Profile of Ohio Adults with Low Environmental Literacy[1]

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ABSTRACT. Environmental literacy is defined as an understanding of natural systems combined with how they interact with human social systems. An Ohio study measured adults' knowledge of ecological principles as the basis of understanding. A telephone survey of 504 Ohio adults measured their knowledge of ecological principles along with their demographics. Low literacy adults are significantly different from those who exhibit high literacy. The lowest literacy group was characterized as less educated, below the median household income, older, female, and minority. Low literacy adults are less likely to engage in outdoor activities, gain information from environmental groups, but are more likely to gain information from television. Low literacy adults are more likely than high literacy adults to use alternative transportation. In targeting environmental education programs to heads of households and Ohio voters, adults with low environmental literacy need to be approached differently than those with high literacy.

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INTRODUCTION

Environmental literacy is the understanding of the interactions between natural systems and human social systems (Barrett and others 1997; Hausbeck and others 1992). Orr (1992) defines ecological literacy as a broad understanding of how people and societies relate to each other and natural systems, presuming an awareness of the "interrelatedness" of life and the knowledge of how the world works as a physical system. The basic principles of ecology such as energetics, cycling, growth, and competition are the common denominators in developing environmental literacy (Odum 1993).

The environmental literacy of Ohio adults was presented by Mancl and others (1999). In this paper, the profile of an adult showing low environmental literacy will be considered and compared to adults who show high levels of environmental literacy. This information will serve to target future environmental education programs to reach out to adults who are heads of households and voters who have a limited understanding of basic ecological principles.

MATERIALS AND METHODS

A random telephone survey of 504 Ohio adults collected responses to questions related to the principles of ecology as described by Mancl and others (1999), and included 32 questions related to the principles of ecology. Other questions used in the same survey related to demographics, attitudes, and environmental actions are presented in Appendix I. This survey has been used by Morrone and others (2001) to measure environmental literacy of other groups.

RESULTS

Respondent surveys were organized into two groups with low literacy respondents scoring in the lowest quartile on the 32 questions on ecological principles and the high literacy respondents scoring in the highest quartile (Fig. 1). These groups were significantly different ($p < 0.05$) in all eight ecological principles.

Those with low knowledge of environmental principles are demographically distinct ($p < 0.05$) and are compared to the high literacy group in Table 1. They are less educated, below the median income, more likely to be female, older, and more likely to be a minority. Low literacy adults are also more likely to be unemployed. While adults with low environmental literacy live throughout Ohio, small towns show the greatest percentage of adults with low literacy. Adults with high environmental literacy live in the highest percentage in suburban areas. Among the demographic factors that do not appear related to level of literacy are marital status, type of residence, and religious beliefs.

In terms of attitudes and behaviors, those with low environmental literacy are sometimes environmentally friendly and are not significantly different from those with high literacy in regards to recycling and buying environmentally friendly products. Both groups equally support environmental candidates. An important difference is that low literacy adults more frequently use alternate transportation.

One difference between the two groups was on the attitude item concerning interfering with nature. Persons with low environmental literacy are less likely to believe that it is disastrous to interfere with nature and that they must live in harmony with it. Low literacy groups are more likely to believe that mankind is created to rule and that humans can fix the environment with technology. Both groups believed that it is their personal responsibility to help improve the environmental quality.

Persons with low environmental literacy are significantly less engaged in outdoor activities. They are also less likely to belong to, receive literature from, or participate in environmental groups. The low literacy group is significantly less likely to perceive environmental threats or to pay attention to environmental issues.

