

The Psychology of Sustainable Behavior

Tips for empowering people to take environmentally positive action



Minnesota Pollution Control Agency

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Introduction

There are many ways we can empower ourselves, and those around us, to live more sustainably. Psychology, the study of human behavior, offers many insights. The purpose of this handbook is to introduce you to research-based tips from psychology to help you in your personal, community, and workplace efforts to empower sustainability.

The recommendations are based on empirical research; most of the studies described here have been published in peer-reviewed academic journals. This document represents many years of psychological studies. Psychology is a diverse field with many contributions to make. I have summarized the studies and findings most relevant to sustainability and sustainable behavior change.

The handbook begins with an overview of the psychology of sustainable behavior, providing a short background on this field of study. The following section then describes how the tips from psychology fit into sustainability campaigns and explains how individual sustainability contributes to broader social and policy change.

There are seven separate tips and they are listed in order of importance. This means that the first tip, “Make sustainability the social default,” has the most influence on sustainable behavior. The second most influential tip is listed next: “Emphasize personal relevance,” and so on.

Within the section dedicated to each tip, there are sub-headings that describe specific ways to work with that tip. For example, under “Make sustainability the social default” there are six sub-headings (e.g., “Communicate normative information,” “Encourage positive social cues for sustainability”). Each of these is a significantly different approach through which sustainable behavior becomes the social default. They are not mutually exclusive: the more of the approaches you incorporate, the more likely you are to see a new social norm. Recommendations and examples of how the different approaches can be carried out in the real world are included at the end of each sub-section, after a description of the approach.

The psychology of sustainable behavior

Human behavior underlies almost all environmental problems, such as air and water pollution, climate change, deforestation, and loss of biodiversity. Research in psychology offers clues as to why people engage in unsustainable behaviors despite their concern about the broader consequences. At the same time, the research also explains why people go out of their way to behave sustainably, and how it is possible to motivate and empower sustainable actions. The goal of the psychology of sustainable behavior is to create the conditions that make sustainable action the most appealing or natural choice.

Most people want to live in a way that treats the ecosystems we depend on with care and respect, and people express increasing worry about the state of our natural environment. Yet we all find ourselves engaging in unsustainable daily behaviors that have negative environmental impacts. We are intelligent, thinking creatures. Why is it so difficult for us to change our behavior and act upon our environmental concerns?

One reason is that though our rational minds may know that change is needed, it is not always our rational minds that drive our behavior.

Why we are not always rational decision makers

One of the most important observations from psychological research is that many decisions are made by automatic, unconscious processes on the basis of information that our conscious, rational brains are hardly aware of. There is accumulating psychological and neuroscience evidence that thinking is the product of two separate systems of reasoning: a rule-based system, which is conscious, rational and deliberate, and an associative system, which is unconscious, sensory-driven and impulsive (Sloman, 1996; 2007). In their book *Nudge*, Thaler and Sunstein, (2008) liken the rule-based system to Star Trek's Mr. Spock, and the associative system to Homer Simpson.

These two systems of reasoning, the rule-based and the associative, work in parallel. However, they do not always agree. The rule-based system is slow and makes decisions based on careful consideration of facts and evidence. The associative system, on the other hand, arrives at a decision much more quickly, giving us our gut-feelings. The associative system is outside of conscious control and responds to subtle sensory cues such as familiarity, emotional (affective) reaction, fleeting real or mental images. Our conscious experience hides the influence that the associative system has on our daily choices; most of us feel like our decisions are based on thinking through the facts. However, the associative system plays an unconscious but powerful role in every move that we make and influences or overrides the conclusions of careful, deliberate thinking. Occasionally, the associative system completely takes over certain decisions, for example when we are multi-tasking, acting on autopilot, or have otherwise disengaged focused thinking.

Sustainable behaviors have little appeal to the associative system. Consider a behavior like biking to work: a person's rule-based system thinks it's a great idea because of all the benefits (health, money savings, fitness), but his associative system responds with a definitive "No way!" perhaps because it just can't handle the idea of walking into the office with "helmet hair."

One way to empower sustainability is to make sustainable actions appealing to the associative system (the Homer Simpson in each of us). A second strategy is to get the attention of the rule-based system so that it can assert itself against the associative system's rejection of a sustainable action ("Helmet hair is really no big deal. We're biking!"). An even better strategy does both: makes a sustainable action appealing and attention-getting for both rational reasons as well as gut-feeling, associative-system reasons.

The tips described in this handbook are designed to create conditions that bolster people's inclination (rational and gut-feeling) to take a sustainable action. However, increasing this inclination is only a first step (though an important one). There are several other important considerations.

Other considerations for a good sustainability campaign

Human behavior is a complex mix of internal, psychological factors and external cues. Unfortunately, though a strong inclination and motivation to behave sustainably is important, it is usually not enough by itself to empower sustainable behavior. A successful sustainability campaign also needs to consider the following:

- 1. All behavior is situational.** Human behavior is the product of internal drives and external circumstances, so when the situation changes, behavior changes with it. Even after a person has formed an intention to behave in a certain way, situational circumstances can lead to a surprisingly different behavior (e.g., “I meant to ride my bike to work three times a week this month, but my bike broke”). Intention must be reinforced and supported across different situational contexts.
- 2. There is no one-size-fits-all solution.** Different people react differently to the exact same circumstances. What one person finds motivating and appealing may have a negative influence on someone else. As much as possible, one should investigate and consider potential individual differences such as temperament, worldview, or personal situations (Note: the recommendation *Know your audience* partly addresses this consideration).
- 3. Sustainable behavior is most likely when there are few barriers (real-world, social, psychological).** Sustainable behavior is easier and thus more likely when people face few barriers to sustainable action. Barriers can be physical, real-world issues such as lack of infrastructure (e.g., no bike lanes), extra expense (e.g., the price of organic foods), or safety worries (e.g., waiting for a bus at night). Barriers can also be cultural or social such as strange looks from friends or coworkers when you bring your own reusable container for a meal. Finally, barriers can be personal and psychological, such as a fear of trying something brand new, difficulty breaking a habit, or lack of knowledge of how to carry out a new action (e.g., composting).

Successful sustainability campaigns start with an analysis of the barriers people face in carrying out a particular sustainable action. Community-based social marketing (www.cbsm.com) is an approach to fostering sustainable behavior with its roots in social marketing and social psychology (McKenzie-Mohr & Smith, 1999). The CBSM approach begins with an analysis of the barriers that stand in the way of one particular behavior. Once barriers have been identified, a community-level strategy is created using a set of CBSM tools.

This handbook is a good companion document for a CBSM campaign. The tips in this handbook provide a general approach to overcoming *typical* psychological and social barriers to sustainable action. CBSM, on the other hand, examines one behavior (or small set of behaviors) and identifies the *specific* psychological, social, and physical barriers that prevent people in a community from carrying out that action.

- 4. There are many forms of action.** A shift toward a more sustainable lifestyle encompasses many different types of actions, some daily and mundane (using less water, recycling), others rare but with enormous impact (going car-free, insulating a house). In addition, there are a number of behaviors that are not in themselves sustainable actions, but which still contribute to creating a sustainable lifestyle and a sustainable world. For example, writing a letter to a legislator or reading a book about growing organic vegetables are both indirectly sustainable actions.

Stern (2008) and McKenzie-Mohr and Smith (1999) advocate that those working on sustainability campaigns focus on bigger impact actions that are easy to achieve, such as one-time actions like buying energy-efficient appliances or a more fuel-efficient car. Whatever your goal is, it may be helpful to consider the types of actions that can be promoted and the level of impact that different actions are likely to have in the context you are working in.

Several authors have created frameworks of actions that contribute to sustainability (Smith-Sebasto & D’Acosta, 1995; Monroe, 2003).

- a. Civic action (e.g., voting, petition signing)
- b. Educational action (e.g., looking up information, reading)
- c. Financial action (e.g., donating money, boycotting a company or product)

- d. Legal action (e.g., using legal system to force compliance with environmental law)
- e. Persuasive action (e.g., advocacy, letter writing)
- f. Direct behavior
 - i. Making a one-time purchase (e.g., buying an Energy Star appliance or insulating a home)
 - ii. Making a frequent purchase (e.g., consistently buying locally produced goods)
 - iii. Curtailing or ending a certain type of behavior (e.g., driving less)
 - iv. Substituting a new for an old behavior (e.g., biking instead of driving)
 - v. Making a behavior more efficient (e.g., carpooling instead of driving alone)

5. Policy change is often the fastest route to individual behavior change. It is unrealistic to think that any sustainability campaign will successfully reach all or even most members of society. Sometimes it is more efficient to forego a campaign at the individual behavior level and to focus instead on crafting and promoting better government policy.

This creates a chicken-and-egg problem, because of course policy change does not happen in a vacuum. New policy happens when influential political leaders become convinced that it is needed. Perhaps they are reached through a sustainability campaign, or, more likely, they are pushed toward policy change by a grass-roots social movement convinced that sustainable change is needed. In any case, psychology can and should play a role in creating this movement.

Individual sustainability paves the way for broader social change

Psychology focuses on factors that influence an individual's behavior, either the individual alone or the individual as part of a group. This focus, on one individual or one action at a time, may seem like a slow route to a more sustainable world. However, it is individual change at the grass-roots level that makes it possible for broader social and policy progress to occur.

