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Integrating Behaviorism and Humanism for Environmental Protection

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Theory and principles from behaviorism and humanism are integrated to propose a synergistic approach for dealing with the human aspects of environmental protection. Numerous intervention agents are needed worldwide to implement the kind of behavior-change techniques that lead to positive attitudes. This requires people to "actively care." Research is reviewed to support an actively caring model, which proposes that certain person states increase one's propensity to actively care for the environment. Strategies to increase these person states or expectancies are found in the basic principles and technology of behaviorism. Behaviorism offers the technology for changing behaviors and attitudes in environment-protective directions, while humanism offers the states or expectancies needed in people to increase their propensity to actively care for the environment.

The health of our planet is inextricably dependent upon human behavior. Some of our behaviors degrade the environment; other behaviors protect our environment. Behaviorists (including experimental behavior analysts and applied behavior analysts) study overt behavior and its observable environmental, social, and physiological determinants. In contrast, a humanistic approach to environmental preservation would focus on reasoning with people or appealing to guilt or "social conscience." In other words, behaviorists target behaviors directly in an attempt to "act people into environmental protection thinking;" whereas humanists target attitudes and thinking strategies directly in an attempt to "think people into environmental protection behavior." This article presents environmental-protection perspectives that integrate theory and research from these divergent subdisciplines of psychology. Consequently, this article attempts to lend

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credence to B. F. Skinner's affirmation that "behaviorism makes it possible to achieve the goals of humanism more effectively" (1978, pp. 9–10).

Environmental Behaviorism

When developing behavior-change interventions, environmental behaviorists have systematically arranged conditions or events preceding target behaviors (i.e., activators) and following target behaviors (i.e., consequences) for the purpose of increasing or decreasing their rate of occurrence. This process of intervention design and evaluation can be represented by a "DO IT" acronym, with D = Define the target behavior to change; O = Observe the target behavior in desired directions; T = Test the impact of the behavior change intervention by examining records of the observed behavior before, during, and after the intervention (Geller, Roberts, Gilmore, & Pettinger, 1994). However, applying behaviorism for environmental protection is not as straightforward as it seems, as illustrated by considering only the first step of DO IT—defining a target behavior to change.

Defining Target Behaviors for Environmental Protection

The varied human behaviors related to environmental protection are countless, occurring daily in almost every situation (e.g., at home, work, school, commercial sites, and in transition between these settings). To review the numerous target behaviors for a comprehensive plan to protect the environment, Geller, Winett, and Everett (1982) used a 2 × 3 × 5 matrix with the following factors: (a) two intervention approaches (physical vs. behavioral); (b) three community sectors requiring an intervention process (residential/consumer, government/institutional, and commercial/industrial); and (c) five target areas for intervention within each sector (i.e., heating/cooling, solid waste management, transportation, equipment efficiency, and water use and disposal).

Obviously, these five targets do not cover the entire domain of environmental protection. For instance, problems related to population explosion, air pollution, land misuse, hazardous waste, and mineral depletion were not addressed by Geller et al. and have not been researched by behaviorists. Cone and Hayes (1980) included population control and noise pollution in their text on behavioral approaches to environmental protection, but the behavior change research in these additional areas has been minimal.

Practically all of the behavior change research for environmental protection has targeted individual and group behaviors in the residential/consumer sector rather than the governmental/institutional or commercial/industrial sectors, where the potential for large-scale benefit is greatest. However, the principles and intervention strategies developed from demonstration projects in the resi-

dential/consumer sector are relevant for designing behavior change intervention and policy in the corporate and governmental sectors of society.

Activators for Environmental Protection

Environmental behaviorists have followed a simple Activator–Behavior–Consequence scheme, or ABC model, when designing behavior change interventions, with the basic premise that activators direct behaviors (as reminders or discriminative stimuli) and consequences motivate behavior (through feedback, reinforcement, or punishment). Activators for environmental protection have taken the form of (a) written or spoken messages (e.g., films, television commercials, promotional fliers, verbal reminders, and road signs), (b) awareness or education sessions, (c) modeling or demonstrations (e.g., on videotape or by live exemplars), (d) goal setting (to reach certain individual or group performance outcomes), (e) commitment techniques (by signing a pledge card to emit certain behavior), and (f) engineering and design techniques that make the desired behavior more salient or convenient (e.g., adding decorated trash receptacles or recycling bins to the milieu).

