

HOUSEHOLD BEHAVIOR CHANGE FOR CLIMATE CHANGE RESPONSE

An Integral Scan

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ABSTRACT The question of how to successfully facilitate the changes needed to avoid dangerous climate change has become a critical one for researchers and practitioners. In this article, I use Integral Theory to guide a scan of one important element of climate change response—household behavior change. The Integral scan is the first step in a long-term research project to develop an integral approach to household behavior change. It comprises an initial exploration of the perspectives needed to design behavior change strategies and suggests areas that will require further research as a more comprehensive map of initiatives emerges. I sketch out the process and principles of an integral approach to household behavior change initiatives, and on designing translative and transformative approaches.

KEY WORDS: behavior change; climate change; household; Integral Theory

It is increasingly clear that climate change poses a serious threat to human life, many of the species and ecosystems that we value and depend on, and, ultimately, the viability of human civilization in its current form. Although some scientists remain skeptical (e.g., Plimer, 2009), the overwhelming majority of credible climate scientists support the view that humans are changing Earth's climate and that these changes pose a serious threat to our way of life (IPCC, 2007; Richardson et al., 2009; Steffen, 2009). The Intergovernmental Panel on Climate Change (IPCC) concludes that we must reduce global greenhouse gas emissions by 50% to 85% between 2000 and 2050 to have any chance of limiting a future temperature rise of two degrees centigrade—a threshold beyond which climate change impacts would rapidly escalate (IPCC, 2007, p. 67). Emission reductions of this magnitude require an economic transformation as profound as the Industrial Revolution, but in one-third of the time (Beinhocker et al., 2008). Some scientists argue that the scale of the required transformation is even greater and that we must in fact reduce greenhouse gas emissions to less than zero to “preserve a planet similar to that on which civilization developed and to which life on Earth is adapted” (Hansen et al., 2008, p. 217).

Faced with this immense challenge, numerous people and organizations around the world are working across multiple scales to change the practices, institutions, systems, and beliefs that contribute to greenhouse gas emissions and climate change. Despite their dedicated efforts, global greenhouse gas emissions continue to accelerate and the current and projected impacts of climate change are becoming more severe (IPCC, 2007). Consequently, the question of how to successfully facilitate the civilizational changes needed to avoid dangerous climate change has become a critical one for researchers and practitioners (e.g., Moser & Dilling, 2007a). Integral The-

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ory has important contributions to make here, having already proven its worth as a framework for understanding current responses to climate change and designing more effective responses (O'Brien, 2009; Riedy, 2007).

In this article, I apply the Integral framework to the specific question of how to facilitate a more effective response to climate change at the household scale. While an effective response clearly requires change at all spatial scales and by all types of actors, I am particularly interested in change involving individuals and small groups at the household and community scale. Ultimately, it is the way we live our everyday lives that creates climate change, and changes in individual behavior will be a crucial part of a successful response to climate change. I am interested in exploring the diverse motivations, drivers, and triggers for behavior change from an integral perspective.

There is an extensive literature on the promotion and establishment of pro-environmental behaviors at the individual, household, and community scale (e.g., Crompton, 2008; DEFRA, 2008; Lucas et al., 2008; Staats et al., 2004; Stern, 2000), with some of that literature focusing particularly on climate change (e.g., Moser & Dilling, 2007a). There is also a diverse community of change agents and practitioners with practical experience in facilitating behavior change that is not always documented in the literature. The Integral framework offers a way of mapping and making sense of this body of theory and practice. The scan presented here is intended as a first step in this sense-making process and initiates a longer-term research project with the following objectives:

- Identify domains or perspectives that are currently neglected in theorizing, designing, and implementing behavior change initiatives
- Use the Integral model to suggest ways to connect and integrate complementary behavior change initiatives that could be more effective in combination
- Draw on the Integral framework to develop, adapt, or design more effective behavior change strategies

I define a *behavior change initiative* as a coordinated attempt to alter practices with a specific objective in mind (i.e., reducing greenhouse gas emissions). A behavior change initiative can be self-generated by a group that is trying to change, externally generated by a change agent that is trying to encourage a group to change, or collaboratively generated through a partnership between a *change agent* and a particular group. A change agent is someone who is skilled at promoting ideas and encouraging people to try or adopt them (AtKisson, 2008). My motivation in undertaking this research is to empower communities and the change agents that work with them to make a transition from carbon-intensive to low-carbon social practices and behaviors. To keep the scope of the research manageable, my current focus is primarily on initiatives that seek to change the way people use energy as a way of reducing greenhouse gas emissions.

The Integral scan covers quadrants, levels, lines, states, and types, but is not intended to do so in a comprehensive way. Rather, it offers an initial exploration of the perspectives that need to be taken into account in designing behavior change strategies and suggests areas that will require further research as a more comprehensive map of initiatives emerges. It begins to sketch out an integral process for designing behavior change strategies.

