

The Need for a More Effective Science of Cultural Practices

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Abstract Behavior analysis has produced a robust theoretical analysis of the contingencies involved in cultural evolution. Yet, thus far, the empirical yield of this work remains quite limited. With this paper, I attempt to provide specific examples of the ways to advance an experimental analysis of the contingencies involved in cultural evolution. I begin with a review of the theoretical analyses developed by behavior analysts and other contextually oriented scientists. Next, I submit that, if the goal of our science is both predicting and influencing cultural phenomena, we must produce experimental analyses of the impact of meta-contingencies on organizations' practices. There is no more pressing reason for doing this than the threat of climate change posed by the continuing growth in human use of fossil fuels. Therefore, the paper provides an analysis of the contingencies influencing organizational practices now affecting continued use of fossil fuels and the contingencies for organizations seeking to prevent their use. One concrete step to advance a science of cultural change relevant to climate change would be to create a database of organizations that are promoting vs. working to prevent fossil fuel consumption and the consequences that seem to maintain their practices. I call for experimental analysis of the impact of altering consequences for these practices and for experimental analyses of interventions intended to change the norms, values, and behavior of organizational leaders who can influence fossil fuel consumption. I then discuss the role of prosocial behavior and values in affecting behavior relevant to reducing fossil fuel consumption because the empirical evidence shows that prosociality favors more "green" behavior. Recent advances in prevention research have identified interventions to promote prosociality, but we need experimental analyses of how advocacy organizations can be more effective in getting these interventions widely adopted.

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This paper examines two inter-related aspects of the evolution of cultural practices that are vital to human wellbeing. The first is the myriad cultural practices that are affecting climate change, a problem that is now well-established as an unprecedented threat to human wellbeing (Klein 2014) and one that behavioral scientists have thus far made only modest contributions toward solving (Alavosius et al. 2016). A closely related issue is the cultivation of prosociality, which is vital to human cooperation and is relevant to our evolving more sustainable practices, because prosocial individuals are more likely to engage in and support practices that will contribute to preventing further climate change.

Increasingly, the scientific community is concerned about the impact of our cultural practices on climate change. In an interview with *American Scientist* (2006), Lester Brown listed unsustainable environmental trends: “shrinking forests, expanding deserts, falling water tables, collapsing fisheries, deteriorating grasslands, eroding soils, rising temperatures, melting ice, rising seas, dying coral reefs and disappearing species.” The American Association for the Advancement of Science has made climate change a major focus of its public education and advocacy. The Union of Concerned Scientists website lists eight advocacy campaigns it is conducting, most of which involve promoting sustainable practices (Union of Concerned Scientists 2015). However, the behavioral sciences can be the most relevant to addressing this problem. Yet, thus far, they have made only minimal contributions to what may prove to be the greatest threat to human wellbeing that we have ever encountered (Alavosius et al. 2016).

Scientists generally view our environmental problems from an evolutionary perspective. It is understood that unsustainable practices have evolved because of their immediate benefit to human populations but that human practices often outstrip the carrying capacity of their environment (e.g., Diamond 2005). Yet, although we understand a great deal about how cultural practices are selected, we have not developed a scientific framework for *influencing* the direction of cultural evolution.

A paper in *Science* by Ehrlich and Kennedy (2005) illustrates the limitations of existing scientific approaches to the problem of sustainable practices. They argue that “...it is the collective action of individuals that lie at the heart of the dilemma.” They call for a Millennium Assessment of Human Behavior that would consist of “an ongoing examination and public airing of what is known about how human cultures (especially their ethics) evolve, and about what kinds of changes might permit transition to an ecologically sustainable, peaceful, and equitable global society.” They emphasize getting individuals to “explore how their own values relate to environmental sustainability...” (All quotes on p. 562).

A dialogue about sustainability would undoubtedly be valuable. However, the strategy of influencing individuals through dialogue overlooks some key determinants of cultural evolution. Changing cultural practices relevant to climate change will require effective analysis of the factors influencing the *actions of organizations*. Organizational practices influence individuals’ values and choices. For example, the oil industry has worked to prevent policies that would reduce fossil fuel consumption (Brown 2010). Similarly, conservation organizations advocate less individual

consumption and lobby for policies that encourage sustainable lifestyles. Until the scientific community develops an effective empirical analysis of the factors that influence these practices, large-scale change in the behavior of individuals relevant to sustainability will be achieved capriciously, if at all.

