Special Section: Environmental Conservation
Original Articles and Reviews

# Strategies for Promoting Proenvironmental Behavior

## Lots of Tools but Few Instructions

P. Wesley Schultz

Department of Psychology, California State University, San Marcos, CA, USA

**Abstract.** Environmental problems have their origins in human behavior, and as a result, any solution to environmental issues will require changes in behavior. While many disciplines in the social and behavioral sciences offer important perspectives on the behaviors linked with environmental problems, the study of the individual brings a focus on cognitive, social, and motivational processes that provides insights into effective ways to promote change. Psychological research on proenvironmental behavior dates back nearly 40 years, and within this rich body of empirical research are a number of well-established findings. Strategies such as prompts, commitments, feedback, social norms, incentives, and convenience have all been shown to effectively promote proenvironmental behavior – at least in some contexts, for some behaviors, and for some individuals. This article begins with a brief overview of these research findings, and then proceeds to examine the less-explored question about *when* various strategies work. The article concludes with recommendations for selecting an appropriate strategy for promoting behavior change, along with fruitful areas for future research.

**Keywords:** conservation (ecological behavior), proenvironmental behavior, behavior change, community-based social marketing (CBSM)



In 2012, I was invited to serve as an expert advisor to a campaign aimed at reducing carbon emissions in the United States. The focus of the campaign was on residential energy use, particularly electricity. The team consisted of governmental officials, program officers, a public relations firm, a marketing firm, and a government contractor. I was the behavioral scientist, added to the team at the last minute to provide guidance on structuring the campaign and integrating best practices for promoting behavior change. The campaign was well funded, and anticipated to run for 5 years. Following is a short selection of a conversation that occurred at the first team meeting:

Program manager: Professor Schultz, what does the research suggest is the strongest motivator of environmental behavior?

Schultz (me): The research has identified a number of effective techniques that can be incorporated into a campaign like ours . . . Some notable examples are prompts, commitments, social norms, incentives, and feedback.

Program manager: Is there one that seems to work best?

Schultz: The research has shown that different types of people respond differently to different types of messages. No one message or program element stands out as uniformly the best. What's important is to match the tool to the audience and the behavior.

Program manager: Well, since our audience is the general public, maybe we should use all of the tools.

Schultz: I would recommend using just one tool of behavior change, and matching the tool to the behavior, audience, and medium that you use in the campaign. Trying to use more than one tool in the same campaign can result in a complicated and less focused message.

Program manager: That sounds like good advice. So which should we use?

The answer to this question is complicated. Most program managers do not want to hear about the need for more research, mixed findings, or lack of data. They want an




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answer. As behavioral scientists, we *should* have an answer. Or at least some guidelines for making recommendations. This article summarizes the research on some of the most widely studied behavior change tools, and advocates for community-based social marketing (CBSM) as a framework for selecting an appropriate tool.

## Introduction

For more than 40 years, environmental psychologists have worked to understand the psychological and contextual antecedents of proenvironmental behavior. On the one hand, environmental psychologists aim to understand the role of the individual in causing and responding to environmental problems. Yet on the other hand, environmental psychologists find themselves as advisors and practitioners in efforts to promote changes in behavior intended to mitigate and adapt to deteriorating environmental conditions. This advisory role means drawing on the scientific evidence to provide informed recommendations for programs that promote more sustainable patterns of behavior. Unfortunately, while the science has identified a number of effective tools, little attention has been given to the boundary conditions that surround each. This article summarizes the research findings on the various strategies used to promote proenvironmental behavior, and then proceeds to examine the conditions that maximize the effectiveness of each. Throughout the article, I argue that while research has identified a number of tools that *can* effectively promote proenvironmental behavior, none will work all the time. Instead, each behavior change strategy has a set of boundary conditions under which it is maximally effective. Drawing on CBSM, the article provides recommendations for identifying which behavior change tool is most appropriate for different types of situations.

## Tools of Behavior Change

There is a large body of psychological research aimed at understanding and promoting proenvironmental behavior (for reviews, see Geller, Winett, & Everett, 1982; Schultz & Kaiser, 2012). In their recent meta-analysis, Osbaldiston and Schott (2012) reviewed the results from 253 experimental treatments that included a proenvironmental behavioral outcome. The 253 treatments were classified into 10 types, and subsequently into four larger sets: Convenience, information, monitoring, and social psychological processes.

This meta-analysis provides a useful starting point for evaluating the effectiveness of the various strategies used to promote proenvironmental behavior. The meta-analytic findings support the following conclusions:

(1) *Proenvironmental behavior can be changed.* Across the 253 treatments, the weighted average effect size ($g$) was medium in strength, with a standardized $g$-value of .45 (cf. Cohen, 1988).