The wealth of field research evaluating the impact of activator techniques on environment destructive and preserving behaviors is reviewed in several sources (e.g., Cone & Hayes, 1980; Geller, 1989; Geller et al., 1982) and will not be discussed here. Generally, activators alone (without consequences) have been effective at increasing environmental protective behaviors when the instructions have been behavior-specific and given in close physical and temporal proximity with opportunities to emit the target behavior, and when performing the behavior is relatively convenient (e.g., like turning off lights in unoccupied rooms, using a particular trash receptacle or recycling container, or purchasing drinks in returnable bottles).

When target behaviors appear relatively inconvenient (i.e., require significant response cost), behavior change interventions have usually required consequences in order to have substantial beneficial impact. A notable exception has been the application of "pledge card commitment" activators. Field researchers, for example, have markedly increased participation in community recycling programs by asking residents to sign cards promising their participation (e.g., Burn & Oskamp, 1986; Wang & Katzev, 1990). There is some evidence that behavior change following this type of commitment strategy is more durable than behavior increased with incentive/reward techniques (e.g., Geller, Rudd, Kalsher, Streff, & Lehman, 1987; Katzev, 1986).

Researchers with a humanistic (or cognitive) orientation have used the success of pledge-card commitment techniques to discredit the application of extrinsic consequences to motivate behavior change (e.g., DeYoung, 1993; Kohn, 1993). It is possible, however, that the influence of commitment pledge

cards is determined by extrinsic social consequences (e.g., signers might anticipate approval or disapproval from others as a result of honoring or not honoring their commitment). Some radical behaviorists also presume that consequences can be internal (as in giving self-recognition for meeting a commitment). In that view, signing a promise card defines a specific rule and honoring the promise is rule-governed behavior, controlled by the three-term contingency of activator–behavior–consequence (cf. Malott, 1992).

Consequences for Environmental Protection

Skinner (1987) claimed that behavior is selected (or determined) by its consequences, and we should not expect many people to modify their behavior as the result of information or advice alone (i.e., activators), especially when the information pertains to a distant future—the case with environmental protection. Although people will often follow advice when the advisor's information (or activator) previously led to reinforcing consequences, this situation requires people to experience the reinforcing consequences of following the advisor's message or rule. This type of learning (or response selection by reinforcing consequences) is especially difficult (or impossible) when the future consequences (reinforcing or punishing) are unclear, uncertain, or remote.

Each of the characteristics of weak consequences is usually present when environmental protective behaviors are advocated. For example, people have typically not conserved water or gasoline until experiencing punishing consequences (e.g., inconvenience and increased monetary costs) of water and gas shortages. Also, the behavior of collecting recyclables has not usually become standard practice until after people experienced (directly or vicariously) the consequences of excessive solid waste (as in media reports of problems finding suitable landfill space or a port to dock a garbage barge).

Rewards vs. penalties. Incentives and disincentives are activators that announce the availability of a rewarding or penalizing consequence, respectively, in order to motivate behavior change. Traditionally, local, state, and federal governments have used disincentives and penalties to motivate environment-preserving behaviors. These attempts to protect the environment usually take the form of ordinances or laws (e.g., fines for littering, illegal dumping, using excessive water, or for polluting land, water, or air), and to be effective, these disincentive/penalty interventions usually require extensive promotion (activators) and enforcement (consequences). Behaviorists have deemphasized this approach, primarily because negative affect, feelings, or attitudes typically accompany attempts to mandate behavior change through disincentive/penalty tactics.

This concern for a person's internal state (e.g., attitude) following an intervention process is quite consistent with a humanistic perspective. In general,

both behaviorists and humanists believe a positive attitude linked with one's change in behavior increases the probability that the desired behavior will become a norm—that is, a socially accepted rule of action (Geller, 1989). Positive attitudes are more likely to follow an incentive/reward approach than a disincentive/penalty intervention, because the former approach is more likely to be perceived as "voluntary" and no threat to individual freedom (Skinner, 1971). In fact, perceiving a threat to one's freedom can lead to behavior contrary to compliance with a mandate (Brehm, 1972).

Types of reward contingencies. The reward contingencies implemented for environmental protection have been diverse. Some rewards have been given after the performance of a desired target behavior, whereas other rewards have been contingent upon a particular outcome (e.g., for reaching a designated level of environmental cleanliness, energy conservation, or water savings). The rewards themselves have varied widely, including such stimulus events as monetary rebates, verbal commendations, merchandise discount coupons, raffle tickets, self-photographs, soft drinks, recognition on an "energy efficient" honor roll, as well as opportunities to engage in a valued behavior (e.g., attend a special event, use a preferred parking space, or tour a mental health facility).

