



basis of our relative failure to respond effectively, at least thus far, also rests within the thoughts, attitudes, feelings, values, norms, and decisions driving unsustainable actions (Gifford, 2011). Consequently, psychological research is critical to understanding why people behave in unsustainable ways, and for designing interventions to motivate behavioral change (Gardner & Stern, 2002; Kazdin, 2009; Koger & Winter, 2010; Scott, Amel, Koger, & Manning, 2016; van Trijp, 2014).

Paradoxically, however, the fundamental connection between psychology and sustainabil-

the natural processes that maintain ecological integrity. “Eighty-three percent of the world’s population now live in countries that use more bio-capacity to support production activities than they have available within their boundaries. The deficit is covered through overexploitation. . . (e.g., through overharvesting and overfishing), net import of resources, and the use of the global commons (for instance, by emitting CO₂ from fossil

disciplines, including ecology, economics, politics, sociology, and philosophy; and d) they thus offer an opportunity to integrate across disciplinary “silos,” which are less apparent in most researchers’ current work (Gurung et al., 2014). In fact, both intra- and interdisciplinary collaborations are urgently needed in order to address pressing social concerns including

the future are relatively recent functions made possible by the comparably young frontal lobes. Some researchers propose a dual-process or continuum-based model of cognition, placing automatic, intuitive, rapid, and emotional (i.e., evolutionarily older, including limbic system) processing on one end, and more deliberate, intentional, slow, and analytic (pre-frontal cortical) mechanisms on the other (e.g., reviewed in Osman, 2004). Unsustainable actions may thus result from weak pro-environmental intuition or emotion; strong anti-environmental affect due to immediate, salient rewards such as pleasure from or convenience with the unsustainable option; along with rational analysis that reveals clearer benefits and typically lower costs for the unsustainable choice (Menzel, 2013). Comparably, Slovic and colleagues (2002) described the “affect heuristic”: if people enjoy an activity, they judge the risks low and the benefits high, and vice versa (disliking an activity leads to high risk, low benefit judgments).

Although emotion can be a powerful motivator of behavior change in a sustainable direction (Weber, 2006), it also has the potential to overwhelm or produce psychic numbing (Gregory, 2003; Lifton, 1982) or other psychological defenses related to identity, emotional withdrawal, and resignation (Lertzman, 2012). To quote Skinner (1991), “the principle modus operandi of [environmental] organizations is to frighten people, rather than offer them a world to which they will turn because of the reinforcing consequences of doing so” (p. 28). In fact, messages about the predicted catastrophic consequences of climate change can actually increase anti-environmental behavior: Dire messages threaten people’s “deeply held beliefs that the world is just, orderly, and stable. Individuals overcome this threat by denying or discounting the existence of global warming, and this process results in decreased willingness to counteract climate change” (Feinberg & Willer, 2011, p. 34). Such messages can also drive a more intense defense of the “American way of life” (i.e., cultural materialism), and attempts to enhance personal self-esteem, including via status symbols derived from material consumption (

assumption that one person's actions are insignificant (Smith, 2015; i.e., "a drop in the ocean" and associated fatalism; Capstick, 2013), along with other cognitive, emotional, and social mechanisms that can interfere with sustainable actions. However, this broad understanding of the influences maintaining social dilemmas can also inform strategies to overcome them, as reviewed in the following sections (see also Gifford, 2014; Osbaldiston & Sheldon, 2002).

Motivation, Moral Norms, and Awareness

Hardin (1968) argued that governmental laws, regulations and incentives are needed to promote widespread prosocial behavior on the part of the public, and although these techniques can be effective, individuals can also take steps to narrow the gap between their own short- and long-term interests. For instance, one can deliberately alter short-term consequences to align with longer-term outcomes. Refusing to buy a parking permit at one's workplace to promote use of alternative modes of transportation; setting a limit on the amount of money one is willing to spend on gas, packaged foods, or other commodities; implementing a point/reward system for riding one's bike a certain number of times per week; or developing another "self-control project" to align with environmental concerns can alter behavior. Doing so not only reduces one's own *egoistic*, but also provides a *model* of sustainable behavior to friends and family; i.e., serving as an antecedent stimulus or *cue* for eliciting similar behaviors from others, and thereby initiating *social norms*. Further, making change at any level is empowering and enhances feelings of *self-efficacy*, which creates a positive feedback loop (the more empowered one feels, the more action one is often willing to take).