- **Small changes do add up.** The cumulative effects of what we each as individuals do can be either devastating (each American's post-workout bottle of water adds up to 2 million bottles sold every 5 minutes) or healing (if every household were to plant native species in their gardens). When one small change is made by many individuals, or one individual makes many small changes, it begins to add up to a significant, positive improvement.
- **Personal changes are the gateways to public change.** An effective way to get people to band together to remove major infrastructure barriers—for example, safe bike routes or a moratorium on new coal plants—is for them to be making small steps toward biking or reducing electricity consumption in their personal lives. A push toward larger policy change is much more likely when many individuals (the grass-roots level) are in favor of the change. People are more likely to vote for—or actively fight for—legislative changes that support things they are already doing (i.e., people who are already taking the bus, bike, carpool, etc., are going to call their legislators to argue for better infrastructure or tax incentives). The work we do to motivate individual change helps pave the way for policy changes.
- **Understanding individual motivation helps create a new frame.** Gaining a better understanding of how groups of individuals think about sustainability and environmental problems can help more effectively frame them in the larger public debate. Finding effective ways to talk about issues, for example by emphasizing the economic aspects over the nature-conservation aspects, is likely to engage a broader segment of stakeholders who may then become more active on both an individual behavior level as well as joining in collective civic action toward policy change.
- **Individual change makes sustainable behavior normal.** As growing numbers of individuals adopt sustainable behaviors, the behaviors become more “normal.” Even if people are not themselves living the lifestyles that society is attempting to bring about with policy changes, they are more accepting of change in that direction when they see more and more people around them taking those steps. Though most people

are loath to admit that social acceptability plays any role in their actions, in fact it plays an extremely strong role (for a compelling case study of this phenomenon, see Griskevicius, Cialdini, & Goldstein, 2008). The more that people see other people living a certain way and talking about things a certain way, the more they come to accept it as a normal way to be and live.

Every tip makes a difference

There is no magic formula for bringing about sustainable behavior. Following every tip described in this handbook will not guarantee sustainable behavior because there will still be barriers to any behavior that you hope to see more of (such as using less energy, driving less, eating local food, eating less meat, etc.). However, implementing a set of these recommendations will increase the probability of a sustainable action.

Tips from Psychology

1. Make sustainable behavior the social default

When asked directly, people vehemently deny that their actions might be influenced by trendiness or popular opinion. However, we are biologically programmed to care what other people think of us and to try to make our behavior fit in. This is a product of our evolution: early humans who were ostracized from their group faced almost certain death out on their own. Because of this biological programming, all people internalize and act on messages from other people, both explicit and implicit messages, about the kinds of behaviors expected and accepted by society. At the same time, people significantly underestimate the extent to which these social messages influence them.

A recent study of household energy use confirms this: when asked outright, participants told experimenters that “what neighbors are doing” was the least likely factor to influence their behavior. However, the results showed that out of four different types of informational messages (environmental impact, money savings, how-to instructions, and how much neighbors are cutting back), the message about neighbors’ behavior was the only message that resulted in participants measurably reducing their own electricity use (Schultz, et al, 2007).

Social norms are the implicit social rules that govern behavior within a community. Norms are not directly established, instead, they develop over time as people go about their daily behaviors, sense people’s reactions to those behaviors, and observe what other people are doing. Social norms differ depending on the group of people, community, or culture. What is considered fully normal, even admirable, in one group may be met with disapproval in another (e.g., offices where casual dress is normal vs. offices where everyone must wear a suit). According to psychologist Robert Cialdini (2004), people are constantly looking for “social proof” to guide their own behavior. That is, they look for clues to what other people are doing in order to understand the appropriate behavior in a given situation. Social proof of what is acceptable is a particularly powerful guide to behavior when the situation is ambiguous or new.

What does this mean for sustainable behavior? Our transition to sustainability brings with it many new ideas and behaviors as well as a fair bit of ambiguity. Polls show that most people think positively about sustainability but they are still uncertain about how to implement it in their everyday lives. They are looking for social proof (“what are my neighbors doing?”) that sustainable behavior is happening, but they are not finding much of it. Right now, change is still more talk than action.

Obviously one of the big challenges we face in creating a sustainable culture is the fact that so many unsustainable actions are considered perfectly normal and even something to strive for: driving alone, living in (and heating/powering) a very large home, eating foods that have traveled long distances, eating meat at every meal, having a weed-free green grass lawn, and continuously shopping for new consumer goods. Sustainable behaviors, such as buying second-hand or taking short showers, on the other hand, are often seen as lower status or undesirable (Sadalla & Krull, 1995).

Social norms create opportunities for change; for one thing, they are dynamic and constantly shifting (just think about fashion trends). The goal for those of us who want to bring about a more sustainable society is to quickly bring sustainable behaviors into the realm of normal, acceptable, and something people aspire to. How do we accomplish this? We need to give people evidence, social proof, that sustainable behavior is acceptable and desirable. Here are some methods.

Communicate normative information

Social proof does not have to come from a real and present group of people. The human sensitivity to social norm information is so pervasive that people find their social proof in the craziest of places: laugh tracks during movies increase perceptions of funniness, tip jars with a bit of money increase likelihood of tipping, advertisements featuring large numbers of people favoring a product increase the perception that the product is good, stickers on a product claiming “most popular” increase sales (see Cialdini, 2004, for a broader discussion).

Research shows that people respond more positively to a behavior, and will imitate that behavior, when there is social proof for it. There are many ways to provide social proof; some are subtle and some are direct.

Recommendations and examples:

- One option is to provide direct evidence. Direct ways of providing social proof include showing people a large number of people behaving in a certain way. A popular introductory psychology course exercise on social proof involves getting the entire group of students to do something slightly strange in public, such as all stare up at the same spot in the sky or raise one hand as if testing the wind, to see how many innocent passers-by imitate the act. The number of passers-by who join in is usually high (but it varies depending on the behavior and the context). Events that attract large crowds, like the Living Green Expo or the Eco Experience at the State Fair are great ways to build social proof that sustainable, green living is something that many people are interested in and doing. Increasing opportunities where people directly witness many other people doing green things, whether large in scope or small, will create momentum toward sustainability. Also, see discussion below “Provide opportunities for people to demonstrate sustainable behavior in front of others.”
- Convey descriptive norms (how many people are taking action). Indirect social proof of social norms is probably easier to provide than direct social proof, and studies show that it can be extremely powerful. There are numerous ways to communicate indirect social proof. For example, normative information is communicated with messages such as “90% of your neighborhood has signed up for a home energy audit” or “9 out of 10 people in Minneapolis consistently recycle.” The important thing to keep in mind is that the social proof only holds if the numbers are fairly impressive and also believable. In research studies, this type of message has effectively influenced behaviors such as hotel guests leaving towels hanging in the bathroom rather than putting them on the floor to be washed, and the amount of energy that people use in their home.
- Find alternative ways of conveying what’s normal. If the numbers you have are not very high, for example you want to increase the rate of composting in a community but only 15% of the residents compost, you can devise other ways to present the information so that it emphasizes the many people who are taking action. For example, you can change the weak sounding “15%” to a raw number: perhaps 15% translates to an impressive-sounding number of households (10,000? 20,000?). If so, then state that number. Or you can report the percentage increase, “last year there was a 60% increase in number of reusable bags brought by grocery shoppers.” You could also create an image that expresses that many households, that many people, or that many smiling cartoon compost bins.
- Another alternative: use less specific normative information. You can also use terms such as “Many of your neighbors” or “Other guests in the hotel.” Research shows that this type of less specific normative information is still effective but there is no information on how it compares to more specific normative information. These messages do let people know that other people are behaving a certain way, and they thus infer that they should, too.
- Communicate injunctive norms (that many people approve of an action). Another option is to not use the descriptive normative information (how many people are doing) but instead use what is called “injunctive” normative information: how many people approve of a particular behavior. It may be the case that only a few people in the area are composting, but that many more think it is a good idea. In this case, the message might be “89% of South Minneapolis residents *are interested in* getting their own backyard composter” or “80% of your neighbors in Excelsior approve of garden composters.”

In addition, for all of these methods of communicating normative information, a critical first step is to define the social group (or community) for whom the information is meant. If it is hotel guests, then make the message relevant to hotel guests. If it is a specific neighborhood, then gather your normative information about that neighborhood. People pay attention when the message captures their attention and is personally relevant, thus, you have to make the message specific to some aspect of their identity or their personal concerns. Note: Whichever method you choose, you definitely should test your message first by asking a few people from your target audience whether the statement is effective and believable.

Encourage positive social cues for sustainability

People like to think of themselves as immune to trends. We all want to think that we form our own likes and dislikes without interference from broader social opinion. However, though most people don’t want to admit it, we are all constantly modifying our behavior based on social signals from others (Cialdini, 2007). Most people

have experienced that sideways look of social disapproval that happens, for example, when you arrive at a restaurant for dinner and realize that everyone else is dressed in formal wear and you have on wrinkled jeans. Social cues can also be positive such as smiles, nods of encouragement, or compliments. All of these signals, positive and negative, provide us with important information about how our behavior compares to what is deemed acceptable and normal in a particular social context. Negative signals compel us to scrutinize what we're doing and adjust it as quickly as possible. Positive cues reassure us that we are on the right course and should continue. Imagine the power of consistently positive social cues for all types of sustainable actions: smiles and nods to people waiting at the bus stop, a thumbs up for bringing your own reusable container to the take-out deli, or the observation "It's great that you walk so many places..." Though it sounds simple (and it is simple), it is a powerful behavior-shaper that is underutilized in our quest for a more sustainable society.

