The Simple Rules of Systems Thinking: How Thinking Systemically is an Emergent Property of Four Simple Thought Structures

Research shows that four patterns of thinking, drawing distinctions/boundaries, organizing part-whole systems, interrelationships, and taking perspectives (called DSRP), are simple rules for the emergent property we call systems thinking (cognitive complexity). Existence of these simple rules is universal in every thought and across human cultures and languages. But awareness of these rules (aka, metacognition) is far less pervasive. Building awareness of the DSRP simple rules has been shown to have highly statistically significant effects on cognitive complexity. To meet its potential, the field of systems thinking should focus on the daily awareness and practice of these rules and the "jigs," "tools," and "moves" that are born of them.

Derek Cabrera (PhD, Cornell) is an internationally known systems scientist who in 2021 was inducted as a Member of the International Academy for Systems and Cybernetic Sciences (IASCYS) for outstanding contributions to the field. Derek serves on the faculty of Cornell University, is Faculty Director for the Graduate Certification Program in Systems Thinking, Modeling, and Leadership (STML) and is senior scientist at Cabrera Research Lab. He serves on the United States Military Academy at West Point's Systems Engineering Advisory Board. He has given two TED Talks, holds two US patents, written and produced a rap song, a children's book on cognition, and numerous book chapters and peer-reviewed journal articles. His research has been profiled in peer-reviewed journals, trade magazines, and popular publications. His work in public schools was documented in the full-length documentary film, RE:Thinking. He was Research Fellow at the Santa Fe Institute (SFI) for the Study of Complex Systems and National Science Foundation IGERT Fellow in Nonlinear Systems in the Department of Theoretical and Applied Mechanics at Cornell University. In 2018, he received the National Science Foundation Small Business Innovation Research (SBIR) for his work in cognitive mapping. He is author of ten books including, The Origin of Ideas: Empirical Studies in Cognitive Complexity (forthcoming 2022), Systems Thinking Made Simple (winner of the 2017 AECT outstanding book award), Thinking at Every Desk, and Flock Not Clock. He is credited with discovering universal organizing rules of systems and systems thinking (DSRP Theory) and organizations (VMCL Theory). He was invited by LinkedIn Learning and eCornell to deliver online courses in Systems Thinking and Leadership. He was Co-Founder and Chief Science Officer of Plectica (since sold to Frameable) where he invented several software applications including Plectica systems mapping and virtual whiteboard. Cabrera is co-editor of the Routledge Handbook of Systems Thinking (forthcoming 2022) and on the editorial board of the international, peer-reviewed journal, Systems. He is the Editor in Chief of the peer-reviewed Journal of Systems Thinking. As a National Science Foundation postdoctoral fellow, he developed new techniques to model systems approaches in the evaluation of Science, Technology, Engineering, and Mathematics (STEM). Cabrera was awarded the Association of American Colleges and Universities' K. Patricia Cross Future Educational Leaders Award. His contributions to the field of systems thinking have been integrated into NSF, NIH, and USDA-NIFA programs, K-12, higher education, NGOs, federal agencies, corporations, and business schools. His systems models are used by many of Silicon Valley's most innovative companies. His books are used as introductory text for undergraduate and graduate students in numerous colleges and universities including Cornell University, the US Military Academy at West Point, and the US Army War College. Cabrera has developed a suite of systems thinking tools for use in academia, business, and beyond including the first validated personal inventory of systems thinking. Prior to becoming a scientist, Cabrera worked for fifteen years around the world as a mountain guide and experiential educator for Outward Bound and other organizations and has climbed many of the world's highest mountains. He also worked extensively with the Conservation Corps and Restorative Justice movements. He holds a PhD from Cornell University and lives in Ithaca, NY, with his wife, Laura Cabrera, three children, and four dogs.