

“I’M TOO OLD TO GO OUTSIDE!” EXAMINING AGE-RELATED DIFFERENCES IN CHILDREN’S ENVIRONMENTAL ORIENTATIONS

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Abstract.—Studies of the recent decline in nature-based recreation participation have identified the growing disconnect between children and the natural world as a persistent problem. Limited childhood exposure to nature may influence preferences and propensities to engage in future environmental behavior, but studies have not indicated when and how these effects are manifested during the maturation process. This study addressed these questions with surveys and interviews designed to assess age-related shifts in three important components of children’s environmental orientations: eco-affinity, eco-awareness, and environmental knowledge. Data were collected from 407 6- to 13-year-olds across northern Georgia and analyzed using nonparametric procedures. Children of all ages displayed relatively high levels of eco-awareness and environmental knowledge. However, Kruskal-Wallis tests revealed a significant decline in eco-affinity and environmental knowledge scores among children in older age groups. Future environmental education programs may benefit from an increased emphasis on building and maintaining eco-affinity in 10- to 13-year-old children.

1.0 INTRODUCTION

The growing disconnect between children and nature is a major concern with profound implications for the environmental, social, and physical well-being of children (Kahn and Kellert 2002, Louv 2005). An absence of authentic outdoor experiences (i.e., “nature deprivation”) may help to explain recent reports of declining health, diminishing environmental literacy, and waning interest in nature-based recreation among younger populations

(Coyle 2005, Kellert 2005, Pergams and Zaradic 2006). Environmental education (EE) has been hailed as one potential solution to nature deprivation. Legislative initiatives such as the No Child Left Inside Act are also gaining momentum, and implementation of EE programs and curricula is expected to increase.

With limited resources and budget constraints, critical decisions regarding when and how EE programs will be most effective are imminent. In this context, defining the ideal target age group for EE delivery has been a subject of substantial debate. An overall increase in environmental concern and emotional attachment to nature has been observed in middle childhood (Eagles and Demare 1999, Kahn 1999, Kahn and Kellert 2002). Other studies have found evidence that specific indicators of environmental attitudes and behavioral intentions are typically higher for younger individuals (Hines et al. 1986, Leeming et al. 1995). Although researchers concur that the development of environmental attitudes and awareness may help children build environmental stewardship values from an early age (Evans et al. 2007), few can agree on the ideal target age group.

As part of a larger effort to evaluate EE program impacts on environmental attitudes and awareness, this research used a mixed-methods approach to focus on age-related differences in environmental orientations. The purpose of this study was to compare the environmental orientations of children from different age groups and to detect critical points in childhood development where age-related differences in environmental attitudes were most evident. Identifying optimal age ranges for EE interventions could affect the design, scope, and implementation of future EE programs.

2.0 METHODS

This study involved 407 children participating in EE summer camps, after-school science clubs, and general after-school programs in Athens-Clarke County, Georgia. All data were collected prior to the EE instruction. Data for children in the summer camps were collected from 18

Table 1.—Pooled age distribution and within-group reliability estimates by age groups.

Age group	Participants	Cronbach's alpha ^a
7 & younger	17	0.814
8	68	0.737
9	74	0.767
10	158	0.864
11	67	0.876
12 & older	23	0.943
TOTAL	407	0.841

^aAlpha for complete 15-item Children's Environmental Perceptions Scale

June to 10 August 2007. Data for children in the science clubs and general after-school programs were collected throughout the 2007-08 academic year. Ages ranged from 6 to 13, but most participants were between 8 and 11 (See Table 1; mean age = 9.7 ± 1.3). Participant age structure was similar across the summer camp, science club, and general after-school groups. Children were placed in six age group categories (7 and younger, 8, 9, 10, 11, 12 and older) to adjust for unequal sample sizes and developmental differences. Qualitative interview data were collected from a subsample of 68 children (mean age = 9.4 ± 1.4) in the EE summer camps.

The children's environmental orientations were measured using the revised Children's Environmental Perceptions Scale (CEPS), a 15-item survey with Likert-type responses designed to gauge levels of eco-affinity and eco-awareness (Larson et al. submitted). Additional multiple-choice questions (four for summer camp surveys and eight for science club and after-school program surveys) were used to assess knowledge of specific environmental concepts. Average scores on the environmental knowledge subscale were calculated to allow for inter-group comparisons. The complete survey instrument was intentionally limited to 23 or fewer items to minimize the time burden for younger survey participants. Researchers administered summer camp surveys in small groups (4 to 10 individuals) and read them aloud to improve comprehension and increase the accuracy of responses. Trained teachers read aloud science club and after-school surveys to groups no larger than 30 students. Approximately 10 minutes was needed to complete CEPS.