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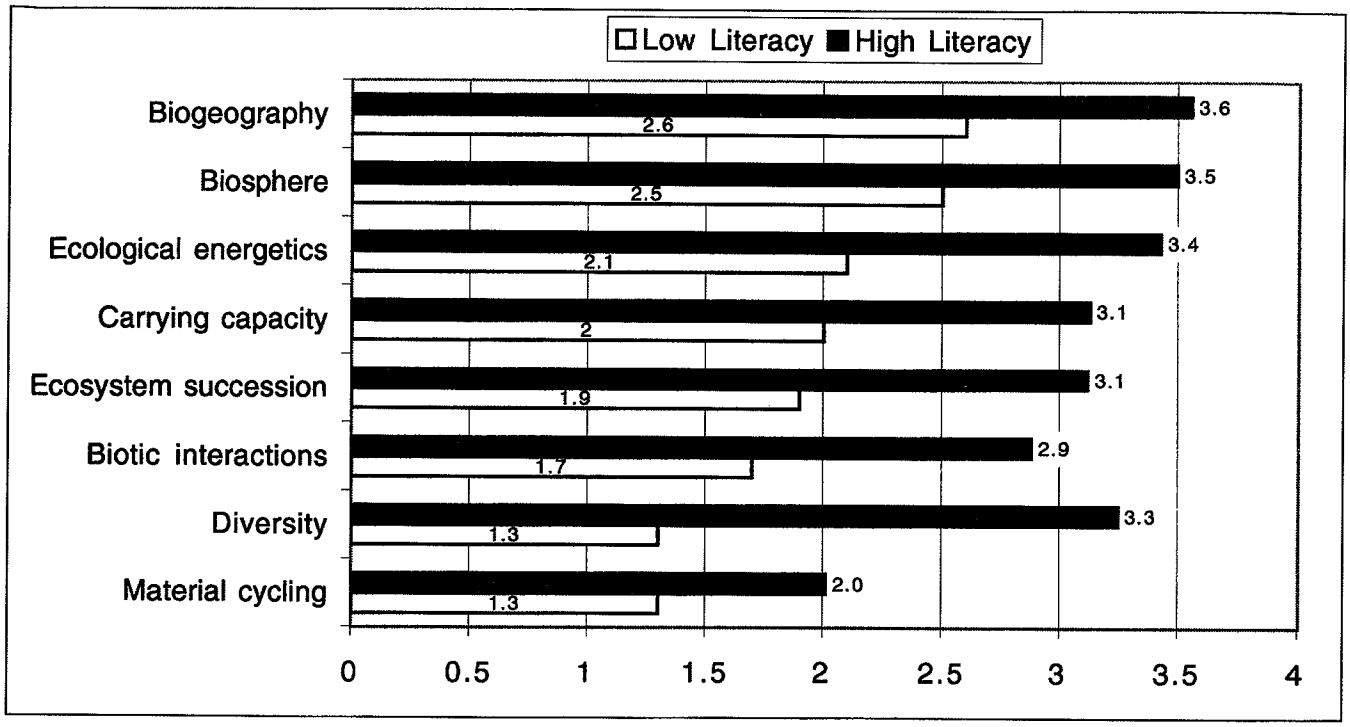

FIGURE 1. Comparison of Ohio adults showing high and low environmental literacy.

Television is the most likely source of environmental information for persons with low environmental literacy. They also trust the news media to provide accurate information about the environment.

DISCUSSION

As programs and policies are developed in Ohio to protect and enhance the environment, reaching persons with low environmental literacy will be a challenge. Increased environmental literacy will enable adults to make more informed decisions about family, community, and state resources directed to Ohio's environmental quality. Programs offered to members of environmental groups involving outdoor activities in suburban areas will not reach people with low literacy. The media will play a key role in reaching the low literacy group. Persons with low knowledge of environmental principles will most likely benefit from vicarious experiences relative to

TABLE 1

Profile of Ohio adults showing low and high environmental literacy.

	Lowest 25%	Highest 25%
Behaviors (1 never to 5 often)		
Pay attention to environmental issues	2.06	1.81
Use alternate transportation	2.71	2.27
Recycle	no significant difference	
Avoid buying excess packaging	no significant difference	
Compost yard waste	no significant difference	
Buy environmental product over other	no significant difference	
Support environmental candidate	no significant difference	
Attitudes (1 strongly agree to 5 strongly disagree)		
Personally responsible for improving env.	no significant difference	
Must live in harmony with nature	1.94	1.41
Interfere with nature - disastrous	2.27	1.95
Mankind created to rule	2.57	2.86
Humans can fix with technology	2.4	2.77

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TABLE 1 (*Cont.*)

Profile of Ohio adults showing low and high environmental literacy.

	Lowest 25%	Highest 25%
Demographics		
Get most info from TV	62%	42%
From newspapers	29%	34%
From magazines	0%	8%
Sources of info. trusted most – media	59%	36%
environmentalists	24%	31%
professors	6%	18%
Higher than median income	35%	56%
More likely to be a minority	24%	7%
Urban	24%	22%
Suburban	25%	31%
Small town	30%	18%
Rural	22%	29%
Education at High School or less	61%	24%
Education at BS or more	11%	46%
Age over 60	23%	10%
Age 31-45	35%	39%
Age 17-30	15%	20%
Gender male	36%	55%
Religion	no significant difference	
Dwelling type	no significant difference	

the environment. Because this group is likely to use alternative transportation, providing positive and encouraging messages about their individual contributions to improving the environment on buses and at bus stops may be a good starting point. This survey shows most Ohio adults believe they have some personal responsibility to improve the environment.