As reviewed in several documents (e.g., Cone & Hayes, 1980; Geller et al., 1982), most of the reward contingencies have produced dramatic increases in the desired behaviors; but unfortunately the behaviors usually returned to preintervention baseline levels when the reward contingencies were withdrawn. Although some have used such reversals to demean incentive/reward strategies to motivate behavior change (DeYoung, 1993; Kohn, 1993), it is noteworthy that most of the intervention phases in this research were relatively short term and likely did not allow sufficient time for natural consequences (e.g., social approval, media recognition, visible environmental improvement) to gain control. Moreover, many of the rewarding consequences (e.g., raffle coupons for prizes donated by community merchants) were inexpensive enough to keep in place for long time periods. Indeed, in some cases it is cost effective to maintain a consequence strategy indefinitely. Many feedback strategies, for example, are cheap and effective, and do not have to be withdrawn.

Feedback techniques. Most of the feedback research for environmental protection has addressed residential energy consumption, and the feedback was usually given to residents (e.g., see reviews by Shippee, 1980; Winett, 1980). The more labor-intensive procedures included the delivery of feedback cards showing the amount of kilowatt hours or cubic feet of gas used (and the cost) for a particular time period. The technology is currently available to deliver this sort of feedback directly and automatically to homes equipped with appropriate displays. Analogous devices have been tested and have shown promise for commu-

nitywide energy savings, including a hygrothermograph giving continuous readings of room temperatures and humidity (Winett et al., 1982), an electronic feedback meter with a digital display of electricity cost per hour (McClelland & Cook, 1979–80), and a special device with a light that illuminates whenever electricity use exceeds 90% of a household's peak level (Blakely, Lloyd, & Alferink, 1977).

A few field studies of feedback intervention for environmental protection addressed the conservation of transportation energy. One study showed a decrease in vehicular miles of travel (vmt) after publicly displaying the vmt of individuals in a work group (Reichel & Geller, 1980). Lauridsen (1977) found vehicular miles per gallon (mpg) increased with a fuel flow meter that displayed continuous mpg or gallons-per-hour consumption; and Runnion, Watson, and McWhorter (1978) increased mpg among short-run and long-haul truck drivers with a public display of individual driver's mpg. More feedback research is certainly needed in the transportation domain, including the development of vehicle feedback displays that give continuous readouts of mpg.

Even with feedback technology for home and vehicle energy use, however, a momentous challenge remains. How can we get substantial numbers of these devices in people's homes and vehicles? And how can we get people with these devices to attend to them regularly, and respond appropriately to the feedback? Increases in energy use (e.g., electricity and petroleum) could be naturally motivating, but usually such increases are gradual and thus are barely noticed. A more proactive approach is to enroll intervention agents to activate environment-protecting lifestyles among friends, neighbors, and coworkers, and to apply basic behavior change consequences (e.g., social approval and disapproval) to motivate energy protective behaviors. In other words, large-scale increases in environment-protective behavior require large numbers of people to apply behavior-change technology as intervention agents. What will it take to activate and motivate such "actively caring" behavior?

An Actively Caring Model

Intervention agents are individuals who care enough about a particular problem or about other people to implement an intervention process in an attempt to make a beneficial difference. In other words, intervention agents actively care. Geller et al. (1994) defined three categories of actively caring (AC), determined by the target of the intervention process—environment, person, or behavior. People actively care from an *environment* focus when they save or redistribute environmental resources (e.g., participate in a car pool, install shower flow limiters, pick up litter, collect recyclables). They are acting to protect the environment.

Attempting to make another person feel better (e.g., intervening in a crisis

situation, actively listening in one-to-one communication, verbalizing unconditional positive regard for someone, sending a get-well card) is AC from a *person* perspective. And third, when people do something to influence another individual's behavior in desired directions (e.g., demonstrating or teaching desirable behavior, giving rewarding or correcting feedback, designing or implementing a behavior-change intervention), they are AC from a *behavior* perspective.