(2) *Some treatments are more effective than others.* In meta-analytic terms, the variability of treatments is quantified using a homogeneity test of the effect sizes ($Q$), and distributed as chi-square. If the effect sizes are heterogeneous, then the strength of the treatment varies significantly across the studies, with some studies producing larger changes in behavior than others. In other words, heterogeneous effects imply that some types of treatments are more effective at changing behavior than others. In their 2012 meta-analysis, Osbaldiston and Schott found that the 253 effects were highly heterogeneous ($Q(252) = 2{,}995$, $p < .001$). In order of magnitude, from strongest to weakest treatments were: cognitive dissonance ($g = .93$), goals ($g = .69$), social modeling ($g = .63$), prompts ($g = .62$), make it easy ($g = .49$), rewards ($g = .46$), justification ($g = .43$), commitment ($g = .40$), feedback ($g = .31$), and instructions ($g = .31$).

(3) *The effectiveness of a treatment is not uniform.* Within each of the 10 treatment types, the effect sizes were heterogeneous, indicating that the strength of each treatment was not consistent across studies. The heterogeneous effects points to the importance of one or more moderating variables (R. Osbaldiston, Personal correspondence, June 4, 2012). For example, prompts have been found to produce significant changes in behavior ($g = .62$), but the heterogeneous effect sizes indicate that prompts have a stronger influence under some conditions or for some behaviors (e.g., easy behaviors vs. difficult ones). To date, these boundary conditions for the various tools have not yet been carefully studied.

The results from Osbaldiston and Schott's (2012) meta-analysis underscore the basic finding that psychological treatments can increase proenvironmental behavior. These treatments can serve as tools for practitioners and program managers interested in developing campaigns aimed at promoting proenvironmental behavior. However, the findings offer little guidance for *when* a tool will be most effective, the types of people who will respond most positively to the different approaches, or the types of behaviors most likely to change. Indeed, the results show a high degree of variability in the amount of behavior change, both as a function of the treatment and the behavioral domain.

The section below begins to offer guidance for selecting an appropriate behavior change tool. Drawing on the existing research, six of the most frequently studied tools used to promote behavior change are examined: prompts, commitments, feedback, social norms, incentives, and convenience. For each, the research findings are summarized and the boundary conditions that have been associated with maximal effectiveness are examined. The boundary conditions focus on two key considerations: the characteristics of the behavior (e.g., barriers), and the target population (e.g., perceived benefits). The focus on these two key considerations is consistent with the Community-Based Social



 

Marketing approach (CBSM; McKenzie-Mohr, 2011), and with research on goal-directed behavior (Kaiser & Wilson, 2004; also referred to as the Campbell paradigm within attitudinal research, Kaiser, Byrka, & Hartig, 2010).

## Community-Based Social Marketing

Social marketing refers to systematic efforts to promote positive change within a community. In essence, it involves the application of social and behavioral science to promote "changes for good" (Kotler & Lee, 2011). CBSM is a type of social marketing that leverages the tools and methods from behavioral science (McKenzie-Mohr, Lee, Schultz, & Kotler, 2012). The approach is "community-based" because it focuses on a group of individuals who share a common connection. Typically, the common connection is geographic, but it could also include social networks, peer groups, a workplace, or even larger regions like a city, offices within a multinational corporation, or apartment complexes within an electric utility service area. The CBSM framework follows a five-step process:

(1) *Identify a specific target behavior*. This first step involves relative comparisons of the impact of different behaviors, the prevalence of the behavior within the target population, and the probability of changing that behavior. The selected behavior should have a reasonable impact on the desired outcome (e.g., reduced carbon emissions, using less water at home, or generating less weight of material in the garbage) and have a reasonable potential for change. Within the CBSM tradition, the selected behavior should be *end-state* and *nondivisible*. End-state behaviors are those that have a direct impact on the goal. For example, turning off the central air conditioner at night is an end-state behavior because it will result in lower electricity consumption. In contrast, purchasing an ENERGY STAR certified fan is not end-state because the purchase itself does not result in reduced electricity use. Nondivisible behaviors are those that cannot be further divided (e.g., installing additional attic insulation, rather than just install insulation).

(2) *Identify the barriers and benefits to the target behavior*. Barriers refer to anything that reduces the probability of engaging in the target behavior. Typically barriers are structural, such as the difficulty of a program or lack of access, but they can also be personal costs that an individual associates with the behavior. Benefits refer to a person's beliefs about the positive outcomes associated with the behavior. This could include saving money, protecting the environment, or receiving social recognition.

