

ENCOURAGING ENVIRONMENTALLY APPROPRIATE BEHAVIOR: THE ROLE OF INTRINSIC MOTIVATION*

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ABSTRACT

Despite over a decade of intense research we know surprisingly little about what encourages people to adopt and maintain an ecologically compatible lifestyle. The purpose of this research was to understand the types of motives people have to conserve natural resources during their daily activities. Data from 263 respondents to a mail-back questionnaire were subjected to dimensional analysis and analysis of variance. Three sets of scales were examined in detail: behaviors, satisfactions, and motivations. The results indicate that people have a variety of motives for conserving resources and derive a series of distinct satisfactions from both recycling and reusing materials. The findings support the notion of a strong relationship between intrinsic motivation and everyday conservation behavior. These findings suggest our understanding of why people conserve resources may be improved by investigating intrinsic motivation and the personal satisfactions derived from conservation activities.

Conservation, despite considerable publicity, remains little practiced by the American public. Some writers have suggested that environmental problems can be best understood as a crisis of maladaptive behavior [1]. From this point of view, our patterns of land use, resource consumption, and wastefulness are damaging to the planet and, in the long run, incompatible with survival.

This dilemma may stem from a failure to fully understand the motives behind conservation behavior. While extrinsic incentives seem to be an appropriate means of dealing with this important issue [2, 3], they have had serious enough limitations to make alternatives worth exploring [4, 5]. A new perspective on

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encouraging conservation behavior is needed if we are to be truly supportive of an ecologically conscious community.

Research on intrinsic motivation has suggested that a good deal of human behavior is best explained in terms of goals and rewards that arise out of participation in an ongoing activity [6-9]. However, only recently has intrinsic motivation been investigated for its role in encouraging environmentally responsible behavior.

Ellis and Gaskell point out that a motive to conserve energy can come from such an intangible factor as active participation (as reported in [4]). Recent research on material reuse and recycling [10] and water conservation [11] point to patterns of intrinsic motivation underlying these behaviors. In a study of newspaper recycling, Pardini and Katzev discussed why their use of a mild, rather than strong form of external inducement was able to maintain conservation behavior when "virtually all attempts to sustain recycling behavior under incentive-based programs have traditionally been characterized by an abrupt cessation of recycling once the external incentive is withdrawn" [12]. They felt that the participants in their study, because of their commitment to try the behavior (at least for awhile), may have been encouraged to "find their own reasons for recycling, to begin to even like doing so, and, as a result, to continue to perform these behaviors on their own."

Many common everyday activities, including some that involve conservation, provide personal satisfaction. People find enjoyment in many ordinary behaviors. Eckblad has asked that more research on motivation be done on such everyday activities [8]. While using the fact that people might like conservation as an incentive may seem odd at first, such an incentive is familiar to us all. People do many things which "feel good" even without the promise of tangible returns. In fact, Deci and Porac believe that, "there is a high degree of correspondence between one's psychological health or well-being and one's being active in the sense of being intrinsically motivated" [13]. Taking Cook and Berrenberg's list of conservation incentives one might, therefore, want to add such intrinsic motives as the satisfaction derived from a frugal life style, a sense that one's actions matter, a feeling of coherence between one's own efforts and the larger world, an overall sense of well-being [14]. These important concerns of people are largely ignored in efforts to encourage conservation. The research reported here investigated the role intrinsic motivation and satisfactions play in the relatively ordinary conservation behaviors of household recycling and reusing.

METHODS

The research reported here focused on a curb-side collection program that had begun in 1977 servicing the west side of the city of Ann Arbor, Michigan. Since its beginning this program had gone through three expansions. All four

areas, the original service area and the three expansion areas, were equally sampled. In addition, the users of a local drop-off recycling station were also asked to complete the questionnaire.

Sample

A total of 800 surveys were distributed to randomly selected residences within the curb-side service area. In addition, a total of 159 surveys were distributed at the Drop-Off Recycling Station. As people drove into the recycling station unloading area they were asked if they would be willing to complete a survey on conservation activities. Most people agreed and were given the survey.