Actively Caring States

With nonhumans as experimental subjects, behaviorists have influenced marked changes in performance when altering certain physiological states of their subjects (e.g., through food, sleep, or activity deprivation). Similarly, behavioral scientists have significantly increased the reinforcing influence of certain rewards (e.g., social approval and food) through simple manipulations of the social context (Gewirtz & Baer, 1958) or the temporal proximity of lunch and response–consequence contingencies (Vollmer & Iwata, 1991). Although behaviorists typically refer to these manipulations of physiological (e.g., food deprivation) or psychological (e.g., social deprivation) conditions as establishing operations (Michael, 1982; Vollmer & Iwata, 1991), these independent variables are certainly analogous to the humanistic concepts of expectancy, personality state, and intrinsic motivation. In other words, certain operations or environmental conditions (past or present) can influence (or establish) physiological or psychological states within individuals, which in turn can affect their behavior. Behaviorists presume the basic mechanism of this impact is through enhancing the quality or desirability of consequences achievable by designated target behaviors.

The author has proposed that certain psychological states or expectancies affect the propensity for individuals to actively care for the safety or health of others; and furthermore, that certain conditions or establishing operations (including activators and consequences) can influence these psychological states (Geller, 1991, 1994). These states are illustrated in Fig. 1, and are variables discussed frequently by humanists but rarely by behaviorists. An integration of behaviorism and humanism is represented by the fact that operations and contingencies developed and evaluated by behaviorists can be used to influence these states defined and appreciated by humanists. Relevance for environmental protection is based on this author's proposal and supportive research (discussed below) that these states (or establishing conditions) increase the occurrence of AC or altruistic behaviors, which include emitting environment preserving behaviors and serving as intervention agents to motivate others to actively care for the environment.

On numerous occasions, the author has used the model in Fig. 1 to stimulate discussions among industry employees of specific situations, operations, or inci-

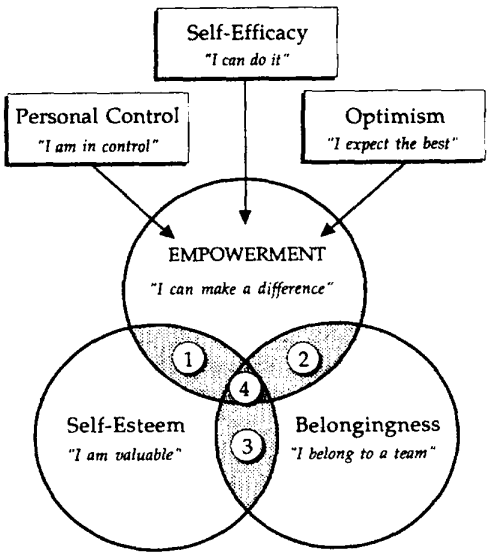

Fig. 1. Person states hypothesized to increase propensity to actively care (adapted from Geller et al., 1994). (1) "I can make *valuable* differences." (2) "We can make a *difference*." (3) "I am a *valuable team member*." (4) "We can make *valuable differences*."

dents that influence the AC person states. Factors consistently listed as determinants of self-esteem, for example, include communication strategies, reinforcement and punishment contingencies, and leadership styles. Participants have suggested a number of ways to build self-esteem, including (a) providing opportunities for personal learning and peer mentoring, (b) increasing recognition for desirable behaviors and personal accomplishments, and (c) soliciting and following up a person's suggestions.

Frequent suggestions for increasing an atmosphere of belongingness among workers have included decreasing the frequency of top-down directives and "quick-fix" programs, and increasing team-building discussions, group goal setting and feedback, group celebrations for both process and outcome achievements, and the use of self-managed (or self-directed) work teams. It is noteworthy that these strategies are frequently implemented by behaviorists working in industry (i.e., organizational behavior managers) to improve work satisfaction, as well as quantity and quality of work output (e.g., Daniels, 1989; Frederiksen, 1982; O'Brien, Dickinson, & Rosow, 1982).

In the management literature, empowerment refers to delegating authority or responsibility, or sharing decision making (Conger & Kanungo, 1988). In

contrast, a humanistic perspective of empowerment would focus on the reaction of the recipient to increased power or responsibility. In other words, a humanistic view of empowerment requires the personal belief that "I can make a difference," and this belief is strengthened with perceptions of personal control (Rotter, 1966), self-efficacy (Bandura, 1977), and optimism (Scheier & Carver, 1985; Seligman, 1991). Such an empowerment state is presumed to increase motivation (or effort) to "make a difference" (e.g., to go beyond the call of duty), and there is empirical support for this intuitive hypothesis (e.g., Bandura, 1986; Barling & Beattie, 1983; Ozer & Bandura, 1990). Note that environmental protection usually requires people to be inconvenienced or to go beyond their normal routine or "call of duty."