(3) *Program development*. Once the barriers and benefits have been identified, a program is developed (or an existing program is modified). The program aims to increase the benefits or decrease the barriers associated with the target behavior, and leverages effective tools of behavior change (e.g., convenience, prompts, social norms, commitment). CBSM differs from traditional social marketing in its emphasis on personalized channels of communication, and although not exclusively, most CBSM programs aim to provide one-on-one communications with members of the target audience (cf. Haldeman & Turner, 2009).

(4) *Pilot testing*. The program elements are then pilot-tested on a small scale, and modified based on the results.

(5) *Implementation and evaluation*. The final step is program roll-out and evaluation.

Since its introduction in 1995, hundreds of CBSM programs have been implemented around the world (see www.cbsm.com). CBSM has been used to target a wide range of conservation behaviors, across public, residential, and commercial settings.

One of the key components of CBSM is the emphasis on developing programs that directly decrease barriers and increase the benefits associated with the target behavior. As noted above, barriers are typically structural and they increase the difficulty of the behavior. However, barriers can also be costs to the individual, in the form of negative consequences associated with the behavior. For example, studies of recycling behavior have shown that individuals are less likely to recycle materials that require cleaning – such as an empty can of cat food – because of their dislike for the texture and odor. In this case, the "ick factor" is a barrier. On the other hand, benefits reflect a person's desire to engage in the behavior – that is, the positive value that the individual attaches to the expected outcomes. These two processes can be represented as separate factors that impede or facilitate behavior. When the benefits are high, and the barriers are low, a high percentage of the population should engage in the behavior. However, when benefits are low and the barriers are high, only a few members of the target population will engage in the behavior. This two-factor model is represented in Figure 1.

Interestingly, this two-factor model of behavior (consisting of barriers and benefits) is similar to Kaiser's theory of goal-directed behavior, and mathematically captured with the Rasch model (Kaiser, 1998; Kaiser & Wilson, 2004). Using survey data, it is possible to statistically model the difficulty for a range of behaviors from within a single class of actions – for example, environmental protection. Once established, the motivation of each individual can be described by the probability to which the person is willing to engage in differentially difficult environmental protection behaviors. As Kaiser, Midden, and Cervinka (2008) state, "a person's motivation to achieve a goal is most obvious in the face of his or her willingness to take on increasingly demanding obstacles or accept progressively painful sacrifices" (p. 153).



 

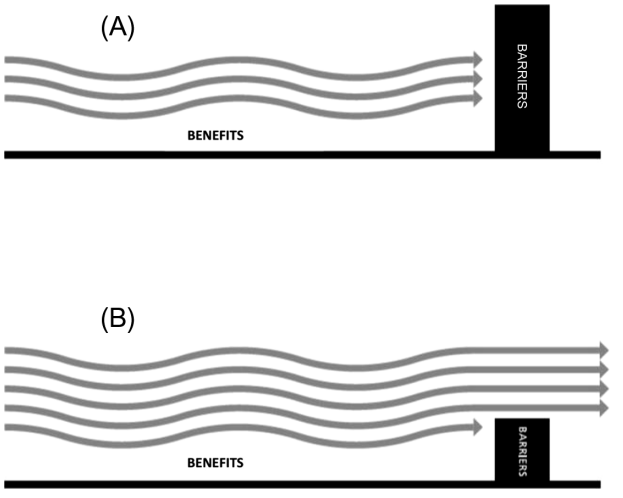


*Figure 1.* A conceptual representation of the role of barriers and benefits in social marketing campaigns.

## Matching Tools of Change to the Behavior

The CBSM framework summarized above provides a useful approach for identifying *when* to use each of the various tools of change. The next section considers four combinations of benefits and barriers, and provides recommendations for the most effective behavior change tools within each. The classification of each tool, summarized in Figure 2, was based on a review of the studies included in the meta-analysis by Osbaldiston and Schott (2012). It provides an initial starting point for classifying behavior change tools, but should be viewed with caution. In essence, these classifications can serve as hypotheses for future empirical research.

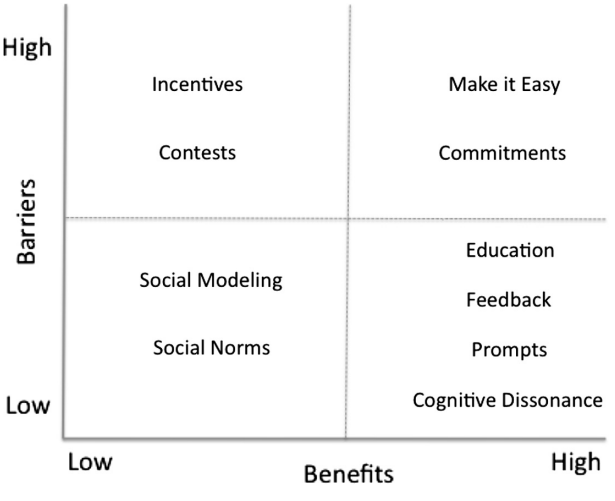


*Figure 2.* When various behavior change tools work best.