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APPENDIX I

Questions to measure the knowledge of environmental behaviors, attitudes and demographic of Ohio adults.

1. Over the past few years, do you think the environment in Ohio has gotten better, stayed about the same, or gotten worse?

2. How well informed do you feel you are about environmental issues? (very informed, somewhat informed, not very informed, not informed at all)

3. In general how much attention do you pay to environmental issues as reported by news media? (a lot, some, a little, or not much at all)

4. Where do you get your information on environmental issues? (TV, newspapers, magazines, workshops or talks, books, the internet – www, or someplace else)

5. What sources do you trust most to give you accurate and unbiased information on environmental issues? (the media such as newspapers and TV, environmentalists, college professors, government employees)

6. Humans must live in harmony with nature in order to survive. (strongly agree, agree, disagree, strongly disagree)

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APPENDIX I (*Cont.*)

Questions to measure the knowledge of environmental behaviors, attitudes and demographic of Ohio adults.

7. One person can't do anything to help the environment. (strongly agree, agree, disagree, strongly disagree)

8. When humans interfere with nature it often produces disastrous consequences. (strongly agree, agree, disagree, strongly disagree)

9. Mankind was created to rule over the rest of nature. (strongly agree, agree, disagree, strongly disagree)

10. Humans can fix just about anything with our technology, including the environment. (strongly agree, agree, disagree, strongly disagree)

11. To what extent do you feel it is your personal responsibility to help improve the environmental quality in your community? (Scale from 1 to 5 where 1 is none and 5 is a great deal)

12. To what extent do you feel it is your personal responsibility to help improve the environmental quality in your state? (Scale from 1 to 5 where 1 is none and 5 is a great deal)

13. To what extent do you feel it your personal responsibility to help improve the environmental quality in the US? (Scale from 1 to 5 where 1 is none and 5 is a great deal)

14. To what extent do you feel it your personal responsibility to help improve the environmental quality in the world? (Scale from 1 to 5 where 1 is none and 5 is a great deal)

15. How often do you work in a flower or vegetable garden as weather permits? (daily, weekly, monthly, yearly, less than yearly, never)

16. How often do you visit a zoo? (daily, weekly, monthly, yearly, less than yearly, never)

17. How often do you hunt? (daily, weekly, monthly, yearly, less than yearly, never)

18. How often do you camp? (daily, weekly, monthly, yearly, less than yearly, never)

19. How often do you fish? (daily, weekly, monthly, yearly, less than yearly, never)

20. How often do you recycle things like paper, glass, and plastic? (Scale from 1 to 5 with 1 being never and 5 being often)

21. How often do you use alternative forms of transportation such as walking, bicycling, car pooling, or mass transit? (Scale from 1 to 5 with 1 being never and 5 being often)

APPENDIX I (*Cont.*)

Questions to measure the knowledge of environmental behaviors, attitudes and demographic of Ohio adults.

22. How often do you avoid buying products with excess packaging? (Scale from 1 to 5 with 1 being never and 5 being often)

23. How often do you compost your yard waste? (Scale from 1 to 5 with 1 being never and 5 being often)

24. How often do you purchase one product over another because it is packaged in refillable, returnable, or recyclable containers? (Scale from 1 to 5 with 1 being never and 5 being often)

25. How often do you support candidates who are concerned about environmental problems and issues? (Scale from 1 to 5 with 1 being never and 5 being often)

26. Are you a member of any environmental group?

27. About how many meetings on environmental issues have you attended within the past year?

28. Do you receive or subscribe to any environmental publications?

29. In what year were you born?

30. What is the highest level of education you have completed?

31. What is your ethnic background?

32. Is your religious preference Protestant, Catholic, Jewish, Moslem, or some other religion or do you not have a religion?

33. How religious would you say you are? (very, somewhat, not very, not)

34. What is your martial status?

35. Are you presently living in an apartment, duplex, condominium, or single family home?

36. Which of the following categories best describes your total family income before taxes?

    a. Less than 10,000
    b. 10,001 – 20,000
    c. 20,001 – 40,000
    d. 40,001 – 60,000
    e. 60,001 – 80,000
    f. 80,001 – 100,000
    g. over 100,000

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