Quadrant Scan: What are we Trying to Change?

Susanne Moser and Lisa Dilling (2007b) argue:

...[F]or communication to be effective (i.e., to facilitate a desired social change), it must accomplish two things: sufficiently *elevate and maintain the motivation* to change a practice or policy and at the same time *contribute to lowering the barriers* to doing so. [emphasis in original] (p. 494)

Using the four quadrants, we can provide even greater clarity: to establish a desired set of behaviors (Upper-Right [UR] quadrant), a behavior change initiative must sufficiently elevate and maintain the individual motivation to carry out those behaviors (Upper-Left [UL] quadrant) while providing supportive systems and institutions (Lower-Right [LR] quadrant) and cultural validation, support, and respect (Lower-Left [LL] quadrant). I will further develop this quadrant scan below, giving examples of behavior change initiatives that have a particular focus on each quadrant and identifying barriers that are particularly apparent from each quadrant perspective.

Upper-Right (Behavioral) Quadrant

Observation of human behavior from an UR perspective is a logical starting point for programs that seek to change behavior. Community-based social marketing (McKenzie-Mohr & Smith, 1999) is one approach to behavior change that makes this perspective explicit. In a community-based social marketing (CBSM) approach, the first step is for the practitioner to identify the behaviors that he or she wants to put in place and the existing behaviors that currently compete with these desirable behaviors. E. Scott Geller (2002) also makes the study of observable behavior his first principle for behavior change programs.

In the specific case of greenhouse gas emissions from household energy use, change agents need to start with an understanding of which behaviors are the most greenhouse-intensive, making them the highest priority for change. The development of a household greenhouse gas inventory, or “carbon footprint,” allows identification of the most greenhouse-intensive behaviors in a particular household. Ideally, a carbon footprint should be personalized or at least specific to the target group for the initiative, so that it accurately represents actual behaviors rather than projecting average behaviors onto a group that may not have average characteristics.

The scope of a carbon footprint, and where it draws the boundaries of responsibility, determines the set of behaviors that become targets for change. This is best illustrated through an example: Australia’s National Greenhouse Accounts (DCC 2008) attribute responsibility for emissions to economic sectors that either directly generated those emissions (e.g., through fuel combustion) or indirectly generated those emissions through consumption of electricity. On this basis, the residential sector is responsible for only 18.2% of total emissions, with water heating, space heating and cooling, and refrigeration identified as the most greenhouse-intensive behaviors and priorities for change (DCC, 2008). This type of carbon footprint only empowers households to act on emissions directly associated with their own energy use.

An alternative approach is to also allocate indirect emissions associated with consumption of goods and services to households, as it is ultimately household demand that is responsible for these emissions (Dey et

al., 2007). This approach gives very different results; emissions from direct energy use are found to account for less than one-third of a household's total contribution to climate change. Almost 30% of a household's emissions are associated with purchase of goods and services like clothing and furniture, another 28% with food consumption, and almost 12% with construction and renovations (ACF & ISA, 2007). By widening the boundary of responsibility incorporated into the carbon footprint, this approach identifies new priority behaviors for change, including purchasing patterns and dietary habits. This more comprehensive form of carbon footprinting is more valuable for design of behavior change initiatives because it provides a more realistic picture of the influence that households can have over greenhouse gas emissions, even beyond their own boundaries.

As noted above, it is not enough to identify problematic behaviors; we also need to have a clear vision of the behaviors that we want to promote in their place. In a community-based social marketing approach to behavior change, these desired behaviors are termed "target behaviors" and they are identified and prioritized based on their potential to bring about the desired change (e.g., reduction in greenhouse gas emissions) and the feasibility of their establishment (i.e., the ease with which barriers to their adoption can be overcome) (McKenzie-Mohr & Smith, 1999). In the case of greenhouse gas emissions from household energy use, target behaviors can be categorized as follows:

- Behaviors that reduce demand for energy services, such as taking shorter showers or turning lights off when not in use
- Behaviors that improve energy efficiency, such as purchase of energy-efficient appliances
- Behaviors that reduce the greenhouse intensity of consumed energy, such as installation of solar water heating or purchase of electricity from renewable sources
- Offsetting behaviors (i.e., purchase of carbon credits to reduce the net carbon footprint)
- Influencing behaviors (i.e., behaviors that influence the likelihood of other households reducing their greenhouse gas emissions from energy use, including conversations with peers about climate change and political activism)

Looking beyond the specific focus on household energy use, a change agent might also target household consumption patterns, purchasing choices, voting choice, and willingness to accept regulatory measures that will reduce emissions, such as emissions trading schemes. Paul Stern (2000) provides a broader categorization of environmentally significant behaviors as environmental activism, non-activist public sphere behaviors (e.g., signing petitions, policy support), private-sphere environmentalism (e.g., consumer purchase behaviors, maintenance of household equipment), and other behaviors (e.g., influencing organizational actions).