### Low Benefits and Low Barriers

In this situation, the target behavior is relatively easy and there are few barriers that impede the action. However, there are few perceived benefits associated with the behavior among the target audience. In these situations, it seems reasonable to utilize tools that increase motivation. Such tools include social psychological processes, especially social modeling.

#### Social Modeling

In the meta-analysis by Osbaldiston and Schott (2012), social modeling included treatments in which "the initiators indicate that they personally engage in the behavior" (p. 273). This included studies of modeling, social norms, and diffusion. Within social psychology, there is a long history of research on normative social influence, with a number of clear findings (Schultz, Tabanico, & Rendón, 2008). Across these studies, normative information has been found to produce robust effects on a range of behaviors, including conservation. For example, a study by Nolan, Schultz, Cialdini, Griskevicius, and Goldstein (2008) provided residents with normative information about the percentage of other households in the neighborhood that engaged in specific energy conservation behaviors (e.g., turning off lights, using fans instead of air conditioning). Over a 4-week period, the results showed a 10% reduction in household electricity consumption, compared to an information-only control condition.

While normative messages have been shown to exert a causal influence on behavior, there are also a number of studies showing moderated effects. For example, normative information tends to produce stronger effects when it comes from a close referent group, rather than an outgroup (Abrams, Wetherell, Cochrane, Hogg, & Turner, 1990). In addition, normative messages that align a descriptive and injunctive component tend to be more influential than just a descriptive norm message (Cialdini et al., 2006). Of particular relevance to the current paper is the finding that normative messages tend to work better for individuals who are not already motivated to engage in the target behavior. For example, Schultz (1999) used normative messages to increase participation in a curbside recycling program. Results showed a 17% increase in the amount of material recycled following a 4-week treatment. But the effect was particularly strong for residents who were low in initial participation rates (an increase of 92%), compared with residents who were initially high in participation (an increase of 10%).

### Low Benefits and High Barriers

In this situation, the target behavior is relatively difficult and the target audience sees few benefits of engaging in the behavior (see Figure 1A). This is the most challenging situation, and at the outset, it is likely that almost no one engages in the target behavior. Of the tools available,



 

those that can increase the benefits associated with the behavior would seem most appropriate. These include incentives, and while not explicitly singled out in the meta-analysis, contests and competitions would also fall into this category. Of the strategies reviewed in this paper, incentives and contests are the only two contingency strategies – that is, behavior change tools that occur after the behavior.

### Incentives

There is a large body of research on reward strategies aimed at promoting proenvironmental behavior. Incentives can take a variety of forms, but they involve providing individuals with a desirable consequence following a behavior or outcome. For example, offering cash incentives for purchasing a more fuel-efficient vehicle can alter purchasing decisions; or offering direct financial incentives for residential retrofit activities can increase home energy efficiency (cf. Schultz & Kaiser, 2012). As an extension, incentive strategies can also involve disincentives for undesirable actions – for example, higher prices for gasoline often result in greater use of mass transit; or per-tonnage charges for trash can increase recycling rates.

Research has shown that contingency strategies such as incentives can be a very powerful tool for motivating behavior change (Dwyer, Leeming, Cobern, Porter, & Jackson, 1993; Geller, 1987, 2002). In general, the larger the incentive or disincentive, the more likely individuals are to respond. In addition, because the motivation to engage in the behavior is extrinsic to the individual, the initial level of motivation generally does not moderate the behavioral response.

However, because contingency strategies utilize an extrinsic motivational basis, they come with a number of limitations. First, the behavior changes that result from incentives are generally not durable, and behavior typically reverts back to baseline rates once the incentive is removed. In fact, there are documented instances of overjustification effects, whereby the behavior drops to rates below the baseline level once the incentive is removed. A second limitation is the specificity of the behavior change, and typically behaviors that are changed as a result of an incentive do not spill over into other domains. In fact, there are instances of moral licensing effects, wherein a person who adopts a proenvironmental behavior because of a contingency is subsequently less likely to choose other proenvironmental actions (cf. Nolan & Schultz, in press). A final consideration with the use of incentives is the outright cost of the program. Because larger incentives are more influential, programs are pressed to provide the maximum incentive possible, and oftentimes these funds are quickly depleted.

