

EDITORIAL: BEHAVIOR ANALYSIS, SUSTAINABILITY, RESILIENCE, AND ADAPTATION

Defenders of the short-sighted men who in their greed and selfishness will, if permitted, rob our country of half its charm by their reckless extermination of all useful and beautiful wild things sometimes seek to champion them by saying the "the game belongs to the people." So it does; and not merely to the people now alive, but to the unborn people. The "greatest good for the greatest number" applies to the number within the womb of time, compared to which those now alive form but an insignificant fraction. Our duty to the whole, including the unborn generations, bids us restrain an unprincipled present-day minority from wasting the heritage of these unborn generations. The movement for the conservation of wild life and the larger movement for the conservation of all our natural resources are essentially democratic in spirit, purpose, and method. (Theodore Roosevelt, *A Book-Lover's Holidays in the Open*, 1916, 299-300)

Teddy Roosevelt wrote this passage after touring the coast of the Gulf of Mexico and viewing damage to wildlife and their habitat created by human activity. He penned a persuasive argument for action to conserve natural resources and protect the many charms of our environment that he saw in his travels about the world. One may wonder what it was like to travel with President Roosevelt. What would he say of those beaches today after the BP oil spills? As president, would he entertain the climate scientists outside the White House (New York Times, 8/16/2011) protesting the oil pipeline linking Alberta oil shale fields with refineries on the gulf coast? Times have changed and leaders tread softly when environmental issues raise the specter of change in practices to which we have become accustomed.

Climate scientists announce with increasing concern that human behaviors have combined with other natural drivers to push the earth's climate towards conditions never before seen by humans (Day, Hall, Yanez-Arancibia, Pimentel, Ibanez-Mart, & Mitsch, 2009) and those changes are accelerating faster than previously thought (Hansen & Sato, 2011). Yet many among us are unconcerned or dismissive of the problem (Maibach, Roser-Renouf, & Leiserowitz, 2009). Political candidates openly question the integrity of scientists and suggest their data are tainted by motivations to garnish funding (see Rick Perry and Michelle

Bachman for recent examples). Other political leaders may see the problem but appease part of their constituency by downplaying the urgency of the science. A problem with an accelerating trend is difficulty detecting the problem during the early rise from baseline. With accelerating trends the rise is nearly imperceptible at first and many do not understand that the nonlinear ramp, subtle at first, will then rush upward. You might relate this to the experience of an amusement park ride that inches forward slowly at first, then swoops forward with increasing speed. The early stage is wholly inadequate for predicting the headlong rush that follows. We experience that novel acceleration as thrilling and outside of our normal sensation of speed. Such will not be the case with climate change. Residents of small Vermont towns did not experience the rising flood waters from hurricane Irene's rains as thrilling. Rather the floods were not predicted by any prior experience and citizens were unprepared for the devastation that befell them.

Behavioral scientists will find themselves increasingly engaged with the human response to climate change and environmental degradation. A recent special section of *The Behavior Analyst* (Heward & Chance, 2010) is one signal of the importance of this. Thompson (2010) explicitly appealed to behavior analysis for solutions to changing human behavior before it is too late. He identifies only three options: 1) prevent further warming, 2) adapt to a changed habitat, or 3) suffer as environments fail to sustain life. There may be little time for option one. The momentum of change is such that changes in human behavior now are insufficient to stop the warming process. We may be past prevention as a solution and facing adaptation to a changed habitat within our lifetimes. Melting ice will increase sea levels making coastlines uninhabitable. People will migrate inland and food production will cease in coastal deltas. Massive adaptation will be required. We witnessed some of this with Hurricane Katrina, which caused massive migration away from the communities on the Gulf of Mexico. More recently Hurricane Irene demonstrated the impact of floodwaters on New England towns. The principal construction projects on earth for the rest of this century may become rebuilding after storms, engineering projects trying to hold back the sea, and construction of new cities inland from the relentless tide.

Competition for the scarce resources necessary to maintain (for developed nations) or achieve (for developing nations) unsustainable but widely coveted energy- and water-intensive lifestyles will be further exacerbated by climate change. Large disparities in access to those lifestyles lead to experiences of deprivation both among and within countries, increasing the risk of violence and armed conflict globally (Mattaini, 2002), and reducing social cohesion within nations and their subdivisions (Putnam, 2000). The US Joint Forces Command (JOE, 2010) examined trends influencing global security and report that climate

change is among the top ten trends that will require military engagement in some combination of combat, security, police, relief and reconstruction activities. They note, “In particular, where natural disasters collide with growing urban sprawl, widespread human misery could be the final straw that breaks the back of a weak state.” The military response covers a broad spectrum from combat to humanitarian aid. It is interesting to ponder the contextual factors that will determine how the military’s vast resources are applied.