An UR quadrant perspective makes additional contributions to the design of behavioral change initiatives. It reminds us that repeated behavior becomes habitual and more difficult to change (IPCC, 2001, p. 368) and that our everyday, inconspicuous behaviors and habits are a central part of the problem (Shove, 2003). It also encourages us to consider human biology and its relevance to behavior change. For example, some behaviors (such as walking and cycling instead of driving) are beneficial to health and this can make them more attrac-

tive. Finally, a behavioral perspective allows us to evaluate the success of behavior change initiatives, as it is ultimately the extent to which new desired behaviors are observed that determines success. However, in the end, a behavioral perspective is partial because it fails to consider what motivates, supports, or hinders behavior.

Lower-Right (Systemic) Quadrant

A LR quadrant perspective reminds us that we are all directly involved in climate change. We are part of the techno-economic system that generates greenhouse gas emissions and our actions within that system can contribute to climate change or help mitigate its progression. We are also part of the ecosystems that are affected by climate change and we can directly experience climate change through our participation in those ecosystems. In fact, humans are embedded in many types of systems, and when designing behavior change initiatives, we need to recognize that desirable behaviors may be constrained or facilitated by those systems. Behavior change initiatives need to change systems to remove barriers to, and provide support for, desired behaviors (Geller, 2002).

Where a behavioral perspective allowed us to identify categories of desired behavior, a systems perspective allows us to prioritize those categories of behavior according to their transformative contribution within the technological system. Thus behaviors that reduce demand for energy are preferable to behaviors that change the way energy is supplied because a reduction in demand will reduce the necessary scale of energy infrastructure and the resources required to construct that infrastructure. Moreover, changes in the way energy is supplied are preferable to offsetting emissions, as offsetting does nothing to transform the underlying technological system that generates greenhouse gas emissions. This perspective allows construction of a hierarchy of desired behaviors.

To adopt these desired behaviors, people need access to technological (and other) innovations that deliver the energy services they desire at lower greenhouse intensity. Innovations, such as solar hot water systems or efficient refrigerators, are taken up by households at varying rates. The theory of diffusion of innovations (Rogers, 2003) identifies a general process through which such innovations are taken up in society. In this theory, diffusion is defined as “the process by which an innovation is communicated through certain channels over time among the members of a social system” (Rogers, 2003, p. 11). The adoption of innovations tends to follow an S-shaped curve, with initial slow uptake only by innovators and early adopters, then much greater and more rapid uptake by the early majority and late majority, followed by slow uptake by laggards (Rogers, 2003, p. 22).¹ Understanding this process can be useful when designing behavior change initiatives, as effective strategies will depend on the stage of uptake of the innovation and the audience of interest. Strategies to encourage initial uptake of an innovation by early adopters will be very different to strategies that seek to accelerate the diffusion of a more-established innovation into the mainstream.

Technology can play many other roles in behavior change initiatives. Information and communication technologies provide people with feedback about their behaviors and their impacts that can lead to changes in behavior by allowing households to associate outcomes, such as energy savings, with particular behaviors (Abrahamse et al., 2005). For example, smart meters that record electricity consumption every half hour can provide householders with almost instantaneous feedback on their electricity consumption patterns via in-home displays or websites. Rapid and frequent feedback is crucial to allow residents to identify increases in

their energy use quickly enough to change their behavior (Abrahamse et al., 2005; Geller, 2002). Traditional metering and billing systems do not provide feedback until weeks or months after the behavior occurred, when it is too late to effect change. Carbon footprinting, discussed above, is another form of feedback and there are many web-based tools available to help people estimate their carbon footprint.

Of course, people may choose not to act on feedback they receive. Recognizing this, other technological approaches seek to channel behavior in a particular direction or even restrict the behaviors that are possible. One approach is to use persuasive technology, which is defined as “any interactive computing system designed to change people’s attitudes or behaviors” (Fogg, 2003, p. 1). A well-known example in Australia is the community advocacy organization GetUp (www.getup.org.au), which uses its website and e-mail campaigns to persuade Australians to take political action on issues like climate change. Another approach is to design out the need for human involvement at the household scale, so that particular carbon-intensive behaviors become impossible. Examples include automated lighting controls that switch off lights when they are not needed and remote switching of air-conditioners by electricity distributors to manage peak electrical demand.

Citizens are also embedded in systems of information provision, communication, and education, which are increasingly facilitated by technology. We now have access to more information than ever before about the impact of our behaviors. Many behavior change initiatives are designed as if provision of information, education, and knowledge will be sufficient to change behavior. In fact, while information about how to behave is necessary for behavior change, it is certainly not sufficient, as it does not provide motivation or remove other barriers (Abrahamse et al., 2005; Chess & Johnson, 2007). Nevertheless, well-designed information and education programs are an important part of behavior change initiatives alongside other actions. According to Geller (2002), an initial “instructional intervention” in the form of education, training, or feedback is usually needed to activate a particular behavior, although different interventions will be necessary to sustain that behavior over time. Tailored information, delivered through home energy audits, for example, appears to be more successful in driving behavior change than general information (Abrahamse et al., 2005; Geller, 2002).