Recommendations and examples:

- Make it explicit: tell people to notice sustainable actions and to reinforce them with positive social cues: smiles, words of support, compliments. People are typically willing to do this. It is a small and easy thing, and most people report that they feel empowered by it and receive positive feedback in return.
- This can be done at any scale. You as an individual can start doing this today. A small number of people giving positive social cues can make a surprising difference; a large number of people can create radical change in the social desirability of a particular action. Start small and scale up. Begin with "the converted," the individuals in the community who are already doing a lot to make their own lives more sustainable. Example: This type of campaign action could include printing up small cards that say "Thank you for _____", allowing people to fill in the blank with the sustainable action that they have noticed (biking, having a rain garden or a "pesticide-free zone" in the yard, etc.) and give the card directly or leave it for the homeowner, business owner, biker, etc.
- Giving negative cues in response to unsustainable behavior can also play a role, but negative cues should be used with more caution. Negative cues are likely to generate a negative response: a direct challenge, a rebellious continuation of the behavior, or reactance: deliberate thwarting of efforts toward a sustainable alternative. Positive Energy, a company in California that is working with electrical utilities to help people cut back on the energy use, tried out the idea of giving high energy users negative social feedback (a frowning emoticon on their energy bills). It resulted in so many irate telephone calls to the utility that the practice was quickly abandoned.

Provide opportunities for people to demonstrate sustainability

People are attuned to more than just social signals, they also notice the actions of people around them (social proof, as discussed above). The more often we see a particular behavior, the more it becomes "normal" and we internalize it as a norm. Think fashion: the first time we see someone wearing "the new look" it usually strikes us as absurd but we soon accept it and may even find ourselves adjusting our own wardrobe to incorporate it. Sustainable behaviors are similar: the first time we see someone bring her own reusable container to the store we find it odd, but after we've seen it a few times we find ourselves more open to the idea of trying it.

Recommendations and examples:

- This tip requires first noticing situations where a particular behavior (e.g., commuting by bus) could be made more public. For bus commuters, are there ways that more people in an office could be made aware that some of their colleagues ride the bus to work? Example: In one office, bus commuters were given a special badge holder for bus riders only. Other workplaces and schools have encouraged reusable mugs for coffee by giving employees and/or students distinctive travel mugs. Peers notice these mugs at the cafeteria or the coffee shop and, when they see several people in their circle using one, they get the idea that it is the accepted norm.
- People are most interested in and aware of the behavior of people they consider similar to themselves. If you, for example, want to encourage high school students to refill a metal water bottle instead of buying bottled water, then you should look for opportunities for other students to demonstrate this behavior, rather than just their teachers.

- It is possible to provide opportunities to “demonstrate” a behavior even when that behavior is something hidden or non-obvious, such as insulating a home. For example, lawn signs stating “This home is becoming energy efficient!” make it clear to neighbors and people passing by that yet another home is taking action. Other strategies include flyers, neighborhood newsletters, or pictures published in a local paper.
- Similar to encouraging positive social cues, demonstrating sustainable behavior is something everyone can do. Start a ripple effect today: wear your bike helmet into the office instead of taking it off at the door, carry your reusable plate, silverware and cup into the company cafeteria, or put your compost bin where it can be seen from the street instead of hidden from view.

Create and support networks that spread sustainable examples

A personal request from a friend or a family member, in many cases even a stranger, is a very strong motivator because the implicit rules of social interaction make it uncomfortable to give a flat-out refusal to a personal request (Cialdini, 2004). Having said that, research shows that we are more likely to respond to a request for action when the appeal comes from someone we know (Boster, Rodríguez, Cruz, & Marshall, 1995) and the people closest to us influence us the most.

One predictor of cutting-edge behavior (example: getting solar panels) is contact with someone who does that behavior (Leonard-Barton, 1981). The lesson from this is that direct social contact with someone who already does something sustainable increases the likelihood that other people will pick up that behavior. The influence increases with the nearness of the relationship and when the “early-adopter” is willing to talk to other people about the behavior he or she is doing. Admittedly this can and does sometimes backfire because the “messenger” is too insistent, others are not ready or interested in the behavior, or because even close friends or family members can have very different worldviews. Still, personal contact with someone behaving sustainably is a positive motivator for trying a new sustainable behavior. Thus, efforts should be made to create and support social networks that have an interest in sustainability.

Further evidence for this idea is found in studies of formal or informal groups working together to improve personal sustainability. For example, Staats, Harland and Wilke (2004) studied people in EcoTeams: groups of 6 to 10 friends and neighbors (people already known and trusted) who came together to increase environmental friendliness of their household behavior. The study found that the social influence from the EcoTeam interactions helped people change their household behaviors and maintain or even increase the change for at least two years after the EcoTeam program finished.

Networks of people working together to become more sustainable have one further psychological influence: they promote an *environmental social identity*. The more people feel a part of a particular group, the more likely they are to adopt the values and behaviors that are associated with that group. Thus if a group identity includes many sustainable actions, individuals who become part of the group, and take on that social identity, will tend to carry out sustainable actions.

Recommendations and examples:

- Help people form teams or networks to implement new behaviors together. Programs like EcoTeam are one established method. There are also many informal, grass-roots networks out there that could be used as models.
- Create opportunities for ordinary people who are already doing certain behaviors to mix with people from their community who are potentially interested in trying these behaviors. Let the “experts” wear stickers that say “I compost, ask me how” or “I am a bike commuter, ask me how I do it” or “I eat local all the time, ask me how.”

Broaden the sustainability norm beyond the “eco-elite”

Historically, the mainstream environmental movement has been thought of as mostly white, middle-class “do-gooders” who have the resources to be able to afford the expense of living green (N.B. This stereotype is perfectly captured in the 2009 ABC cartoon series *The Goode Family* <http://abc.go.com/primetime/thegoodefamily/index>).

Van Jones, a green activist and founder of Green for All, points out “But nobody is doing our new green movement any favors by continually portraying it solely as the playground of a white, affluent ‘eco-elite.’” He notes that most news stories and magazine features with sustainability themes feature images of affluent white people: completely missing are the faces of the working class or the non-white. Van Jones wants to push the edges of the green norm to include a broader audience. His own work creates “on-ramps” to sustainability for people from low-income communities and communities of color.

Recommendations and examples:

- Extend your efforts beyond the “usual” communities served by green initiatives. Invite representatives from communities who are otherwise not present at sustainability discussions. Find out what the norms are in that community or social group and how sustainability might already be a part of those norms.
- When communicating social norms, be sure that the images include people from a variety of backgrounds, ages, and ethnicities.

Break down bystander confusion

All people have had the experience of being out in public and witnessing a situation that made them feel uncertain of what to do. Consider this scenario: a teenager screams as he is chased down a city street by a group of rambunctious fellow teenagers. Does he need help? Should someone intervene, or is it just a teenage game? People on the street stop and look and then glance away, confused and uncertain as to the appropriate response. This phenomenon is called *bystander confusion*: the tendency for individuals in a crowd to avoid helping another person who appears to be in need. The psychological explanation for bystander confusion is that the *uncertainty* of the situation (i.e., does he need help, or is he joking with friends?) causes people to look for cues from other people to tell them the appropriate response (i.e., call the police vs. ignore the noisy teens). The others present are equally uncertain, and interpret everyone else’s lack of action to mean that action must not be appropriate. The group becomes locked into uncomfortable, mutually reinforced inaction. Though it seems counterintuitive, the likelihood of individual action decreases as the number of bystanders increases: more people doing nothing increases the social perception that “nothing” is the proper response.

Environmental writer Janisse Ray has likened our current world climate situation to a society-wide case of bystander confusion. The analogy also works equally well for other social and sustainability issues. For global climate change, the comparison is this: despite urgent warnings from scientists that something must be done, most people have made few personal changes. When one looks around, one sees people making a few minor changes (perhaps changing light bulbs) but nobody appears to be taking the kinds of significant steps that might actually be commensurate with the urgency of scientists’ messages. Thus the social cues tell us “Serious action is not the appropriate response. The appropriate response is small action or ‘wait and see.’”

How do you break bystander confusion? In fact, the cycle of inaction dissolves at the first sign of someone stepping forward to take decisive action. In the screaming teenager scenario described above, a single voice yelling “Call the police!” would likely prompt six or seven of the onlookers to reach for their cell phones or even to rush to help the pursued teen.

Recommendations and examples:

- Make people aware of the phenomenon of bystander confusion. Let them know that people are often frozen in inaction simply because they don’t see anyone else taking action. Practice simple but compelling responses. This knowledge may give people the confidence to be the one to break the bystander confusion.

2. Emphasize personal relevance

We humans are hard-wired to take special interest in anything that is related to our own selves. Again, our very survival has historically depended on it. Messages that people perceive to be personally relevant receive significantly more attention and are thus more likely to prompt deeper, deliberate processing.

One profession that has built itself on this premise is advertising and marketing. Americans are bombarded with information, particularly commercial information. One study found that we encounter more than 3,000 advertisements each day. Of those messages, we consciously notice about 80 and actually react to around 12 (American Association of Advertisers, as cited in Corbett, 2006). Advertisers have learned many tricks, including market segmentation, to get people's attention and persuade them of the merits of their product.

When it comes to issues of ecological stability and sustainability, those who have valiantly tried to get the message out have largely failed at making it personally relevant. The American public does not necessarily see environmental issues as something that they are likely to experience or be affected by. This is particularly true in the case of global climate change: despite a great deal of sound scientific evidence and great media attention, only a small number of Americans (35%) believe that climate change will harm them or their families, whereas 61% believe it will harm future generations and plant and animal species (Leiserowitz, Maibach, and Roser-Renouf, 2009).

It's not about the environment!

When we talk about "environmental" problems, we reinforce the artificial division that we have created between ourselves and the ecological systems we rely upon. In fact, the environment is not something separate from us; humans are an integral part of the environment and significant damage to the environment will ultimately affect human life. "Environmental" problems have effects that go beyond nature; air and water pollution are the cause of many human illnesses and even death, and climate change impacts not only human health but also the health of the economy. For example, increasingly severe storms, droughts, and heat waves destroy crops and damage property.

