

I return, finally, to one of the questions that began this article, Who will want to rear the children? If we continue to allocate this activity on a strictly sexual basis, if we continue to generally denigrate its significance, and to make it necessary for those who do it to sacrifice their self-esteem and independence and to reduce their potential for other kinds of contributions to their culture, then the answer, I believe, is that those who want to rear the children will be those who are fearful of autonomy and distrustful of their own capacities to function in the larger community. If, however, we come to view children as desirable rather than necessary, and to view child rearing as not incompatible with other creative activities, then such a question will not need to be asked. Many will still decide, for all sorts of personally valid reasons, that parenthood is not for them, but others, remembering their own joyful childhoods, will be eager to participate in such an experience again, as parent now instead of child.

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Ecology: Let's Hear from the People

An Objective Scale for the Measurement of Ecological Attitudes and Knowledge

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Psychology, like many other sciences, has recently been grasping (some would say "gasping") for relevance. For many sciences, a mere glance from the windows of their ivory towers brought an end to the search for relevancy. Their eyes burned and their vision was limited by the hazylike condition of the atmosphere; they were overwhelmed with the numbers of people, the noises they made, the material they consumed, their trappings and their trash. The landscape was changing rapidly, and the view from the tower was no longer pleasant and the tower itself no longer isolated. The issue of ecology demanded relevance. Indeed, it demanded preeminence. With the problem apparent, scientists began to look for a solution in their typical fashion. Technological solutions were sought for what were defined as technological problems. Thus, the rush is now on to develop new gasolines, new engines, nonpolluting detergents and energy sources, biodegradable products of all kinds, filtering systems and recycling systems, etc. Society appears to have made the assumption that such advances will, indeed, solve the problem.

Technology has won battles in the past, in the arenas of medicine, transportation, and automation, but it may not provide the answer to the current ecological crisis. First, the mushrooming nature of

this problem does not allow us to depend on the time-honored, but time-consuming, methods that eventually yield the necessary technological solutions. Just when this mushrooming deterioration will reach the point of no return is uncertain, but present trends in land occupancy, ocean pollution, particulate air pollution, radioactive waste release, and mineral depletion indicate that the "crunch" will occur *before the turn of the century*—in less than 30 years (Meadows, Meadows, Randers, & Behrens, 1972). Furthermore, technological solutions have a certain intrinsic futility since the present issue is best conceptualized as a problem of increasing population, increasing consumption, and increasing demand. Conceptualized in this manner, the solution to such a problem does not lie in traditional technological approaches but rather in the alteration of human behavior. In short, the ecological crisis is a crisis of maladaptive behavior. Thus, the problem falls squarely in the domain of psychology. Ultimately, the solution lies with the sciences that deal with changing human behavior. Indeed, ecology is uniquely psychology's problem. In this regard, psychology's task is to articulate the problem in terms of individual behavior and thus to develop guidelines for ameliorative programs. The implementation of such programs, however, would be under the aegis of, for example, some governmental body.

To date, psychology has apparently not recognized the scope of its responsibility in this issue; in fact, in light of the urgency and magnitude of this problem, psychology's response could be characterized as "traditional" and meager (see, e.g., Wohlwill,

¹This article is based on a paper presented at the annual meeting of the Western Psychological Association, Portland, Oregon, April 1972.

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1970). The response has been traditional in two ways. First, there has been a tendency toward theorizing and abstracting with a concomitant avoidance of the immediate real nature of the problem. A second, somewhat related point is that psychology historically has had a tendency to be scientific in a fairly restrictive sense (Lachenmayer, 1970), that is, dependent on a strict experimental methodology where all but one variable is controlled.

Additionally, there has been a tendency to define "ecological psychology" restrictively, in terms of studying the effect of qualities of the environment on man's behavior, while the effect of man's behavior on the environment has been relatively ignored. Combining the "experimental model" and the interest in the environment's effect on behavior, ecological psychology has tended to become a somewhat remote and peripheral pursuit that is not dealing directly with an immediate solution to the crisis.

A basic reconceptualization of the problem in terms of human behavior dictates a solution in terms of altering that same behavior. To date, there is a paucity of data available to help in the understanding, prediction, and modification of these behaviors. At this point, we must reemphasize the urgency of this problem: the so-called "crunch" is predicted to occur within the next 30 years. Given this urgency, the most feasible solution lies in the immediate changing of critical behaviors on a population-wide basis. Furthermore, we must note that this is not simply an issue of numbers (cf. population control movements) but, more importantly, of what those numbers do. Even if population size remained static, present consumption-pollution behaviors pose limited viability. Clearly, our task is the immediate one of assessment, understanding, and modification of critical population behaviors.

We must "go to the people" in an attempt to understand these behaviors. We must determine what the population "knows" regarding ecology, the environment, and pollution; how they feel about it; what commitments they are willing to make; and what commitments they do make. These are necessary antecedent steps that must be made before an attempt can be made to modify critically relevant behaviors.