From an economic perspective, the relative cost of a behavior is a critical determinant of its likelihood of adoption. Neoclassical economic theory contends that a rational consumer will adopt the behaviors that maximize their individual utility. In practice, the neoclassical economic model fails to capture the complexity of human motivation and behavior, which is influenced by numerous interior and exterior factors (van den Bergh et al., 2000; Wilhite et al., 2000). Nevertheless, systems that implement a financial penalty for undesirable behavior and reward desired behavior do have a crucial, but partial, role to play in the design of behavior change initiatives. Emissions trading, which puts a price on carbon emissions, is one such approach that has the potential to alter household behavior by increasing the relative price of greenhouse-intensive energy sources. Other financial incentives, including direct subsidies and payments, favorable tax treatment, and low-interest loans, can also help to make desired behaviors more attractive. However, no amount of financial inducement will motivate behavior change if there are other systemic or interior barriers to those behaviors.

Citizens are also embedded in legal, political, and social systems that can help or hinder behavior change. In some cases, the most important barrier to a desired behavior might be a feature of the legal or political system that requires large-scale political action to address. Many approaches to behavior change seek to

establish supportive social networks for households (e.g., Staats et al., 2004) and change agents (e.g., The Change Agency, 2008; Young, 2007), or to build social movements for change (e.g., Meyer, 2007). While the exterior characteristics of these social structures are of interest, the characteristics of their shared interiors or culture are arguably more important for successful behavior change, and it is to the cultural quadrant that I now turn.

Lower-Left (Cultural) Quadrant

Individuals are members of numerous cultural groups, including their households or families; their peer, social, and interest groups; their neighborhood and workplace communities; ethnic and language groups; and their national culture. These groups have shared meanings, worldviews, cultural practices, and discourses that can validate or discourage particular behaviors. Behavior change at the individual level is difficult to sustain without collective support from a broader group. Successful behavior change initiatives need to understand and work with cultural context.

There is substantial evidence that individuals are more able to initiate and sustain changes in behavior if they are participating in supportive groups that provide appreciation and positive regard for the changes that the individual has made (Geller, 2002; Rabkin & Gershon, 2007; Staats et al., 2004). This cultural validation increases the likelihood that the individual will continue to perform the behavior for long enough to become fluent and establish it as a habit (Geller, 2002). There are many successful examples of the use of supportive groups to effect behavior change, including the establishment of carbon-reducing teams in Portland (Rabkin & Gershon, 2007), carbon rationing action groups (CRAGs) in the United Kingdom (<http://www.carbonrationing.org.uk/>), and Transition Towns around the world (Hopkins, 2008). One of the best-known examples is the EcoTeam Program, which sets up groups of 6 to 10 people (who usually already know each other) to meet regularly, decide on pro-environmental actions they can take at home, and share their experiences with the group in a supportive environment (Staats et al., 2004). Research on this program finds that it is relatively successful in establishing lasting behavior change and that the group dynamics and feedback are important factors in this success (Nye & Burgess, 2008; Staats et al., 2004). An important element in this kind of program is the notion of a commitment, which is “an oral or written pledge or promise to change behavior (e.g. to conserve energy)” (Abrahamse et al., 2005, p. 275). Commitments made to a group can be particularly effective because the individual is then motivated not only by their own norms, but also by the expectations and social norms of the group (Abrahamse et al., 2005).

The initiatives discussed above seek to establish small-scale supportive cultures for behavior change. Other change agents pursue cultural change on a larger scale, seeking to establish social movements and activist cultures for climate change response. These change agents recognize that large groups of people with shared values can create the political pressure for a strong response to climate change. Our shared cultures influence the way we vote, the extent to which we become politically active on issues like climate change, our willingness to accept regulation in the name of climate change response, and the strength of the social movement for action on climate change. Climate change activists have established thriving cultures of protest and resistance that critique the adequacy of climate change response. In Australia, this subculture is embodied through grassroots Climate Action Groups that actively seek change in their local communities (www.climatemovement.org.au), regular rallies, protests, and acts of civil disobedience through which these groups come together, a Camp for Climate Action held in Newcastle in 2008 (www.climatecamp.org.au), and Australia's

Climate Action Summit in early 2009 (www.climatesummit.org.au), which established the Community Climate Network. Activist culture exerts pressure for change on mainstream culture from the outside, and this can prompt households to change behavior, although the targets of activism are more typically governments and business.