Though most people who are concerned about environmental issues and sustainability understand that the environment is not something "out there," a significant number of Americans think of "the environment" as a separate entity, like "the moon" or "the trade deficit." Why should we be concerned about saving this separate, irrelevant entity, particularly if it involves personal sacrifice or has broader economic consequences?

Recommendations and examples:

- Avoid talking about "environmental issues" or "the environment." Instead, point out the human aspects of environmental issues: "the air we breathe," "the water we drink," "the resources we rely on," "the climate that sustains human life."

Beware of labels

Certain words evoke strong reactions and it turns out that, similar to "environment," the label "environmentalist" is such a word. In studies conducted by Amel, Scott, Manning and Stinson (2007) it was found that people disagree with a politician's vote if encouraged by "environmentalists." The study presented people with a short, made-up scenario: "Senator Johnson, under pressure from *environmentalists*, voted against the Omnibus Budget Bill because it contained a provision to drill in the Arctic National Wildlife Refuge." People who read this scenario were very likely to say that Senator Johnson's decision was wrong. However, when the word "environmentalist" was replaced with the words "concerned citizens" (i.e., "Senator Johnson, under pressure from *concerned citizens*..."), people were likely to say that the senator's decision was appropriate. People so avidly disliked the influence of environmentalists in the scenario that they said they disagreed with Senator Johnson's decision even when, on the very same survey, they argued that we should not drill in the Alaska National Wildlife Refuge (which was Senator Johnson's decision).

Other research supports the idea that people do not want to be associated with "environmentalists": when asked to describe their personal identity, people give low rankings to any statement that mentions the word "environmentalist" (Amel, Manning, Scott, 2006).

The lesson here is that labels are powerful cues for what is personally relevant. This is rooted in the psychology of personal and social identity. Our identities are our sense of who we are, our unique personal characteristics as well as our social roles and membership in social relationships and groups. Unknowingly using the “wrong” label will alienate a significant number of people if the characteristics associated with that label are in conflict with their identities. Though the dictionary definition of environmentalist is quite benign, and many people proudly call themselves environmentalists, the word evokes an extreme and negative image for many: “hippy, tree-hugger, smelly, vegetarian, protester” (Amel, Scott, Manning & Stinson, 2007). This is not an image that most people associate with themselves. Thus, when an issue is labeled as something that “environmentalists” are advocating for, people then doubt that the issue is relevant or important to their own lives, no matter what this issue is. Some may even have an immediate contrary reaction (called *reactance*): “if it’s something that environmentalists are advocating for, then it must be something extreme that I disagree with.” There are other labels that evoke similar reactance. For example, the label “Republican” or “Democrat” makes people who identify with the other party immediately think “it must be wrong!”

Fortunately, labels can usually be avoided or replaced with something less stigmatized. Amel et al suggest using neutral and more broadly descriptive terms whenever possible to describe groups of people advocating for sustainability or ecological stability. For example, the terms “concerned citizens,” “citizen groups,” or “people worried about clean air and water” are descriptive, inclusive, and less likely to marginalize the issue and the people involved.

Recommendations and examples:

- Be careful of labels. When referring to people who are advocating for a particular policy or behavior, use inclusive descriptors such as “concerned citizens” or “Minnesotans fighting for clean water.” Using statistics and numbers instead of labels can work too, for example: “3,000 Minnesotans called their senator.” Avoid terms like “environmentalists” or “environmental groups.”

Understand your audience’s worldview

No two people view the same issue in exactly the same way; people hold different worldviews which influence how they interpret and react to issues around them. For example two much-discussed conflicting worldviews are the conservative vs. the liberal (often denoted with the labels “Republican” vs. “Democrat”). Worldviews are an internally held set of ideas and beliefs about how the world operates. They act as a kind of filter: (new) information that conflicts with the worldview is less likely to be accepted than information in harmony with it. People develop their worldviews slowly over time; worldviews are relatively stable and resistant to change.

Not only are people more accepting of information that conforms to their already-held beliefs about the world, they also actively seek worldview-confirming information (Nickerson, 1998). This is called the *confirmation bias*. A real-world example is the fact that most people prefer to read newspapers or blogs with a political perspective similar to their own.

Environmental and sustainability communication often fails because of conflicts with people’s worldviews. For example, people who hold the belief that humans are meant to dominate and control the natural world are *not* likely to respond to pleas to “conserve nature” or “save wildlife.” Similarly, people who are preoccupied with economic concerns or whose worldview does not include the idea that a stable ecological system is necessary for economic success are unlikely to be persuaded by arguments about drowning polar bears. They are also unlikely to ever buy the magazine that features polar bears on its cover. Finally, people who are preoccupied with personal, egoistic concerns are less affected by appeals to altruism. Schultz and Zelezny (2003) argue that appeals to altruism will almost always fail because they clash with the self-enhancing values and worldview that a majority of Americans hold (e.g., convenience, independence, success).

An audience segmentation study was published in March 2009 by Maibach, Roser-Renouf and Leiserowitz. They conducted telephone surveys with nearly 2,000 Americans, asking them questions about their beliefs about climate change and their willingness to carry out a set of behaviors that impact CO₂ emissions. They found that Americans fall into six fairly distinct groups with respect to the issue of climate change. The groups are: the Alarmed (18%), the Concerned (33%), the Cautious (19%), the Disengaged (12%), the Doubtful (11%), and the Dismissive (7%). Each of these groups represents a different “climate change worldview” which demands its own unique message. An important observation made by the authors: people from all the

different groups do share certain behaviors: for example, people in the Dismissive group have made many energy-efficiency improvements in their homes (e.g., 75% have caulked/weather stripped). However, when asked about the benefits they see in energy conservation behaviors such as turning down the thermostat in winter or using less air conditioning in the summer, the two groups diverge. The Alarmed group sees “It helps reduce global warming” as a benefit, but the Dismissive group adamantly does not. However, both groups see “It saves me money” as a benefit to these types of behaviors. An important conclusion in these results: people have many—and divergent—sources of motivation for the actions that they take.

Recommendations and examples:

- To communicate effectively, it is critical that you investigate and understand the audience that you are communicating with and then frame your message to be congruent with their worldviews. What are their concerns and priorities? How diverse are the worldviews within and among them? What are some of the features of their worldviews?
- If necessary, create different messages or campaigns tailored to the different audience segments you are working with. Though it may be more complicated, the results will be substantially better if you can target the specific audience segment with a message/campaign that is tailored to their concerns and worldview.
- If your issue is global climate change, download and read through the audience segmentation analysis by Maibach, Roser-Renouf, and Leiserowitz (2009). This study is available in pdf form at <http://environment.yale.edu/uploads/6Americas2009.pdf>

Find a new frame

Scientists and others who are concerned about environmental issues too often assume that a simple communication of the seriousness of the scientific evidence is enough to galvanize people to take action (Nisbet and Mooney, 2007). Unfortunately, this is not the case. One problem, argue scholars such as Nisbet, Mooney, and George Lakoff, is the way scientific evidence and other information is presented; how it is *framed*. Message framing involves presenting facts from a particular perspective or interpretive framework. For example, the issue of water pollution can be framed as an “environmental problem;” this interpretive framework is one that emphasizes impacts on ecological systems, wildlife, and the aesthetics of nature. An alternative frame might be one that presents water pollution as a “threat to human health.” This alternative interpretive framework emphasizes risk to people.

Environmental issues are complex and multidimensional. For example, an issue like global climate change is inextricably tied to human health, social justice, the economy, national security, morality, and the welfare of future generations (to name just a few). Yet the media presentation of climate change often narrows the focus to warmer temperatures, melting arctic ice, and drowning polar bears: a “trouble in the arctic” frame. When considered in this frame, the full spectrum of climate change effects recede in people’s minds. This is exactly the effect that framing has: it imposes an organization on the information so that some aspects of the story become salient and memorable, while other elements fade away in importance, are not allotted mental attention, and are not remembered later.

Framing, when done ethically, is not about misleading people or misrepresenting information. Instead, framing is honestly communicating the evidence but in a way that emphasizes how the issue connects to people’s deeper concerns and values; framing makes an issue more personally relevant. A good frame is compatible with the target audience’s worldview.

Recommendations and examples:

- Explore all the dimensions of your issue. Think about how your issue impacts more than just “the environment.” Draw out an impact diagram of all the other effects that your sustainability or environmental issue has. When you construct your messages, emphasize those dimensions of the issue that are more likely to hook into people’s interests or concerns. To frame information effectively, the frame must be compatible with worldview. Some possible dimensions:

- Personal finance (becoming more sustainable can save you money, or not becoming sustainable may cost you more)
- Human health (especially personal health and family health)
- Moral obligation (many religions emphasize a human moral obligation to care for creation)
- National security (resource scarcity creates conflict and destabilizes political situations)
- Social justice and human rights (environmental breakdowns disproportionately affect the poor and people of color in the United States)
- Economic (“green jobs” spur economic growth)
- Obligations to future generations (children, grandchildren)
- National pride (developing sustainable technology provides an opportunity for the U.S. to reassert itself as a world leader in technology and ingenuity)
- You are not limited to just one frame or hook; the same message can encompass more than one perspective (i.e., human health *and* economic impacts of climate change). The important thing is, once again, to know your audience and choose your perspectives and hooks based on their priorities and concerns.

Focus on local issues, local effects

For a majority of Americans, global climate change is seen as a serious threat to far away places, distant people, and non-human species (Leiserowitz, 2007; Leiserowitz et al, 2009). This is due in part to the reality that the impacts of many environmental problems, including climate change, are today being felt more acutely in other parts of the world: receding glaciers in Greenland, desertification in Africa, water pollution in China, mangrove destruction in Central America. The news media also reinforce this focus on far away places in their reporting on environmental problems.

