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FUTURE RESEARCH IN THE SOCIAL, BEHAVIORAL, AND ECONOMIC SCIENCES: A VIEW FROM ANTHROPOLOGY

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Abstract:

Future research in the SBE Sciences should challenge and broaden our fundamental reliance on assumptions of economic rational choice as the basis for human behavior, including social behavior. This will extend multi-disciplinary science and scientific methods to new research on how non-economic structures fundamental in shaping human behavior arise, how they are maintained, and how individuals refer to structure in rationalizing choices. “Structures” refers to preferences, values, beliefs, cultural rules, norms, and precedence and appears in anthropological and economic sciences as an ontological and historical force constraining and shaping human choice. Challenging questions of the future that will unlock new interdisciplinary SBE science will probe how, at what scales, and with what predictability cultural structures arise and constrain human behavior. Effective scientific definition of structure itself remains a critical component of such research, which offers the potential to propel behavioral modeling and prediction apace with increasingly sophisticated computation and measurement tools. Such research will require partnerships across the SBE and STEM disciplines and will be transformative in its engagement with the large-scale, long-term cultural structures that lie outside of conventional scientific epistemologies.

Calls for the abolishment of *Homo economicus* are not new, but it has proven challenging to replace the quantifiable precision of economic rational choice with a scientific concept of structure. Even given our technological prowess in modeling and predicting the outcomes of complex variable combinations and interactions, fundamental choices made at social and individual scales continue to confound us. Economic markets still defy rational prediction, individuals still decide against their best interests, and civilizations seemingly collapse. Within anthropological science, there exists a long dependency on rational choice through evolutionary theory, which broadly expects an individual to act in ways that maximize fitness, for which currency, energy, efficiency, and other measurable returns serve as quantifiable proxies. The economic rationalism inherent in human behavioral ecology (HBE, a branch of evolutionary ecology) has been widely, if not always explicitly, embraced as a scientific basis for modeling economic and social functioning and change. Yet HBE models can barely explain the foraging strategies of small groups living at the margins of the global world and can neither explain nor

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predict the behaviors of specialized and integrated human agents operating exchange within complex society or societies. Agent-based modeling (ABM) has likewise embraced economic rationalism as the basis for agents' decisions in computer programs. The premise is that what is not economically rational is cultural, relegating cultural structure to the role of epiphenomenal remainder in human behavior. Yet no anthropologist truly believes that cultural behavior is epiphenomenal to human rationality, nor do such models provide predictive explanation of the complex, observable world. There are alternatives, including ABM using social goals rather than material or monetary ones, but the ontogeny of such social goals lacks scientific basis. This paper will explore some of the challenges in researching what has been termed cultural structure and endorse the applications of science methods and technologies beyond the boundaries of science theory.

Definitions:

"Economic Rationalism" refers to the fundamental assumptions of the two most significant theoretical underpinnings of all anthropology and much of social science—Evolutionism and Historical Materialism. Both rely on a (quantifiable) materiality, whether the environmental constraints on production and reproduction in the case of evolution or materialism's base of technology and environment. On such material foundations rest the opportunities and costs inherent in every social relationship and the expression of every human ideal or principle. Whether conscious of all opportunities and costs, each human makes choices following sets of rules. Economic rationalists assume that humans who fail to recognize or heed material constraints will prove less successful in production and reproduction than those who do and that the societies and ideals people set up can be explained in terms of material conditions in their genesis and maintenance. In this sense, new science questions aimed at addressing and broadening economic rationalism as a basic assumption will be foundational. Economic rationalism provides the decision-making currency for social modeling, including agent-based models (ABM) and HBE models. Since materials are easy to measure and observe, and success can be quantified as measured outcome, materiality has long been the low-hanging fruit in anthropological science.

Theoretical frameworks:

But it is time for sciences to embrace the challenges inherent in the structural frameworks that constrain materiality. The challenges are foundational because science theory poorly, if at all, recognizes and explains cultural structure or its genesis without recourse to the very rationalism culture subsumes. Anthropologists have long argued that structural frameworks exist, beginning as early as Marcel Mauss and his late 19th C contemporaries who, although fascinated with technology and materiality as the basis for social life also emphasized that *extant cultural parameters constrain and condition* the ways in which humans develop technologies and materials. These ideas were influential in the work of French sociologist Pierre Bourdieu, whose writings proved a relativistic antithesis to science theory but nevertheless laid out compelling

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arguments for cultural structures that constrain economic rationalism and materiality. Historians, anthropologists, sociologists, and many economists recognize that these exist and that rationalism is constrained by what may be heuristically here called "culture," but science and explicitly scientific research has remained firmly focused on material conditions and explains culture only as culture developed from material constraints, not as cultural structure constraining materiality.

