Let the social sciences evolve

Commentary on D. S. Wilson et al., Evolving the Future: Toward a Science of Intentional Change

Paul E. Smaldino[a] and Timothy M. Waring[b]

[a]*Center for Advanced Modeling in the Social, Behavioral, and Health Sciences, Johns Hopkins University, Baltimore, MD 21209*
[b]*School of Economics & Sustainability Solutions Initiative, University of Maine, Orono, ME 04469*

psmaldi1@jhmi.edu timothy.waring@maine.edu
http://www.smaldino.com http://timwaring.wordpress.com/

Abstract: We agree that evolutionary perspectives may help us organize many divergent realms of the science of human behavior. Nevertheless, an imperative to unite all social science under an evolutionary framework risks turning off researchers who have their own theoretical perspectives that can be informed by evolutionary theory without being exclusively defined by it. We propose a few considerations for scholars interested in joining the evolutionary and social sciences.

Wilson and colleagues argue for the integration of evolutionary theory into the human behavioral sciences in order to bring about a science of intentional change. Such an integration is sorely needed: Given current rates of anthropogenic environmental damage, we need to change not only our management of the earth, but also the culturally guided mindsets and the institutions that shape perception and guide behavior. In particular, cultural evolution through selection on guided variation and between-group competition can help us understand how to effect intentional change through direct influence on both variation and selection pressures. But the way in which we approach such interdisciplinary work will play an enormous role in its success.

Evolutionary theory has much to offer the social sciences. Evolutionary theorists have done a better job than most at formalizing the processes of change among individuals in a population responding to internal and external pressures, resulting in useful and versatile constructs such as the adaptive landscape, the red queen, and the hawk-dove game. Frameworks, however, come from all over. Game theoretic formulations such as the prisoner's dilemma originally came to evolutionary theory via economics and political science. Many fields have frameworks and constructs that would be valuable to a science of intentional change. Consider *dynamical systems theory,* which provides a formal framework to how interlinked systems change over time. Evolution, as a theory of change, is related, but dynamical systems theory can be discussed

independently and can also help us understand the behavior of individuals and groups. Examples include the dynamics of romantic bonds and marital conflict (Cook et al. 1995; Ferrer et al. 2012), relationships between psychotherapists and their patients (Liebovitch et al. 2011), the development of personality (Nowak et al. 2005), and the dynamics of opinions and social identities (Deffuant et al. 2000; Smaldino et al. 2012). Much insight can be gained without an explicit invocation of evolution.

More importantly, vaulting evolutionary theory to the top of the theoretical totem pole risks alienating researchers who might be receptive to input from an evolutionary perspective but are hesitant to consider it as an overarching framework. Social scientists and scholars have no wish to be colonized by a "universal Darwinism" (Hodgson 2005). They have their own theoretical perspectives that can be informed by evolutionary theory without being exclusively defined by it. An imperative to draw all social science into the evolutionary framework risks turning off researchers who could otherwise benefit from the wisdom accrued by evolutionary thinkers. We think this can be avoided. The question is not how can evolutionary theory unite the social sciences, but how can it serve and connect them in order to fill important gaps.

One particularly striking gap concerns the processes of endogenous cultural change. Anthropologists study culture, but often without reference to the cognitive mechanisms that make culture possible, or the use of quantitative models. Psychologists study human cognition and social behavior, but rarely the population-level consequences of culturally guided behavior. Economists study the societal distribution of resources and the dynamics of individual choice, but treat preferences as exogenous and ignore culture. And most social sciences have not adopted methods for modeling emergent or endogenous behavior within social systems. Although there are exceptions, disciplinary traditions have developed in such a way that endogenous cultural change is rarely addressed directly. Evolutionary theory could provide the necessary links between these different approaches.

We propose a few considerations for scholars interested in joining the evolutionary and social sciences. One place to start is to recognize that evolutionary theory has already spread widely across the social sciences. There are evolutionary traditions in psychology, but also in anthropology (Alvard 1998; Boyd & Richerson 1987; White 1943), economics (Dopfer 2005; Veblen 1898), and sociology and organizational studies (Aldrich 1999; Hannan & Freeman 1977; McKelvey 1982). These are the frontlines of the integration of evolutionary thinking with the complexities of human behavior and society. Each of these traditions, however, remains marginal in its own field. They are not integrated, and use different lexicons and highlight different processes. One way to pull the social sciences together is to foster links among the different extant evolutionary subfields.