Other change agents work within mainstream culture to effect change. Two Australian examples are Earth Hour and the 1 Million Women campaign. Earth Hour (www.earthhour.org) is an event in which people are encouraged to switch off their lights for a specified hour on a specified day. Earth Hour began in Sydney in 2007 and has spread to more than 4,000 cities around the world. Earth Hour works closely with media partners to raise awareness of climate change and provide an opportunity for large-scale symbolic action. Switching off lights for an hour has little impact on greenhouse gas emissions but this symbolic act, involving millions of people, does have the potential to change the way a culture perceives itself and to normalize the act of reducing energy use. According to Dilling and Moser (2007), individuals and the media find it difficult to make cultural connections with climate change and climate change response, and events like Earth Hour can be understood as an attempt to build these connections.

The 1 Million Women campaign (www.1millionwomen.com.au) seeks to provide a supportive group for individuals that wish to take action, but on a much larger scale than the initiatives discussed above. Its goal is to inspire 1 million Australian women to take practical action on climate change by each adopting a personal goal of cutting greenhouse gas emissions by one ton within a year of joining. The website provides guidance on how to achieve the reductions and ways to map progress and share stories and experiences. As with the other initiatives discussed here, it seeks to provide cultural validation and support for adopting behaviors that reduce energy use and greenhouse gas emissions.

When contemplating ways to initiate cultural change, we need to remember that some practices have particular cultural significance and that this may make change in these practices difficult in the short-term. For example, I was involved in a project that ran workshops with citizens from various backgrounds to discuss the ways they used energy (Riedy et al., 2004). Some of the workshops involved migrants from particular ethnic and cultural groups. During the project, it emerged that some of the participants had experienced very high electricity bills because they liked to gather around an electric radiant heater with the windows open in winter (to replicate the experience of gathering around the campfire in their country of birth). They were reluctant to change this practice because of its cultural significance. This does not just apply to migrant communities. In Australia, there has been huge growth in the use of outdoor gas heating at cafes and restaurants during winter so that we can continue our cultural preference for an outdoor lifestyle, despite the weather. While some cultural practices will need to change to respond to climate change, behavior change programs need to pursue their goals with cultural awareness and sensitivity.

A cultural perspective reminds us that change agents themselves need a supportive culture. Moser and Dilling (2007b) identify the need for interdisciplinary, practice-oriented research on social change that pursues “mutual education and eventual integration” (p. 509). Communication and linkages between the many people pursuing social change in the context of climate change response are poor and there is much to be gained by mapping and reviewing what has been attempted, making connections, sharing insights into what works in particular contexts, and providing supportive networks in which change agents can participate. The Global

Transition Initiative (www.worldforum.org/2009global-transition.htm), proposed by the State of the World Forum and others, intends to make a substantial contribution here by enabling people the world over to share ideas, develop strategies, track progress, and collaboratively build and implement a global social change process.

One final insight provided by a cultural perspective is that the individuals and households that change agents work with are participants in a dialogue, not passive recipients of behavior change initiatives. In other words, when we engage in a behavior change initiative, we enter into a dialogue where we seek mutual understanding, and all involved may come away changed.

Upper-Left (Experiential) Quadrant

The values, beliefs, attitudes, mental models, and experiences of an individual—their interior structures—will shape the way they behave and are a critical consideration in designing behavior change initiatives. The way that interior structures shape our response to climate change is still poorly understood but is subject to a great deal of research at present (e.g., Crompton, 2008; DEFRA, 2008; Moser & Dilling, 2007a; Stern, 2000). One thing that is abundantly clear, however, is that the nature of climate change presents some particular experiential and psychological challenges.

First, climate change is not something that most people will experience directly and tangibly, which is problematic because “the psychology literature suggests that people need to have visceral experiences of climate change impacts before it matters to them” (O’Brien, 2009, p. 5). Climate change has some natural attributes, such as lack of immediacy, time lags, and threats to self-interest, that contribute to its perception as non-urgent (Dilling & Moser, 2007). It is seen as a problem that affects other people, future generations, or other species. Unfortunately, by the time large numbers of people do experience climate change directly, it will be too late to prevent the worst impacts. Change agents need ways to make climate change tangible to people and to increase the sense of urgency with regard to action on climate change.

Second, as Karen O’Brien (2009) eloquently states:

Climate change is a cognitively complex issue: it is a ‘big picture’ problem, and to understand its full implications a worldcentric perspective is required, as well as an ability to handle both complexity and paradox. Individuals, groups, and institutions need a well-developed capacity to be self-reflexive...This demands a high level of cognitive development, which may be demanding for many adults. (p. 4)

Furthermore, according to Dilling and Moser (2007), “Most adults’ educational experiences do not prepare them well to deal with integrated, interdisciplinary problems (like climate change) that require agile responses and systems-thinking capabilities” (p. 12). In other words, understanding a global problem with deep systemic roots is difficult, and for many people it is easier to disengage from the issue. Change agents need ways to represent climate change in terms that people can readily grasp.

