficial is the idea that the skills and abilities acquired from fishing will generalize to other situations. I expect that through learning to manipulate the environment while fishing to achieve a goal, one will be able to further adapt to their everyday surroundings. This is a phenomena seen in other research. For

example it has been found the self-efficacy in multiple dimensions can be improved through adventure therapy even when that specific dimension was not targeted (Widmer, Duerden, & Taniguchi, 2014). This is also a concept that Bandura suggests occurs with general self-efficacy. It is clear from the previous research that recreational fishing impacts social factors, but how do we determine if it is truly beneficial to youth on other levels?

Therefore in order to investigate these possibilities, I conducted research at the Barry Conservation Camp in Milan, NH the summer of 2014. As a youth summer camp that focuses primarily on fishing, I will be able to measure certain aspects of well-being before and after the fishing experiences to determine if any changes occur. I expected to find positive changes related to self-esteem, self-efficacy, social connectedness, and general well-being from the start to the end of the camp.

Overall, because of its unique ability to provide opportunity for mastery and autonomy, I believe that recreational fishing may provide benefits for adolescents. These benefits may last into adulthood and decrease the nature-deficit and the issues derived from it. In the words of Henry David Thoreau, “many men go fishing all their lives without knowing it is not the fish they are after”. Therefore what they really are after is procuring the psychological and physiological benefits of fishing.

Methods

Participants

All thirty nine youth that were enrolled in the Barry Conservation 4-H Camp in Milan, NH summer 2014 were sent invitations to participate in the study. Of these, 37 accepted the invitation. Informed assent from the youth participant was obtained from these 37 children and

youth at the start of their camp experience. Further requirements, such as being over the age of 12, limited the sample for these analyses to a total of 26 participants. The mean age of the eligible participants was 13.70 ($SD = 1.29$) with a range of 12 to 16 years. Of the 26 participants, 73% were male and 89% were white. Only 8% indicated that they had never been fishing prior to this camp experience. For those youth who had fished before, the average age of onset of participation in fishing was 6.60 ($SD = 2.47$) years of age, with an average of 7.00 ($SD = 2.99$) years of fishing experience.

Procedures

The Institutional Review Board of the University of New Hampshire as well as the 4-H Barry Conservation Camp granted approval for this project. Participants were recruited from the pool of enrolled campers. Those that were enrolled in the fishing camp week were sent invitations to their home explaining the study. Passive informed consent procedures were used and opt-out postcards were sent to parents. Only one parent chose to opt-out their child from the study. Informed assent was obtained from the youth on the first day of camp. The names of all the participants in the study were entered into a drawing for one \$50.00 gift card to Cabella's Sporting Goods store as incentive for their participation. All participants received a small token prize, a fishing lure, after completion of the study. Surveys were completed on the first and on the last day of camp and were administered by a staff member on the project.

Measures

Social Self-Efficacy.

Social self-efficacy was measured using the Social Self-Efficacy Scale (Muris, 2001), which consists of eight questions ($\alpha = 0.65$) regarding social competencies. It measures

youths' self-assessments of their ability to negotiate social situations and produce successful social interactions. The responses for items range from 1= Not Very Well to 5= Very Well.

Composite scores were computed using the mean of the items.

Optimism.

Optimism was measured using a subscale of the Mental Health Measure in the National Longitudinal Survey of Youth (1997). It consists of four items ($\alpha = 0.63$) that measure the level of optimism that youth feel about themselves and their future. Responses range from 1= Strongly Disagree to 4= Strongly Agree. Items 2 and 4 were reverse coded and then composite scores were computed using the mean of the items.

Resilience.

Resilience was measured using the Resilience Scale (Neil & Dias, 2001). The scale consists of twenty-five ($\alpha = 0.93$) items that measures components of resilience in different domains of young peoples' lives, ranging from planning and thinking ahead to level of independence. Responses range from 1= Disagree to 7= Agree. No responses required reverse coding and composite scores were computed using the mean of the items.

Social Connectedness.