### Competitions

Another type of contingency strategy – and in fact, a specific type of incentive – is a contest. Contests can take a variety of forms, including competitions between individuals or groups, lotteries in which individuals receive entries for engaging in a proenvironmental behavior, or games in which individuals can receive points and prizes for achieving certain levels of a proenvironmental behavior. For the purposes of this paper, we focus on competitions in which groups (e.g., households, dorms, schools) compete against each other, with the winner receiving a prize. Such competitions are illustrated with programs like "Ready, Set, Recycle" which pits households against each other to reduce the amount of recyclable material in their trash cans; Recycle Mania in which colleges and universities compete to have the highest percentage of their waste recycled; the Minnesota Energy Challenge in which households compete against each other to use the least amount of electricity; and the Aquacue Water Battle in which university dorms compete to see who can use the least amount of water.

The research on competitions suggests that they can be an effective tool for promoting proenvironmental behavior (Katzev & Johnson, 1987; Shrum, Lowrey, & McCarty, 1994). In addition, the behavior changes that result from contests and competitions are often strongest among individuals who were previously not motivated to engage in the behavior. For example, studies of recycling programs find that nonrecyclers tend to respond more favorably to incentives and rewards than do recyclers (Shrum et al., 1994).

Despite the effectiveness of competitions and contests, there are some important considerations. First, like incentives, the behavior changes that result from competitions and contests tend to be short lived, and they rarely persist beyond the competition period. For example, in the Minnesota Energy Challenge some residents engaged in extreme behaviors in order to win, including turning off their refrigerator and burning candles at night for light. But once the competition ended, these households resumed their regular routines. A second problem associated with competitions is the potential for heightened levels of intergroup conflict (Sherif, 1966), and programs should be mindful that competitions can exacerbate preexisting tensions between groups. And finally, a third problem associated with competitions is the possibility of sabotage, whereby individuals work to undermine the efforts of their opponents (e.g., turning on the sprinklers at night for a rival dorm in a water competition, or removing material from the recycling bins of a competitor).

## High Benefits and Low Barriers

In this situation, the target behavior is relatively easy and the audience is motivated (Figure 1B). At the outset, it is likely that a substantial percentage of the target audience is already engaging in the behavior. Using the CBSM behavior selection process (step 1 in CBSM), such a behavior would typically not be selected for an intervention because of its high base rate within the target population. In these cases, when the goal is to support an existing behavior with an already-motivated audience, informational materials are appropriate. This can include instructions and



 

justifications, along with feedback. In addition, prompts that serve as a reminder can also be effective.

## Education

Most efforts to promote proenvironmental behavior contain some amount of factual information. Whether it is instructions about how or when to perform the behavior, justifications for the importance of a behavior, or attempts to raise awareness about the severity of an issue, most programs disseminate information. However, the research on the role of education in behavior change programs is mixed. On the one hand, a large body of psychological research has shown that individuals who are more knowledgeable about a behavior are more likely to engage in it (Hornick, Cherian, Madansky, & Narayana, 1995; Schultz, Oskamp, & Mainieri, 1995). However, there is little evidence supporting a causal link between knowledge and behavior, and oftentimes increases in knowledge do not translate into behavioral changes (Abrahamse, Steg, Vlek, & Rothengatter, 2005; Schultz, 2002). A similar pattern emerges for issue awareness. While research has shown that attitudes are correlated with behavior (Bamberg & Möser, 2007), there is little evidence that promoting more favorable attitudes toward a behavior can induce change (Vining & Ebreo, 2002).

The problem with information-intensive campaigns is that they do not increase motivation (either intrinsic or extrinsic). Part of the problem is selective exposure, whereby individuals who are not interested in a topic are less likely to read, watch, or listen to information about it. Second, even when individuals with low interest in a topic are exposed to the information, instructions alone do not provide a reason to engage in the behavior. For example, Staats, Wit, and Midden (1996) evaluated a government campaign designed to educate residents about actions they could take to prevent climate change. The results showed an increase in knowledge following the campaign, but there was little in the way of behavior change. Interestingly however, there was an increase in reported willingness to take action among individuals who were already motivated to take action prior to the campaign. Given these findings, education and instructions are best used in instances where the target audience is already motivated, and the barriers to the behavior are generally low.

## Feedback

In many ways, feedback is a specific type of education. Typically feedback is provided to individuals about their prior behavior – for example, the amount of water consumed at home on a monthly basis over the past year. With the development of new technologies, the granularity of the feedback has become increasingly more refined, and we can now receive real-time feedback about energy consumption in our homes, or gasoline consumption in our cars, among many other behavioral domains.