As I describe in the next section, cogent analyses exist of factors influencing the evolution of cultural practices. However, scientific knowledge that could guide *intentional* efforts to influence the evolution of sustainable cultural practices remains limited. If we are to progress, the first priority should be development of a science of cultural practices that *experimentally evaluates* strategies for influencing the practices of formal organizations and governments.

Analyses of Cultural Practices Relevant to Preventing Further Climate Change

A selectionist analysis of societies' major cultural practices has been developed (Alavosius et al. 2016; Biglan 1995, 2003; Biglan and Glenn 2013; Diamond 1999, 2005; Gilbert 1978; Glenn 1988, 2004; Harris 1974, 1977, 1979, 1989; Malagodi 1986; Ponting 1992; Sober and Wilson 1999; Wilson 2003; Wilson et al. 2014). Analysts apply knowledge from the fields of genetics, molecular biology, biogeography, behavioral ecology, epidemiology, linguistics, archaeology, cultural anthropology, historical records, and contemporary anthropological studies. They present accounts of how cultural practices are selected by their contribution to the survival and expansion of human groups and how practices that outstrip the carrying capacity of the environment lead to the demise or dwindling of groups and thereby the discontinuance or diminution of their practices.

Most analyses concern the historical evolution of human groups' major practices, including agriculture, war making, religion, and efforts to deal with disease. For example, both Diamond (1999) and Harris (1974, 1977, 1979) describe the evolution of agriculture as a result of the advantage it initially gave groups in supporting larger populations and armies that could conquer surrounding nonagricultural groups. Wilson (2003) analyzes the selective advantage that religion provided to groups by improving altruism and cooperation.

However, selectionist analyses also address the evolution of contemporary cultural practices. Glenn (1988, 2004) proposed the concept of the *metacontingency* to account for the selection of the practices of groups or formal organizations. The interlocking behavior of two or more people is selected when it achieves an outcome sustaining further instances of a practice. For example, the adoption and spread of quality control in the auto industry seems due to the competitive advantage it gave Japanese auto-makers. Their adoption of quality control practices resulted in increased market share. American companies adopted these practices only when they observed their effect on market share (Halberstam 1986).

This framework provides a systematic and empirically testable analysis of the factors that influence the types of practices that concern Ehrlich and Kennedy (2005). Practices with beneficial or harmful effects on human wellbeing have been selected by their contribution to the material outcomes of those engaged in the practices. According to this framework, the manufacturing, research, marketing, public relations, and lobbying

practices of modern business organizations are selected by their success in achieving market share and profit. For example, analyses of previously secret tobacco company documents show their marketing, lobbying, and public relations practices evolved over the past 100 years due the profitability of cigarette sales combined with threats to and restrictions on their marketing practices that resulted from growing recognition of the harmful effects of cigarette smoking (Biglan 2004; Biglan and Taylor 2000). Similarly, oil companies' efforts to raise doubts about global warming (e.g., Democracy 2005) are designed to prevent public policy changes that threaten oil company profits.

Although these examples involve practices that many readers might oppose, they are not intended to motivate animus toward these organizations. Rather, they are intended to point to contingencies that must be understood if effective action is going to be taken to alter practices that are, in the long term, harmful to human well-being.

Analysis of metacontingencies is also relevant to understanding the practices of organizations that could counter harmful practices. For example, we can understand the development of tobacco control advocacy organizations in terms of the financial support for tobacco control that has been motivated by an increasingly precise, detailed, and widely publicized analysis of tobacco's harm (Biglan and Taylor 2000). That analysis points to the need for research on how to generate financial support for organizations working to identify and control environmentally harmful practices.

Pursuing the Goal of Prediction-and-Influence

Evolutionary analyses of cultural practices are necessarily contextual. That is, they all involve the identification of environmental contingencies that are antecedents to, or consequences that select, practices. Knowledge of these contingencies provide at least a start to creating a science that enables intentional efforts to affect the further evolution of cultural practices (Wilson et al. 2014). However, the ultimate value of this research is a matter of whether it can actually be shown to result in effective strategies for bringing about change. Thus, we need *experimental* research that evaluates the impact of manipulating consequences believed to affect organizational practices. If we are explicit about pursuing the goal of not only predicting relationships between practices and consequences, but also of *influencing* practices, it will increase the likelihood of finding practical strategies for affecting cultural practices.

