Formal Theory & Causality

Lecture 5 – Part II

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Exp Class Lectures

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- What do we learn from such experiments?

Control, Random Assignment, & FTA

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- Stress tests very important ways in which to evaluate robustness of theory & results

FTA & the Analysis Stage

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- A larger number of FTA experiments are being conducted in the field where control is less easily maintained & random assignment can be problematic

FTA & the Analysis Stage

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- Lots of way do this, discuss one example.

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FTA & the Analysis Stage

Optimization Errors in Experiments

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- Yet, from the first FTA experiments researchers discovered that although in a number of experiments the overall predictions of the theory might be supported by the average behavior of subjects, clearly some subjects chose at variance with the predictions.
- Could these variations in subjects' choices be a consequence of errors that subjects make in translating their preferences into choices?
- Consider the centipede Game

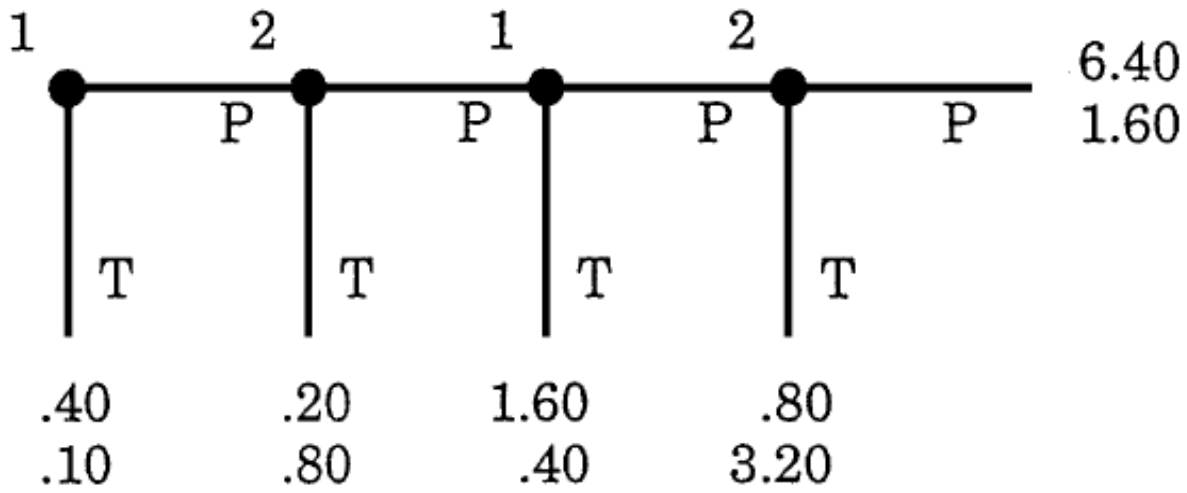

Figure: The Centipede Game from McKelvey and Palfrey (1992)

FTA & the Analysis Stage

Quantal Response Equilibrium

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- QRE is a generalization of probabilistic choice models such as logit and probit to game theoretic situations.
- Key assumption actors' deviations from optimal decisions are negatively correlated with the associated costs and that in equilibrium players' beliefs about these deviations match the equilibrium choice probabilities.
- Goeree, Holt, and Palfrey (2008) provide an axiomatic definition of what they label *Regular* QRE and they demonstrate that given these axioms regular QRE exist in normal form games.

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- $\sigma_{ij} = \frac{e^{\lambda U_{ij}(\sigma)}}{\sum_{k \in S_i} e^{\lambda U_{ik}(\sigma)}}$ for all $i, j \in S_i$ where σ_{ij} is the probability i chooses strategy j & $U_{ij}(\sigma)$ is the equilibrium expected payoff to i if i chooses decision j and the players in the game have a strategy profile of σ.

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- A higher λ reflects a less noisy response to the payoffs. In the extreme, when $\lambda = 0$ subjects are choosing purely randomly and when $\lambda = +\infty$ subjects are choosing according to the Nash equilibrium.

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FTA & the Analysis Stage

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- However, criticism exemplifies importance of assumptions made about stochastic processes when creating a theoretically derived structural model for empirical evaluation.

FTA, Field Experiments, & Observational Data

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- Examples with nonexperimental data – Coate & Conlin & others