Researchers and trained volunteers conducted personal interviews, which were semi-structured to provide a more detailed look at an individual's interaction with nature. Questions encouraged children to describe their leisure-time activities, outdoor experiences, and opinions of nature. Interviews ranged from 2 to 10 minutes, with an average duration of about 6 minutes.

The reliability and validity of the survey instrument was assessed with SPSS 17.0 (SPSS, Inc., Chicago, IL). Reliability estimates of internal consistency were measured for the overall population and subgroups using Cronbach's alpha. An exploratory factor analysis with oblique rotation was used to identify constructs embedded in the 15-item CEPS. Eco-affinity, eco-awareness, and environmental knowledge scores were compared using nonparametric procedures, including Kruskal-Wallis tests and Mann-Whitney *U* tests because of deviations from normal data distribution. Follow-up tests were conducted using Mann-Whitney *U* tests with Holm's sequential Bonferroni corrections to evaluate pairwise differences among the age categories. Incomplete surveys were omitted from the analysis. Qualitative data were assessed using an inductive analysis and constant comparative method to identify emerging patterns and classify interview responses into a set of ordered categories to supplement quantitative data (Dey 1993).

3.0 RESULTS

Overall reliability coefficients for the revised 15-item CEPS (Cronbach's alpha = 0.841) and the eco-affinity (alpha = 0.860) and eco-awareness (alpha = 0.700) subscales were high. Internal consistency remained high within the data when reliability coefficients were stratified by age group (See Table 1). The factor analysis supported a two-factor structure that was consistent with previous results (Larson et al. submitted).

Kruskal-Wallis tests comparing survey scores across age groups revealed significant differences in eco-affinity ($\chi^2_{5,N=359} = 37.8$, $p \leq 0.001$, $\eta^2 = 0.11$) and environmental knowledge ($\chi^2_{5,N=368} = 21.3$, $p = 0.001$, $\eta^2 = 0.06$). Differences in eco-awareness scores among age groups were not evident ($\chi^2_{5,N=363} = 4.2$, $p = 0.527$, $\eta^2 = 0.01$). In general, eco-affinity decreased as

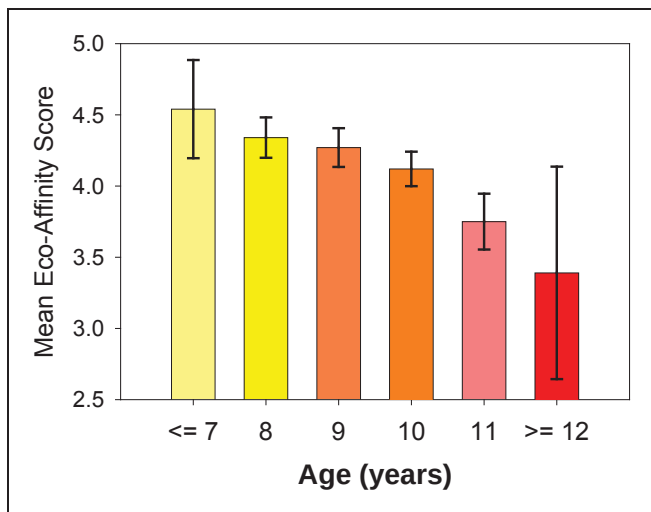


Figure 1.—Mean eco-affinity scores by age group ($\pm$ 95% CI).

children got older (see Fig. 1). Scores for 8-, 9-, and 10-year-olds were significantly higher than scores of children 11 and older. Pairwise comparisons showed a peak in environmental knowledge at age 10 (see Fig. 2). Environmental knowledge was significantly lower in 11-year-olds and appeared to continue on a downward trajectory for children 12 and older. The large variability associated with mean scores for children 12 and older was likely due to the small sample size. Children in the after-school science clubs displayed higher eco-affinity, eco-awareness, and environmental knowledge scores than children in the EE summer camps or general after-school programs.