However, like education, the research on feedback suggests that it works best for individuals who are already motivated (Schultz, 2010). Feedback, in the absence of an added motivational source such as a competition, or cost, is unlikely to result in behavior change. For example, Bittle, Valesano, and Thaler (1979–1980) provided households with daily feedback about kWh consumed. Results showed no change in overall energy consumption, and while high baseline consumers reduced their consumption, low and medium baseline users increased consumption (see also Katzev, Cooper, & Fisher, 1980). In summarizing the research findings on feedback, Katzev and Johnson (1987) conclude that it "acts as a spur to individuals already primed to conserve energy" (p. 66).

## Prompts

In many instances, individuals do not act because they forget. In these instances, a visual or auditory reminder can prompt the person and can facilitate behavior. Examples included posted signs on a light switch to turn off the light, or a sticker on the dash of the car reminding the driver to bring reusable shopping bags to the store.

Prompts have been used effectively across a number of environmental domains, including energy conservation (Oceja & Berenguer, 2009; Winett, 1978), litter prevention (de Kort, McCalley, & Midden, 2008), and recycling (Austin, Hatfield, Grindle, & Bailey, 1993). Prompts typically contain simple reminders, rather than persuasive appeals. As such, prompts tend to work best in situations when the person is already motivated to engage in the behavior. In addition, prompts work best for simple behaviors that require very few steps or effort. Prompts are best suited for repetitive behaviors that occur with frequency, rather than one-time actions. And finally, prompts work best when they are placed in close proximity to the behavior, when they are worded politely, and when they emphasize the correct behavior (e.g., "turn the lights off," rather than "don't leave the lights on"; or "recycle your plastic containers" rather than "don't litter"; cf. Geller et al., 1982).

## Cognitive Dissonance

This draws on our desire for consistency in our thoughts and actions. As originally proposed by Festinger (1957), cognitive dissonance results when a person holds two cognitions that are psychologically inconsistent. Once induced, the person is motivated to reduce the dissonance by changing their cognitions or their behaviors. Programs that utilize cognitive dissonance as a behavior change tool typically highlight the inconsistency between a person's attitudes and behavior. Osbaldiston and Schott (2012) also included foot-in-the-door treatments within the dissonance category. This technique involves inducing small behaviors first, pointing out that the small behavior reflects their favorable attitude toward the issue, and concluding with an opportunity for a larger behavior.



 

Studies of cognitive dissonance have a long history in social psychology, and a number of studies have applied the technique to promote proenvironmental behavior (Aitken, McMahon, Wearing, & Finlayson, 1994). For example, Dickerson, Thibodeau, Aronson, and Miller (1992) used a dissonance treatment to reduce shower duration among female swimmers. As the swimmers approached the locker room, they are asked to participate in a water conservation project. The dissonance treatment consisted of a commitment and a mindfulness prompt. The mindfulness prompt involved a series of questions designed to remind the swimmer that she sometimes wasted water (e.g., "When showering, do you ALWAYS turn off the water while soaping or shampooing?"). The commitment was obtained by signing their name to a flyer that read:

> Please conserve water. Take shorter showers. Turn showers off while soaping up. IF I CAN DO IT, SO CAN YOU.

Following the interaction, the swimmers proceeded to the locker room, and their shower times were recorded in seconds. Results from the Dickerson et al. (1992) experiment showed that the dissonance condition (mindfulness coupled with a commitment) produced the shortest shower duration (221 s) compared to a control condition (302 s). Additional analyses showed that the commitment and mindfulness treatments were effective at inducing behavior change by themselves, but less so than the combined dissonance condition.

While the dissonance treatment has been found to be effective across a range of domains, it is predicated on an initial favorable attitude toward the behavior. That is, dissonance treatments are most effective for a target audience that is already motivated to engage in the behavior. For example, in the study by Dickerson et al. (1992), the swimmers were initially asked, "Are you in favor of water conservation?" to ensure that the dissonance treatment would be appropriate. Similarly, in a study in which dissonance was used to promote residential energy conservation, Kantola, Syme, and Campbell (1984) selected for their study only individuals who "agreed" or "strongly agreed" with a survey question asking "it is your personal duty as a responsible citizen to save as much electricity as possible."

Finally, there is some evidence that dissonance treatments work best for behaviors that have few barriers. Thogersen (2004) argues that proenvironmental behaviors can be viewed as a single class of actions, and that there is pressure for individuals to remain consistent in their behaviors across the domain (e.g., conserving water, recycling beverage containers, conserving electricity, and so on). However, Thogersen (2004) proposes that dissonance pressures will be most noticeable on simple behaviors, and not on more difficult behaviors. "Cognitive dissonance may be unpleasant, but the unpleasantness of the sacrifices needed in order to behave in an environmentally responsible way may easily be worse, in which case most people adopt other than behavioral means to resolve the dissonance or simply choose to live with their perceived behavioral inconsistency" (p. 101).