Social connectedness was measured using the Social Connectedness Scale (Lee & Robbins, 1995). The eight item ($\alpha = 0.84$) scale assesses the degree to which youth feel connected to others in their social environment. Responses range from 1= Strongly Disagree to 6= Strongly Agree. All of the items were reverse-coded so that a higher score indicates more connectedness to others. After reverse coding, composite scores were computed using the mean of the items.

Global Self-Worth.

Global self-worth was measured using the Global Self-Worth subscale from the Self Perception Profile for Young Children (Harter, 1985). The six item ($\alpha = 0.83$) global self-worth subscale is an overall measure of how well children like themselves and whether or not they are happy with themselves and the way they are leading their lives. Responses are divided into two columns each with two response choices. Starting at the left, items are coded as follows: Really True for Me= 1, Sort of True for Me= 2, Sort of True for Me= 3, and Really True for Me= 4. Reverse coding was necessary for items 3, 4, and 5. Composite scores were computed using the mean of the items. The higher the score the greater the child's self-worth.

Self-Esteem.

Self-esteem was measured using Rosenberg's Self-Esteem Scale (1965). This ten item ($\alpha = 0.84$) scale is a measure of self-esteem, self-worth, self-respect and ability. Responses are scored on a 4 point Likert-type scale ranging from 3=Strongly Agree to 0= Strongly Disagree. Responses 2, 5, 6, 8, and 9 required reverse coding so that higher scores reflect greater self-esteem. Composite scores were computed using the mean of the items.

Additional Measures.

In addition to obtaining the above measures, data collection phase two consisted of an additional twenty-five questions adapted from the Youth Experience Survey (YES: Hansen, Larson, & Dworkin, 2003). Participants were instructed to think about their experiences while fishing when answering. These questions encompassed a variety of key developmental components, ranging from self-discipline to belongingness. Questions such as “[During my fishing experiences at camp I] thought about who I am” enable us to determine if fishing provides meditative time for adolescents.

Three open-ended questions were also included in phase two of the data collection. These included “What is your favorite part about fishing?”, “How has fishing changed the way you are as person?”, “How do you think fishing can help people?”.

Results

Descriptive results for all key variables separated by pre- and post-camp waves are provided in Table 1. The mean score on social self-efficacy for all participants at wave one was 3.74 ($SD = 0.61$) with a range of 2.40 to 4.80. There was no significant difference between males ($M = 3.78, SD = 0.59$) and females ($M = 3.71, SD = 0.64$). At wave two the mean score on social self-efficacy was 3.79 ($SD = 0.62$) with no difference between males ($M = 3.73, SD = 0.62$) and females ($M = 3.94, SD = 0.69$). The range was similar to wave 1, from 2.4 to 4.60. As shown in Table 2, social self-efficacy at wave one was correlated with wave one optimism, $r = .40, p < .05$, wave one resilience, $r = .45, p < .05$, wave one self-esteem, $r = .46, p < .05$, wave two social self-efficacy, $r = .46, p < .05$, and wave two resilience, $r = .47, p < .05$. Social self-efficacy at wave two was correlated with fishing history in years, $r = .44, p < .05$, wave one social self-efficacy, $r = .464, p < .05$, wave one social connectedness, $r = .53, p < .001$, wave one self-esteem, $r = .44, p < .05$, and wave two resilience, $r = .44, p < .05$.

The mean score on optimism for all participants at wave one was 2.67 ($SD = 0.44$), with a range from 2.0 to 3.5. There was no significant difference between females ($M = 2.75, SD = 0.52$) and males ($M = 2.65, SD = 0.42$). At wave two, the mean score for optimism was 3.10 ($SD = 0.53$). The range increased to 2.0 to 4.0. Again, there was no difference between males ($M = 3.19, SD = 0.48$) and females ($M = 2.91, SD = 0.65$). Optimism at wave one was correlated with wave one social self-efficacy, $r = .40, p < .05$, wave one social connectedness, $r = .53, p < .05$,

wave one self-esteem, $r = .64, p < .05$, and wave two optimism, $r = .68, p < .001$. Optimism at wave two was correlated with resilience at wave one, $r = .49, p < .05$, and wave one self-esteem, $r = .45, p < .05$.

