

## Lesson 1: The Scientific Process

### I. PRE-ANALYTICAL “WORLDVIEW” = RAW MATERIAL

1. Perception of reality = the existing understanding of facts
2. Ideology = the characteristic beliefs of a particular group, culture or class at a point in time (value-laden ideas about what is important and proper ways of proceeding)
3. Random knowledge and intuition

*Worldview informs the analytical effort in a number of important ways, such as helping to determine what is important to investigate, and deciding whether truth is a higher value than religious belief.*

### II. ANALYTICAL EFFORT

#### 1. Research question formulated – what is important?

- \* Time and other resources are scarce: why focus on this question?
- \* Who funds the research—and why?

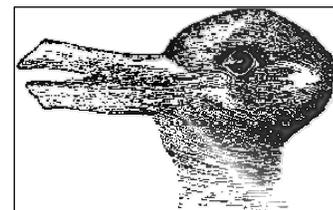
#### 2. Model building – how we “see” the world

Do markets always clear? If yes—build a Classical model. If not—a Keynesian model.

Keynes: “The composition of this book has been for the author a long struggle of escape.... from habitual modes of thought and expression. The ideas which are here expressed so laboriously are extremely simple and should be obvious. The difficulty lies, not in the new ideas, but in escaping from the old ones....<sup>1</sup>”

#### 3. Data Collection

- a) Definition of variables – how you define a variable affects its size and other characteristics
- b) How much data to collect? A large sample reduces error but costs more. Is the extra expense worthwhile in the quality of data received?
- c) Ethical methods of data collection – Hitler’s concentration camps?
- d) Collection of “facts” requires perception and interpretation  
→ The Duck-rabbit problem
- e) The act of collecting the data changes it!  
→ Heisenberg’s Uncertainty Principle



- Putting a thermometer into a pot of water changes the temperature in the pot.
- Asking a discouraged worker if they are actively seeking work might inspire them to go out and look again.

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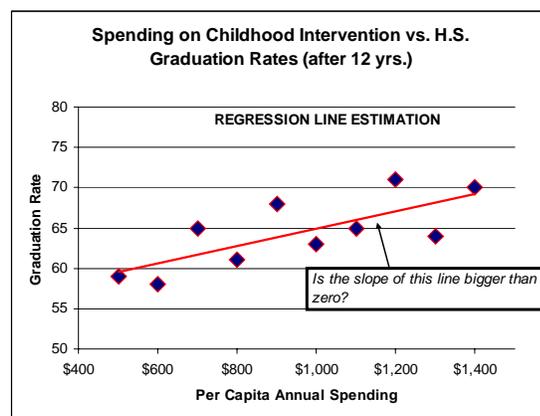
<sup>1</sup> John Maynard Keynes, *A General Theory of Employment, Interest, and Money* (NY: Harcourt, Brace & World, 1964 [1946]): viii.

#### 4. Data Analysis

a) Assessing **statistical significance** – requires investigator make an independent judgment about the type of acceptable errors – or accept the “general consensus” worldview.

\* Set acceptable Type I error (false positive)

b) Assessing **economic significance** – involves convincing others. It is a dialogue about more than if the line has a positive slope. Does the slope have “oomph”? (McCloskey)



#### 5. Research Dissemination

a) Truth-telling – why be truthful about the results? (There is no purely scientific reason for being truthful, only a judgment that truth is intrinsically important.)

b) External financing – who “owns” the results? Will unfavorable findings be scuttled?

c) External evaluation – expectation of fair hearing in academic journals of high quality  
\* Do evaluators consider their own reputations when commenting on work that is critical of their own?

#### 6. Economic Knowledge – will change the world

“Facts” that are accepted as truth—after the scientific process—will likely change attitudes, laws, and the existing worldview. “Positive” economics changes the world—and thus has ethical implications.

### III. SUMMARY

“Positive” economics is a mixture of:

“science”                      and                      “normative values”  
(analytical effort)                      (judgments)

According to this interpretation, value-free science is both not possible and not desirable. An economist who understands her own biases and worldview can be more objective and impartial.

Adherence to absolute ethical standards (e.g., for honesty and fiduciary conduct) enhances the scientific process. Science needs ethics (just as ethics probably needs science).