Of the 959 questionnaires distributed, 275 were returned although twelve of these were incomplete. Thus, the 263 questionnaires included in the data analysis represent an overall return rate of 27.4 percent. The data analysis included 188 respondents from the curb-side collection area distribution and seventy-five respondents from the drop-off recycling station distribution representing return rates of 23.5 percent and 47.2 percent respectively. These are low but reasonable return rates given the mail-back, no follow-up nature of the data collection procedure [15].

Approximately 56 percent of the respondents were women. About 16 percent of the sample were under thirty years old, 50 percent were in their thirties or forties, 16 percent were in their fifties, and 18 percent were sixty or older. The respondents were mainly long-time residents with over 47 percent having lived in Ann Arbor for over twenty years. The average household size was reported as 2.7 people and a vast majority (70%) described their households as "more than one person where all are related."

Survey

The survey instrument included a four-page questionnaire (two sheets printed on both sides) and a postage-paid return envelope. A short cover letter was included and respondents were provided with a phone number to call if they had any questions.¹ All items other than a series of background questions used a 5-point rating scale.

The questionnaire contained groups of items which measured conservation *behavior*, *satisfaction*, and *motivation*. Thirty items were included that measured such behaviors as recycling, reusing, and saving material. The thirty-nine satisfaction items covered satisfaction gained from avoiding waste, participating in activities that matter in the long run, and saving things. Also included were questions on satisfaction from living by an ecological ethic, saving

¹ The questionnaire and the accompanying cover letter are available by writing to the author at 170 Dana Building, School of Natural Resources, University of Michigan, 430 East University, Ann Arbor, Michigan 48109-1115.

energy, having a chance to participate, being a member of an affluent society, etc. The questionnaire also included fifteen items which dealt with motivation. Items were included which measured both intrinsic and extrinsic motivation, as well as a general desire for a non-materialistic approach to life.

The data analysis involved two separate steps. First, the three distinct sets of questionnaire items (behavior, satisfaction, and motivation) were processed through dimensional analysis and stable scales were identified. Scales were identified using both a nonmetric factor analysis program (Guttman-Lingoes Smallest Space Analysis III; see [16]) and the ICLUS Hierarchical Cluster Analysis program developed by Kulik, Revelle, and Kulik [17]. The scales were tested for their degree of coherence using Cronbach's coefficient alpha — a measure of internal consistency [18]. In the second step, the relationships among the sets of scales were investigated.

RESULTS

Behavior Scales

The two behavior scales are described in Table 1. These scales are slightly correlated, $r = .34$. Recycling and reusing activities, while both forms of ecologically responsible behavior, are interesting in their differences. Recycling involves a link between the household and the community since it involves a community scale organization, if only to store the collected materials prior to sale. In contrast, reusing is centered within the household, involving a form of direct at-the-source recycling. As one respondent reported, "We are reusers not recyclers. Our immediate and extended family recycles much among ourselves."

While recycling has no direct effect on household's purchase of new goods, reusing behavior can reduce marketplace consumption. The American lifestyle has been characterized as one of conspicuous consumption, yet the respondents reported a significantly higher score on the Reuser scale ($t = 10.11$, $df = 256$, $p < .001$). This suggests that at least a segment of the population may be practicing underconsumption.

The distinction between recycling and reusing behavior and the pattern of higher endorsement of the latter is comparable to earlier survey findings [10]. The questionnaire had included roughly equal numbers of items on reusing and saving behaviors. The intent was to see whether people distinguish between hoarding things and actually reusing them. While a tour through a few basements or outbuildings would suggest the former behavior is more prominent, the respondents clearly grouped saving and reusing behaviors together.