In fact, Minnesota is already experiencing adverse impacts from climate change, though most Minnesota citizens might not recognize them as climate-related. For example, an explosion in the population of the pine bark beetle is killing trees in Minnesota. Usually, the beetles are killed by the extreme cold of winter; however, as winters become milder in Minnesota due to climate change, more beetles are surviving through a second or even third winter.

When people learn about effects such as these, physically present in their own state or community, they begin to understand that environmental issues are not “out there” but “right here,” and not “sometime in the future” but “right now.” Though the current effects of climate change on local American communities are not yet severe, they are affecting places that people care about and identify with.

The importance of focusing on local issues and local effects is underscored by survey results showing that people are much more concerned about “water pollution in my community” as compared to just “water pollution” (Manning, Amel, Scott, 2008).



Minnesota Department of Natural Resources Archive,
Minnesota Department of Natural Resources,
Bugwood.org

Recommendations and examples:

- Identify local environmental impacts in the community you are working with. Link your sustainability campaign or issue to a strong local focus.

3. Make hidden information visible

Our own senses give us little evidence that environmental problems are real. Though scientists are alarmed by the pace of global climate change, soil erosion, and species extinction detected with their sensitive instrumentation and systematic data collection, these phenomena are happening in slow enough increments that our human senses are unable to detect them. Our senses also do not detect the toxins, such as pesticides or endocrine disruptors, that we are told are in our air, food, and water. These substances are invisible, tasteless, and don't have a giveaway smell. In fact, most "environmental hazards" either cannot be perceived except with the help of science, or they are "virtual risks," which even scientists debate and express uncertainty about (Adams, 1999).

Our personal experience also contradicts the reality of these environmental and human health problems. Our lives are continuing pretty normally despite the dire warnings, which makes it difficult to take the threat of things like environmental toxins too seriously. After all, people often point out, "We ate/drank/breathed all that junk growing up and we're still here to tell the tale. So it can't be that bad." Research shows that people often feel that they personally are less vulnerable than others in the face of a risk like climate change (the optimism bias), and media attention seems to heighten this risk denial even further (Costa-Font, Mossialos, & Rudisill, 2009).

Overcome perceptual barriers

Human perception is limited. First of all, we are limited to our five senses (sight, hearing, smell, touch, taste), each of which is sensitive to specific types of information. None of our senses can detect common pollutants like carbon monoxide, sulfur dioxide, or fine particulate matter. Perception is also limited by location and point in time. We cannot personally detect Amazon rainforest destruction because it is occurring far away: distance is a perceptual barrier. The slow time course of most environmental changes is also a perceptual barrier: the human senses are good at picking up abrupt changes but very poor at perceiving slow, incremental change such as increase in traffic congestion, thickening smog, or dwindling species. There is also a "generational amnesia" component to this (Kahn, 2001): children today accept a degraded ecological system as "normal," whereas older generations see it in comparison to the less degraded ecology of their youth.

One powerful way to overcome perceptual limitations is to recreate the information missed by our senses with a vivid, concrete image.

Recommendations and examples:

- **Vivid, concrete images** are one powerful way to make invisible information visible. For example:
 - To overcome invisibility due to the abstract, dispersed nature of the issue: the photographic work of visual artist Chris Jordan vividly shows the volume and negative impacts of American consumption. http://www.chrisjordan.com/current_set2.php
 - To overcome invisibility due to distance: capture a compelling image of an issue that is happening far away. An example is this photograph of water samples collected from urban rivers and lakes in China. The extremely unnatural colors are shocking but what makes the image even more disturbing and effective is that there are so many different samples, each with a different, vibrant color: http://www.treehugger.com/files/2007/05/chinese_water_pictures.php
 - To overcome invisibility due to information beyond human sensory sensitivity: make CO₂, or any other invisible pollutant, vivid and visible with a real-world display such as a large, black cloud or balloon attached to the tailpipe of a car or SUV.
- **Action/animation**
 - The Black Balloon Commercial (Part I and Part II) is an excellent example of an animated vivid image of CO₂ emissions. (Part I: http://www.youtube.com/watch?v=6Eg_SEAnE-M, Part II: <http://www.youtube.com/watch?v=gX7yTJ9AccY&feature=related>, another version, with a baby: <http://www.saveenergy.vic.gov.au/getthefacts/whatisblackballoon.aspx>)

- Time lapse photos show startling changes over time that are otherwise difficult to perceive. On the Wired Magazine web site there are several time-lapse satellite videos, for example: Amazon deforestation, the disappearance of the Aral Sea, and the drying up of Lake Powell. (<http://www.wired.com/wiredscience/2009/05/earthobservatoryvideos/>)
- **Graphical displays**
 - The books of Edward Tufte, for example *The Visual Display of Quantitative Information*, are an excellent resource for help in designing powerful and effective visual depictions of otherwise abstract information.
 - EnergyGuide labels on appliances are one example of visually depicting energy savings over time.
- **Real-world demonstrations**
 - The campaign “Think Outside the Bottle” sponsors events called “The Tap Water Challenge,” where people take a blind-folded taste test to see if they can taste the difference between tap water versus bottled. It is a vivid, memorable, and convincing experience for most, to realize that tap water is as good as costly and unsustainable bottled water.
- **Words** can also create images.
 - Labels, such as a small sign on the garbage can that states “Landfill” to remind people that, though they no longer see it, their trash doesn’t just “go away.”
 - Another label example: “These come from trees” stickers on paper towel dispensers in public restrooms. The fact that paper towels require trees to be chopped down is invisible to people when they reach for a towel. The sticker reminds them—it makes the origins of the paper, the trees, visible. “These come from trees” is a “guerilla public service announcement” movement begun by Pete Kazanjy in Silicon Valley.
- Analogies make abstract numbers into something people can understand or visualize. For example, “Recycling just one plastic bottle saves enough energy to power a light bulb for 30 hours.” (from http://www.epa.qld.gov.au/environmental_management/waste/public_place_recycling/) or “An American taking a five-minute shower uses more water than the typical person living in a developing country uses in a whole day,” (from <http://water.org/waterpartners.aspx?pgID=916>).



Build feedback loops with informational or social feedback

Feedback is information that is given after a person (or group of people) has performed an action. The way feedback is delivered varies greatly, ranging from positive, personal, verbal information given immediately (e.g., “Hey, nice job! You turned off the lights when you left the room!”) to negative, impersonal, text-based information given after a delay (e.g., a household energy bill). According to psychological learning theory, feedback works because it creates cause-and-effect connections in the brain, which wants to avoid negative outcomes and seeks positive outcomes. If you receive positive feedback (a smile) for putting your plastic bottle in the recycling bin, your brain notices the reward and you will want to repeat the behavior in the future. Conversely, if you receive negative feedback (a dirty look) for putting a plastic bottle into the garbage bin (as opposed to in the recycling), the negative feedback is noted by your brain and this makes it less likely that you will aim for the garbage bin the next time.

Informational feedback

The impressive gas mileage obtained by Prius drivers is a great example of how feedback can impact behavior. Improved gas mileage is due only in part to technology. Yes, the hybrid technology is responsible for significant fuel savings, but better driving behavior, motivated by feedback, makes up the rest. The Prius dashboard contains a real-time display of gas mileage, allowing drivers to see their miles per hour drop precipitously each time they step hard on the accelerator. This ability to see the direct connection between driving behavior and mileage outcome, because of the feedback display on the dashboard, allows drivers to adjust their driving to avoid ruining their MPG. (Note: Some people, called “hypermilers” take extreme measures to maximize their fuel efficiency, aided by the real-time feedback display (for more information: <http://en.wikipedia.org/wiki/Hypermiler>).

Recommendations and examples:

- **Usage feedback.** The feedback available to Prius drivers falls into this category: information about how much fuel is being used displayed as miles per gallon.
- **Cost feedback.** Again, using the example of a Prius dashboard, the display could give feedback about the amount of money spent per mile (or hour) with current driving style. People receive both usage and cost information each month on their electricity bill.
- **Feedback about impact.** Information can also reflect the impact a particular behavior is having, such as number of pounds of CO₂ saved by a particular action or pennies/dollars that remain unspent. Impact can be positive (e.g., pounds of CO₂ emissions cut) or negative (e.g., amount of pollution emitted).
- **Comparative feedback.** Feedback is more meaningful when there is a baseline to which current behavior can be compared. Comparative feedback provides this baseline directly by showing people, for example, their current energy or water use compared to their use in the past. The most common type of comparative feedback has typically been historical, “one year ago....” However, increasingly researchers are finding that normative comparative feedback is quite effective for motivating sustainable behavior in certain circumstances. Normative comparative feedback (also discussed above: “Communicating normative information”) provides people with information about what their neighbors are doing, for example in the form of a graph displaying an individual’s electricity use (or water, or miles driven, etc.) compared to a group average (neighbors, community, similar-sized homes) (see Schultz, Nolan, Cialdini, Goldstein & Giskevicius, 2007). Comparative normative feedback can also be less specific, such as the statement “your neighbors are conserving more electricity than you are.” In any case, the individual sees how his or her behavior differs from the group norm. It is important to note that there is a caveat to this type of feedback. In one recent study, people who were given the feedback that their electricity use was above average cut their use, but people who were below average actually increased their use when given information that they were below the neighborhood average (this demonstrates the power of the social norm to influence behavior; people don’t want to be too different, no matter how different is defined). However, this was overcome with a simple “smiley face” drawn on the energy bill. The smiley face indicated social approval for lower energy consumption. People who received the smiley face continued to use less energy.
- Feedback effectiveness is increased when feedback is about something that people are concerned with. Someone who is not interested in reducing her carbon footprint is probably not going to be affected by feedback about how changing her light bulbs is reducing her carbon footprint. A recent study confirms this: people who value sustainability are much more likely to take steps to reduce their carbon emissions in response to feedback about their carbon footprint, whereas people who do not value sustainability do not take steps to reduce their carbon footprint after feedback (Brook & Crocker, 2008). The feedback may even influence them to behave in ways that increase their carbon footprint. The key, as always, is to know your audience and to tailor your feedback to things that people care about and are interested in. In other words, *frame* the feedback to be personally relevant. As just noted, a person who is not interested in reducing her carbon footprint is less likely to respond to information about how different behaviors (e.g., changing light bulbs, driving less, eating less meat)

impact her carbon footprint. Yet these behaviors also have financial, health, and other impacts and providing feedback along one or more of these dimensions may elicit a response.