The mean score for resilience at wave one for all participants was 5.16 ($SD = 0.94$). The range was 2.6 to 6.4. While not significant, males ($M = 5.26, SD = .98$) reported slightly higher means than females ($M = 4.82, SD = 1.13$). At wave two the mean score was 5.52 ($SD = 0.98$), with males ($M = 5.67, SD = 0.97$) and females ($M = 5.31, SD = 1.27$) not differing greatly. The range was 3.3 to 6.7 at wave 2. As shown in table 2, resilience at wave one was correlated with fishing history in years, $r = .48, p < .05$, wave one social self-efficacy, $r = .45, p < .05$, wave one social connectedness, $r = .44, p < .05$, wave one self-esteem, $r = .47, p < .05$, wave two optimism, $r = .49, p < .05$, and wave two resilience, $r = .66, p < .001$. Wave two resilience was correlated with wave one social self-efficacy, $r = .47, p < .05$, wave one resilience, $r = .66, p < .001$, wave one self-esteem, $r = .62, p < .001$, and wave two social self-efficacy, $r = .44, p < .05$.

The mean score for social connectedness at wave one was 5.09 ($SD = 0.88$), with a range of 3.3 to 6.0. There was no difference between males ($M = 5.05, SD = 0.89$) and females ($M = 4.98, SD = 0.98$). At wave two the mean score for all participants was 5.21 ($SD = 0.94$), with no difference between males ($M = 5.05, SD = 0.89$) and females ($M = 4.98, SD = 0.99$). The range at wave two was 3.0 to 6.0. As seen in table 2, social connectedness at wave one was correlated with wave one optimism, $r = .53, p < .05$, wave one resilience, $r = .44, p < .05$, wave one self-esteem, $r = .83, p < .001$, wave one global self-worth, $r = .46, p < .05$, wave two social self-efficacy, $r = .53, p < .05$, and wave two self-esteem, $r = .72, p < .001$. Wave two social connectedness was correlated with only wave two global self-worth, $r = .58, p < .05$.

The mean score for global self-worth at wave one was 3.43 ($SD = 0.69$) with no significant difference between males ($M = 3.32$, $SD = 0.75$) and females ($M = 3.19$, $SD = 0.53$). The scores ranged from 1.7 to 4.5. At wave two the mean score for all participants was 3.40 ($SD = 0.62$), again, with no difference between males ($M = 3.52$, $SD = 0.60$) and females ($M = 3.11$, $SD = 0.60$). The range at wave two was 2.2 to 4.0. As shown in table 2, global self-worth at wave one was correlated with wave one social connectedness, $r = .46$, $p < .05$, wave one self-esteem, $r = .65$, $p < .001$, wave two self-esteem, $r = .58$, $p < .05$, and wave two global self-worth, $r = .51$, $p < .05$. Wave two global self-worth was correlated with wave one self-esteem, $r = .48$, $p < .05$, wave one global self-worth, $r = .51$, $p < .05$, wave two social connectedness, $r = .58$, $p < .05$, and wave two self-esteem, $r = .46$, $p < .05$.

The mean score for all participants on self-esteem at wave one was 3.29 ($SD = 0.52$), with no significant difference between males ($M = 3.36$, $SD = 0.56$) and females ($M = 3.06$, $SD = 0.31$). The range of scores was from 2.4 to 4.0. At wave two the mean score for self-esteem was 3.99 ($SD = 0.59$), with no difference between males ($M = 4.01$, $SD = 0.65$) and females ($M = 3.78$, $SD = 0.25$). The range at wave two shifted up, ranging from 3.0 to 5.5. As shown in table 2, wave one self-esteem was correlated with wave one social self-efficacy, $r = .46$, $p < .05$, wave one optimism, $r = .64$, $p < .001$, wave one resilience, $r = .47$, $p < .05$, wave one social connectedness, $r = .83$, $p < .001$, wave one global self-worth, $r = .65$, $p < .001$, wave two social self-efficacy, $r = .44$, $p < .05$, wave two optimism, $r = .45$, $p < .05$, wave two resilience, $r = .66$, $p < .001$, wave two self-esteem, $r = .82$, $p < .001$, and wave two global self-worth, $r = .48$, $p < .05$. Wave two self-esteem was correlated with wave one social connectedness, $r = .72$, $p < .001$, wave one self-esteem, $r = .82$, $p < .001$, and wave one global self-worth, $r = .58$, $p < .05$.