The challenges posed by a theoretical orientation that reverses the envelope, putting culture ontologically and structurally outside materiality have led to non-scientific description of cultural structure, such as anthropologist Marshall Sahlins' seminal study of the death of Captain Cook and his more general outline in *Culture and Practical Reason* (1976). But scientific explanation of how, at what scales, and with what predictability cultural structures arise and constrain human behavior remains handicapped by the historical epistemologies that have removed cultural structure from the purview of science. New archaeological studies (e.g., in Arabia, Egypt, and the Andes) suggest that cultural structures are long-term and persist outside the dynamics of change. If scientists are to understand and contribute with predictive capacity how cultural structure constrains human decision-making in a global world facing narrowed diet breadth, climate change, and an increasingly strained resource base, then science research must deliberately engage cultural structure, even with its challenges in measurement, relativism, and problematic ontogeny (where does it come from if not from economic rational choice in a material world? How can science understand its perpetuation and predict its change?).

Scientific Strategy:

This is a big, transformative bite into "non-science" for science, even SBE science with its disciplinary ranks already well filled by cultural relativists. The fights of the 1990s with the fissioning of departments and academic disciplines are well known, and frankly were pointless. But scientific advances—in methodologies, multi- and inter-disciplinary approaches, and computational capacities—point toward ever more complex models that can be built from cultural structure with its practical referencing. Challenging and broadening our reliance on economic rational choice will transformative because it requires reconciling opposing epistemologies in science and culture studies. What is called for is a transformation by challenging the basic assumption underpinning a breadth of SBE sciences rather than a new challenge question within the theoretical architecture of evolutionary-material models. One approach, but one unlikely to suffice alone, is the incorporation of costs into existing rationalism models by assigning currency to symbolic and ritual behaviors. Thus the distance travelled on pilgrimage or to participate in a political rally would figure into the calculation of human decision-making. Sociologist Anthony Giddens laid groundwork for this capacity in *The Constitution of Society* (1984) in which he marked the practical referencing of cultural structures with clear signposts for scientific inquiry. Drawing on time-space geographers, Giddens signaled the significance of daily paths and encounters (a concept perhaps usefully compared to economic network theory), which are tangible aspects of social encounters and practical society that can be

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modeled. By clearly defining the referencing of extant cultural structure as a quantifiable, measurable practice through observable daily paths, this approach is grounded in objectivism. Perhaps most visionary are Giddens' almost wistful remarks about the significance of "inter-societal systems" (involving forms of relations between societies of differing types), and "time-space edges" (interconnections between different societal types). These are of greatest interest for the study of cultural structure, ontogeny, and change. Both are concepts ripe for formal scientific modeling and predictive testing using computational power unfathomable decades ago.

Recent Research Results and Standing Questions:

Future research should build upon the objectivist approaches of Giddens and time-space geographers and upon the multi-disciplinary collaborations between SBE and STEM disciplines built into the Human Social Dynamics (HSD) initiative in NSF-SBS. Through such collaborations, scientists have generated predictive models for crime hot-spots (DHB 0527388) implicating practice theory (neighborhood familiarity). Likewise, the venture of SBE-HSD into history to comparative case study for patterns and modeling in the HSD study of world systems (AOC 0527720) points to the capability to understand and predict large, complex systems like states whose maintenance and perpetuation is not guided by rationalism. Research also builds on technologies such as increasingly high-resolution remotely-sensed imagery of earth's surface and improved statistical models to automate detection of spatial features such as archaeological sites that serve as proxies, marking time-space paths and time-space edges from past societies (DHB 0624368). While these studies represent but a fraction of recent research, they point to the partnerships, technological capacities, methodologies, and reach of scientists to address the outstanding problems of how to observe, measure, and quantify cultural structures and the constraints these place on human behavior, and at what scales (individual, group, inter-group, complex systems) cultural constraints can objectively and predictably be understood.

Range of Disciplines: Whereas the perspective in this paper is an anthropological one, the issues and challenges engage social, behavioral and economic scientists at both in terms of meta-disciplinary theory and in partnerships that may include SBE and STEM disciplines. Obvious disciplines include but may not be limited to Anthropology, Biology, Computer Science, Ecology, Economics, Engineering, Geography, Psychology, Sociology, and Statistics.

Implications for Future Research within and across the Disciplines:

Understanding and generating a capacity to predict the roles of extant cultural structures in human behaviors and behavioral responses to external phenomena such as climate change, resource scarcity, or crowding can hardly be overstated, yet the very definition and objective description of cultural structure remains a challenging problem. Culture is understood by everyone, yet poorly defined. Its utility as a broad concept lies in its relevance to a wide array of scientific and non-scientific disciplines, and understanding cultural structure therefore inherently offers an inter-disciplinary target for high impact SBE research with broad social implications.

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