Rationality or Irrationality of Preferences?
A Probabilistic Specification of Tversky's Lexicographic Semiorders

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Amos Tversky's seminal paper on "intransitive preferences" in *Psychological Review (1969)* has set the stage for a substantial multi-disciplinary literature that reports that individual human and animal decision makers can have intransitive, hence irrational, preferences. Tversky suggested that the participants in his experiments made choices among gambles in accordance with <u>intransitive lexicographic semiorders</u>. Regenwetter, Dana, and Davis-Stober have revisited this literature (*Psychological Review*, in press*; Frontiers in Quantitative Psychology and Measurement*, 2010*)* and demonstrated an array of conceptual, mathematical, and statistical errors in prior work. They concluded, using both prior and new data, that observed choice behavior is consistent with variable, but transitive, latent preferences. This talk revisits Tversky's original idea and develops a new probabilistic model of lexicographic semiorders that permits rigorous quantitative testing of Tversky's idea. Full fledged testing of this model requires order-constrained statistical inference, which has only be developed in the last few years. We will introduce the model, discuss its mathematical properties, and illustrate its descriptive performance with some empirical data.