We also caution against diving too deep into evolutionary theory without carefully establishing a grounded framework and definitions. In this regard, it is more productive for the evolutionist to take steps *backward* to establish a common set of referents than it is to push *forward* with the complexities of one's theory without first

establishing trust. The terms “symbotype” and “Darwin machine” are examples of terms that, although they are well defined, may push too far forward into the domains of the very social scientists that Wilson et al. are trying to court.

Social scientists are wary because they see evolutionists making big assumptions (e.g., Lumsden & Wilson 1981). But the core of evolutionary theory is so simple that it should never offend anyone, if presented appropriately. *Adaptation occurs when selection acts on heritable variation*. The general theory makes no big assumptions about the strength of selection or the sources of heritability or variation, only that adaptation occurs when all three combine. This disarmingly simple idea is a good candidate for a unifying behavioral framework. Evolution has also provided many valuable insights on phenomena such as maladaptation, path dependence, and the interactions between levels of selection. But the value of these insights cannot be realized unless evolutionists take a step backward in learning the full complexities of the topics their colleagues study. Wilson et al. do this as well as anyone.

We agree that evolutionary perspectives may help us organize many divergent realms of the science of human behavior. We suggest that evolutionary research will be welcomed if evolution is used as a way to connect topics in behavioral sciences, thus providing value from the bottom up, rather than suggesting reorganization from the top down. The contribution by Wilson et al. is an important step toward making those connections.

References

Aldrich, H. (1999) *Organizations evolving*. Sage.

Alvard, M. S. (1998) Evolutionary anthropology and resource conservation. *Evolutionary Anthropology* 7:62–74.

Boyd, R. & Richerson, P. J. (1987) The evolution of ethnic markers. *Cultural Anthropology* 2(1):65–79.

Cook, J., Tyson, R., White, J., Rushe, R., Gottman, J. & Murray, J. (1995) Mathematics of marital conflict: Qualitative dynamic mathematical modeling of marital interaction. *Journal of Family Psychology* 9:110–30.

Deffuant, G., Neau, D., Amblard, F. & Weisbuch, G. (2000) Mixing beliefs among interacting agents. *Advances in Complex Systems* 3(4):87–98.

Dopfer, K. (2005) *The evolutionary foundations of economics*. Cambridge University Press.

Ferrer, E., Steele, J. S. & Hsieh, F. (2012) Analyzing the dynamics of affective dyadic interactions using patterns of intra- and interindividual variability. *Multivariate Behavioral Research* 47:146–71.

Hannan, M. T. & Freeman, J. (1977) The population ecology of organizations. *American Journal of Sociology* 82(5):929–64.

Hodgson, G. M. (2005) Generalizing Darwinism to social evolution: Some early attempts. *Journal of Economic Issues* 34:899–914.

Liebovitch, L. S., Peluso, P. R., Norman, M. D., Su, J. & Gottman, J. M. (2011) Mathematical model of the dynamics of psychotherapy. *Cognitive Neurodynamics* 5:265–75.

Lumsden, C. J. & Wilson, E. O. (1981) *Genes, mind, and culture: The coevolutionary process*. Harvard University Press.

McKelvey, B. (1982) *Organizational systematics: Taxonomy, evolution, classification*. University of California Press.

Nowak, A., Vallacher, R. R. & Zochowski, M. (2005) The emergence of personality: Dynamics foundations of individual variation. *Developmental Reviews* 25:351–85.

Smaldino, P., Pickett, C., Sherman, J. & Schank, J. (2012) An agent-based model of social identity dynamics. *Journal of Artificial Societies and Social Simulation* 15(4):7.

Veblen, T. (1898) Why is economics not an evolutionary science? *The Quarterly Journal of Economics* 12(4):373–97.

White, L. A. (1943) Energy and the evolution of culture. *American Anthropologist* 45(3):335–56.