

# 實驗經濟學一：行為賽局論

Experimental Economics I: Behavioral Game Theory

## 第十三講：現場實驗

## Lecture 13: Field Experiments

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本課程指定教材：Colin E. Camerer, *Behavioral Game Theory: Experiments in Strategic Interaction*. New York: Russell Sage Foundation; New Jersey: Princeton UP, 2003.




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# Harrison and List (JEL 2004)

- What Consists a Field Experiment?
- Various Types of Field Experiments
  - Lab Experiments in the Field
    - Aka Artefactual (what?) Field Experiment
  - Framed Field Experiments
  - Natural Field Experiments
  - Policy Experiments (Social Experiments)
  - Natural Experiments
  - Thought Experiments (and Neuro!)

# What is a Field Experiment?

- Field:
- "...an investigation, study, etc., carried out in the **natural environment** of a given material, language, animal, etc. and not in the laboratory, study, or office."
  - Oxford English Dictionary, 2<sup>nd</sup> Ed.
- What are the components of a **natural environment**?

# Six Factors of the Field

- Nature of the **Subject Pool**
- Nature of the **Information** Subjects Bring In
- Nature of the **Commodity**
- Nature of the **Task** or **Trading Rule** Used
- Nature of the **Stakes**
- Nature of the **Location** (Environment)

# Categories of Experiments

1. (Conventional) Lab Experiments
2. Lab Experiments **in the Field**
  - Non-standard subject pool (or location?)
  - Neutral Context: **Artefactual** Experiment
  - Field Context: **Framed Field Experiment**
3. Natural Field Experiment


# Why are They Important?

- In the Field, the key to evaluate treatment effects is to construct a **counterfactual** by
- **Controlled Experiments** (most convincing)
- **Natural Experiments** (Cannot have outcome shocks correlated with treatment)
- **Propensity Score Matching** (PSM)
- **Instrumental Variables** (IV)
- **Structural Estimation** (impose structure)

# Lab Experiments in the Field


- **Neutral Context:** Artefactual Field Experiment
  - Not "Artificial," but **Artefactual** (what?)
- **Subject Pool:** Students used for convenience
  - Are they representative?
- **Selection Bias to the Lab**
  - Who will come? Is this correlated with behavior?
  - Risk averse people might not want to come (and make risky choices in the experiment)

## Lab Experiments in the Field

- **Recruitment Bias** (Rutstrom, IJGT 1998)
- Elicit values of a private commodity
- \$0 ☐ \$2 ☐ \$10 show-up affect who comes
- Can correct with relevant characteristics
- Same as exit polls correcting selection bias 



# Lab Experiments in the Field

- **Are Students Different?** (Harrison-Lesley96)
- Can we mimic large survey results using only a student sample?
  - A statistical model with student data and demographics **predicts** national survey results
- Students are representative **conditional on** their socio-demographic characteristics! 
  - Problem is whether they are diverse enough...


# Lab Experiments in the Field

- **Are Students Different?**
- If age affects behavior, how can students of age 18-24 predict that of age 18-70?
- Could be even worse if unobservable characteristics (can affect behavior)
- At least try to collect a batch of individual characteristics for **conditional** comparison

# Lab Experiments in the Field

- Lichtenstein and Slovic (1973)
  - Preference reversals in downtown Las Vegas
- Kagel, Battalio and Walker (1979)
  - How prices, weekly feedback on usage, conservation info. affect electricity demand
  - Volunteers vs. random sample
- Binswanger (1980, 1981)
  - Holt and Laury (2002) in India

# Lab Experiments in the Field

- Smith, Suchanek and Williams (1988)
  - Asset Bubbles
  - One experiment was done with professional and business people in the Tucson community
  - Still had a bubble (but with heavy volume and did not burst at the end) – more of a bubble?! 
- Recall: Henrich et al. (2001, 2004) and Tanaka et al. (2010)

# Lab Experiments in the Field

- Field Context: Framed Field Experiments
- Information Subjects Already Have
  - Neutral context could mean that you have no control over the context subjects might impose
- Commodity
  - Induced demand vs. Things they know
  - Hanoi Tower Game: Computerized McDaniel and Rutstrom (2001) vs. Montessori
    - Children in Montessori can violate constraints when exploring, but subjects in computerized settings cannot
  - Field Substitutes (Can this affect behavior?)

# Lab Experiments in the Field

- Task Nature: Is this their everyday life task?
- Harrison and List (2003)
  - Do pro-sports card-dealers suffer the winner's curse in auctions?
  - They have heuristics developed to avoid the winner's curse (but specialized for dealers)
- Would other heuristics help people avoid money pumps?