In an attempt to provide such data, the present authors have developed an ecology scale which is

currently used primarily as a research device. While preliminary results are quite positive, our method is modest. The direction, however, is essential. The present scale and data are thus presented as a model, albeit crude, in the hope that further research will be stimulated.

Method

The ecology scale is comprised of four subscales with a total of 130 items. The verbal commitment (VC) subscale, containing 36 items, measures what a person states he is willing to do in reference to environment-pollution issues. This subscale includes such items as "I'd be willing to ride a bicycle or take the bus to work in order to reduce air pollution" and "I would probably never join a group or club which is concerned solely with ecological problems." In contrast to this subscale, the actual commitment (AC) subscale, containing 36 items, measures what a person actually does in relation to pollution-environment issues. It includes such items as "I have switched products for ecological reasons" and "I save some waste materials for recycling." The affect (A) subscale, consisting of 34 items, measures the degree of an individual's emotionality related to ecological issues. Item examples are "I become incensed when I think about the harm being done to plant and animal life by pollution" and "I get depressed on smoggy days." Finally, the knowledge (K) subscale, containing 24 items, measures specific factual knowledge related to ecological issues. It includes such items as "Which of the following materials usually takes longest to decompose? A) Tin, B) Iron, C) Aluminum, D) Copper, E) Steel" and "Mercury has been found in unacceptable levels in A) Fruit, B) Vegetables, C) Seafood, D) Beef, E) Soft Drinks."

Items for the verbal commitment, actual commitment, and affect subscales are presented in a true-false format. To control for acquiescence and negative sets, approximately 50% of the items are worded in a positive manner and 50% in a negative manner. Items for these three subscales are randomly mixed in the survey booklet. Knowledge items, which incorporate a multiple-choice format, are presented at the end of the booklet.

Items in the present scale were selected from a pool of approximately 500 items. During initial item selection, an attempt was made to use items that reflected different degrees of commitment, affect, and knowledge. For example, the item "I would donate a day's pay to a foundation to help improve the environment" measures a high degree of verbal commitment, while the item "I'm willing to purchase beverages only in returnable bottles" measures a lower degree of such a commitment. After initial item selection was performed by several groups of psychology graduate students, the scale was presented to three independent judges (PhD psychologists) who assessed the appropriateness of each item in its subscale. Interjudge disagreement led to the exclusion of six items.

The contrasted-groups approach to criterion validity was employed by administering the scale to Conservation Committee members of two chapters of the Sierra Club (Los Angeles area). Data analysis revealed that these persons scored significantly higher on all subscales (see Tables 1 and 2) than do groups of college and noncollege adults. The Sierra Club members thus functioned to anchor the high end of the scale, but because of the social desirability

related to the ecology issue, no suitable low-anchor group has yet been found.

The scale was administered to two additional groups of subjects. A college group was obtained by testing all students in three lower division psychology courses at California State University at Los Angeles. A noncollege adult group was obtained by testing any adult who was a resident of the Los Angeles area and who had less than 13 years of formal education. No additional criteria for subject selections were used. Subjects in all three groups were tested anonymously.

Reliability was estimated separately for each subscale by use of the split-half technique with a randomly selected N of 12 from the college group. The following Pearson reliability coefficients (corrected with the Spearman-Brown formula) were obtained: for VC, .91; AC, .93; A, .92; and K, .89.

Results

Table 1 presents means and standard deviations on the various subscales for the Sierra Club, college, and noncollege groups.

A two-factor (Groups \times Subscales) analysis of variance showed a significant interaction ($F = 21.2$, $df = 2/125$, $p < .001$). A series of t tests (presented in Table 2) reveals that the Sierra Club group scored significantly higher than the college and noncollege groups on all subscales. College subjects, in turn, scored significantly higher than noncollege subjects on all subscales.

Intercorrelations among the subscales revealed that Subscale K did not correlate significantly with any of the other scales for any of the groups. Subscale A correlated moderately high with Subscale VC (.59, .75, .72) for the college, noncollege, and Sierra Club groups, respectively. Intergroup differences in correlation were not significant. Similarly, Subscale VC correlated moderately high with Subscale AC (.40, .39, .45) for the three groups, respectively. Again, intergroup differences among correlation were not significant.

The degree of relationship between Subscales A

TABLE 1
Means and Standard Deviations for the Various Groups on Ecology Subscales

Group	N	VC		AC		A		K	
		M	SD	M	SD	M	SD	M	SD
Sierra	32	24.75	3.87	24.28	5.03	31.06	4.17	16.88	3.44
College	36	19.43	5.75	15.04	6.89	26.14	5.95	13.00	3.51
Noncollege	40	16.15	6.35	10.50	5.29	21.25	8.14	10.45	3.45

Note. VC = verbal commitment; AC = actual commitment; A = affect; K = knowledge.