Satisfaction Scales

Three satisfaction scales emerged from the survey data and are presented in Table 2. The satisfaction from Frugality — defined as the careful use of resources

Table 1. Behavior Scales

<i>Scale Names and Items Included</i>	<i>Mean</i>	<i>S. D.</i>	<i>Alpha</i>
Reuser:	3.58	.72	.84
Reuse unused side of paper			
Buy things designed/built to last			
Look for ways to reuse things			
"Hand down" clothing in family			
Reuse paper lunch/grocery bags			
Save gift wrapping paper			
Save cardboard boxes for later use			
Recycler:	2.91	1.09	.80
Recycle non-deposit glass jars and bottles			
Recycle what curb-side program can't take			
Encourage friends, etc. to recycle			
Recycle non-deposit steel/aluminum cans			

and the avoidance of waste — can easily be applied to daily living, involving such things as what items we purchase, what activities we undertake, and how we dispose of wastes. In America, frugality and hard work have been hallmarks of our culture since colonial days. The frugality concept received considerable attention during the fifties and sixties as a middle-class rejection of the high-consumption and high-waste lifestyle in the developed countries [19, 20]. The frugality concept has recently been characterized as a central aspect of a conserver society [21], as well as a goal worthy of national attention [22, 23]. While we are regularly reminded that such simple values build character, the respondents seem to go beyond the utilitarian nature of frugality to suggest it also provides reward and fulfillment.

The idea that humans did not evolve as passive beings, willing to accept solutions from kindly others, but rather as active, knowledge-generating and knowledge-utilizing creatures has gained wide support [24]. The sense of being needed, of having a chance to influence how things are decided, is not a luxury but a necessary part of our psychological well-being. The chance for Participation, to be involved, is viewed as satisfying by the respondents.

Finally, a satisfaction from Prosperity emerged which focuses on the pleasure gained from having the conveniences of our modern society. It would seem to reflect the satisfaction people feel in being members of a thriving, affluent group.

The correlation between the Frugality and Participation scales was .59. The satisfaction from Prosperity scale had very low correlations with the other satisfaction scales, $r = .03$ and $.12$. This suggests that enjoyment of comfort and convenience, the satisfaction of belonging to a thriving community, and the

Table 2. Satisfaction Scales

<i>Scale Names and Items Included</i>	<i>Mean</i>	<i>S. D.</i>	<i>Alpha</i>
Frugality:	3.78	.81	.87
Keeping things running past normal life			
Finding ways to avoid waste			
Repairing rather than throw away			
Saving things I might need someday			
Doing things which don't rely on others			
Finding ways to use things over and over			
Participation:	3.65	.88	.93
Reduce pressure on Earth to supply needs			
Helping make sense out of our world			
Fitting into our place in natural scheme			
Taking actions that can change our world			
Do things that help bring order to world			
Not pushing resource scarcity onto future			
Influencing how society solves problems			
Reducing dependency on scarce resources			
Doing things that matter in the long run			
Living by an ecological ethic			
Prosperity:	2.97	.78	.83
Having clothing that is in style			
Having new items to try, evaluate, and buy			
Having vast resources at our disposal			
Having many choices when buying			
Having luxury/conveniences of our society			
Using latest electronic consumer product			
Knowing we are looked upon as affluent			

appreciation of high quality products are not in direct opposition to the other sources of satisfaction.

Motivation Scales

The three motivation scales developed from the dimensional analysis are presented in Table 3. The Extrinsic Motivation scale had an extremely skewed distribution with 196 out of 263 respondents marking the first category of the 5-point rating scale (indicating low endorsement) for both items which make up this scale. Whether this is indicative of how the general public feels about extrinsic motivation to conserve is unclear given the data collection procedure employed. Perhaps one must resort to paying people for responding to surveys

Table 3. Motivation Scales

<i>Scale Names and Items Included</i>	<i>Mean</i>	<i>S.D.</i>	<i>Alpha</i>
Non-Materialism: Not evaluate everything in dollars More pleasure from the non-material Invest in what only grandchild will see Have more modest economic expectations	4.00	.77	.78
Intrinsic Motivation: Recycling — only reasonable thing to do Good seeing more people recycling Conservation — keeping with natural order I recycle because it feels right I get good feelings from conservation	3.95	.93	.84
Extrinsic Motivation: Recycle only if paid to do so Need large dollar incentive to recycle	1.29	.63	.63

in order to capture more extrinsically motivated individuals! The Intrinsic Motivation scale was also skewed although to a much lesser extent and in the opposite direction. The Extrinsic and Intrinsic Motivation scales are moderately correlated, $r = -.43$.