## High Benefits and High Barriers

In this fourth situation, the target behavior is difficult and the audience is motivated. In essence, individuals see the target behavior as important, but there are large barriers that impeded its widespread adoption. In these situations, program activities that directly target the barriers and make the action easier (or less painful) would seem most appropriate.

### Make It Easy

There is clear evidence that the context of the behavior matters (Steg & Vlek, 2009; Werner, Brown, & Gallimore, 2010). Making a behavior more convenient, reducing the physical demands required for an action by making the proenvironmental behavior the default, or reducing uncertainty can lead to large changes in behavior (Corral-Verdugo, Frias-Armenta, Tapia-Fonllem, & Fraijo-Sing, 2012; Midden, Kaiser, & McCalley, 2007).

This is where environmental psychology is most relevant. One of the basic lessons from 60+ years of research in environmental psychology is that context matters. In many instances, context can override personal variables like attitudes or beliefs. Consider the case of pet waste. Pet ownership is a worldwide phenomenon, and around the world large numbers of people choose to have pets as companions – especially dogs (American Pet Products Association, 2012). In urban areas, this poses a problem when pet owners take their dogs for an evening walk through the park. Pet waste poses a number of social and environmental problems, including bacterial contamination of local waterways. To address this, many cities have local laws and ordinances requiring that pet owners pick up and dispose of their pet's waste. Yet the problem often persists.

In thinking about how to promote the desired behavior change, it is tempting to target awareness or education. Examples might include messages about the importance of keeping local areas free of pet waste, radio ads about the harmful environmental consequences of pet waste, or televised messages that picking up after one's pet is the law. However, research suggests that these strategies are rarely effective. Instead, one of the most effective strategies is to install a pet disposal station in frequently used areas that contains a bag and a can for disposal (Nichols Kearns, 2011).

It is important here to add a caveat about increasing the convenience of a program. One common strategy is to publicize the "ease" of the behavior, and not to make any changes in the underlying program. Campaign messages about "it's easy to ..." abound, yet there is little evidence to suggest that such messages are effective. Indeed, trying to convince someone that a behavior is convenient, requires little effort, or is simple, fails to address the underlying structural barriers. One strategy that may be effective at changing the perceptions of the difficulty of a behavior is to induce the action, for example through a trial program in which individuals are encouraged (or even incentivized) to try the behavior. Alternatively, programs can capitalize

 

on time periods during which habitual behavior patterns are disrupted, and individuals are receptive to alternative behaviors (Verplanken, Walker, Davis, & Jurasek, 2008). In this regard, experience can serve as a tool for changing the perceived difficulty of a behavior.

### Commitment

In some situations, structural changes to directly address the barriers are not feasible. In these situations, commitment strategies can provide an effective motivational tool. Commitment strategies involve asking participants to make a written or verbal indication of their willingness to engage in a behavior. This is most frequently operationalized by signing a pledge card, but it can also include verbal statements or online pledges. Across a number of studies, individuals are more likely to engage in a behavior following a commitment (DeLeon & Fuqua, 1995; Werner et al., 1995). While the basic effect has been well established, few studies have examined the boundary conditions that can maximize the commitment effect. McKenzie-Mohr (2011) argues that commitments exert the largest influence on behavior when they are made public (e.g., posted on a billboard, or in a newspaper) and durable (e.g., the posted information is lasting, rather than for a short period of time). In addition, there is some evidence that specific pledges are more influential than general ones.

Several studies have found that commitment strategies are most effective when used with a target audience that is already motivated. On the one hand, such individuals are more likely to make the commitment, compared to individuals who are apathetic toward the issue or perhaps even opposed (cf. Lokhorst, van Dijk, & Staats, 2009). On the other hand, individuals who are initially more motivated toward the behavior are more likely to follow through on their commitment. To illustrate, Matthies, Klöckner, and Preissner (2006) used commitments to increase proenvironmental modes of transportation (i.e., riding a bicycle or using public transportation). As part of their involvement in an ongoing study of transit mode, participants were given the chance to make a commitment to 10 different climate-saving activities (e.g., "I commit to use public transportation at least one time during the next two weeks for my regular trip"). Results showed an overall effect of the commitment at changing transit mode, but the effect was particularly strong for participants who expressed an initial personal moral obligation to engage in climate-saving actions.

