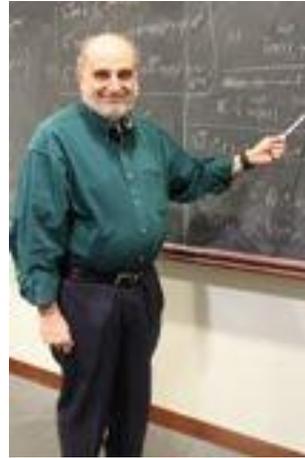


# EPSTEIN INSTITUTE SEMINAR ▪ ISE 651

## Taylor's Law via Ratios, for Some Distributions with Infinite Mean

**ABSTRACT** – Taylor's law (TL) originated as an empirical pattern in ecology. In many sets of samples of population density, the variance of each sample was approximately proportional to a power of the mean of that sample. In a family of nonnegative random variables, TL asserts that the population variance is proportional to a power of the population mean. TL, sometimes called fluctuation scaling, holds widely in physics, ecology, finance, demography, epidemiology, and other sciences, and characterizes many classical probability distributions and stochastic processes such as branching processes and birth-and-death processes. We demonstrate analytically for the first time that a version of TL holds for a class of distributions with infinite mean. These distributions and the associated TL differ qualitatively from those of light-tailed distributions. Our results employ and contribute to methodology of Albrecher and Teugels (2006) and Albrecher, Ladoucette and Teugels (2010). This work opens a new domain of investigation for generalizations of TL. This work is joint with Professors Joel Cohen and Victor de la Pena.



**Dr. Mark Brown**

Professor, Columbia University  
Department of Statistics

**SPEAKER BIO** – Dr. Mark Brown is a Professor in the Department of Statistics at Columbia University. He received a BA in Mathematics at CCNY in 1964, an MS in Statistics at Stanford University in 1965 and a PhD in Statistics from Stanford University in 1968. He is Fellow of the ASA since 1975, and a Fellow of the IMS since 1980. His research has been in applied probability models, reliability theory, Markov chains, first passage times, bounds and inequalities, and applied statistics. He is part of the team at Georgia Tech University, which developed the LRMC method for ranking college basketball teams. This methodology has been very accurate relative to competing methods and has received significant sports fan and media attention. Previous to joining the faculty at Columbia Mark has held faculty appointments at Cornell University, (IE-OR), City College, CUNY, (Mathematics), and Florida State University, (Statistics), as well as visiting appointments at Stanford, NYU, George Washington University, IBM Thomas J. Watson Research Center, and the Memorial Sloan-Kettering Cancer Center. He is a longtime friend and research collaborator of Sheldon Ross, and is honored to visit and speak at the Viterbi School of Engineering at USC.

**USC** Viterbi

School of Engineering  
*Daniel J. Epstein Department of  
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**TUESDAY, APRIL 18, 2017**

**3:30PM – 4:50PM**

USC ANDRUS GERONTOLOGY CENTER (GER), Room 206