Third, climate change is an issue that can provoke strong emotional responses, such as “massive fear, despair, or a sense of being completely overwhelmed and powerless,” which “can end all further thinking” (Dilling

& Moser 2007, p. 12). Further, “Other emotions—such as guilt or other ways of feeling manipulated—can provoke staunch resistance” (Dilling & Moser 2007, p. 12). Common reactions to the constant barrage of bad news about climate change and the emotions that it provokes include denial, projection of responsibility, blind optimism, fatalism, psychic numbing, and apathy (Moser, 2007). None of these reactions are conducive to behavior change. Not surprisingly, Geller (2002) argues that behavior change programs should focus on positive consequences to motivate desired behavior.

Integral Theory, and particularly an understanding of developmental levels and lines in the UL quadrant, provides valuable insights into how to design behavior change initiatives to overcome these psychological barriers. I will discuss developmental levels and lines below.

Levels: Translation and Transformation

Integral Theory contends that human interior structures develop over time through levels or waves that transcend and include previous levels or waves. As people move through these levels, the way they interpret and understand the world changes. Consequently, people operating from different stages of development have very different understandings of climate change and different motivations for changing their behavior in response to climate change. One simplified categorization identifies development of worldviews with respect to climate change response through fatalist, hierarchical, individualistic, and egalitarian stages (Riedy 2008). *Fatalists* are likely to deny that climate change is a problem, be disengaged from policy debates, and have little motivation for change. Those who favor a *hierarchical* worldview prefer rule-based responses to climate change and may change their behavior to ensure legal compliance. *Individualists* prefer the use of market instruments to respond to climate change and may change their behavior to take advantage of financial incentives. *Egalitarians* prefer equitable responses to climate change, such as allocation of equal rights to the atmosphere, and may change their behavior as a contribution to social justice.²

This understanding of human development immediately points to two distinct strategies for motivating behavior change: translation and transformation (Brown & Riedy, 2006). Translation is the act of designing or tailoring messages, of:

...connect[ing] with people just as they are, motivating and informing them in a way that is in alignment with how they already see the world. These communications resonate with a person’s existing worldview, without requiring them to be a different person in order to take action. (Brown & Riedy, 2006, p. 666)

Transformation, on the other hand, attempts to change the way a person sees the world. It seeks to trigger personal development along one or more developmental lines towards more-inclusive structures. In the case of climate change, truly understanding and caring about the impacts of climate change requires the ability to take the perspective of others—people in other places where impacts are already being felt, future generations, and other species. Transformation builds the developmental capacity to take more perspectives (Esbjörn-Hagens & Zimmerman, 2009). Both translation and transformation potentially have a role to play when designing behavior change initiatives that seek to reduce energy use. I will consider each in turn.

Behavior change initiatives that employ translation, in the guise of social marketing, are relatively common.

There is widespread recognition in the theory and practice of behavior change that individuals have different values, beliefs, attitudes, and personal norms and that different messages are needed to reach different people (e.g., DEFRA, 2008; McKenzie-Mohr & Smith, 1999; Stern, 2000). Thus social marketing approaches use market segmentation techniques to “characterise different sectors of the target audience according to the motivations presumed to underlie their willingness to undertake behavioural change,” and then tailor messages to the values that dominate within that segment (Crompton, 2008, p. 5). Market segmentation translates the motivations for undertaking a particular behavior into terms that are more likely to resonate with the values held by a market segment. The social marketing approach is a definite step forward from single-message behavior change campaigns and has proven effective in motivating small, specific changes in behavior (Crompton, 2008).

The big challenge for an integral approach to household behavior change is to develop messages and language that resonate with each of the main human developmental stages without compromising the ultimate objective of avoiding dangerous climate change. To achieve the deep and rapid cuts in greenhouse gas emissions required to avoid dangerous climate change, we will probably need to fundamentally change consumption patterns and reduce material consumption: “The comfortable perception that global environmental challenges can be met through marginal lifestyle changes no longer bears scrutiny” (Crompton & Thøgersen, 2009, p. 6). Instead of finding ways to make these substantial lifestyle changes palatable, social marketing has so far tended to focus on simple, painless steps, such as changing light bulbs, in the hope that this will lead to more radical changes in the future (Crompton, 2008). Unfortunately, the evidence that adoption of one, small pro-environmental behavior will increase people’s inclination to adopt other, larger pro-environmental behaviors is sparse and contested (Crompton & Thøgersen, 2009). Worse, people can think they have done their part by taking those small actions and their motivation to take further action diminishes. While current social marketing approaches can be very effective in establishing some pro-environmental behaviors, their effectiveness diminishes as the scale of necessary change begins to conflict with underlying values.

The challenge, then, is to make radical household behavior change palatable across a diverse range of world-views. It is critical that change agents learn how to translate the imperative for urgent action on climate change into terms that work for everyone, regardless of their values.