Programmatic Research on Practices Affecting Climate Change

Targeting the Most Important Practices of Organizations The first step in the development of scientific research on this problem is to identify organizations that engage in practices affecting climate change and the specific practices they engage in that influence climate change. The practices influencing greater climate change include those that directly contribute to it, such as the consumption of fossil fuels, and those that indirectly harm it by promoting harmful practices. Examples of the latter include marketing fossil fuels, lobbying against policies that would reduce their use, and media that cast doubt on scientific evidence about the harm of fossil fuel consumption. Similarly, empirical research must identify organizational practices that directly or indirectly promote practices that would reduce the risk of further climate change. Examples include organizations that are innovative in the use of clean energy and

nongovernmental organizations that advocate for policies favoring a reduction in the use of fossil fuels.

Building a database of organizations that engage in practices affecting climate change (positively or negatively) would facilitate conducting research on how to influence their practices. Once an inventory exists of organizations with a significant positive or negative influence on climate change, it will be possible to focus scientific attention on identifying factors that influence the adoption and dissemination of beneficial practices and the diminution of harmful practices. This requires theoretical and empirical analyses of two sorts. The first involves identifying consequences that favor sustainable versus unsustainable practices. The second involves influencing organizations to adopt more sustainable practices through changes in the planning, analysis, values, and norms of those organizations.

Experimental Analysis of the Impact of Altering the Consequences of Organizational Practices As noted, existing evidence indicates that organizational practices are selected by their material consequences. Organizations that promote unsustainable practices do so because those practices continue to produce immediate financial benefits. However, that analysis is no less applicable to organizations promoting sustainable practices; their efforts have been selected, in part, by the prior success of the practices in garnering financial support.

Empirical research delineating the contingencies between practices and their outcomes will lead to more effective efforts to influence these practices. Experimental manipulations of consequences hypothesized to influence these practices would be especially valuable. Although difficult to conduct, research modifying organizational consequences is not impossible. For example, we found that a program of rewarding stores for not selling tobacco to adolescents significantly reduced the rates of such illegal sales (Biglan et al. 1995, 1996).

A variety of natural experiments is already underway. For example, a number of multi-state or regional collaborations are implementing cap and trade systems to reduce greenhouse gas emissions (Union of Concerned Scientists, N. D.). Cap and trade systems establish a goal for the reduction of (in this case) greenhouse gas emissions and then require organizations to pay for the right to emit more than their allowable limit. Organizations that come in under their limit can sell credits to emit more than the allowable limits to organizations that cannot or choose not to reduce their emissions. The Regional Greenhouse Gas Initiative (RGGI) consists of 10 northeastern and Mid-Atlantic States that have created a cap and trade system designed to reduce the emission produced by electricity generation. Similarly, the Western Climate Initiative (WCI) consists of seven western states and four Canadian provinces that have introduced a cap and trade system targeting the reduction of most greenhouse gas emissions. Their goal is to reduce emissions by 2020 to 15 % below the 2005 levels.

Numerous natural and planned experiments of this type could be implemented. They could involve further testing of cap and trade systems at local, state, or regional levels. But they might also involve evaluating the impact of other types of consequences. For example, merely requiring organizations to assess their level of carbon emissions and make that information available publicly could have an impact on their practices. This becomes increasingly likely to have an impact as the importance of reducing emissions becomes more widely understood and desired by most people. Such a system could be

further strengthened by giving public recognition to good “corporate citizens” or using other schemes to encourage consumers to patronize these good citizens. Conversely, the effect of campaigns to boycott companies that fail to reduce emissions could be evaluated.

Organizations that are seeking to reduce emissions could implement such schemes by advocating for local policies that require them. A multiple baseline design (Biglan et al. 2000) could be used to experimentally evaluate the impact of advocating and implementing such a policy across a small number of communities. Such studies would assess (1) the impact of the advocacy effort on the adoption of the targeted policy by communities and (2) the ultimate impact on emissions.

