



## Review of Thomas Dietz and Andrew Jorgenson's *Structural Human Ecology*



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**Thomas Dietz and Andrew Jorgenson, eds. 2013. *Structural Human Ecology: New Essays in Risk, Energy, and Sustainability*. Pullman, WA: Washington State University Press. 227 pages, ISBN 978-0874223170 Paper (\$28.95).**

This collection makes two very important contributions to the field of environmental sociology. First, it highlights the impressive and critical contributions of scholar Eugene (Gene) Rosa, former Boeing Professor of Environmental Sociology at Washington State University (WSU), to the field of structural human ecology. The volume's contributions were assembled from presentations at a conference held at WSU in 2011 to honor and build upon Gene's portfolio of scholarship. And it was Gene's personal insistence that the contributions to the conference stretch beyond his personal work to include related contemporary work and potential future syntheses that resulted in the volume's second significant contribution, which is to bring together in one volume the historical foundations and key contemporary contributions in the field of structural human ecology, as well as a set of cogent recommendations for future research.

The volume's ten chapters are organized into four sections. The first section describes and clarifies the foundations of structural human ecology by describing Rosa's scholarship and tracing his contributions as they manifest in current theoretical and methodological challenges within the field. The introduction, by Dietz and Jorgenson, describes the primary themes and approaches that tie together the field of structural human ecology. Drawing upon Rosa's seminal piece "Metatheoretical Foundations for Post-Normal Risk" (Rosa 1998), Dietz and Jorgenson illustrate that, while structural human ecology is not a unified set of theoretical tenets, those

engaged in the development of this approach share a set of principles that guide their scholarly exchange of ideas. First, context matters – an argument that receives detailed consideration in the volume’s wrap-up chapter by Dietz. The second principle is that theoretical arguments require empirical evaluation; and, relatedly, the third principle is that the development of explanatory models requires very careful conceptualization and attention to underpinning assumptions.

One of the true gems of this section of the book is Richard York’s contribution (Chapter 2), which summarizes and extends Gene’s “Metatheoretical Foundations of Post-Normal Risk” (affectionately called “Meta”). York takes on the challenge that historical contexts and background conditions present when building predictive models. Reminiscent of Weber’s emphasis on historical specificity, York argues that the factors associated with a specific outcome in one context may not result in the same outcome in another setting with different sets of historical circumstances. Therefore, scholars are encouraged to take a broad approach to predictive enterprises and interrogate the underpinning assumptions that accompany existing models before they are applied in significantly different settings. Dietz adds to the richness of the theoretical contribution of the volume in Chapter 3, where he highlights the challenges of ontology and epistemology in the application of structural human ecology to praxis in the policy world. Drawing from the analytic-deliberative tradition (NRC 1996), he discusses the challenges that arise when (1) trying to apply general models to specific locations; (2) when public tolerance for risk diverges in either direction from the probabilities of negative outcomes predicted by positivist science; and, (3) when positivist scientific findings are verifiable, but those findings aren’t directly observable by members of the broader public.

The second section of the collection expands on the concept of risk with a focus on mitigating, managing, and governing risk. Ortwin Renn and his colleagues present an interesting discussion of the challenges that arise from Climate Engineering. Public acceptance of large engineering on the scale of carbon capture and storage is unclear based on surveys and public dialogues in Europe. Furthermore, the risks of climate engineering technologies have not been fully assessed, making prediction of success and unforeseen negative outcomes uncertain. Given the increasingly important role that uncertainty plays in complex risk assessment, Kasperson’s article delves into three forms of uncertainty and ways to manage each. Aleatory uncertainty stems from significant data gaps that make assessment of particular scientific questions impossible; model-parameter uncertainty refers to the fact that models often fail to capture important contextualizing, timing or situational factors, leading to blind spots in our findings; and finally epistemic uncertainty stems from true ignorance as to the risks a new technology or action poses, resulting in posited outcomes that may be completely off target. Building resilience through adaptive management and the precautionary principle are the recommended response to such uncertainties, according to Kasperson. As a masterful practitioner, Paul Stern’s chapter on

governing the risks of emerging technologies brings lessons from his work for the National Research Council to bear on the role of institutions in organizing risk mitigation. The case of hydraulic fracturing (a risk we face daily in my home state of Oklahoma) is used as an opportunity to illustrate a set of institutional design principles that Stern feels will be adaptive and resilient enough to incorporate scientific knowledge and the public good while navigating through uncertainty. In each of these cases, Rosa's work suggests that good governance structures that include transparency, public participation and consensus building are key components to approaching uncertainty in productive ways. Likewise, the precautionary principle is central to approaching technological development when outcomes cannot be predicted with normal scientific methods.

The third section of the book illustrates the types of empirical findings that the structural human ecology approach produces using a diversity of data sources. The macro-comparative core of structural human ecology scholarship is well-illustrated in chapters by Allan Mazur, Andrew Jorgenson and Sandra Marquart-Pyatt. Mazur's chapter illustrates the relationship between energy consumption and quality of life; each increases in a relatively linear way until very high levels of consumption are reached. At that point, indicators of quality of life no longer track with increased energy use. Mazur also examines the relationship between energy consumption and population growth, and his findings indicate that this relationship differs between industrialized and developing nations. Perhaps the quintessential structural human ecology scholar, Andrew Jorgenson's chapter provides both a nice overview of the field of structural human ecology (SHE, as he calls it) and an excellent empirical example of SHE in action. I found his explanation of the STIRPAT model components and their operationalization to be the clearest I have ever read, making this chapter a top choice for classroom use. He also presents a new analysis of the effects of population and affluence on carbon emissions that parses out regional and temporal variations while illustrating the robust nature of population and affluence as drivers of environmental change. Marquart-Pyatt's piece serves as an example of how structural human ecology and work on environmental concern can come together. By combining approaches, she tests a multilevel model that estimates individual and country-level effects together with indicators of ecosystem wellbeing. Her findings bolster arguments that country-level conditions impact individuals in ways that systematically impact their feelings of environmental efficacy and environmental threat awareness.

Structural human ecology has certainly found its voice in this comprehensive edited volume. First, it is a tour-de-force of the contributions of a significant figure in environmental sociology—Gene Rosa, even featuring a piece of Gene's artwork on its cover. And, finally, it serves as a mature foundational collection that clarifies – ontologically, epistemologically, methodologically and empirically – the terrain of one of the most important contemporary sub-

fields of environmental sociology. Having been in attendance at the conference in Pullman in 2011, it is an honor to see, expressed in print, the atmosphere of rigorous but genuinely scholarly comradery and shared appreciation that converged around Gene Rosa's life and work. This volume is a must read—mostly because of its excellent scholarly contributions, but also because of the spirit in which it was assembled. RIP, Gene!

### References

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