The complementary approach to translation is transformation. Transformation has the potential to shift the pattern of values and other interior structures in society towards levels that are more sympathetic to climate change response. However, it is very difficult to facilitate personal transformation and development, particularly on a short-time scale. Transformation requires an individual to undertake “transformative practices such as therapy, contemplation, meditation, and community service [that] help [them] discover the roots of their attitudes, beliefs, and emotions that give rise to care for or the neglect of the environment” (Esbjörn-Hargens & Zimmerman, 2009, p. 6). This is a very personal process that people need to come to willingly.

Very little is known about how to consistently facilitate transformative development. Transformative learning theory (Mezirow, 2000; Taylor, 1998) is a field that may offer useful insights on how to establish transformative practices. Edward Taylor (1998) argues that “significant learning involves the transformation of meaning structures through an ongoing process of critical reflection, discourse, and acting on one’s beliefs” (p. 12). Initiatives that pursue significant behavioral change, requiring significant learning on the part of participants,

need to engage with the meanings and beliefs of the participants and seek transformation of their perspectives over time. This transformation “is usually the result of a disorienting dilemma due to a disparate experience in conjunction with a critical reappraisal of previous assumptions and presuppositions” (Taylor, 1998, p. 7). How to work with individuals to initiate or expose disorienting dilemmas and build the capacity and desire for critical reflection is a key question for further research.

Given the urgency of climate change response and how little is known about how to consistently facilitate human psychological development, change agents should concentrate primarily on translative strategies that work with existing values. However, it is also important to experiment with ways of working in partnership with communities to facilitate transformative processes that rapidly increase the proportion of the population operating consistently from at least a green altitude of consciousness.

Lines: Multiple Intelligences

The Integral framework recognizes that development is a fluid and inconsistent process, which happens at different rates along multiple lines. One way of characterizing the lines of development in the UL quadrant is as multiple intelligences (Gardner, 1999, 2006). Discarding the idea of a single measure of intelligence, Gardner identified linguistic, logical-mathematical, musical, bodily-kinesthetic, spatial, interpersonal, intrapersonal, and naturalist intelligences (Gardner, 2006). I will not dwell on the details of each intelligence here, as the main points I wish to make are that:

- All people possess these different intelligences or developmental lines and have developed them to varying degrees, so behavior change initiatives can reach more people more effectively if they address multiple intelligences.
- Individuals have different strengths and it is wise to design behavior change initiatives to work with these strengths.

The idea of developmental lines or multiple intelligences presents a strategy for dealing with the fact, identified earlier, that most people do not have direct experience of climate change and this reduces their motivation to act. We can engage multiple intelligences to help people grasp what the experience of climate change is like. O’Brien (2009) argues that the “science and policy communities dealing with climate change...insist that presenting rational arguments and complex graphics of climate model output should be enough to convince people to change their behavior” (p. 4). This approach may well work for those with a strong logical-mathematical intelligence but will not work for those who rely more heavily on other intelligences. Instead, change agents need to find ways to present the experience of climate change poetically, musically and spatially, through art and aesthetic experience (for example). As O’Brien (2009) puts it, we need “artists, museum curators, advertisers, and others [to] creatively present climate change to different audiences” (p. 5).

Although this is an area where further research is certainly needed, there has already been some progress in finding ways to present climate change to people so as to engage developmental lines other than the cognitive or logical-mathematical lines. One example is The Canary Project (www.canary-project.org), which produces visual media, events, and artwork with the objective of building public understanding of human-induced climate change and energizing commitment to solutions. Among several key strategies, The Canary Project attempts to visualize global warming in compelling ways, using artistic or aesthetic experience to create a

visceral impact and felt experience of the phenomenon. Another example is *The Age of Stupid* (www.ageofstupid.net), a film that creates a fictional 2055 in which the world has been devastated by climate change. Watching the film can give people a much more powerful sense of how climate change might feel than any number of scientific presentations. At the very least, incorporating this kind of material into behavior change initiatives will increase the potential to reach people, regardless of the contours of their psychograph (i.e., their unique levels of development across multiple lines).

States: When are Individuals Receptive to Change?

I will only touch briefly and speculatively on states (psychological, ecological, economic), as I believe this is an area that requires a great deal more research in relation to household behavior change. A particular research question is: are there states in which individuals are more or less receptive to change? And how can change agents work with these states? Some initial ideas are presented below.

I have already discussed how bombardment with alarming information about climate change can create emotional states of fear, despair, and denial. These are not creative spaces from which to develop and change, and change agents need to be very careful to avoid disempowering mental and emotional states and to reinforce positive and optimistic states.