Altering the consequences of organizational practices is analogous to altering the contingencies selecting genes or behavior (Glenn 2004). Altering consequences for large organizations is admittedly difficult. For example, by raising the gasoline tax one might alter the consequences for making fuel-inefficient vehicles. However, increasing taxes on gasoline would itself require effective actions by many advocacy organizations, which thus far have not been able to counter the influence of the oil and auto industries on US policymaking.

This fact points to the need for experimental evaluations of advocacy efforts. That might not seem like research that behavior analysts do. However, no other branch of the behavioral sciences understands the value of multiple baseline designs. Moreover, the recent work on Relational Frame Theory (Biglan and Barnes-Holmes 2015; Hayes et al. 2001) may provide ways in which behavior analysts can improve upon existing persuasive communications procedures. For example, experimental analyses of how people can be influenced to value “green behavior” or “green policies” could lead to more efficient and effective ways to promote change.

Influencing the Norms and Priorities of Corporate Leaders A second type of research is analogous to gene manipulation. It involves influencing organizations to adopt more sustainable practices through changes in the planning, analysis, and norms of those organizations. For example, a law might require businesses to assess the costs associated with the use of fossil fuels and to analyze ways in which the use of alternative energy sources could reduce their costs and increase profits. Such analyses identifying cost reductions could influence the adoption of those new practices. In this instance, the consequence—greater profit—would not change; instead, the company would alter its analysis of the relationship between practices and profits.

A more interesting example would test strategies for influencing companies to alter a practice, not because it was perceived that the altered practice would improve profits or that changes in the law required it, but because organizational leaders concluded that the altered practice was in the interest of society’s long-term wellbeing. If this sounds mentalistic, consider that Relational Frame Theory research has shown that relational networks, in which a given stimulus is related to other valued stimuli, change the value of the formerly neutral stimulus (Hughes and Barnes-Holmes 2016). “Society’s long term wellbeing” is a verbal stimulus that one may associate with images of fewer deaths due to climate change, the prevention of mass extinctions, more violent weather, etc. This underlines the need for research on how to influence the development of relational networks that increase the functional value of practices contributing to reducing the threat of further climate change.

In sum, the adoption and spread of cultural practices favoring the prevention of further climate change will benefit from empirical research on organizational practices that affect climate change and on the factors that influence the adoption and dissemination of beneficial practices. Science has enabled us to better discern threats to our wellbeing, but until science delineates the contingencies that influence organizations' practices, we will make little progress in moving toward more beneficial practices.

Strengthening the Efforts of Advocacy Organizations

The present analysis points to the need to identify, coordinate, and support organizations working for sustainable practices worldwide. Building a database of such organizations would facilitate their coordination and support while enabling research into their practices. The database could support analysis of the correlates of organizations' advocacy efforts in an effort to determine what influences effective advocacy. The database could aid experimental evaluation of strategies for improving organizations' effectiveness. For example, using multiple baseline designs (Biglan et al. 2000), we could test the impact of strategies for getting people to join and/or support the organization and strategies for getting policies adopted.

The Cultivation of Prosociality

The discussion thus far has focused narrowly on the behaviors and cultural practices that would directly affect climate change. However, the choices that people, organizations, and nations make to sacrifice proximal reinforcers in the interest of the wellbeing of other people alive today and those who will follow is a classic problem that confronts every way in which we might try to improve human wellbeing (Biglan and Barnes-Holmes 2015; Biglan and Embry 2013). In this context, recent research on prosociality may contribute to addressing this problem. To put it simply, the promotion of prosociality in our societies may make people more favorable to taking actions that benefit others—both those alive today and those to come.

Recently, bio-behavioral scientists from different disciplines have come together around a conceptualization of prosocial behavior that organizes a framework for increasing society's wellbeing (Biglan 2015; Biglan and Embry 2013; Biglan and Glenn 2013; Wilson 2015; Wilson et al. 2014).

Wilson et al. (2009) define prosocial behavior as any belief, attitude, or behavior that contributes to others and/or to society as a whole. Some forms of prosociality involve environmentally friendly behavior. Indeed, Sheldon et al. (2011) have shown that countries with more people who endorse prosocial values have higher levels of support for families and children and lower carbon footprints. Materialistic values that involve the endorsement of wanting to be rich and famous tend to be negatively correlated with prosocial values (Kasser et al. 2007). And, materialistic values are associated with greater consumption. A recent review of the evidence (Kasser 2016) provides additional evidence that materialism is associated with more environmentally destructive behaviors.

