URBAN WILDERNESS CANOE ADVENTURES

Evaluation Brief

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Background and Purpose

UWCA Program Overview

The Urban Wilderness Canoe Adventures (UWCA) provides a continuum of experiences for youth and families that are designed to engage participants in a lifelong relationship with the outdoors, encourage environmental awareness, and foster leadership and skill development.

The UWCA seeks to achieve these goals through efforts and activities designed to reach and engage underserved, low and middle income urban youth and families.

The partnership between Wilderness Inquiry and the Center for Applied Research and Educational Improvement (CAREI) began in 2010. Since that time, CAREI evaluators have collected data from over 3,000 students, primarily in grades 5-8 (Appendix A). Evaluators have also surveyed or interviewed more than 60 teachers whose students participated in UWCA Mississippi River trips.

Past Findings

Findings from all previous evaluations indicated that the UWCA river trips are an effective means of engaging youth with the outdoors and promoting environmental awareness. Our evaluations have found over 70% of participants:

- agreed they are more interested in the environment,
- worked as a member of a team,
- believed trip leaders were friendly,
- learned how to protect the environment , and
- gained new skills as a result of the trip.

Student responses to surveys underscore the importance of preparing students prior to the river trip and the positive impact trip participation has on students' connections to peers and adults, students' attitudes about science and the environment, and students' self-confidence and competence. Our findings also suggest that trip leaders play an important role in participant outcomes. These findings are very consistent with those found in the literature on outdoor and adventure education (Casson & Gillis, 1994; Norton & Watt, 2014; Passarelli, Hall, & Anderson, 2010).

KEY FINDINGS

Our findings indicate that UWCA participation is associated with growth in:

- ***Connection*** to others
- ***Competence*** to do well and be successful
- ***Contribution*** to society and others
- ***Environmental awareness***

Students who had positive perceptions about their trip leaders and who received preparation for the trip from their teachers showed more growth in these qualities than their peers.

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Teachers' perspectives also corroborated the data collected from students across all five years of evaluation. For instance, over 90% of the teachers who responded to the teacher survey reported that trip activities were age-appropriate, and more than 95% reported that trip leaders were knowledgeable and friendly to all students. Teachers consistently reported that students on the trips worked well in groups, benefited academically as a result of the field experience, and exhibited a high level of engagement on the trip (i.e., paid attention, respected others, participated enthusiastically). One teacher wrote:

> *This trip really brought students together. They had been bickering in the canoe, but after a while spontaneously began working as a team to paddle faster and they were laughing a lot.*

Teachers also said that they believed the students with the fewest outdoor experiences benefitted most from the river trip experiences and reported that students talked about the experience long after the field trip had ended.

Our Current Work

Our aim in this Evaluation Brief is to look across the data we have collected during the past five years. And, since we a have sufficient amount of data, we can look at these data in other ways to more fully understand the impact UWCA has had on participants.

In earlier evaluations, we attempted to measure the effectiveness of UWCA participation using attitudinal, academic, and behavioral outcomes, such as the impact of the program on participants' attitudes, test scores, and school attendance. The research literature and our past findings, however, suggested programs similar to the UWCA may have a greater influence on non-academic outcomes, such as student engagement, self-confidence, and competence, than on academic outcomes (e.g., Passarelli, Hall, & Anderson, 2010).

In 2013, we developed a new conceptual framework to assess the effectiveness of the UWCA river trip program using three important social and emotional factors: connection, competence, and contribution (Sheldon & Farnsworth, 2013). We wanted to see whether or not these factors might be better indicators of UWCA program efficacy. Also, because an important goal of UWCA trips is to increase participants' awareness of the environment, we wanted to determine whether or not trip participation correlated with environmental awareness as another indicator of program effectiveness.

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Research Questions

This Evaluation Brief answers four important research questions:

1) Do group differences (e.g., gender, culture, or previous outdoor experience) correlate with participants' connection to others, ability to contribute to others and society, feelings of competence, and environmental awareness?
2) Do characteristics of trip leaders (e.g., if they are fun and/or friendly) correlate with participants' connection to others, ability to contribute to others and society, feelings of competence, and environmental awareness?
3) Does preparation and instruction before the trip correlate with participants' connection to others, ability to contribute to others and society, feelings of competence, and environmental awareness?
4) Does interest in science and valuing of nature correlate with participants' environmental awareness?

We used exploratory factor analysis to statistically group responses to questions from the student surveys to represent the constructs of connection, competence, contribution, and environmental awareness (for details, see Appendix B). These groupings as well as our definitions of *connection*, *competence*, *contribution, and environmental awareness* are presented below.