Weather states can have a strong influence on public perceptions of climate change. The public appears to associate extreme weather events with climate change (Bostrom & Lashof, 2007), and we would expect the experience of these events to lead more people to see climate change response as an urgent issue. Certainly, there is evidence that the long drought in Australia in recent years coincided with a substantial increase in public awareness and concern about climate change (DECC, 2007). Scientists expect that the changing climate will increase the frequency and intensity of other weather events, such as wildfires, floods, heat waves, and intense storms (e.g., Steffen, 2009). We can speculate that personal experience of these other extreme weather events could also strengthen belief that climate change is occurring and is an urgent concern. Change agents can potentially use these weather events to help people to understand climate change more tangibly, but great sensitivity is needed to avoid any perception of callously taking advantage of events that may have caused great human and ecological devastation.

With the advent of the global financial crisis, we have been presented with a case study of how economic states can impact on climate change response. To date, a definitive answer on whether climate change response has become harder or easier under conditions of economic recession is difficult. On the one hand, discretionary household (or government) spending that may have been put towards climate change response is more likely to be held back for other purposes during times of economic hardship. On the other hand, the various economic stimulus packages that have been introduced by governments around the world have often incorporated actions that will aid climate change response, particularly where those actions provide a boost to employment or develop infrastructure that can provide a future competitive advantage. In Australia, economic stimulus measures included a A\$4 billion Energy Efficient Homes package to install ceiling insulation and solar hot water systems in homes. As Thomas Homer-Dixon (2006) reminds us, times of crisis are also opportunities for renewal when actions that are not prioritized in times of stability suddenly become viable. For change agents, this means being prepared to act quickly when states that present an opportunity or leverage point arise.

Types: Gender and Behavior Change

Of all the areas discussed here, the influence of type on household behavior change has received the least attention and needs the most research. I will briefly consider the role of gender types in household behavior change. Surveys of attitudes and values in relation to climate change often reveal slight gender differences. For example, a survey in New South Wales found that men were more likely to claim knowledge about climate change than women, but women were more concerned about the impact of climate change, and more likely to see responsibility for action as lying with the local community (DECC, 2007). There were also differences in the type of responses preferred by women and men. Survey results like this can help to identify behavior change strategies that may appeal to both genders or can be targeted effectively to each.

In recognition of gender type differences, behavior change initiatives have emerged that specifically target women. I have already mentioned the 1 Million Women campaign, which appeals to feminine qualities of solidarity and communion with other women to attract participants. Another initiative aimed at women is Oxfam Australia's Sisters on the Planet, which tells the stories of six women from around the world that are facing climate change in an effort to inspire action by Australian women.³ There is evidence that women around the world are most vulnerable to climate change (UNDP, 2008), and this knowledge may encourage women in affluent countries to change their behavior.

Further research is needed to understand how behavior change initiatives can best appeal to different types, including gender types, personality types, and even the types of people identified in the theory of diffusion of innovations (i.e., innovators, early adopters, early and late majority, and laggards).

Conclusion

This analysis takes a tentative first step towards an integral approach to household behavior change, focusing specifically in this case on climate change response. Much more work is needed to incorporate additional literature and lessons from practical experience, and to continue the process of making connections between discrete bodies of theory and practice. Nevertheless, we can begin to see the broad steps or principles that would form part of an integral approach to design of household behavior change initiatives:

1. Observe existing behaviors and identify desired behaviors
2. Identify systemic (i.e., technological, economic, informational, institutional, legal, social) barriers to the target behaviors and design system modifications to overcome these barriers and support the desired behaviors
3. Build a process for group support and cultural validation for households that are involved in change processes, whether on a large or small scale
4. Assess the demographic and psychographic profile of the target group
5. Translate messages to resonate with these profiles
6. Experiment with transformative learning processes to help participants to develop and grow
7. Use techniques to engage multiple developmental lines and intelligences, and multiple types
8. Be prepared to take advantage of states in various contexts as they arise

All of these steps can be employed more or less collaboratively. A change agent could run through these steps before approaching a group to try and initiate change. Alternatively, a change agent could work through each of the steps in close partnership with a group, helping the group to identify its own challenges, processes, messages, and techniques.

This broad sketch of an integral approach to household behavior change requires more research and testing. The next stage is to identify behavior change initiatives in Australia that are seeking to reduce greenhouse gas emissions, and locate their elements on the Integral map. This will point to neglected perspectives and opportunities to link complementary approaches. Subsequently, I will assess the extent to which existing initiatives follow the process and principles outlined above and work with specific initiatives to test and refine the efficacy of an integral approach to household behavior change in practice. Further research on translative and transformative approaches to behavior change and ways to engage multiple intelligences are critical if we are to design behavior change initiatives that can successfully tackle the scale of change needed to avoid dangerous climate change.

NOTES

¹ The S-shaped curve is apparent when the percentage of the target group that has adopted an innovation is plotted on the vertical axis and time is plotted on the horizontal axis.

² For a more detailed discussion of these worldviews and their theoretical basis, see Riedy (2008).

³ For more information, see www.oxfam.org.au/campaigns/climate-change/take-action/sisters-on-the-planet/.

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