In order to determine if any changes occurred between time one and time two in any of the six dimensions, a paired-sample t-test was employed. Two-tailed tests were conducted because scores could have potentially changed in either direction. The analyses indicated significant gains in two of the dimensions (optimism and self-esteem), and a marginally significant in one (resilience). The remaining three (social self-efficacy, social connectedness, and global self-worth) did not show any significant differences in any direction. As shown in Table 1, Optimism significantly increased from wave one ($M = 2.67$, $SD = 0.44$) to wave 2 ($M = 3.10$, $SD = 0.53$), $t = -4.45$, $p < .001$. Self-esteem also significantly increased from wave one ($M = 3.29$, $SD = 0.52$) to wave two ($M = 3.99$, $SD = 0.59$), $t = -9.47$, $p < .001$. Resilience was found to marginally significant with a p-value of 0.07. Resilience increased from wave one ($M = 5.16$, $SD = 0.94$) to wave two ($M = 5.52$, $SD = 0.98$), $t = -1.88$).

Additional questions at wave two were answered on a 5-point Likert scale of agreement, with 1 being strongly disagree, 2 being disagree, 3 being uncertain, 4 being agree, and 5 being strongly agree. For this analysis the groups were collapsed in to agree, uncertain, and disagree. On the question, while fishing I learned to be patient, 74% of the adolescents reported that they agreed or strongly agreed. There was no significant difference between males (75%) and females (72%). On the question, while fishing I realized that other people counted on me, 86% of adolescents reported agreement. While not significant, males reported less agreement (82%) than females (100%). On the next question, 69% of adolescents reported agreement to learning that their emotions effected how they performed. A significant difference was found between males (56%) and females (100%), $t(21) = -2.10$, $p < .05$. This indicates that females reported agreement to this question more than males. Only 44% of adolescents reported that while fishing they became better at handling stress, however it should be noted that a large proportion (35%)

were uncertain. This uncertainty was seen among the females, who while only 14% agreed to this statement, 77% were uncertain. As for the males, 57% agreed with this statement, suggesting that males became better at handling stress than females while fishing. Leading to the next question, 58% of adolescents reported agreeing to statement that while fishing, they practiced self-discipline. While not significantly different, males reported higher agreement (69%) than females (34%). It should also be noted that females reported more uncertainty to this question as well (50%). Approximately 60% of adolescents agreed to the three questions about learning to set priorities, organize time, and focus attention, with little differences between males and females. A greater proportion, 78%, of adolescents reported agreement to trying new things while fishing. There was little difference between males (81%) and females (72%), but it should be noted that among the females, 29% were uncertain.

In addition to trying new things, 65% of adolescents reported trying a new way of acting around people while fishing, with females (71%) reporting slightly higher than males (63%). As for starting to think more about the future, 61% of adolescents agreed to this statement, with little difference between males (69%) and females (72%). There was however a difference between males (50%) and females (72%) in their response to thinking about who they were while fishing. Approximately 56% agreed to this statement. As for becoming better at controlling one's temper, 48% of adolescents agreed to this, with little difference between males (50%) and females (43%). However, females were more likely to report being uncertain, 57%, to this question. Overall, 43% of adolescents reported a positive turning point in their life related to this fishing experience, with 48% uncertain. There was minimal difference between males (44%) and females (43%).

As for the open ended questions, the youth responded with a broad and diverse set of answers but noticeable patterns emerged. For the first questions, *what is your favorite part about fishing*, the majority of youth responded that “catching fish” was their favorite part. While this was the most common answer, many other insightful responses were elicited from the youth. For example more than one adolescent reported “connecting with nature” to be their favorite part. Other answers included having fun and learning from mistakes, and relaxing.