Employees at the author's AC training sessions have listed a number of ways to increase empowerment, including (a) dividing overwhelming tasks into distinct smaller ones, more easily managed (with continuous monitoring of behaviors and outcomes); (b) setting short-term goals and tracking achievements; (c) offering frequent rewarding and correcting feedback for process activities (e.g., environmentally responsible vs. irresponsible behaviors), rather than only for outcomes (e.g., amount of energy savings or environmental pollution); (d) providing opportunities to set personal goals, teach peers, and chart progress; (e) teaching employees basic behavior-change intervention strategies (e.g., response feedback and recognition procedures), and providing them time and resources to implement and evaluate intervention programs; (f) showing employees how to graph daily records of baseline, intervention, and follow-up data, and (g) posting response feedback graphs of group performance. Again, these strategies or action plans for enhancing perceptions of empowerment are already practiced quite regularly by behaviorists working in industry.

Support for the Actively Caring Model

There are actually a number of empirical studies, mostly in the social psychology literature, that support the individual components of the AC model depicted in Fig. 1. The bystander intervention paradigm (Darley & Latané, 1968) has been the most common (and rigorous) laboratory technique used to study variables related to AC behaviors. With this approach, factors presumed to affect AC behavior (i.e., self-esteem, empowerment, and belongingness) were measured or manipulated among subjects, and subsequently these individuals were placed in a situation where they had an opportunity to help another individual who presumably encountered a personal crisis (e.g., falling off a ladder, dropping personal belongings, or feigning an illness or heart attack). The latency in attempting to help the other person was the primary dependent variable, studied as a function of a subject's social situation or personality state. All AC behaviors studied in these experiments were person focused and reactive (i.e., helping a

person feel better), or they were environment focused (i.e., redistributing resources to benefit someone else). The AC behaviors were never behavior focused and proactive (i.e., attempting to change another individual's behavior in beneficial directions), which is actually the type of AC behavior most needed to protect the environment over the long term.

Self-esteem. Michelini, Wilson, and Messe (1975) and Wilson (1976) measured subjects' self-esteem with a sentence completion test, and then observed whether they helped another individual in a bystander intervention paradigm. Subjects with high self-esteem were significantly more likely than subjects with low self-esteem to help another individual pick up dropped books (Michelini et al., 1975), and to exit an experimental room to help a person in another room who screamed he had broken his foot following a mock "explosion" (Wilson, 1976). Analogously, subjects with higher self-esteem scores were more likely to help a stranger by taking his place in an experiment that would presumably give them electric shock (Batson, Bolen, Cross, & Neuringer-Benefiel, 1986).

Belongingness. The social psychological construct most analogous to the AC concept of belongingness is group cohesion or the sum of positive and negative forces attracting group members to each other (Wheeless, Wheeless, & Dickson-Markman, 1982). By systematically manipulating group cohesion in groups of two and four, Rutkowski, Gruder, and Romer (1983) evaluated whether group cohesion can reverse the usual bystander intervention effect. Cohesiveness was manipulated by having groups discuss topics and feelings related to college life. Both frequency and speed of helping a "victim" (confederate) who had ostensibly fallen off a ladder was greater for the cohesive groups. Indeed, the most AC behavior was found among subjects in the high-cohesive/four-person group condition.

In a retrospective archival study, Blake (1978) studied real-world relationships between group cohesion and the ultimate in AC behavior—altruistic suicide. He collected data from official records of Medal of Honor awards given during World War II and the Vietnam War. The independent variable was the cohesiveness of combat units (estimated by group training and size), and the dependent variable was percentage of "grenade acts"—voluntarily using one's body to shield others from exploding devices. Blake found the smaller, more elite, specially trained combat units (e.g., the Marine Corps and Army airborne units) accounted for a significantly larger percentage of grenade acts than larger, less specialized units (e.g., Army nonairborne units).

Personal control. The personal control factor of the AC model represents one of the most extensively researched individual difference variables, and refers to a general expectancy regarding the location of forces controlling an individu-

al's life (i.e., internal vs. external factors). Persons with an *internal* locus of control believe they normally have personal control over important life events as a result of their knowledge, skills, and abilities. In contrast, people with an *external* locus of control believe factors like luck, chance, or fate have significant influence in their lives (Rotter, 1966). From a behavioristic perspective, externals generally expect to have less personal control over the pleasant and unpleasant consequences they experience than do internals.