## Practical Considerations

The primary goal of this paper was to sketch an initial framework for identifying the best tools of behavior change for a specific application. While the existing research has identified a number of effective tools for promoting proenvironmental behavior, there remains considerable uncertainty around *when* each tool is most appropriate. Drawing on a CBSM framework, this paper examines the effectiveness of several widely-used strategies as a function of: (a) the perceived benefits associated with the behavior and (b) the costs (i.e., barriers) associated with the behavior.

The resulting classification provides a tentative set of recommendations for selecting various behavior change tools. In instances of low levels of motivation within the target audience, the recommended strategies include incentives, contests, competitions, social modeling, and social norms. In instances when the target audience has a high level of motivation, recommended strategies include structural changes to make the behavior easier, along with commitments, education, feedback, prompts, and cognitive dissonance.

While this classification procedure provides a starting point for selecting an effective strategy for promoting proenvironmental behavior, there are several important practical considerations that will influence the final choice. Foremost among these is the staff and financial resources available, the degree of control over the program elements, and the time course of the program.

### Financial Resources

Because most of the data available regarding behavior change techniques come from academic studies, little is known about the costs associated with the various strategies. Most academic studies are conducted on a small scale, often with fewer than 100 participants in each condition. The techniques tend to be staff intensive, and they involve student research assistants who provide careful oversight and treatment implementation. But applying these techniques on a city-wide or region-wide scale often requires a substantial financial cost.

There are several important considerations in determining the costs of a program. First, an ineffective program can never be cost effective. That is, achieving a return on investment requires that the return is greater than zero. Second, maximizing the impact of the treatment will result in greater returns. So matching the behavior change tool to the appropriate audience and behavior can produce a more cost effective campaign. And finally, researchers and practitioners should provide cost information in reporting the results from their programs. This should include both labor hours and materials. Such data will allow future programs to anticipate the costs for various approaches, and provide important information about the viability of different behavior change strategies.

### Degree of Control

One of the important themes in this paper is the balance between enhancing benefits or reducing barriers. Oftentimes, the best way to change behavior is by changing the physical context in which the behavior occurs. Consider the case of transit modes. In many urban areas, traffic congestion and parking are major issues, and a sizeable amount



 

of money is invested to encourage commuters to use alternative modes of transportation (i.e., something other than a private vehicle). Target behaviors can include walking, riding a bicycle, using mass transit, or carpooling, among others. Each of these behaviors comes with its own set of barriers and benefits, and some audiences will be more responsive than others.

Continuing the transit example, consider a person's choice to ride a bicycle to work. Some of the barriers might include safety, inconvenience, weather hardships, time, distance, and lack of access to a bicycle. Benefits might include exercise, parking convenience, reduced stress, and financial savings. Based on these considerations, the initial decision must be made whether to reduce barriers by changing the context (e.g., building dedicated bicycle lanes throughout the city center) or to enhance motivation by targeting the person (e.g., a pledge campaign to obtain personal commitments from employees in the city center to ride their bicycle). If there are simple contextual changes that can be made to improve the convenience of riding a bicycle, this would be the preferred strategy. But obtaining funding for construction projects can be difficult and time consuming, whereby a pledge campaign can be implemented more quickly. And if matched to an appropriately motivated audience, the pledge campaign can generate good results.

### Time Course

A final practical consideration is the time course of the program. If the campaign is intended to be a one-time activity, then using an approach such as a contest, competition, or financial incentive makes sense. Such techniques can be effective for a large number of individuals, and they can often produce quick behavioral responses. However, given the potential limitations associated with extrinsic motivational approaches, they are typically not a good choice for programs that are intended to run for several years.

## Conclusion

In conclusion, psychologists are increasingly being asked to help design programs to promote proenvironmental behavior. Fortunately, psychological research has identified a number of behavior-change tools that can be used to create effective programs. Strategies such as prompts, commitments, feedback, social norms, incentives, and convenience have all been shown to effectively promote proenvironmental behavior – at least in some contexts and for some individuals. But while there is good evidence that these tools *can* be effective, there is little systematic guidance for determining *when* to use each tool. One solution comes from CBSM, which focuses on the barriers and benefits associated with a target behavior. By adopting a CBSM framework and focusing on the barriers and benefits, psychologists can provide a clear and informed set of recommendations for developing conservation programs.

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About the author

P. Wesley Schultz is Professor of Psychology at California State University, San Marcos, CA, USA. His research interests are in applied social psychology, particularly in the area of sustainable behavior. His current work focuses on social norms, and the importance of social norms in promoting conservation.

P. Wesley Schultz

Department of Psychology
California State University
333 S. Twin Oaks Valley Rd.
San Marcos
CA 92078
USA
Tel. +1 760 750-8045
E-mail wschultz@csusm.edu



 