Qualitative results indicated that 81 percent of children interviewed preferred outdoor or indoor/outdoor activities to those that occurred exclusively inside. The overwhelming preference for outdoor activities was consistent across age groups. Most children of all ages (85 percent) also claimed they enjoyed being outside. According to one 11-year-old girl, “Outside is just better than being inside. Inside, there’s nothing to do.” Distinct age-related outdoor activity patterns began to emerge in the inductive analysis of interview responses. In general, younger children (≤ 10 years old) reported spending more time outside in their own backyards than older children. Older children tended to engage in more social outdoor activities than younger children and described less direct interaction with nature than their younger counterparts.

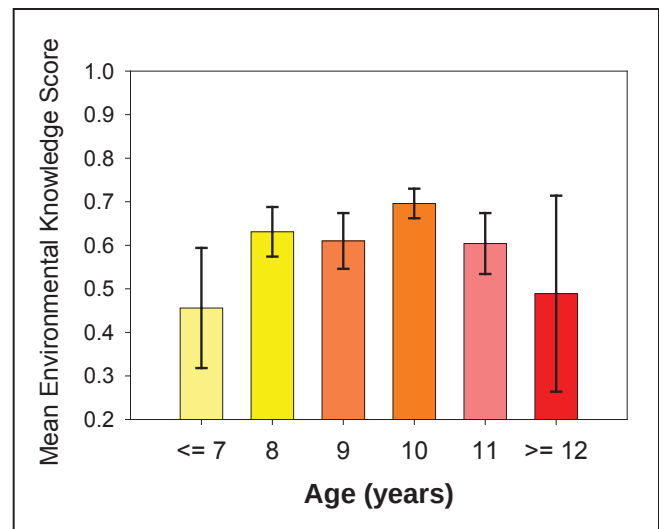


Figure 2.—Mean environmental knowledge scores by age group ($\pm$ 95% CI).

4.0 DISCUSSION AND IMPLICATIONS

This study attempted to build on child development theory to provide an empirical framework for evaluating age-related differences in environmental orientations. Results revealed significant declines in eco-affinity and environmental knowledge for children between the ages of 10 and 11. The CEPS data suggest that EE efforts could focus on maintaining positive eco-affinity and environmental knowledge in 10-year-old children before they progress into the teenage years. A decreased emphasis on formal outdoor science activities once children make the transition from elementary to middle schools typically around age 11 may be related to their diminishing preference for nature (Coyle 2005). Environmental education initiatives exclusively focused on building awareness may fail to stimulate interest in nature, which is a more direct measure of a child’s ability to nurture a continued connection with the natural environment.

Although most children expressed a general passion for the outdoors, children from different age groups appeared to experience nature in distinct ways. When children 11 and older described their outdoor experiences, many of their stories involved friends or social activities. Interviews with younger children (≤ 10 years old) included more references to independent exploration and direct contact with nature. This study supports Vadala et al.’s (2007) argument that interaction

with nature and interaction *within* nature represent two very different behaviors with distinct outcomes. For children approaching adolescence, outdoor experiences may be valued more as social development and peer networking opportunities than as a medium for direct contact with native ecosystems (Burton et al. 1996). Future EE programs could adapt to the shifting priorities of older children and present material in a manner that promotes eco-affinity and environmental knowledge through interaction within nature.

This research provides a useful baseline, but additional research that expands the sample frame and research design is needed to identify specific mechanisms that explain age-related changes in environmental orientations. The current investigation relied primarily on data from self-selected participants of nature-based camps and after-school clubs, and these children may not accurately represent the environmental orientations of the average child in the general population. For example, many children in the sample displayed high eco-affinity scores that reflected a strong pre-existing interest in nature. Consequently, differences in children's environmental orientations among age groups in the general population may be even more pronounced. Future research should also control for other demographic variables (e.g., ethnicity, gender). Ethnic differences in eco-awareness and environmental knowledge, for instance, have been observed in previous studies (Bullard 1993, Larson et al. 2008); therefore, an ethnically biased sample may confound interpretation. Finally, a longitudinal study that controls for individual differences by tracing the development of a child's attitudes over time would allow for more meaningful comparisons and more powerful analyses of age-mediated shifts in children's views of nature. With these improvements, researchers will be better equipped to examine the significance of the age 10-to-11 transition as an optimal intervention point in the struggle to combat nature-deficit disorder.

5.0 CITATIONS

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