Those high-esteem subjects who showed more AC behavior than low-esteem behavior in Wilson's (1976) bystander intervention study (discussed earlier) were also characterized as *internals,* in contrast to the lower self-esteem *externals,* who were less apt to display AC behavior. Similarly, Midlarsky (1971) observed more internals than externals willing to help another person perform a motor coordination task that included receiving electric shocks. In addition, those who helped at an accident scene scored significantly higher on personal control (i.e., internals) and self-esteem than did those who only stopped and watched (Bierhoff, Klein, & Kramp, 1991).

Sherrod and Downs (1974) asked subjects to perform a task while hearing loud, distracting noise. They manipulated subjects' perception of personal control by telling half that they could terminate the noise (if necessary) by notifying the experimenter through an intercom. The subjects who could have terminated the noise (but did not) were significantly more likely to comply with a later request by another individual to take some extra time (with no extrinsic benefits) to solve math problems.

Self-efficacy. Self-efficacy refers to people's beliefs that they have the personal skills and resources to complete a task successfully (Bandura, 1977). Other individual difference factors relate significantly to this construct, including self-esteem (Rosenberg, 1965), locus of control (Rotter, 1966), and learned hopefulness (Zimmerman, 1990). Thus, research that showed more AC behavior from internals with high self-esteem (e.g., Bierhoff et al., 1991; Midlarsky, 1971) indirectly supported this factor as a potential determinant of AC behavior. Zimmerman (1990) defined "empowering experiences" as experiences that provide opportunities to learn skills and develop a sense of personal control. He proposed empowerment to be a product of learned hopefulness. In other words, people become empowered as they gain control and mastery over their lives and learn to use their skills to affect life events.

Optimism. Optimism is the learned expectation that life events, including personal actions, will turn out well (Scheier & Carver, 1985; Seligman, 1991). Researchers have manipulated optimistic states (or moods) among individuals by giving them unexpected rewards or positive feedback and then observing frequency of AC behaviors. Isen and Levin (1972), for example, showed that

individuals who found a dime in the coin return slot of a public phone (placed there by researchers) were more likely to help a stranger who dropped a folder of papers than were individuals who did not find a dime. Similarly, students given a cookie while studying at the university library were more likely than those not given a cookie to agree to help another student by participating in a psychology experiment. Carlson, Charlin, and Miller (1988) reviewed these and other studies that showed direct relationships between an optimistic mood state and AC behavior.

Berkowitz and Connor (1966) manipulated subjects' success at a puzzle task. Subsequently, successful subjects made more boxes for a confederate than did the unsuccessful subjects. In a series of analogous laboratory studies, Isen (1970) manipulated subjects' performance feedback on a perceptual motor task. Subjects told they had performed extremely well were more likely to emit AC behavior (i.e., picking up a dropped book, donating money to a charity, holding a door open for a confederate) than did those told they had performed very poorly. These studies illustrate overlap between optimism, self-efficacy, and personal control. That is, it is reasonable to assume that feedback regarding personal success increases one's feelings of competence and personal control in the situation as well as one's expectation of good outcomes (i.e., optimism).

Direct Tests of the Model

The author and his students have been conducting a series of studies to test the AC model in field settings, and so far the results have been quite promising. We have developed a "safety culture survey" (SCS) for industrial application, which includes measures of each person factor hypothesized to influence AC (see Fig. 1). The SCS also assesses the respondent's willingness to AC in various ways. More specifically, the following nine AC questions with a 5-point Likert scale ranging from *strongly disagree* (1) to *strongly agree* (5) were randomly interspersed throughout the 154-item SCS: (a) If I know a co-worker is going to do a hazardous job, I am willing to remind him/her of the hazards (even if the employee is familiar with the job); (b) I feel comfortable praising my co-workers for working safely; (c) I am willing to warn other co-workers about working unsafely; (d) I am willing to do whatever I can to improve safety, even confronting other co-workers about their unsafe acts; (e) I am willing to observe the work practices of a co-worker and record his/her safe and unsafe behaviors; (f) I am willing to pick up after another employee to maintain good housekeeping; (g) When I see a potential safety hazard (e.g., oil spill), I am willing to correct it myself if possible; (h) I am willing to pick up workplace litter that I did not cause myself; (i) If I notice an unsafe feature in the equipment outside my work area, I am willing to take corrective action (e.g., notify my supervisor or complete appropriate paperwork).

