

## II. Science

### A. Goal of Science

Describe a phenomenon

Understand & Explain a phenomenon (ID cause and effect)

Prediction

Control / Application

### B. **Knowing the World** : Epistemology

#### Folk Wisdom

1. Authority - Because someone (expert) says so
2. Tenacity - Because it has always been so and nothing will change that
3. A Priori - Because it seems reasonable and Likely

#### Logical Positivism (Whitley):

- Originally developed as a field of Analytical Philosophy (The Vienna Circle of the 1920) - largely grounded in the notion of the “empirical verifiability criterion of meaning” - statements are only meaningful if they are empirically verifiable.
- Logical Positivism dominated Social/Behavioral Science philosophy in 40s and 50s, and still seems to be an implicit assumption today.
- In the field of psychology, logical positivism is characterized by the following assumptions.

#### 1. Science should be (based on my grouping of Whitley’s Table 1.1, p. 8)

a. Objective / Empirical - only things that can be directly observed can be studied.

b. Interested in Basic Research

c. Identify Universal Truths (contextual variation is a nuisance variable)

- Truth is invariant (a fact can only be interpreted one way / by an expert)

- The goal is to identify Lawlike generalizations

d. Reductionist- a phenomenon can be reduced to its component parts which can be independently studied in isolation to learn about the phenomenon.

- Science approaches truth in progressive and isolated increments - each study builds on past research and takes us one step closer to truth. (Isac Newton - Standing on the shoulders of giants)

- The world can be classified into mutually exclusive components.

-Greek Dualism (Socrates, Plato, & Aristotle) - Soul and Body

-Descartes Dualism - Mind & Body,

-Rational & Irrational, Objective vs. Subjective

#### 2. Scientific Method - Theorize, hypothesize, test, revise (Self-Correcting)

Francis Bacon (1500 - 1600's) : Formalized the Scientific Method

#### Humanism (Whitley) :

1. Science should be

- a. Intuitive and Subjective
  - Objectivity may be an illusion - we must acknowledge that all “objective” observations are grounded in one’s worldview (culture, history, politics, religion, philosophy, etc.)
- d. Anti-Reductionist Concerned with Contextual influences.
  - E.g., Systems Theory, Dynamical Systems Theory, Social Constructionism
  - Spinoza : Monism (Spiritual World and Physical world are one. Man and Woman and meaningless without the other for comparison; They are relational). - Model is dominant in non-western epistemology (e.g., Mestizo Perspective, Africentric Perspective, Eastern Philosophy/Science)
- c. Searching for Relativism (not universal principles)
  - Truth is relative to the time and place it is evaluated (K. J. Gergen)
  - Facts can be interpreted may different ways.
  - Subjects are the experts not the researchers.
- c. Concerned with Applied Problems that benefit people.

Thomas S. Kuhn(1970)- The structure of scientific revolutions - Science is not incremental and linear - Science is guided by history and change occurs through paradigm shifts.

The basis of Scientific knowledge is grounded in the “provisional consensus of scientists” (<http://en.wikipedia.org/wiki/Postmodernism>, retrieved 1/24/06)

Postmodern / Social Constructionist (Foucault, K J Gergen) / Critical Theory / Post Structuralism (literary Critique/ Foucault, Lecan // vs. Structuralism - Semiotics - Levi-Strauss)-

- Concerned not just with application, but with transformation of science.
- Knowledge is socially constructed for the benefit of those who do the defining.
  - Psychological “truth” has largely been defined in ways that place and keep psychologists and those like them (European, Male, Elite) in superordinate positions and others in subordinate positions.
  - Francis Bacon: “nature [is] female, and the goal of science [is] to ‘bind her and make her your slave’” (as cited in Riger, 1992, page 730)