



Pareto-based Science: New Methods for Studying Distributions

Prof. Bill McKelvey

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Session 2: 17th June (1:30 pm for 1:45 pm – 3:45 pm)
G-1, 20 Kingsway (Entrance through Portugal Street)
London School of Economics

Abstract:

My talk begins with a comment on the practitioner relevance of organization science research, noting the discipline-push vs. cure-pull basis of research legitimacy. Then I focus on the idea that – whereas studies of ‘averages’ are what gain statistical legitimacy and academic recognition, not to mention promotion – reality is that practitioners worry more about positive and negative extremes: they get promoted when there are positive ones and fired when outcomes are dramatically negative.

To make the difference in studying averages vs. extremes more compelling, I focus, next, on what counts as useful knowledge by comparing organization studies with earthquake science – after all, I come from California, a land of 500 quakes per week! The difference is dramatic. Knowing about the ‘average’ quake is useless; it is the extremes that kill and cost \$billions.

In a world of connected data-points, the ‘law of large numbers’ will uncover Pareto rank/frequency distributions, not the ‘normal’ distributions presumed by econometricians! Rank/frequency distributions, for example, can range from a Wal-Mart or Carrefour at one extreme to millions of Ma&Pa stores at the other. Using current econometric approaches is often like looking for the average of elephants and mosquitoes. In fact the ‘average’ animal doesn’t exist; studying whatever is at the average applies to nothing and surely does not apply to extremes like elephants or mosquitoes. Same is true for trying to ‘average’ the Wal-Marts and Carrefours with Ma& Pa stores. As Robert Axtell said recently at the Organization Science Winter Conference (Squaw Valley, 2008), ‘The average firm does not exist!’

Another fundamental difference is that the academic-discipline perspective applies discipline-centric theories to different levels of organizations – psychological studies of workers at the bottom; economic studies of industries at the top. I focus, instead, on causal dynamics that are scalable; that is, like causal dynamics in cauliflowers, the same dynamic works at multiple levels – Murray Gell-Mann calls this ‘middle-level theory’. It is particularly relevant in living systems. Most of my talk is devoted to eight elements of Pareto-based Science:

1. Extremes at $N = 1$: ‘talking pigs’.
2. Overlapping i.i.d. & idiosyncratic micro-niches in the high-frequency tail.
3. Vertical slices progressing from large toward smaller samples down to $N = 1$ ‘talking pigs’.
4. Horizontal scalability dynamics – research how butterfly-events and levers do or do not scale up
5. Bak’s ‘self-organized criticality’ – principle of achieving efficacious adaptivity at the ‘edge of chaos’.
6. Power laws as the ‘diagonal’ in Gini coefficient methods.
7. Power laws as indicators of efficaciously adaptive self-organization.
8. Methods aimed at better indicating/locating i.i.d. vs. connectivity effects at intra- and inter-firm, industry and economy levels of analysis.

About the speaker:

Prof. Bill McKelvey received his Ph.D. from the Sloan School of Management at MIT and is currently Professor of Strategic Organizing at UCLA’s Anderson Graduate School of Management. His book, *Organizational Systematics* (1982), remains the definitive treatment of organizational taxonomy and evolutionary theory. He has advised some 170 student consulting projects in firms and produced more dissertation award-winning doctoral students than any other B-School professor in the US. His “keynote” talk featured all over Europe: “Improving Corporate IQ” focuses on how CEOs can use basic complexity theory to raise the probability of finding new strategies in a changing, hi-tech world by improving the optimal mix of human and social capital.

Please e-mail ComplexityGroup@lse.ac.uk as soon as possible and by 12th June at the latest to let us know you plan to attend. Students and LSE academics only, are invited free. Everyone else will need to contribute £20 per session (there are two sessions, this is Session 2) to cover costs.