CONNECTION

Connection is defined as interpersonal relationships between people (peers, teachers, trip leaders). Survey items that served as indicators of connection include the participants' self-report of connection to teachers and the extent to which they felt closer to others following the trip.

COMPETENCE

Competence is defined as participants' belief that they can do things well and be successful in school and in interactions with others. Survey items that served as indicators of competence include: the participants' sense of belonging, ability to work well in groups, perception of their own good qualities, beliefs regarding the importance of earning good grades, and perception of their success at collecting and using data.

CONTRIBUTION

Contribution is defined as the desire or intention to "give back" to others, including peers, the program, and society. Survey items that served as indicators for contribution include: an ability to work as a member of a team, development of the knowledge necessary to contribute to society by protecting the environment, the development of new skills, and the acquisition of knowledge about issues that affect the Mississippi River which may support a contribution to society.

ENVIRONMENTAL AWARENESS

Environmental awareness is defined as knowledge of environmental issues as well as interest in environmental science. Survey items that served as indicators for environmental awareness include: the participants' interest in science, the environment, and hands-on learning opportunities.

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Methods

Exploratory Factor Analysis

To explore our framework more fully, we analyzed the data we collected from a large number of participants (*N*=680) in 2013 and 2014. For this analysis, we created outcome variables that represent connection, contribution, competence, and environmental awareness by grouping survey items together using a method known as Exploratory Factor Analysis (EFA). Additional information about this procedure and the results of the analysis are found in Appendix B.

Regression Analyses

We used a regression analysis to determine whether or not particular youth attributes or characteristics make them more or less likely to exhibit growth in competence, connection, and contribution. We also tested the extent to which the development of environmental awareness was predicted by group differences (e.g., gender, culture, or previous outdoor experience) and other factors such as trip preparation, family attitudes toward the environment, and student interest in science. These analyses were conducted using data from 232 youth who participated in the UWCA river trips in 2013 or 2014 for whom we had a complete dataset (both pre- and post-trip survey). Additional information about the sample used in these analyses and the methodology are found in Appendix B.

Results

Our intentions were to determine whether or not certain youth characteristics correlate with the development of UWCA participants' connection, competence, contribution, and environmental awareness. Results are discussed below. A complete table of results is included in Appendix C.

Group Differences

Group differences (e.g., gender, culture, or previous outdoor experience) were not correlated to the development of connection or contribution. Significant differences were found, however, in the development of competence based on both ethnicity and previous experience. We found that students who identified themselves as African showed more growth in competence when compared to their White, Hispanic, and African American peers. While this relationship is not causal, it is important to consider the role ethnicity and culture may play in students who identify themselves as African.

Further, we observed no significant growth in competence for students who had already participated in three or more outdoor experiences. One possible explanation for this finding is that the participants attained an "experience ceiling" for growth in this quality after two or more experiences. If this is the case, students who have participated more than two times in the river trip may need novel experiences to grow in areas of competence.

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Trip Preparation and Trip Leaders

In addition to checking for group differences, we wanted to better understand the role adults play in ensuring positive outcomes for participants. We posit that adults (teachers and trip leaders) play an essential role in developing connection, contribution, and competence in youth participants. We tested whether or not it was important for teachers to have prepared their students for the trip using the pre-trip lessons and whether or not the trip leaders influenced participants' outcomes. We found that pre-trip preparation and engaging trip leaders both correlated strongly with higher participation benefits in connection, contribution, and competence.

We found that participants who believed their trip leaders were "fun" and "friendly" demonstrated significantly greater gains in connection, contribution, and competence. Likewise, participants who were prepared for the UWCA experience prior to the river trip showed more growth in connection, contribution, and competence after the trip as compared to their peers who were not prepared prior to the trip. These results support the need for ensuring that trips are led by high quality leaders and that teachers prepare their students for the trip experience via class lessons.

Environmental Awareness

We found that participant growth in environmental awareness was not strongly correlated with student characteristics (e.g., gender, culture, or previous outdoor experience). However, participants who were interested in science before the trip and whose teachers prepared them for the trip were more likely to show growth in environmental awareness than their peers. Likewise, participants who said their families thought it was important to learn about nature showed more growth in environmental awareness following trip participation. Notably, an interest in participating in hands-on learning experiences did not significantly correlate with the participants' development of environmental awareness.

