

## 2. Methodology

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Economics 176

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We need to “transfer” these characteristics to experimental subjects in order to test a model’s predictions

- Beliefs/information: Easy to provide to subjects (just tell them!)
- Actions: Easy to control by setting rules of the game
- Preferences: Much trickier

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**Solution:** Provide subjects with a *reward medium* linked to preferences from the model.

- Must satisfy a set of conditions.

# IVT Condition 1: Non-satiation

The reward medium should be something that subjects always want more of (or always want less of).

- Money
- Grades
- Tedious effort

## IVT Condition 2: Salience

The reward mechanism must significantly reward subjects who take action that would make the hypothetical agent from the market better off.

Subjects must be acutely aware of the correspondence between their actions and rewards.

## IVT Condition 3: Dominance

The payoffs in the reward mechanism must be more important to subjects than other things going on in the experiment.

- Rivalry
- Boredom
- Confusion
- Altruism

## IVT Condition 3: Dominance

Note, this does **not** mean that subjects should never be in a position to feel rivalry or altruism.

Just means subjects should only be motivated by these things when the agent from the model might also be motivated by these things.

# Unique Principles of Economics Experiments

Induced Value Theory demands unique practices in economics experiments.

Hertwig and Ortman suggest four principles that differentiate economics experiments from psychology and social psychology experiments.

# Principle 1: Pay for Performance

Psychology experiments rarely pay.

Very rarely pay based on subjects' decisions

We need this in order ensure non-satiation and dominance.



## Principle 2: Repetition

Economists typically have subjects repeat tasks many times in a row.

Experience as training method.

Focus analysis on experienced data.

Often important for satisfying salience!

## Principle 3: Clear instructions

Experimental economists are strict about clear instructions explaining the experiment in a lot of detail.

Needed in order to satisfy salience.

## Principle 4: No deception

Psychology experiments often involve misleading subjects about the rules of the game.

This violates IVP:

- Dominance and salience can be seriously compromised.

# Experiment Types: Theory Test

Simplest type of experiment tests the predictions of existing theory

This can be a formal theory...

- **Example:** A bid in a first price auction with uniform value distributions will be:

$$b = \left(\frac{n-1}{n}\right)v \quad (1)$$

... or an informal theory

- **Example:** People are more likely to be generous when someone else has been generous to them.

# Experiment Types: Comparing Theories

Another type of experiment compares the relative explanatory power of two or more competing theories.

- **Example:** Is complete information necessary to achieve competitive equilibrium (as Marshall theorized) or are prices sufficient to guide trade to a competitive equilibrium (as Hayek theorized)?
- **Example:** Do subjects learn from the price formation process in financial markets (as rational expectations theory suggests) or do they rely only on their own private information (as traditional competitive analysis suggests)?

## Experiment Types: Study “Homegrown” Preferences

Induce some preferences and then find out about the nature of naturally occurring preferences subjects bring into the lab with them.

- **Example:** At what rate do people discount future payments?
- **Example:** Do people have pure preferences over the earnings of others?
- **Example:** How averse are people to risk?

# Experiment Types: Inspire New Theory

Learn about topics about which core economic theory cannot make predictions (or make imprecise predictions).

- **Example:** Do people learn to make rational decisions with experience? If so, how?
- **Example:** Do people form unspoken agreements (tacit collusion) with each other when interacting repeatedly?
- **Example:** Do people form expectations naturally that lead to financial market bubbles?

# Experiment Types: Design New Institutions

Find out how to set up rules for interaction that best achieve some goal.

- **Example:** Design an auction for pollution permits that will only allow pollution when really necessary.
- **Example:** Auction off slots on a space shuttle to competing scientists, so slots only go to the most valuable projects.
- **Example:** Design institutional rules that encourage contribution to public goods.



## Experiment Types: Study Learning

Find out what it takes and whether people learn to do the rational thing or converge to equilibrium with experience and feedback.

- **Example:** Double auction experiments show that equilibrium emerges unconsciously from individual decisions.
- **Example:** Oprea et al. (2009) show that people adjust to eventually learn to properly value real options, a task that ordinarily requires advanced math!
- **Example:** John Van Huyck and coauthors show how social norms (conventions) emerge from repeated interaction in coordination games.

# Some Advantages of Experiments

- Direct tests of theoretical predictions
- Avoid selection biases.
- Know what variables are being caused and which are doing the causing (avoid chicken/egg problems)
- Replicate findings
- Induce what you can't observe
  - Information
  - Preferences

# External Validity

Big concern: Do experiments say something about the real world?

- If an experiment is testing a piece of economic theory, it is at least as externally valid as that piece of economic theory!
- If no, it is important to try to properly specify the economic system to make the results as applicable as possible.
- Regardless, experiments give real incentives to real people and look at real behavior – an experiment is the real world.
- In general, an experiment is externally valid to the degree that experimental design captures what is important about phenomenon under study.