At the same time, evidence indicates that, when people are threatened in a variety of ways, they become more likely to endorse materialistic values and less likely to endorse prosocial values (Sheldon and Kasser 2008). From an evolutionary perspective, in a threatening world you would do well to focus on having the material resources you need to survive.

Elsewhere (Biglan 2015), I have described the environmental conditions essential to nurturing prosociality and preventing the development of anti-social behavior and other problematic forms of behavior, such as risky sexual behavior. It is essential to minimize socially and biologically toxic conditions in families and schools and to richly reinforce the wide variety of prosocial behaviors that are vital to an individual's successful development and to the wellbeing of those around that person. To the extent that we can evolve our health care and educational systems to provide the evidence-based programs and policies that have proven beneficial in making families and schools more nurturing, we may be able to dramatically increase the prevalence of prosociality in society.

The practices of corporate capitalism are also relevant to the nurturing of prosociality. For example, Kasser and Linn (2004) review evidence that corporate marketing to children increases their materialism and undermines prosociality. Unfortunately, corporate advocacy for business-friendly policies has further eroded societal support for policies that would favor influencing corporate practices that could prevent further climate change. The recent evolution of capitalism has increased the adoption of policies that have contributed to increased poverty and economic inequality, which undermine nurturance in families and schools (Biglan 2015). In brief, an organized advocacy for policies favorable to business developed beginning in the 1970s. It led to much more public support for business-friendly policies, and those policies (e.g., the repeal of Glass Steagal, which had prohibited banks from engaging in both commercial lending and the sale of investment instruments) contributed to the practices that led to the great recession of 2008 (McLean and Nocera 2011). At the same time, advocacy for free markets and minimal government have reduced public support for government-funded efforts to improve wellbeing.

The challenge then is to generate public support for both the adoption of policies that would reduce family economic insecurity and for the widespread implementation of evidence-based family and school interventions that reduce conflict and increase prosociality (Biglan 2015). Increased government and private funding is needed to make available the evidence-based programs that promote prosociality. Efforts to do this are growing. Organizations such as the Coalition for Evidence-Based Policy, sponsored by the Evidence-Based Policy Initiative of the Laura and John Arnold Foundation (<http://www.evidencebasedprograms.org> and <http://www.toptierevidence.org>), the Jim Casey Youth Opportunities Initiative (<http://www.jimcaseyyouth.org/>), the National Prevention Science Coalition to Improve Lives (<http://www.npscoalition.org/>), and the Society for Prevention Research (<http://www.preventionresearch.org/>) are advocating for the increased use of evidence-based interventions. However, although the evidence-based interventions they advocate have resulted from a vibrant and effective behavioral science, much less research has been employed to further the effectiveness of advocacy for the use of these programs and policies.

Toward a More Effective Science for Preventing Further Climate Change

A hallmark of science is its incremental accumulation of knowledge about influences on phenomena important to human beings. Over the last 300 years, we have accumulated tremendous knowledge about how to affect the material world. Within the last 50 years, knowledge about human behavior has increased significantly (Biglan 2015). We are thus at a point where an intentional science of cultural change is possible (Biglan and Embry 2013). If we do not develop it, human societies may suffer substantial harm. Ironically, if they do suffer harm, it will be because, even though science has made so much progress in manipulating the physical world, it has failed to develop a science that alters the cultural practices that exploit the physical sciences in ways that harm human wellbeing.

In this paper, I have tried to show that an experimental analysis of the influences on organizational practices is critical to arresting the accelerating pace of climate change. Behavior analysts have made contributions to how we might alter the consequences for individual behaviors that affect the climate. But unless we improve our ability to influence the practices of large organizations, our impact on climate change will be minimal. We have theoretical accounts of how the practices of organizations are shaped and maintained (e.g., Biglan and Cody 2013; Biglan and Glenn 2013), but we must develop an experimental analysis of how to influence the organizational practices that contribute to accelerating climate change and those that advocate for needed changes in policies and practices. If we do not, we will fail the ultimate test of our science: its contribution to human wellbeing.

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Conflict of Interest The author declares that he has no conflict of interest.

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