- Be very cautious when giving negative feedback, particularly if the negative feedback might be interpreted as a personal attack. As the Positive Energy experience illustrates, people do not respond well to feedback that implies some sort of personal failure or inadequacy.
- Feedback effectiveness is increased when the information is easy to understand, accessible, interesting, and engaging. The Prius dashboard is again a good example: the feedback display is in the line of sight, dynamic, and easy to understand (a number that goes up or down according to current mileage, along with a graphical display of the same information).
- Studies show that feedback must be given fairly frequently (Fischer, 2008). Continuous feedback, as in the case of the Prius, is very effective. And, as predicted by learning theory, when the feedback goes away, the behavior change often reduces or stops (unless a solid habit has formed).
- Effectiveness of feedback is also influenced by the credibility and trustworthiness of its source. If the source of the feedback is considered biased or ill-informed, then the feedback will be ignored.
- Specific information about what people can do to improve their performance also makes feedback more useful and more likely to lead to a response. For instance, to help people use less energy, a utility bill with feedback could also include a list of effective ways to cut their energy needs (e.g., switch to CFLs, plug appliances into a power strip, etc.).
- Finally, feedback improves performance when people are working toward a specific goal. A study by Van Houwelingen and van Raaij (1989) examined goal-setting and feedback in cutting natural gas consumption. The goal for all participants was to use 10% less natural gas. Three different groups received one of three types of feedback, and all three types of feedback on gas use resulted in some gas savings. However, the group that saved the most (and exceeded the 10% goal) received cumulative daily feedback via an in-home monitoring system.

Social feedback

Information about social approval or disapproval is an important form of feedback (also discussed above: “Communicating injunctive norms”). When given feedback that a particular action is viewed negatively by many in the community, people are less likely to repeat the action. As mentioned above, social feedback can be as simple as a hand-written smiley face given along with comparative or other informational feedback (Schultz et al, 2007).

Recommendations and examples:

- The same general rules that are true for informational feedback also apply for social approval feedback (or feedback about *injunctive norms*): it is more effective when it is visible, engaging, and from a credible source. One likely difference (though this is a question awaiting empirical examination) is that social approval feedback needs an element of the personal. That is, in the example of the smiley face on the utility bill, it may be that the smiley face is effective when hand-written but ineffective when printed by an impersonal computer.

4. Foster mindfulness

Through evolution, our brains have evolved several important time- and energy-saving processes. Heuristic thinking is an example. Heuristics are thinking short-cuts, or rules-of-thumb. We use heuristic thinking anytime we rely on a simple cue or label to guide a decision without a deeper consideration of what the cue or label really means. For example, imagine a grocery shopper who sees a sticker on a product that says “all natural.” The phrase activates a heuristic or bias that “natural is good.” The grocery shopper may not take the time to further examine the product and the real meaning behind its claim of “all natural,” particularly if he or she is under time pressure or is multitasking.

Research by Amel, Manning, and Scott (2009) provides support for the idea that people who are in a more mindful state of awareness tend to act more sustainably. Thus, increasing mindfulness is likely to also increase sustainable behavior.

Engage thinking with something surprising

One way to get people's attention and prompt mindful processing is to surprise them with a startling or unexpected piece of information. Psychologists, particularly those interested in education and learning, have conducted many studies to investigate what makes a text or a message more likely to attract and keep people's attention and to encourage them to engage in deeper, deliberate processing.

One of the factors that seems to do this is novelty or surprise. New and unexpected information attracts attention and interest. A popular 2007 book, *Made to Stick*, by Chip and Dan Heath, suggests surprise as one of the things that makes an idea "sticky" or more likely to be remembered.

Recommendations and examples:

- Provide statistics or images of resource consumption patterns or lifestyles of people from various countries of the world. Resources such as the images of Chris Jordan (<http://www.chrisjordan.com/>), or the photos and books of Peter Menzel (*Hungry Planet* and *Material World*, see <http://www.menzelphoto.com/>).
- Most people are surprised when they learn that their TVs and computers still use energy when in standby mode. This information can be given in a vivid and surprising way. For example, place a picture of vampire next to appliances that should be unplugged or shut off using surge protectors instead of leaving on standby.

Encourage alignment with personal values

One of the side effects of our modern stressful and hurried lives is that we tend to lose track of the things that make living meaningful and significant, such as our connections to close friends and family or our desire to make a difference in the world. Rushing through our days on autopilot, not really thinking through the impacts of our decisions, we sometimes do things that we later realize are incompatible with our values. In the context of reframing environmental messages, Kaplan (2000) has suggested emphasizing deeper values and reminding people how sustainable actions (or sustainable living) can contribute to things like being needed by/connected to others, making a difference in the world, being competent, and creating a good life. At least two separate areas of research confirm this link between activated personal values and sustainable behavior, particularly when personal values are ecologically friendly. First of all, in a series of studies investigating the values and motivation, Verplanken and Holland (2002) found that people preferred ecologically friendly options if their personal environmental values had been primed. In a second set of studies, Vohs and colleagues (Schmeichel and Vohs, 2009) found that people who took a moment to reaffirm personal core values were better able to practice self-control in a consumer task compared to people who were not prompted to think about their values.

Recommendations and examples:

- Prompts, or small reminders, are one possible way to encourage people to think of their deeper values. For example, a group advocating for voluntary simplicity might create small see-through stickers that people could attach to their wallets or directly on their credit cards, stating "Is this purchase in line with my values and goals?"

Focus on improvement, not perfection

People frequently find themselves paralyzed by confusion: they want to do the "right" (i.e., sustainable) thing, but are not sure which of their options is the most sustainable. In a 2008 Roper Green Gauge poll, 23% of American consumers reported that they have "no way of knowing" if a product truly is green. The choices can be overwhelming: Cloth diapers vs. disposable? The local, non-organic lettuce raised hydroponically vs. the fair-trade, organic lettuce flown in from California? Change all light bulbs now, but create waste by throwing

away perfectly good light bulbs vs. change bulbs as they need to be replaced, but live with higher energy use due to inefficient bulbs?

Confusion is understandable. First of all, what little information is available about the impacts of different choices is incomplete and conflicting: one report says that recycling saves energy, another report talks about the enormous amount of energy “wasted” to recycle plastic. Second, sometimes the most sustainable option in terms of one aspect, such as energy (e.g., change all light bulbs), has unsustainable impacts elsewhere, such as waste generation (i.e., throwing away perfectly good bulbs). Third, in many cases, the “best” behavior depends on where you are and other circumstantial details. For example, disposable diapers may be a better choice if you live in a region prone to water shortages whereas cloth diapers are preferable in places where water is less of an issue but there are landfill/incinerator concerns. Another example of how impact varies with the situation is electric tankless water heaters, which may be the best option where the energy is supplied by a solar PV panel but not if it comes from a coal-burning power generation station.

There are numerous lists out there of “50 things you can do to save the planet,” but these lists aren’t detailed enough to truly help make real-world choices, and besides, few people carry these lists with them as they navigate the minutiae of daily life.

Despite this, people can improve the sustainability of their daily life decisions even if they don’t know the exact actions they “should” be taking. What they need to do is ask themselves some straightforward, basic questions about the broader impacts of their choices. (Another recommendation to overcome confusion is described later: “Communicate effective actions.”)

Recommendations and examples:

- Instead of giving people a list of behaviors that they should be doing, find ways to encourage them to ask themselves questions:
 - Do I really need this?
 - Can I borrow this instead, or find it used?
 - How far away has it come from?
 - Could this be done/created with less waste?
 - Is there a lower energy way of doing this?
 - Could this item and/or its packaging be recycled?
- Create a checklist of these sorts of big-picture questions that people can carry with them, for example on a pad of paper for a grocery list or a credit-card-sized format to keep in one’s wallet.

5. Create opportunities for competence, skills, and knowledge

What are the sources of motivation that cause someone to try a new behavior? According to self-determination theory (Ryan & Deci, 2000), people are drawn to activities where they feel autonomous and competent, and that give them a sense of relatedness to other humans. Self-determination theory suggests that people need these three things (competence, autonomy, and relatedness) for well-being and healthy functioning. Activities that threaten these basic needs tend to be avoided.

In order to feel competent and autonomous in their attempts to live more sustainably, people need help, they need reasonable choices, and they need information that helps them learn and helps them choose. Actions such as composting, taking the bus, or planting a vegetable garden are fairly complex, multi-step behaviors that must be learned and practiced. People need opportunities to familiarize themselves with the actions, to learn about them in a non-threatening environment, before they will comfortably choose to regularly engage in them.

Give task-specific information

Is knowledge important in motivating a sustainable action? It depends on the *type* of knowledge. A study by Frick, Kaiser, and Wilson (2004) found that a basic knowledge of ecological systems has only an indirect influence on sustainable actions. A more direct and powerful predictor of sustainable behavior is whether a

person holds the “how-to” knowledge necessary to carry out the behavior. Thus, in addition to providing opportunities to try out a behavior, it is also helpful and important to make available clear, task-specific directions.