TABLE 2

Test Comparisons of the Various Groups on Ecology Subscales

Group	VC	AC	A	K
Sierra Club and college ($df = 86$)	4.67***	6.65***	4.14***	5.04***
Sierra Club and noncollege ($df = 70$)	6.72***	11.20***	6.21***	7.84***
College and noncollege ($df = 94$)	2.62*	3.49***	3.40**	3.54***

Note. VC = verbal commitment; AC = actual commitment; A = affect; K = knowledge.

* $p < .02$.

** $p < .01$.

*** $p < .001$.

and AC for the college and noncollege groups was .40 and .39, respectively. The same relationship was significantly higher (.83) for the Sierra Club group.

Discussion

Due to the preliminary nature of the present data, conclusions must be tenuous. However, several interesting trends are noted. First, it appears that most persons have a relatively high degree of verbal commitment and affect, with lower levels of actual commitment and knowledge. In colloquial terms, most people say they are willing to do a great deal to help curb pollution problems and are fairly emotional about it, but, in fact, they actually do fairly little and know even less. This conclusion is suggested by mean differences on the various subscales as well as correlational data which suggest a relatively higher relationship between Subscales A and VC and a lower correlation between these subscales and Subscales AC and K.

Knowledge presents a manifold problem. First, the very nature of ecology with its complex interactions between organisms and environment serves to make its subject matter difficult to understand and assimilate. Consequently, despite its current popularity, the average person appears to know very little about ecology. Thus, it becomes difficult to develop an ecological knowledge scale with many high-probability, or "easy," items. Such difficulties may serve to explain low Subscale K correlations with other subscales.

From the psychologist's point of view, high levels of concern (Subscale A) over ecological issues and high verbal commitment to these issues should make fertile soil for the modification of ecologically

relevant behaviors (Subscale AC). The task, however, is an enormous one since, to be effective, such behaviors must be altered on a population-wide basis. A related problem confronting us is one of education, that is, developing in the population more knowledge about ecology, the environment, and pollution. Again, the task is enormous, but the outcome is critical.

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Special Issue: New Approaches to Behavioral Research on Smoking

In April 1973, the *Journal of Abnormal Psychology* published a monograph issue "New Approaches to Behavioral Research on Smoking." The material in this special issue was an outcome of a conference held in Tucson, Arizona, on March 30-31, 1972. The research, the conference, and the publication of the material were sponsored by the American Cancer Society. Because of the special nature of this issue, individual copies may be obtained through the Subscription Office of the APA at the cost of \$5 per copy.

Subject-Experimenter Perceptions of Ethical Issues in Human Research

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Psychology has laid claim to being the first profession to use empirical methods in developing a code of ethics (APA, 1953). Beginning with the basic data of commonsense judgments by responsible psychologists, the original code and its revision (APA, 1963) were drafted from modal issues and decisions. Despite these pioneer efforts and the production of wide-scale collaborative response from the membership, there is little evidence in the literature of continued experimental interest in this area. Hamsher and Reznikoff (1967), in fact, have reported an inverse relationship between a researcher's experience and his interest in ethical problems. It seems that our efforts at self-regulation have been, in large part, reactions to perceived public pressures concerned in one way or another with individual rights, whether expressed through journalistic *exposés* and congressional hearings (Amrine, 1965), policies of the larger scientific community (Panel on Privacy and Behavioral Research, 1967), or new research support requirements (USDHEW, 1971).

The only focus in the psychological literature on ethical topics has been on the use of deception in personality and social-psychological research. Controversy has centered on the effectiveness of this design in eliminating experimental artifact. Beginning with Rosenthal's (1966) unnerving disclosure of experimenter bias effects, a growing concern has been evidenced about the impact of the experimenter-subject relationship on research out-

comes. Stricker (1967), Seeman (1966), and Carlson (1971) have traced the growth of experimental studies in the area of personality and psychological research over the last two decades. Such designs now characterize over half of the studies published in this area and are coded "as much de rigueur as significance at the [Kelman, 1967, p. 3]." Orne (1962), Orne and Howard (1968), and Schultz (1969) have attempted to provide alternative explanations of this trend. Difficulties in the area of experimental design have emphasized, they have agreed on the result: the experimenter is fast becoming the only one who controls the situation. They have agreed also about the need for alternative means of enlisting the cooperation and participation of the subject rather than artificially imposed conditions to elicit "pure" responses.

Stuart Cook and his colleagues (Committee on Ethical Standards, 1971, 1972) have recently opened this area to discussion through their comprehensive codification of ethical issues in human research. The Committee has broadened the decision strategies in their proposed standards. They have suggested collegial review and pre-testing of studies of subject reactions as additional ethical decision making.

Compatible with the Committee's suggestion is the approach of balancing benefits against risks. The assumed disparity between ethical viewpoints of the experimenter and his subject. The subject is frequently seen as ethically sensitive to procedures involving his own welfare, but scientifically trained to evaluate the merit of the study. The researcher, on the other hand, is assumed to be in a position to know his subject's potential value, but less concerned with his subject's comfort or personal rights.

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