To date this survey has been administered at nine industrial sites, and rather consistent support for the AC model has been found. The stepwise regression analyses from these assessments have resulted in high regression coefficients, e.g., .54 (n = 262), .57 (n = 307), and .7 (n = 207) at the three plants studied by Geller and Roberts (1993); and .52 (n = 328) and .68 (n = 202) at the two plants studied by Geller, Roberts, and Gilmore (in press). The personal control factor was usually the most influential in predicting willingness to actively care, with belongingness (or group cohesion) predicting significant independent variance in AC propensity at all but one of the plants. Self-esteem, optimism, and self-efficacy have always correlated highly with each other and willingness to actively care, but usually only one of these factors predicted *independent* variance in reported AC behavior (i.e., above that predicted by personal control and belongingness).

In one test of the AC model, Roberts and Geller (1995) studied relationships between workers' on-the-job AC behaviors and prior measures of their self-esteem, optimism, and group cohesion. More specifically, after a workshop that taught the principles behind the AC concept, employees (n = 65) agreed to give their co-workers special "actively caring thank-you cards" (redeemable for a beverage in the cafeteria) whenever they observed a co-worker going beyond the call of duty (i.e., actively caring) for another person's safety. Those employees who gave or received an AC thank-you card scored significantly higher on measures of self-esteem and group cohesion than those who did not give or receive an AC thank-you card.

In another test of the AC model, five of the author's students asked individuals (n = 159) who had just donated blood at a campus location to complete a 60-item survey that measured each of the five person factors in Fig. 1. The high return rate of 92% was consistent with an AC profile, but most remarkable was that this group scored significantly higher ($p < .01$) on each of the five subscales than did a group of students (n = 292) from the same university population (Buermeyer et al., 1994).

Concluding Comments

Following the first Earth Day in the spring of 1970, behavioral scientists began applying behavior-change interventions to solve environmental problems. Many field studies developed and evaluated community-based interventions to reduce such environment-destructive behaviors as littering, lawn trampling, vehicle miles traveled, and purchasing beverages in throwaway containers. Other behavior-change research tested techniques to increase such environment-preserving behaviors as picking up litter, collecting and delivering recyclables, car pooling, and practicing a number of low-cost conservation techniques (e.g., installing insulation and shower-flow limiters, adjusting thermostat settings and

wearing temperature-appropriate clothing, reducing the use of air conditioners, adjusting energy use for peak-load demands, and increasing the use of mass transit). Several innovative and practical behavior-change interventions emerged from this research, many cost effective for communitywide application. Although the results from this domain of behavioral science research were promising, large-scale applications of the practical intervention programs have been minimal. The textbooks (Cone & Hayes, 1980; Geller et al., 1982) reviewing this work have been read by few individuals besides students at the relatively few colleges and universities offering courses in environmental psychology.

Many excuses can be given for the lack of governmental, corporate, and societal interest in the environmental behaviorism of the 1970s, including ineffective dissemination of the practical research findings to agencies and audiences, who continue to be more intrigued with engineering technology and "quick-fix" approaches to environmental protection. In fact, the theme of environmental behaviorism—conservation through low-technology community-based intervention—has been typically viewed as incompatible with big business and consumer convenience.

Federal, state, and local governments have seemed content to pass environmental control legislation and then penalize individual, group, or corporate infractions of such policy. Neither behaviorists nor humanists advocate the use of disincentives/penalties to change the behavior and attitudes of a culture, yet this approach remains popular, partly because (a) laws, policies, and ordinances are relatively quick and easy to implement; (b) this approach represents the traditional governmental approach to managing behavior; and (c) the monetary fines from noncompliance provide funds (i.e., reinforcing consequences) for the mandating government, organization, or community.

This article reviewed a number of behavior change approaches to environmental protection that do not incorporate mandates, disincentives, or penalties. However, these more positive (and humanistic) approaches to environmental protection are only feasible for large-scale implementation if many more people actively care enough to implement them. Theory and research were presented to suggest ways for increasing AC. The five person states presumed to increase AC propensity are rooted in humanism, whereas the technology available to enhance these states (and then AC) is founded in behaviorism. Thus, it seems that environmental protection warrants an integration of humanism and behaviorism. The synergy that could result from the interdisciplinary and collaborative research and application suggested in this paper is just what our environment needs.

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