What we believed before, but now we have strong evidence of…

- Trip leaders and preparation prior to the field experience are clearly key to the overall experience. Together, fun and friendly trip leaders and pre-trip preparation during classroom lessons explain a statistically significant difference in the experience between participants who demonstrated significant growth in connection, contribution, competence, and environmental awareness and their peers who did not show significant growth in these characteristics.
- Students who have been on these or similar trips more than three times experience a tapering off of growth in competence; thus, we infer there may be an "experience ceiling."
- Student characteristics (i.e., gender and race/ethnicity) do not seem to be significant factors in participants' development of connection, contribution, or environmental awareness. There *is* a slight, statistically significant, correlation with race/ethnicity on competence. Students who identify themselves as African demonstrate a larger growth in competence when compared to their non-African peers.

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Discussion and Implications

The results of our more rigorous analyses support conclusions of earlier evaluations. These results suggest UWCA river trip participation has important implications for the development of essential social and emotional competencies.

Below are some considerations and implications of the results of these analyses.

1. **Trip leaders matter.** Impact of the trip leader has the largest influence on all three factors. That is, students who identified the trip leader as fun and friendly reported higher increases in all three factors (connection, competence, contribution), and the trip leader was the largest predictor of gains in competence (26% of the variance), connection (25% of the variance), and contribution (45% of the variance).
2. **Pre-trip preparation.** Student perceptions of how well they were prepared for the trip were also correlated with student gains in competence, connection, and contribution. Pre-trip preparation by teachers explains additional variance above and beyond the impact of trip leader on competence (2.5%), connection (10.7%), and contribution (7.2%).
3. **Together both Trip Leader and Preparation** explained nearly 29% of the variance in competence, 36% of the variance in connection, and 52% of the variance in contribution.
4. **Environmental awareness.** Pre-trip preparation also explained the largest and statistically significant amount of variance in environmental awareness.
5. **The environmental awareness factor increased** for students who indicated higher levels of pre-trip preparation, interest in science, and family interest in nature. This combination of factors predicted the greatest increase in environmental awareness among students who participated on the trip.
6. **Persisting environmental interest.** 80% of students indicated increased environmental interest after the river experience. And over 80% of students reported learning how to protect the environment and learning about issues that affect the Mississippi River.
7. **Enhancing teacher and district buy-in** to prepare students for environmental education experiences is an essential factor in increasing the program's impact on youth participants.
8. **Teamwork.** Nearly 90% of participants reported working with others as a team.
9. **Returning to the Mississippi.** In surveys administered in 2010 and 2012, approximately 70% of the students indicated that they would like to canoe on the Mississippi again.
10. **The General Wilderness Program Assessment Inventory.** Our preliminary statistical analysis suggests that CAREI's survey is a valid and useful instrument. Additional item analysis and possible revisions could further improve its usefulness.

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Appendices

Appendix A. Participant Descriptive Statistics

a. Participant Data Summary Table 2010-2014

b. Current Evaluation Sample Summary Table

Appendix B. Expanded Information on Evaluation Methodology

a. Exploratory Factor Analysis

b. Regression Analyses

Appendix C. Regression Results

Appendix D. References

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Appendix A. Participant Descriptive Statistics

Table 1: UWCA Demographics Frequencies for all students

	Year 2010		Year 2012			Year 2013			Year 2014			All Observations
Demographics	Post	Total	Pre	Post	Total	Pre	Post	Total	Pre	Post	Total	**Grand Total**
	(*N* = 329)	(*N* = 329)	(*N* = 665)	(*N* = 408)	(*N* = 1073)	(*N* = 299)	(*N* = 303)	(*N* = 602)	(*N* = 583)	(*N* = 377)	(*N* = 960)	**(N = 2964)**
Gender												
Female	160	160	311	114	425	131	132	263	261	165	426	**1274**
Male	147	147	301	106	407	168	171	339	303	186	489	**1382**
Missing	22	22	53	188	241	0	0	0	19	26	45	**308**
Ethnicity												
African	--	--	24	8	32	15	18	33	44	28	72	**137**
African American	--	--	191	59	250	63	63	126	155	103	258	**634**
American Indian	--	--	25	9	34	9	7	16	20	11	31	**81**
Asian	--	--	57	29	86	26	27	53	33	24	57	**196**
Hispanic	--	--	125	50	175	72	90	162	134	84	218	**555**
White	--	--	63	33	96	17	18	35	42	23	65	**196**
Other	--	--	84	21	105	30	16	46	62	38	100	**251**
Multiple Ethnicity	--	--	55	19	74	61	58	119	78	44	122	**315**
Blank	--	--	41	15	56	6	6	12	15	22	37	**105**
Missing	329	329	0	165	165	0	0	0	0	0	0	**494**
Grade Level												
5th	49	49	5	1	6							**55**
6th	95	95	153	49	202							**297**
7th	101	101	257	111	368							**469**
8th	63	63	198	65	263							**326**
9th	1	1	5	1	6							**7**
10th	--	--	3	1	4							**4**
11th	--	--	0	0	0							**0**
12th	--	--	7	1	8							**8**