Recent research suggests that it is possible to increase environmental engagement by promoting a future orientation (e.g., via priming techniques: "imagine your life circumstances four years from now"), while simultaneously minimizing immediate concerns ("e.g., overcoming opposition to the initial costs of solar energy production") (Arnocky, Milfont, & Nicol, 2013). Exposure to scenes from nature may also reduce temporal discounting. In one recent series of studies, participants who viewed photographs of landscapes from natural settings (vs man-made urban environments) were less likely to discount future rewards, measured by selecting a larger, delayed reward rather than a smaller, immediate one (van der Wal, Schade, Krabbendam, & van Vugt, 2013). The authors attributed their findings to participants' concern for the future, as opposed to self-control or mood. "This is an important result because *future orientation* is an essential ingredient for promoting individual and social change" (van der Wal et al., 2013, ital. added).

A number of approaches grounded in social psychology and social cognition can likewise contribute to "triumph over the commons dilemma," including reducing uncertainty about personal impacts; strengthening social relationships via a sense of belonging to community (*social identity*) and enhanced interpersonal trust; as well as incentives, including *social norms* and *reciprocity* (van Vugt, 2009). Research suggests that when people are reminded of the personal relevance of their ecological harmful actions, they are more willing to forgo immediate benefits and make contributions for the benefit of the group, because they recognize that acting for the common good *is* acting in self-interest (Milinski, Sommerfeld, Krambeck, Reed, & Marotzke, 2008; Ostrom, Burger, Field, Norgaard, & Policansky, 2007).

philosophy. Even in competitive situations where others are acting “greedy,” people who hold pro-environmental values can exhibit self-restraint when the consequences of collective self-interest are salient (Sussman, Lavallee, & Gifford, 2015).

Although several thinking distortions can defend against anxiety and concurrently maintain social dilemmas (“I’m only one person;” “That’s just human nature”), it is possible to undermine the commons dilemma by pointing out the flipside (e.g., have students generate counter-arguments) (Smith, 2015; see also Lappe’s (2011) description of thought traps and the conversely empowering “thought leaps”). Likewise, the predictions from research regarding attempts to enhance personal self-esteem when faced with anxiety concerning one’s mortality can include efforts to leave a legacy, such as contributing to the

stressed or cognitively fatigued, it is much easier to fall into social traps. Conceivably, positive experiences in nature can also foster a sense of *biophilia* that can lead to altruistic efforts to protect and preserve those areas and their inhabitants (reviewed in Gifford, 2014).

Conclusion

Overall, it appears that *biophilic* efforts focused on people's "everyday behavior within place-based communities" are required, not only because of the "biophysical realities" of our time (i.e., declining material and energy supplies; DeYoung & Princen, 2012), but also because community-based initiatives can address the psycho-social-spiritual dimensions of a changing climate (Doppelt, 2012, 2016). Strengthening local communities and fostering social networks not only builds individual and collective *resilience* to weather the coming storms (Doppelt, 2016), but also reduces the likelihood of prioritizing self-interest (e.g., van Vugt, 2009). In something of a case study, a few residents of Martha's Vineyard spearheaded an initiative to improve the public bus system and expand community wind power (Nevin, 2005, 2010). By "thinking locally and acting locally," people can avoid the overwhelm and paralysis that can be associated with "thinking globally" (Kolbert, 2008). The Transition Town Movement represents another example, enabling locally based conversions away from fossil-fuel based economies and transportation systems (Hopkins, 2008).

Such *biophilic* strategies can enliven and inspire, even in the face of daunting challenges. In fact, people are "at their best when they help themselves and help others, when they are called on to be creative and self-directed, and when they are tackling problems that are challenging, genuine, and meaningful. Human ingenuity, long aimed at crafting an industrial society, must now be aimed at crafting a durable civilization. The creative effort contains its own rewards" (DeYoung & Princen, 2012, p. xxiii).

We hope that by tackling these issues in their courses, instructors and their students will join us in educating for – and building – a sustainable future. If each of tomorrow's activists, politicians, scientists, and citizens is better educated about human behavior and its underpinnings, all will benefit.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

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Author Biographies

Susan M. Koger teaches Psychology for Sustainability, Biopsychology, Psychology of Learning, and Introductory Psychology, among other courses. Her scholarship focuses on the effects of toxicants such as pesticides on brain development and function, and the role of psychology in environmental studies.

Britain A. Scott has taught a variety of introductory and specialized topics courses in social psychology, women's studies, and environmental studies. Her ongoing research projects center around three primary interest areas: physical attractiveness and media messages about beauty, the impact of pornography on cognitive function and social interaction, and humans' relationship with the natural environment.