Answers on the second-opened question provided a more in depth look into how they felt fishing impacted them personally. Youth responded to *how has fishing changed the way you are as a person*, with a vast array of answers, but the most common answer was that they were more “patient” and “calmer”. Other answers included that fishing has made them “happier” and that they have “learned to love/respect the outdoors”. One youth even reported that they have “learned that they must wait for good things to happen”.

As for the third question, *how can fishing help people*, the most common answers were that “it can provide food” and that “it is stress relieving”. Other answers included that it “provides entertainment”, “gets people outdoors”, “gets people to love/respect nature”, and in some cases “provides jobs”. Some of the other interesting answers included that fishing can help people “clear their mind”, “enhance their mood”, and “understand themselves better”.

Discussion

This study’s purpose was to investigate whether any potential changes occurred in indicators of positive youth development following a fishing camp experience. Additional questions about youth activity experiences also enabled us to determine what the positive aspects of recreational fishing are. Leisure activities such as recreational fishing can be beneficial to children and youth. It is in this context that children and youth assert their own identities,

demonstrate self-determination, and can also learn meaningful skills. Skills such as patience and self-discipline, which are not ordinarily taught in schools, can be acquired during this time.

Outdoor leisure activities may be even more beneficial to children and youth than activities in traditional indoor settings. Previous research has shown that this is the case in a number of ways. Louv's nature-deficit assertion and the biophilia hypothesis bolster the findings that outdoor activities are more beneficial to youth than indoor. Whether it be the connection with nature, or having unlimited boundaries, outdoor recreation has proven to be more effective than indoor activities. Therefore it is no wonder why recreational fishing would have positive impacts on children and youth.

The results of the this study suggest that recreational fishing in a camp setting impacts adolescents in positive ways and that through participation in this sport youth are learning valuable life skills. This can be seen from the paired-sample t-test and from the answers received on the additional and open-ended questions.

From the analyses presented, it is clear that the recreational fishing experience impacted the youth in a positive manner. Even though 3 out of the 6 dimensions did not change significantly over time, the 3 that did change significantly indicate positive changes occurred. Resilience, while only marginally significantly improved, was impacted by the experience in a positive way. Optimism and self-esteem were the two dimensions in which significant improvements from pre- to post-camp were observed. However, an important correlation to note is that of fishing history and resilience. This correlation suggests that the longer the adolescent had been fishing the higher the score on resilience they initially had. This in itself suggests that recreational fishing may increase resilience and is further corroborated by the increase between wave one and two. As for self-esteem and optimism, having not been significantly correlated

with the adolescents' fishing history, we cannot be sure if their increases are due to the camp or the fishing component.

Evidence from adolescents' reports of their experiences while fishing at the camp suggest that fishing is associated with a broad range of positive experiences. First, it has been reported in a variety of ways, that fishing increases patience. With 74% of youth reporting that they practiced patience and patience being one of the most common answers to open-ended question, how has fishing changed you, there is little doubt that the fishing experience is related to patience. Self-discipline was also another component that youth expressed experiencing during the fishing experience, as well as the ability to handle stress better. These types of self-control behaviors are important to adolescents. It is during adolescence that youth must learn to control their urges and temper, and through recreational fishing it is clear that they are practicing behaviors that help them with self-control.

Time management and the ability to organize time effectively was also a component that the youth experienced during recreational fishing. With so many youth reporting that they practiced these skills while fishing, there is no doubt that this is a benefit of fishing. Such skills are very important in the development of healthy children and youth, particularly adolescents. During adolescence, youth are faced with a variety of time use options and much learn to effectively manage their schedule. Overscheduling and disorganization can lead to stress, and so it is important to learn these types of skills (Melman, Little, & Akin-Little, 2007).

The additional questions asked in the Youth Experience Survey also enable us to see that recreational fishing may provide meditative time for adolescents in which they can think about their future and about themselves. These types of cognitive exercises are important in adolescent development as adolescents start to become aware of how they fit in society and their

environment. Thinking about one's self or self-identity is important as adolescents begin to develop their own identities (Schwartz, Zamboanga, Luyckx, Meca, & Ritchie, 2013). Much like Erikson would suggest, the adolescents are questioning their identity and are facing the complexities of developing their identity. This is an important stage in development as they begin to shift from role confusion to identity formation. Furthermore it was interesting to see that a great majority of youth expressed that they learned that others counted on them. It is this shift from a self-centered child viewpoint to a more adult perspective of the world that may be showing here.