Table 2. Demographic characteristics of sample population used for regression analyses

Variable	2013	2014	Total
Gender			
Female	76	26	102
Male	103	27	130
Race/Ethnicity			
African	15	6	21
African American	50	14	64
Asian	22	2	24
Hispanic	78	22	100
White	14	9	23
Trip Experience			
None	40	7	47
One	105	28	133
Two	21	13	34
Three+	13	5	18

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Appendix B. Expanded Information on Evaluation Methodology

Exploratory Factor Analysis

During each year of the evaluation (2010-2014), a student survey was administered before and after the UWCA river trip; however, only the 2013 and 2014 survey versions were identical. Thus, Exploratory Factor Analysis (EFA) was conducted on items contained in the post-trip survey for only the 2013 and 2014 data. We felt this ensured consistency while exceeding the minimum threshold of cases needed to conduct this type of analysis (i.e., sample size N=500; Tabachnick & Fidell, 2013).

Students (N=680) were presented with 25 statements and asked to indicate the extent to which they agreed or disagreed with each statement on a four-point scale with "1" indicating strongly disagree, "2" indicating slightly disagree, "3" indicating slightly agree, and "4" indicating strongly agree. Twelve of these items seemed to align well with the constructs of competence, connection, and contribution and were included in our analyses to create the outcome variables.

Regression Analyses

Once our outcomes (i.e., competence, connection, and contribution) were created, we ran regression analyses to determine what participant characteristics and other factors (e.g., trip preparation and trip leader qualities) were associated with participants' development of competence, connection, contribution, and environmental awareness. Because some of the predictors came from the student responses on items in the pre-trip survey, only those students (N=232) who responded to both the pre-trip and post-trip surveys and answered all of the questions in both surveys were included in the regression analyses. The predictor variables consisted of a composite variable measuring student perception of the trip leader, a composite measuring student perception of preparedness for the trip, and a family attitude variable measured by the extent to which students reported whether or not their family believed learning about nature is important.

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Appendix C. Regression Results

Table 3. Regression Results for Four Factors

	Competence				Connection				Contribution				Environmental Awareness			
Variable	*B*	*SE B*	*df*	*p*	*B*	*SE B*	*df*	*p*	*B*	*SE B*	*df*	*p*	*B*	*SE B*	*df*	*p*
Intercept	1.71	0.21	221	0.000***	0.42	0.28	221	0.139	0.61	0.22	221	0.006**	0.75	0.22	220	0.001**
Race/Ethnicity (White)																
African	0.22	0.15	221	0.138	-0.19	0.20	221	0.342	0.13	0.15	221	0.390	0.03	0.16	220	0.828
African American	0.14	0.12	221	0.233	-0.05	0.16	221	0.774	0.05	0.12	221	0.670	0.13	0.13	220	0.301
Asian	>0.01	0.14	221	0.980	0.06	0.19	221	0.765	-0.09	0.15	221	0.557	0.05	0.15	220	0.753
Hispanic	0.08	0.11	221	0.467	0.12	0.15	221	0.445	0.02	0.12	221	0.887	0.12	0.12	220	0.303
Gender (Male)																
Female	0.02	0.06	221	0.772	-0.03	0.09	221	0.703	0.08	0.07	221	0.232	0.07	0.07	220	0.300
Previous Experience (None)																
One	-0.02	0.08	221	0.849	-0.04	0.11	221	0.696	0.01	0.09	221	0.914	0.04	0.09	220	0.636
Two	0.17	0.11	221	0.128	0.12	0.15	221	0.434	0.08	0.12	221	0.492	0.02	0.12	220	0.853
Three or more	-0.30	0.14	221	0.028*	0.19	0.18	221	0.302	-0.03	0.14	221	0.837	0.09	0.14	220	0.546
Preparation	0.14	0.05	221	0.005**	0.42	0.07	221	0.000***	0.30	0.05	221	0.000***	0.457	0.05	220	0.000***
Trip Leader	0.29	0.05	221	0.000***	0.36	0.06	221	0.000***	0.50	0.05	221	0.000***				
Pre-trip Science Interest													0.15	0.04	220	0.000***
Family													0.12	0.04	220	0.004**
N				232				232				232				232
R^2				0.288***				0.361***				0.519***				0.418***

Note: * *p<0.05, ** p<0.01, ***p<0.001*

Note: R^2 denotes the explained variance of **Preparation** and **Trip Leader** combined in our final model.

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