# Lab Experiments in the Field

- Stakes (Monetary or Mental)
- Poor Country/Double Stakes
  - Slonim and Roth (1998), Holt and Laury (2001)
- Target People who really Care
- Bohm (1972)
  - Swedish TV program for a closed community
  - Six procedures all produce the same bids
- Follow-up: Bohm (JPubE 1984)



# Natural Field Experiment

- Natural Field Experiment
  - Conducted in an existing economic institution so subjects don't even know it is an experiment
  - (Why isn't this deception? Part of real life!)
- Levine and Plott (1977)
  - Levine's flying club wants to design fair agenda
  - Plott suggested Levine to propose the agenda that would lead to his desired outcome
  - Later surveys elicited preferences
- Back to the Lab: Levine and Plott (1978)





# Natural Field Experiment

- List and Lucking-Reiley (2002)
- Charitable Contribution Solicitation
  - Raise \$3,000 to buy a computer
  - Assign different seed money amounts (10%, 33%, 67%) and refund (if goal is not met)
  - 3000 HH with income > \$70k; donated before



# Other Field Experiments

- Policy Experiments (Social Experiments)
  - Evaluate Policy Effectiveness by randomizing between treatment and control group
  - Ester Dufflo, Michael Kremer are experts who work in developing countries (Kenya, India,...)
- Natural Experiments
  - Simply observe naturally occurring controlled comparisons between treatments

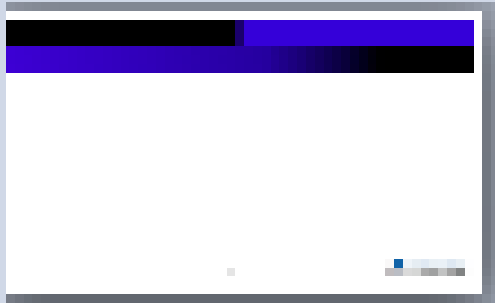




## Other "Field" Experiments

- Thought Experiments
  - Are **thought experiments** really field experiments?
- Neuroeconomic Experiments are **real thought experiments**
  - Neuronal activity are measured during their **natural reaction** to stimulus!
  - Key: Monitor the natural mental process when the experimental treatment is administered

# Conclusion

- Field Experiments try to make experiments **less artificial**
- But why are lab experiments **unnatural**?
  - Because of its **neutral language**?
- Just need to conduct experiments **naturally**!
  - Neutral language is only a benchmark...

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1-20			國立臺灣大學 經濟學系 王道一 教授
3	...an investigation, study, etc., carried out in the natural environment of a given material, language, animal, etc. and not in the laboratory, study, or office		Oxford English Dictionary, Second Edition. qtd. in Jeffrey P. Carpenter, et al, “Field Experiments in Economics: An Introduction,” Research in Experimental Economics, Vol.10, pp.2. 依據著作權法第 46 、 52 、 65 條合理使用
8	Recruitment Bias Elicit values of a private commodity....Same as exit polls correcting selection bias		Home-grown Values and Incentive Compatible Auction Design, International Journal of of Game Theory, Vol.27, (1998),pp.427-440 依據著作權法第 46 、 52 、 65 條合理使用
9	Students are representative conditional on their socio-demographic		G.W.Harrison and J.C Lesley, “Must Contingent Valuation Surveys Cost So Much?” Journal of Environmental Economics and Management, Vol.31,(1998), pp.91.

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12	One experiment was done with professional and business people in the Tucson community. Still had a bubble ...did not burst at the end) – more of a bubble	  	Vernon L. Smith, Gerry L. Suchanek and Arlington W. Williams, “Bubbles, Crashes, and Endogenous Expectations in Experimental Spot Asset Markets,” <i>Econometrica</i> , Vol. 56, No. 5 (Sep., 1988),pp.1130-1131. 依據著作權法第 46 、 52 、 65 條合理使用
14	They have heuristics developed to avoid the winner's curse (but specialized for dealers)		G.W. Harrison and John A. List, “Naturally Occurring Markets and Exogenous Laboratory Experiments: A Case Study of the Winner’s Curse,” <i>The Economic Journal</i> , Vol.118, (2008), pp.824. 依據著作權法第 46 、 52 、 65 條合理使用
16	Levine's flying club wants to design fair agenda ...Plott suggested Levine to propose the agenda that would lead to his desired outcome		Michael E. Levine and Charles R. Plott,” <i>Agenda Influence and Its Implications</i> ” <i>Virginia Law Review</i> , Vol. 63, No. 4 (May, 1977)pp.564 依據著作權法第 46 、 52 、 65 條合理使用
	Paise \$3 000 to buy a		John A. List and David Lucking-Boiley “The effects of Seed