Sustainability can be defined as a state in which current practices of a population meet the needs of the population while not hindering future generations from meeting their needs. It is the essence of Roosevelt’s consideration of the “womb of time” as the playing field of a sustainable society extends to those yet to be born. Much evidence suggests we may not be able to sustain our current practices. Grant (2010) offers a provocative account of changing individual’s reinforcer preferences as a bridge from sustainability to adaptation. If people learn to value less resource-intensive reinforcement, consumption of goods and services produced via wasteful processes could diminish, thus preventing further environmental degradation. It would also ready us for life with less of what we currently enjoy, but ready access to even richer options. Not incidentally, such resource-light lifestyles could be widely achieved, reducing economic inequality and deprivation experiences, and thereby conflict, while supporting the social cooperation that will be required to address climate change, peak oil, and the other global challenges we face.

Resilience provides a further perspective. Behavior as our interaction with our environments is a dynamic process potentially entailing countless variations. Systems scientists have demonstrated that diversity contributes to resilience; a richer array of more sustainable lifestyle options could help to shift behavior away from current practices maintained by our appetites for material wealth, while reducing experiences of deprivation. We might surrender some behaviors that are untenable and maintain others as crucial to our values as humans. Here again, Roosevelt offers wisdom when he appeals to conservation for the greatest good for the greatest number. His utilitarian philosophy is evident along with his belief in democratic ideals. As resources to sustain materialistic lifestyles fade, we might as a species resiliently adopt practices supporting the collective good while decelerating the mindless consumption of low-grade reinforcers (luxuries). But perhaps thinking at the level of our species is too bold. We can think comfortably about individuals being more or less resilient in the face of challenge as our science rests on analyses of individual behavior. Looking at communities and societies raises the complexity to larger units of analyses. The collective actions of citizens of Martha’s Vineyard, MA (Nevin, 2010) offer an example of

community cooperation to sustain life on their island. Residents engaged in a democratic process and adopted wind farms as a source of the island's energy to reduce reliance on fossil fuels. Resilience can be operationalized at many levels from the vantage point of a single individual facing life stressors up through the lens of societies facing hardships like floods and disasters (Zautra, Hall, & Murray, 2010). When challenged, each needs the repertoires and practices required to recover or bounce back from challenges and then move forward in some sustained response to adversity.

Collective repertoires of resilient, nonviolent, cooperative practices appear to be our best hope for achieving sustainability. The rugged individualist riding the range in pursuit of more stuff would then encounter moral corrals herding her toward conservation of resources for others. Social values might come to trump personal desires and sustain positive social behaviors adapted to a changed planet. Concern for others, cooperation, and collective effort are humanity's best hope as stressors mount from environmental degradation. Such repertoires will not come easily, because they challenge existing values grounded in widely reinforced relational framing, and supported by narrow corporate interests. Change is likely to require significant organizing, perhaps including, among other strategies, sustained campaigns of "constructive noncooperation," a widely successful Gandhian form of social struggle for realizing the construction of an alternative, healthy culture within the shell of an existing, destructive system (Mattaini and Atkinson, 2011; Mattaini, in preparation).

Behavior analysts can find common ground with other behavioral scientists (Stern, 2000) and embark on a comprehensive approach to readying populations for a changed planet. Behavior analysts are gearing up for action. BASS (Behavior Analysis for Sustainable Societies) is the most recently formed special interest group within the Association for Behavior Analysis International (ABAI). ABAI plans a conference in August 2012 at Ohio State University (Behavior Change for a Sustainable World) to gather scientists, community leaders, educators, business people and citizens to explore directions, mobilize resources, and activate initiatives. BASS is linked with BFSR (Behaviorists for Social Responsibility) and sees this journal as a prime outlet for dissemination. We can anticipate a resurgence of efforts in regards to environmental issues and human behavior as the evidence mounts that the world is turning into a different place and a complex sequence of reactions occur in response. Social responsibility seems a key feature of citizenship behavior needed as the world's resources are depleted and communities, societies, and cultures adapt to a new context.

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