Recommendations and examples:

- Create “how-to” resources: a fact sheet with step-by-step directions, illustrated instructions, a video.

Provide hands-on opportunities to try new behaviors

Many sustainable behaviors are brand new to people. If you have never taken the bus before, or shopped at the bulk-bin at the grocery store or co-op, it can be quite a daunting and pride-threatening experience when you try it for the first time. You don’t know the unwritten rules of the behavior or the social norms surrounding it. You don’t know what equipment you might need, how it works, or where to get it. When faced with all of these unknowns and the potential embarrassment or stress associated with the experience, a lot of people choose to simply avoid the new behavior.

To overcome these threats to people’s competence, people need opportunities to safely gain the knowledge and skill they need. What is required is a chance to try something out in a supportive, no-stress, non-threatening environment. The answer: hands-on opportunities to practice a new behavior.

Recommendations and examples:

- Hold a formal or informal neighborhood gathering, or encourage a local environmental nonprofit to sponsor a demonstration day. Give people a chance to try things out. Let them try their hands at rotating a compost bin, hold worms and feel the rich soil from a worm bin, install a CFL or a faucet aerator, etc.
- A fabulous example of an effective hands-on opportunity is the MetroTransit bus with the bike rack on the front that is parked at the Minnesota State Fair Eco Experience building. There is a bike parked near the bus so that people can see how it works to lift a bike onto the front bike rack on the bus. This is a safe, non-threatening environment to try this behavior and gain competence and mastery: there is no pressure from a bus full of people watching impatiently, no bus driver anxious to drive away.
- Create demonstrations on video that run through the steps of things like composting, weather-stripping windows, lifting the bike onto the rack on the front of the bus.
- Make “experts” available (online, at an event, etc.) to answer questions or to run through the steps with someone new to a behavior.
- In situations where it is likely that there will be beginners to an action (e.g., on the community pick-up day for pre-ordered compost bins or home weatherization kits), have several people on hand to answer questions as well as a “try it out” demonstration table.

Communicate effective actions

Knowledge of what actions are effective in addressing environmental problems is also an important predictor of sustainable action (Frick, Kaiser, & Wilson, 2004). People are more likely to choose actions that they believe are effective (Manning, Amel, Scott, 2007).

As discussed above (“Focus on improvement, not perfection”), information on effectiveness is often unavailable, conflicting, or unclear. When it comes to household energy efficiency, Gardner and Stern (2008) note: “When strategies are proposed for households, they often appear in laundry list format, giving little or no priority to effectiveness.”

One result is that people with intentions to act more sustainably are taking action, but their efforts could be focused on something with much more impact. For example, at least one study has found that people greatly overestimate the effectiveness of recycling, while they underestimate the negative impact of behaviors such as meat eating and air travel (Manning, Amel, Scott, Taknint, Balzer, Cupara, & Condon, 2008). To make matters worse, people also show a tendency toward a “one action bias,” the feeling that if they have taken one sustainable action, they have done their fair share and do not need to do anymore (Weber, 1997, as described

in Weber, 2006). If the one action people are taking is to recycle (chosen in part because they think it is highly effective), they are missing out on considerable positive sustainability impact from the actions they are not taking.

People respond to information about what is effective, but there are few sources for this information. Thus, providing people with an indication of the effectiveness of different sustainable actions will help them to maximize their positive impact. It will also reinforce people's sense of autonomy because it gives them the power to choose particular actions based on their effectiveness.

Recommendations and examples:

- Provide information about relative effectiveness of various actions. One good source of this information, with respect to energy savings, is the following article by Gardner and Stern, published in *Environment*: <http://www.environmentmagazine.org/Archives/Back%20Issues/September-October%202008/gardner-stern-full.html>

6. Make change a byproduct of other events

Human beings are habit-prone. A well-practiced task or routine quickly becomes second nature and we no longer have to pay attention in order to carry it out. Like automaticity and heuristic thinking (discussed above) forming habits is helpful in that it allows us to concentrate our cognitive resources on things that require more sustained attention. The downside to habitual behavior is that once a routine has become a habit, it is difficult to change how it is carried out (Neal, Wood & Quinn, 2006). We complete many daily actions habitually and without thinking; at least one study established that participants performed nearly 50% of their daily behaviors without thinking about what they were doing (Wood, Quinn, & Kashy, 2002). Once a habit is formed, the steps are so well-practiced that we rarely consciously process exactly how to get ourselves to work and back, dispose of wastes, use technology (like computers), or consume our food. In fact, Wood and colleagues (2002) found that participants' thoughts strayed away from what they were doing as much as 60% of the time that they were engaging in a habit. Unfortunately, many habits are less sustainable than they could be (e.g., brushing teeth with the water running, driving alone to work, never bringing a reusable cup to the coffee shop) and they are likely to stay that way unless we exert substantial effort to change them (Holland, Aarts, & Langendam, 2006). It is not easy to change a habit, as anyone who has made (and probably quickly broken) a New Year's resolution can attest. We are particularly uncomfortable about a change in habits when that change has been forced upon us rather than a change that we choose (it threatens our autonomy).

Make the sustainable choice opt-out rather than opt-in

It is often possible to restructure the situation so that mindful processing isn't really necessary for a person to make a sustainable choice. Instead, the context or environment is designed so that the automatic process that is cued results in a more sustainable decision. Thaler and Sunstein (2008) describe a number of scenarios where the decision context "nudges" people toward better choices. For example, people are much more likely to participate in a company-sponsored savings plan if their enrollment in the plan is automatic rather than voluntary. In the "opt-in" situation (the way most plans are currently structured), people have to take the extra step to sign up for the plan. Many don't bother to sign up, and they thus miss out on the financial benefit of their company's matching contributions. When the enrollment context is restructured to an "opt-out" situation (employees are automatically enrolled and thus have to take the extra step of filling out a form in order to not participate), significantly more people participate. Most sustainable actions are voluntary, opt-in actions (e.g., you have to go out of your way to choose the "Windsource" option on your Xcel bill if you want to buy renewable energy). Many situations can be restructured so that the sustainable action is given as the default. People are welcome to change their choice; their autonomy is in no way threatened. However, most people will not bother to make the small effort needed to switch from the default option to something else.

Recommendations and examples:

- When offering people options, make the sustainable choice the default. For example, one event organizer reported that she made the default meal option vegetarian at all her company-sponsored events. It was possible for people to request a non-vegetarian meal, but few people actually went to the trouble.

- If it isn't possible to make the sustainable option the default, at least make it the first and most obvious choice on the list. For example, when sending a letter or email giving people directions to a location, provide the public transportation (or bicycle or walking) directions *first*, followed by other options (such as by car).

Find the moments of flux

Intentionally breaking a habit can be a very hard thing to do. Habits form with behaviors that have been repeated to the point where the brain no longer needs to make conscious effort to enact them. The context in which a habitual behavior occurs can be enough to trigger the habit, and, if the context doesn't change, then the habit tends to stay. However, a relatively simple change in life circumstances can be enough to disrupt a habit (Wood, Witt, & Tam, 2005; Verplanken & Wood, 2006). Fortunately, there are many points in life when circumstances are disrupted for perfectly normal reasons: change points. Research shows that people are most able to handle new habits (sustainable ones!) when old habits are changing anyway. It is hard to make a change when the circumstances of everyday life remain the same. But when everything in life is being readjusted, due to a move, a marriage or divorce, a new job, etc., then forming a new habit occurs naturally. These change points are a good time to get people helpful resources/information about sustainable options—bus routes, renewable electricity, Community Supported Agriculture memberships, etc. Having a baby is a particularly powerful life-changing point, finds Frameworks Institute (How to talk food systems, 2006). New parents are especially open to exploring sustainable behaviors.

In addition, the structure of our society encourages people to form unsustainable habits. The things that are most easy and convenient, and often with the most socially supported infrastructure, are generally not the most sustainable daily behavior choices (e.g., convenience foods, driving). Therefore, people need extra support when they are in the process of breaking an old, unsustainable habit, and forming a new, sustainable, and potentially more difficult behavior pattern.

Recommendations and examples:

- Make a list of the change points that people in your target community are likely to experience. Some possibilities: moving, job change, marriage, divorce, becoming a parent, starting a new school, remodeling a home, changing vehicles. Examine the change points and think about the kinds of resources that people would find useful while undergoing these changes. Intervene at these change points to make sustainable behavior a new easy habit. By providing information and resources at natural change points, you give people the support and information they need to try out sustainable options and perhaps form a new, sustainable habit.

For example:

- Work with neighborhood groups or real estate offices to create “welcome packages” to people moving to a new area. These packets could contain free bus passes and public transit/bicycle maps, information about carpooling, coupons for sustainable local businesses and products, etc.
- Collaborate with area businesses and nonprofits to provide sustainability resource packets for their new employees.
- Provide resources to new parents via parenting magazines, programs such as ECFE (Early Childhood Family Education), pediatrician practices, or hospital birth units and OB/GYN offices. New parents are an especially receptive group for integrating sustainability into their lives. The birth or adoption of a child seems to create a new sense of responsibility and awareness of the impacts that currently unsustainable lifestyles will have on the health and welfare of future generations.

7. Balance urgency with realistic hope

How should serious environmental issues be presented? On the one hand, it is important that we understand the risks we are facing, and that we see these risks as potentially affecting us personally. On the other hand, if all we hear is doom and gloom, our psychological defense mechanisms are likely to shut down any possibility of action that might help address the problem.