It was interesting to gain the perspective of the adolescents on how fishing may be beneficial. The open-ended questions that were asked of the adolescents corroborated what the quantitative results had found. Youth reported that they found themselves to be more patient and calmer following the fishing experience. They also reported that they were happier as well. While we did not survey specifically for happiness, the results showing that optimism and self-esteem bolster what the youth are saying. Overall, it seems as though recreational fishing, at least for youth at this camp, was associated with mood enhancing properties.

Overall, it appears that recreational fishing may have benefits to its participants, particularly adolescents. This study has shown that resilience may be increased through participation in fishing activities and potentially optimism and self-esteem as well. The qualitative questions enable us to see that fishing impacts patience, stress, and identity. Recreational fishing therefore may be a good addition to extracurricular activities and should be looked upon in the same manner. This may be especially true for rural youth, where other recreational opportunities are limited, but fishing is readily available.

It is my hope that like Bandura suggests, self-efficacy learned in one situation will enable one to increase self-efficacy in other situations. It is this generalization or transferability that makes recreational fishing important, because it is not the fish we are truly after, it is the psychosocial benefits.

Limitations

This study provides useful information and helps us to begin to understand why recreational fishing may be a positive outlet for children and youth. However, given this experiment was done using youth attending 4-H summer camp, it is difficult to weed out whether the changes were caused by the fishing itself or the camp experience more broadly. Camp experiences in themselves have been found to produce positive effects in children and youth (Allen, Cox, & Cooper, 2006; B. A. Garst, Browne, & Bialeschki, 2011; Henderson, Whitaker, Bialeschki, Scanlin, & Thurber, 2007; Thurber, Scanlin, Scheuler, & Henderson, 2007). Ideally, a matched camp experience sample without fishing would have been sampled, but sometimes such idealities are difficult to find and produce. In order to weed out the effects of the camp, it would be also ideal to conduct a study that examined anglers compared to the general population of non-fishermen. Only then can we truly determine if recreational fishing has positive effects.

Additional limitations included the small sample size of the participants. Perhaps if a larger sample was used we would have seen more significant differences between pre and post camp. Having an unequal proportion of males and females also created a dilemma in the analyses. It was difficult to determine whether any significant differences exist between males and females given that there were so few females to report on. Preliminary analyses on males and females show that they may have different experiences, but given that there were so few

females, the results were not significant. It is important to note, however, that significant differences were found even with this small sample.

Another limitation of the study was the inability to keep record of how much fishing each youth actually participated in while they were at camp. It would have been ideal to have a measure of fishing intensity to determine if that had any effect on the changes in the 6 dimensions or answers on the additional and open-ended questions. It would have also been advantageous to have a third collection period. This would enable us to determine if the fishing experience had any lasting effects on the youth. As it stands right now, we are limited to only knowing the immediate effects of the fishing experience.

However despite these methodological and analytical limitations, this study show that recreational fishing can have positive impacts on children and youth. Overall, future research needs to be conducted to further investigate this phenomena.

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IRB #: 6017

Study: The Potential Well-Being Benefits of Fishing for Youth

Approval Date: 10-Jun-2014

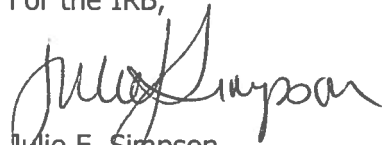
The Institutional Review Board for the Protection of Human Subjects in Research (IRB) has reviewed and approved the protocol for your study as Exempt as described in Title 45, Code of Federal Regulations (CFR), Part 46, Subsection 101(b). Approval is granted to conduct your study as described in your protocol.

Researchers who conduct studies involving human subjects have responsibilities as outlined in the attached document, *Responsibilities of Directors of Research Studies Involving Human Subjects*. (This document is also available at <http://unh.edu/research/irb-application-resources>.) Please read this document carefully before commencing your work involving human subjects.

Upon completion of your study, please complete the enclosed Exempt Study Final Report form and return it to this office along with a report of your findings.