The third motivation scale deals with a non-materialistic approach to life. It involves such concepts as modest expectations, a willingness to forego tangible returns on investment, and a desire not to always view a new situation as an opportunity to maximize personal gain. The respondents have a high average score on a scale which reflects a point of view at odds with the national goal of continued economic growth.

The Non-materialism scale is weakly related to the Intrinsic and Extrinsic Motivation scales with correlation values of .36 and -.13 respectively, indicating a common variance of about 13 and 2 percent. A review of the items included in the Intrinsic Motivation and Non-materialism scales helps to explain their separateness. The Intrinsic Motivation scale is specific to recycling behavior, with conservation or recycling mentioned in each item. The Non-materialism scale, in contrast, captures a more general sense of behaving in an ecologically-responsible manner.

Monetary reward is not a dominant motive in the respondents' decision to recycle. This result supports the finding of numerous surveys which have revealed that economic rewards have only the slightest effect on people's willingness to recycle [25]. In fact, for the present sample the two

non-economic motives were highly endorsed (means of 4.00 and 3.95) while the Extrinsic Motivation scale mean was exceedingly low (1.29). The differences between the Extrinsic Motivation scale and the other motivation scales is highly significant ($t = 31.25, df = 249, p < .0001$ for the Intrinsic Motivation scale and $t = 40.22, df = 244, p < .0001$ for the Non-materialism scale).

Behavior-Satisfaction Relationships

The relationships between the conservation behaviors and the satisfaction scales followed a meaningful pattern. In particular, the respondents associated satisfaction from Frugality with both household recycling ($F = 5.15, df = 2,254, p < .01$) and reuse of materials ($F = 38.95, df = 2,259, p < .0001$). The Resuer scale, however, showed the more dramatic relationship with a substantial difference on the Frugality scale among the respondents reporting different amounts of reuse behavior (a spread of 0.9 scale points on the mean scores on Frugality scale). Thus, the respondents reported deriving a personal source of satisfaction from the frugal use of ordinary household resources.

The behavior scales were also significantly associated with the satisfaction from Participation scale ($F = 8.15, df = 2,230, p < .001$ for the Recycler scale and $F = 12.12, df = 2,234, p < .0001$ for the Reuser scale). These results suggest that respondents view conservation behavior as an opportunity to participate in a community activity, as a way to make a difference in the long run and as a way of taking actions which can change the world.

Only the Recycling scale was associated with the satisfaction from Prosperity scale. This was a negative association ($F = 12.21, df = 2,252, p < .0001$) with respondents who reported higher levels of recycling activity deriving lower amounts of satisfaction from Prosperity.

These findings support the notion that involvement with a conservation activity can be seen as satisfying in its own right. This suggests that ecologically responsible behavior might be encouraged by helping people to discover that there are intrinsic payoffs associated with such activities.

Evidence of an Intrinsic Motive to Conserve

The survey respondents clearly linked intrinsic motivation to conservation behavior. There were strong positive relationships between the Intrinsic Motivation scale on the one hand and the Recycling ($F = 66.22, df = 2,243, p < .0001$) and Reusing ($F = 22.33, df = 2,249, p < .0001$) scales on the other. This association was particularly striking with regard to the Recycling scale where there is a full 1.5 scale point difference between those respondents in the highest and lowest categories of the Intrinsic Motivation scale. The same pattern of relationships held for the Non-materialism scale. The Non-materialism scale was significantly associated with the Recycling scale ($F = 4.92, df = 2,240, p < .01$) and the Reusing scale ($F = 18.4, df = 2,244, p < .0001$).

In contrast, the relationships between the Extrinsic Motivation scale and the conservation behavior scales were negative. That is, individuals who reported higher scores on the Extrinsic Motivation scale reported lower scores on the Recycler scale ($t = 7.19, df = 250, p < .0001$) and the Reuser scale ($t = 2.55, df = 255, p < .01$).

The motivation scales were also associated with the satisfaction scales. The Intrinsic Motivation scale is related to both the Frugality and Participation scale ($F = 37.08, df = 2,249, p < .0001$ and $F = 66.28, df = 2,227, p < .0001$ respectively). The same pattern of relationships exists between the Non-materialism scale and these two satisfaction scales ($F = 18.17, df = 2,244, p < .0001$ for the Frugality scale and $F = 37.31, df = 2,224, p < .0001$ for the Participation scale). In each instance these relationships are positive, those respondents reporting higher scores on the Intrinsic Motivation and Non-materialism scales reported deriving significantly greater satisfaction from Frugality and Participation.