In studies of responses to a health threat, fear and a sense of vulnerability are important predictors of behavior intention (Rogers, 1983; Witte, 1992; de Hoog, Stroebe, & de Wit, 2007). However, an equally important predictor of behavior in these studies is people's sense of efficacy: there is a course of action, such as a successful treatment, that addresses the threat (response efficacy), and they feel capable of taking that action (self efficacy). When people who are vulnerable to a health threat also have a high sense of efficacy, they are likely to cope with their fear by taking action. If, on the other hand, they feel low efficacy, they are more likely to engage in what is called emotion-focused coping, an attempt to control the uncomfortable emotion (fear) through denial, apathy, resignation, repression, etc. (Folkman & Lazarus, 1990). Obviously, taking action is the more adaptive approach and more likely to lead to good outcome. However, when people either know of no hopeful solution (e.g., an extremely bleak diagnosis), or they are incapable of taking the actions necessary (e.g., because of money, addiction, physical limitations), dampening their fear and worry through denial (or any other emotion-focused coping mechanism) gives them relief.

Little research has been done to examine whether these findings in the health literature also hold true in the realm of environmental threats. We do know that environmental issues are typically presented as serious threats, and many people are very worried about them. We also know that too much fear is, at the very least, ineffective if not counterproductive. An analysis by Pelletier and Sharp (2008) suggests that fear-inducing messages are most effective for making people aware of an issue and encouraging them to take it seriously. However, once people recognize the problem, further fear-inducing information is ineffective at motivating adaptive action. And Fredrickson (1998) argues that negative emotions such as fear limit a person's immediate "thought-action repertoire" to fight-or-flight-fulfilling responses, making it less likely that a long-term sustainable action could be considered as an appropriate response. Positive emotions, on the other hand, tend to open up the field of possible actions and allow people to generate creative, novel responses.

Thus, sustainability campaigns should encourage hope and positive emotions. They should focus on increasing people's response efficacy (i.e., "There are effective solutions to these serious environmental threats.") and their sense of personal efficacy (i.e., "I can carry out the actions necessary to avoid and/or address these threats.") (See Moser, 2007, for a further discussion.)

Have a positive vision that emphasizes solutions

Just as people who have been informed of a serious health threat are relieved to hear of a hopeful treatment, those who worry about environmental issues are relieved to hear that there are promising solutions available. There is a positive world worth working toward: cleaner energy, greener food, more efficient and comfortable transportation options, just and vibrant communities. Yet many discussions of environmental issues forget to mention that there could, in fact, be a happy outcome. This leaves people in a negative emotional state, and thus less likely to feel charged to take action (Fredrickson, 1998; Moser, 2007).

A positive vision offers people a goal to work toward. Having an achievable goal gives people a motivational lift (see "Set challenging but attainable goals"). Without a goal, people lack a focal point for their efforts. However, it is important that the vision, the goal, be seen as realistic. Expectancy that a goal will be reached encourages further efforts.

One of the problems with communication of a positive environmental vision is a lack of connection between an overall society-wide (or global) goal, and the actions that one person can take in day-to-day life. Even the most extreme individual action has negligible impact on global problems (e.g., one person completely giving up all fossil fuels makes hardly a dent in U.S. fossil fuel consumption), and the types of actions that people are best able to take are clearly incommensurate with the magnitude of the problems (e.g., change your light bulbs to stop climate change?). Personal action thus may seem rather futile, unless the action is connected to broader solutions and higher impact goals. People conceptualize goals in a hierarchy, with abstract goals (e.g., live more sustainably) consisting of more concrete goals at a lower level in the hierarchy (e.g., drive less) (Carver

& Scheier, 2001; Rasmussen, Wrosch, Scheier, & Carver, 2006). People are more likely to feel empowered to take action when they can see that their personal, workplace, or community goals and actions connect to this system or hierarchy of higher level and higher impact goals (e.g., a community or small group effort to be carbon neutral, or produce zero waste).

Recommendations and examples:

- Talk about the future that we are working toward, rather than the threats that we are trying to avoid. Articulate the many positive things that are possible and well-worth working toward.
- Create a visual image (perhaps a tree chart or diagram) of how people's individual efforts tie into larger efforts (Eco-team goals? Community efforts? Neighborhood goals?), which in turn fall nicely under good things that are happening and making a difference at a state or regional level.

Show people they're not alone

"Broader solutions" are by definition those that many people are engaged in. Thus, provide people with the evidence that many people are taking action. Help people feel part of a greater movement. They may still feel that their own personal positive impact is minimal, but when taken together with all the others who are taking action, the cumulative impact is significant.

Recommendations and examples:

- Show images of many faces carrying out the sustainable action you want to promote. Give numbers. Tell people's stories.
- Show people how their impact is multiplied by all the other people who are taking similar sustainable steps in their lives. For example: how many trees can 10 people plant compared to one person acting alone? Wangari Maathai's story is a great source of inspiration of how a single person's vision can blossom into radical environmental healing when she is joined, first by a few, and then by many. (http://nobelprize.org/nobel_prizes/peace/laureates/2004/maathai-bio.html)
- If possible, create events or other opportunities for people to see, in person, the huge numbers of people who are taking sustainable steps in their lives. Document the numbers at these events. For example, take photos and post them or display them on a digital screen. This creates not only a sense of community and additive positive impact, but also contributes to a social norm.
- Connect people to efforts already underway in existing social networks. For example, Facebook now offers a link to distributed computing projects (where many individuals donate their computers' spare processing power and give researchers greatly expanded processing capacity) such as Climateprediction.net, a project to produce climate predictions to the year 2080 and test new climate models.

Redefine the scale

Emphasizing "small wins" can aid in solving seemingly intractable social problems (Weick, 1984; Winter & Koger, 2004). Weick proposes that the overwhelming scale of many social problems raises people's stress arousal to counterproductively high levels. Such high arousal discourages appropriate, well-thought-out responses. When, however, the large problems are redefined into smaller, more manageable pieces, they are less likely to evoke high arousal and, without high stress arousal, people are better able to consider and implement an effective solution (Weick, 1984). Recently, Winter and Koger have suggested that the strategy of small wins is applicable when dealing with an issue such as climate change, where the overwhelming scale and lack of public response can leave one feeling powerless and discouraged (Winter & Koger, 2004). The results of recent research endorse Winter and Koger's suggestion. Reframing the carbon reduction goal from "80%" to "2% per year" effectively redefines the scale of the problem and creates manageable ("2%") pieces (Manning, Amel, Forsman, & Scott, in press). People find the rescaled goal significantly more motivating.

Recommendations and examples:

- Think about the different ways that your issue can be broken down into smaller, manageable pieces. In Weick's terms, look for "controllable opportunities of modest size that produce visible results" (pg. 40). Winter and Koger provide the example of Alcoholics Anonymous, which rescales the problem of giving up an addiction into "just for today."

Set challenging but attainable goals

People are more likely to succeed in taking action when they have a specific goal. Goals are motivating: they direct attention, help maintain momentum, and guide toward successful strategies (Locke, 2001; Locke and Latham, 1990). Research also shows that the most motivating goals have certain characteristics: they are specific and challenging (Locke and Latham, 1990; 2002; 2006). Specific goals are those that are stated in concrete terms, for example "improve performance by 20%" (Bar-Eli, Tenenbaum, et al, 1997) or are stated behaviorally, such as "bike 20 miles per day." These types of goal statements have been found to result in higher achievement than vague goal statements such as "do your best" (Locke and Latham, 2002).

To be considered challenging, a goal must be relatively difficult but still realistically attainable. If a goal is too easy, then people are not motivated by it (e.g., change a light bulb?). Similarly, a goal that is clearly unrealistic and overly difficult causes people to give up and not even take the first steps toward achievement (e.g., go completely carbon neutral?) (Locke and Latham, 1990). Thus the best goals are specific, realistic, and challenging and can be broken down into specific behavioral steps. This type of goal results in the highest levels of motivation and achievement.

Only a few studies have examined goal setting and sustainable behavior. One set of experiments examined goal setting and energy use. These studies show that having a goal does tend to result in energy savings (Abrahamse, Steg, Vlek, Rothengatter, 2007). Challenging goals are, as expected, more effective in bringing about energy savings: Becker (1978) compared two different energy-savings goal conditions, a group that aimed for a 2% savings (easy goal) and a group that aimed for a 20% savings (challenging goal). The challenging goal resulted in a 15% savings overall whereas the easy goal group saved less than 6%.

Another study looked at people's responses to two different goal statements about cutting carbon emissions. Manning, Amel, Forsman, and Scott (in press) found that people were significantly more likely to say they could "be a part of the solution" when the goal was stated as "cut carbon 2% per year until the year 2050" as opposed to "cut carbon 80% by 2050." Both result in approximately the same emissions cuts, however, the "2% per year" goal is perceived as challenging but attainable. The 80% goal is not easily broken down into achievable sub-goals and is thus perceived as impossible.

A number of researchers have found that goal setting alone does not have as much influence as when goal setting is combined with feedback (Abrahamse, Steg, Vlek, Rothengatter, 2005). A study by Van Houwelingen and van Raaij (1989) examined goal-setting and feedback in cutting natural gas consumption and found that cumulative daily feedback about progress toward the goal was most effective in prompting reductions in use.

Recommendations and examples:

- The most motivating goals are those that are challenging but realistic. Thus you must investigate what your audience perceives as realistic and what they find challenging and help define goals with these in mind.
- Goal setting tends to be more effective when the goal is one that people are interested in achieving, as opposed to a goal set by a third party such as the government, a utility, or some other distant entity. As much as possible, involve people in the process of setting goals.
- Goal setting must be implemented with some sort of feedback system so that people can gauge their progress toward the goal (See "Build feedback loops with social or informational feedback").

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