If you have questions or concerns about your study or this approval, please feel free to contact me at 603-862-2003 or Julie.simpson@unh.edu. Please refer to the IRB # above in all correspondence related to this study. The IRB wishes you success with your research.

For the IRB,



Julie F. Simpson
Director

cc: File
Sharp, Erin

Table 1.

Descriptive Statistics and t-test Results for Six Targeted Outcome Variables

Outcome	Pretest		Posttest		n	95% CI for Mean Difference	r	t	df
	M	SD	M	SD					
1. Social Self-Efficacy	3.74	0.61	3.79	0.63	23	-0.33, 0.22	.46*	-.384	22
2. Optimism	2.73	0.44	3.10	0.53	23	-0.55, -0.20	.68*	-4.45**	22
3. Resilience	5.16	0.94	5.52	0.98	17	-0.77, 0.05	.66*	-1.88 [†]	16
4. Social Connectedness	5.09	0.88	5.21	0.94	21	-0.61, 0.38	.30	-.479	20
5. Self-Esteem	3.29	0.52	3.99	0.59	20	-0.87, -0.55	.82*	-9.47**	19
6. Global Self-Worth	3.43	0.69	3.40	0.62	20	-0.28, 0.33	.51*	.172	19

Table 2.
Pearson's R correlations

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Gender	-													
2. Age	.166 (.42)	-												
3. Fishing History	-.067 (.75)	.591 (.001)	-											
4. W1 SSE	-.027 (.90)	.174 (.395)	.212 (.299)	-										
5. W1 Optimism	.107 (.60)	.247 (.225)	.301 (.135)	.395* (.046)	-									
6. W1 Resilience	-.207 (.36)	.383 (.078)	.475* (.025)	.446* (.037)	.330 (.134)	-								
7. W1 SC	-.035 (.86)	.083 (.686)	.221 (.277)	.387 (.051)	.532* (.005)	.441* (.040)	-							
8. W1 SE	-.178 (.41)	.176 (.410)	.293 (.164)	.463* (.023)	.642* (.001)	.470* (.036)	.826* (.000)	-						
9. W1 GSW	-.089 (.67)	-.055 (.794)	-.068 (.747)	.265 (.200)	.365 (.073)	.228 (.320)	.460* (.021)	.653* (.001)	-					
10. W2 SSE	.157 (.48)	.236 (.279)	.443* (.034)	.464* (.026)	.353 (.098)	.445 (.050)	.532* (.009)	.435* (.049)	.247 (.268)	-				
11. W2 Optimism	-.242 (.27)	.127 (.563)	.217 (.319)	.245 (.261)	.676* (.000)	.487* (.034)	.348 (.104)	.446* (.043)	.150 (.506)	.271 (.211)	-			
12. W2 Resilience	-.165 (.48)	.236 (.304)	.334 (.139)	.473* (.030)	.251 (.272)	.663* (.004)	.408 (.066)	.622* (.003)	.021 (.931)	.435* (.049)	.369 (.100)	-		
13. W2 SC	.143 (.54)	.180 (.436)	.197 (.392)	.277 (.224)	.066 (.802)	.066 (.802)	.302 (.183)	.288 (.233)	.425 (.062)	.397 (0.75)	.234 (.307)	.182 (.456)	-	
14. W2 SE	-.180 (.42)	.116 (.606)	-.022 (.923)	.179 (.426)	.414 (.056)	.295 (.235)	.718* (.000)	.824* (.000)	.577* (.006)	.193 (.389)	.362 (.098)	.400 (.072)	.334 (.151)	-
15. W2 GSW	-.313 (.18)	-.251 (.286)	-.084 (.725)	.196 (.408)	.294 (.209)	-.184 (.495)	.412 (.071)	.479* (.038)	.514 (.020)	.262 (.264)	.178 (.452)	-.074 (.762)	.583* (.011)	.464* (.045)

SSE: Social Self-Efficacy, SC; Social Connectedness, SE: Self-Esteem, GSW: Global Self-Worth.

Pearson's R on top, alpha in parentheses.

*Significant correlations in bold.