And finally, the relationships between the Extrinsic Motivations scale and the Satisfaction scales are interesting in their contrast. The Extrinsic Motivation scale is negatively associated with the satisfaction from Participation scale ($t = 3.47, df = 234, p < .001$). And, in one of the only significant relationships with the Prosperity scale, the Extrinsic Motivation scale is *positively* related to the satisfaction from Prosperity scale ($t = 3.86, df = 254, p < .0001$).

DISCUSSION

The demonstrated relationships between intrinsic motivation and environmentally appropriate behavior offers exciting possibilities. It turns out that people are not drifting aimlessly about waiting for the next extrinsic reward to motivate them into action. They seem able to derive personal satisfaction from the very activities that others so often try to externally reinforce.

In general, one need not feel constrained by existing behavioral change strategies that treat people as subjects in need of manipulation by extrinsic incentives. It may be wise to resist incorporating extrinsic incentives in a new conservation program under the assumption that this is the *only* way to encourage environmentally appropriate behavior. The best use of program funds may not be to use them as a one-time reward. A more frugal approach might be to use these funds to enhance people's discovery of the satisfactions which can be derived from conservation activities.

A remaining critical question is why environmentally appropriate behaviors, such as those measured by the Recycler and Reuser scales, would be found satisfying and intrinsically motivated. The answer must, in part, be related to the nature of the behaviors involved. The behavior scales deal with caring deeply about the nature of one's interactions with the environment. As Midgley says:

When we ask whether such things can concern us, we are asking whether we are the kind of beings whom such things concern. This is the kind of question which Kant asked and answered about departed spirits. He said that these were no concern of ours, that we had no business with them, because nothing that we did could have any effect on them. That is not an argument which can be used about the environment [26].

With our distant and not so distant past being one of uncertain availability of resources, it would have been prudent for people to interact with the environment in a frugal and conservative manner. There should be no need for one to hypothesize an external reinforcement for such behavior unless one wants to call survival an extrinsic reward. Acting in an ecologically appropriate manner should be, in other words, intrinsically motivated.

Sears has considered the behavior patterns of early humans and concluded, "He knew that lean years will surely follow the fat, and so he was never really wasteful of the bounty which lay at his hand" [27]. Given the uncertainty of resource availability people who found frugality and conservative behaviors to be satisfying would likely enjoy an adaptive advantage. One would expect, therefore, to find such patterns of satisfaction and intrinsic motivation to be relatively widespread, although perhaps latent, in the population. Such a latent motivational structure closely aligned with ecologically sensitive behavior offers the environmental planner a foundation on which to develop effective conservation strategies.

The careless, wasteful, and frivolous use of the Earth's finite resources will bring on shortages and hardship, if not in our time then in the time of our children or grandchildren. Human survival demands that these resources be cared for as if they were all there will ever be [28]. Rarely, if ever, has it been suggested that a future of frugality and conservation would be a future filled with satisfaction. Yet the study reported here strongly suggests a conservation-oriented lifestyle may also be rewarding and fulfilling. It is fortunate that the lifestyle we must somehow forge for ourselves may be enjoyable to live in.

REFERENCES

1. M. P. Maloney and M. P. Ward, Ecology: Let's Hear It From the People, *American Psychologist*, 28, pp. 583-586, 1973.
2. J. Cone and S. Hayes, *Environmental Problems/Behavioral Solutions*, Brooks/Cole, Monterey, California, 1980.
3. E. S. Geller, R. A. Winett, and P. B. Everett, *Preserving the Environment: New Strategies for Behavior Change*, Pergamon Press, New York, 1982.
4. P. C. Stern and G. T. Gardner, Psychological Research and Energy Policy, *American Psychologist*, 4, pp. 329-342, 1981.
5. L. McClelland and R. J. Canter, Psychological Research on Energy Conservation: Context, Approach, Methods, in *Advances in Environmental Psychology: Vol. 3 - Energy Conservation: Psychological Perspectives*, A. Baum and J. E. Singer (eds.), Lawrence-Erlbaum Associates, Hillsdale, New Jersey, 1981.

6. M. Csikszentmihalyi, Intrinsic Rewards and Emergent Motivation, in *The Hidden Costs of Reward: New Perspectives on the Psychology of Human Motivation*, M. R. Lepper and D. Greene (eds.), Lawrence Erlbaum Associates, Hillsdale, New Jersey, 1978.
7. E. L. Deci, *Intrinsic Motivation*, Plenum, New York, 1975.
8. G. Eckblad, *Scheme Theory: A Conceptual Framework for Cognitive-Motivational Processes*, Academic Press, New York, 1981.
9. M. R. Lepper and D. Greene (eds.), *The Hidden Costs of Rewards: New Perspectives on the Psychology of Human Motivation*, Lawrence Erlbaum, Associates, Hillsdale, New Jersey, 1978.
10. R. De Young, Some Psychological Aspects of Recycling: The Structure of Conservation Satisfactions, unpublished manuscript, 1985.
11. R. De Young and J. Robinson, Some Perspectives on Managing Water Demand: Public and Expert Views, *Canadian Journal of Water Resource*, 9, pp. 9-18, 1984.
12. A. U. Pardini and R. D. Katzev, The Effects of Strength of Commitment on Newspaper Recycling, *Journal of Environmental Systems*, 13, pp. 245-254, 1983-1984.
13. E. L. Deci and J. Porac, Cognitive Evaluation Theory and the Study of Human Motivation, in *The Hidden Costs of Reward: New Perspectives on the Psychology of Human Motivation*, M. R. Lepper and D. Greene (eds.), Lawrence Erlbaum Associates, Hillsdale, New Jersey, 1978.
14. S. W. Cook and J. L. Berrenberg, Approaches to Encouraging Conservation Behavior: A Review and Conceptual Framework, *Journal of Social Issues*, 37, pp. 73-107, 1981.
15. F. Kerlinger, *Foundations of Behavioral Research*, Holt, Rinehart and Winston, New York, 1973.
16. J. C. Lingoes, A General Survey of the Guttman-Lingoes Non-Metric Program Series, in *Multidimensional Scaling, Volume 1*, R. N. Shepard, A. K. Romney, and S. B. Nerlove (eds.), Seminar, New York, 1972.
17. J. A. Kulik, W. R. Revelle, and C. C. Kulik, Scale Construction by Hierarchical Cluster Analysis, University of Michigan Computing Center, unpublished manuscript, 1970.
18. L. J. Cronbach, Coefficient Alpha and the Internal Structure of Tests, *Psychometrika*, 16, pp. 297-335, 1951.
19. C. Henderson, The Frugality Phenomenon, *Bulletin of the Atomic Scientists*, 34, pp. 24-27, 1978.
20. R. Inglehart, *The Silent Revolution*, Princeton University Press, Princeton, New Jersey, 1977.
21. K. E. Henion and T. C. Kinnear (eds.), *The Conserver Society*, American Marketing Association, Chicago, Illinois, 1979.
22. W. Johnson, *Muddling Toward Frugality*, Shambhala Publications, Boulder, Colorado, 1978.
23. ———, *The Future Is Not What It Used To Be: Returning To Traditional Values In An Age Of Scarcity*, Dodd, Mead and Company, New York, 1985.
24. S. Kaplan and R. Kaplan, *Cognition and Environment: Functioning in an Uncertain World*, Praeger, New York, 1982.

25. The Public's Opinion of Recycling, *Resource Recycling*, 1, pp. 6-7, 1982.
26. M. Midgley, Toward a New Understanding of Human Nature: The Limits of Individualism, *How Humans Adapt: A Biocultural Odyssey*, in *Seventh International Smithsonian Symposium*, Smithsonian Institution, Washington Washington, D.C., 1981.
27. P. B. Sears, *This is Our World*, University of Oklahoma Press, Norman, Oklahoma, 1937.
28. J. Passmore, *Man's Responsibility for Nature*, Duckworth, London, 1974.

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