Science and Psychology

Week 1

Exercise

- Write down two things that you know.

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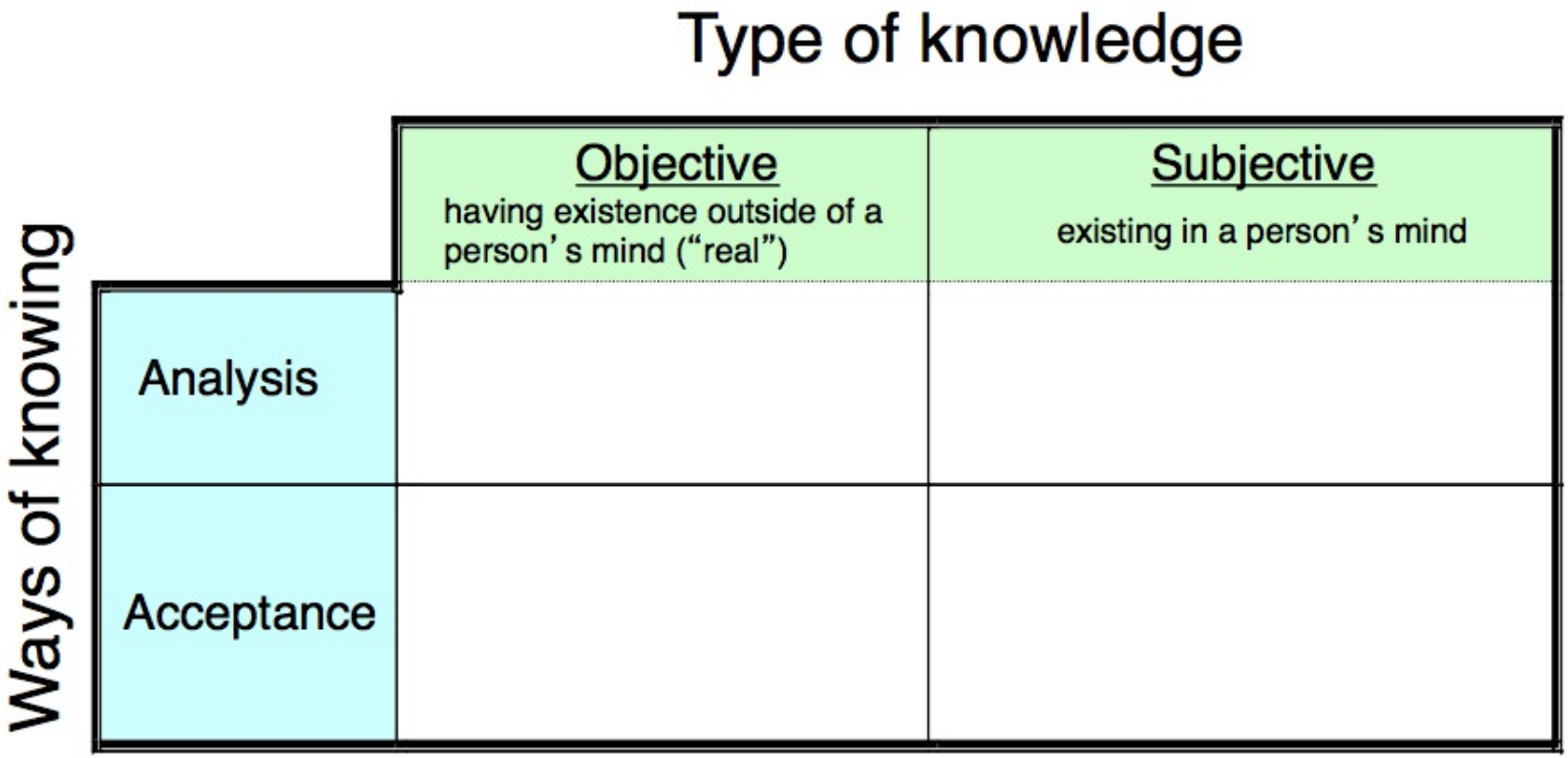
- Write down two things that you know.
- Write down HOW you "know" these things.

Methods of Inquiry



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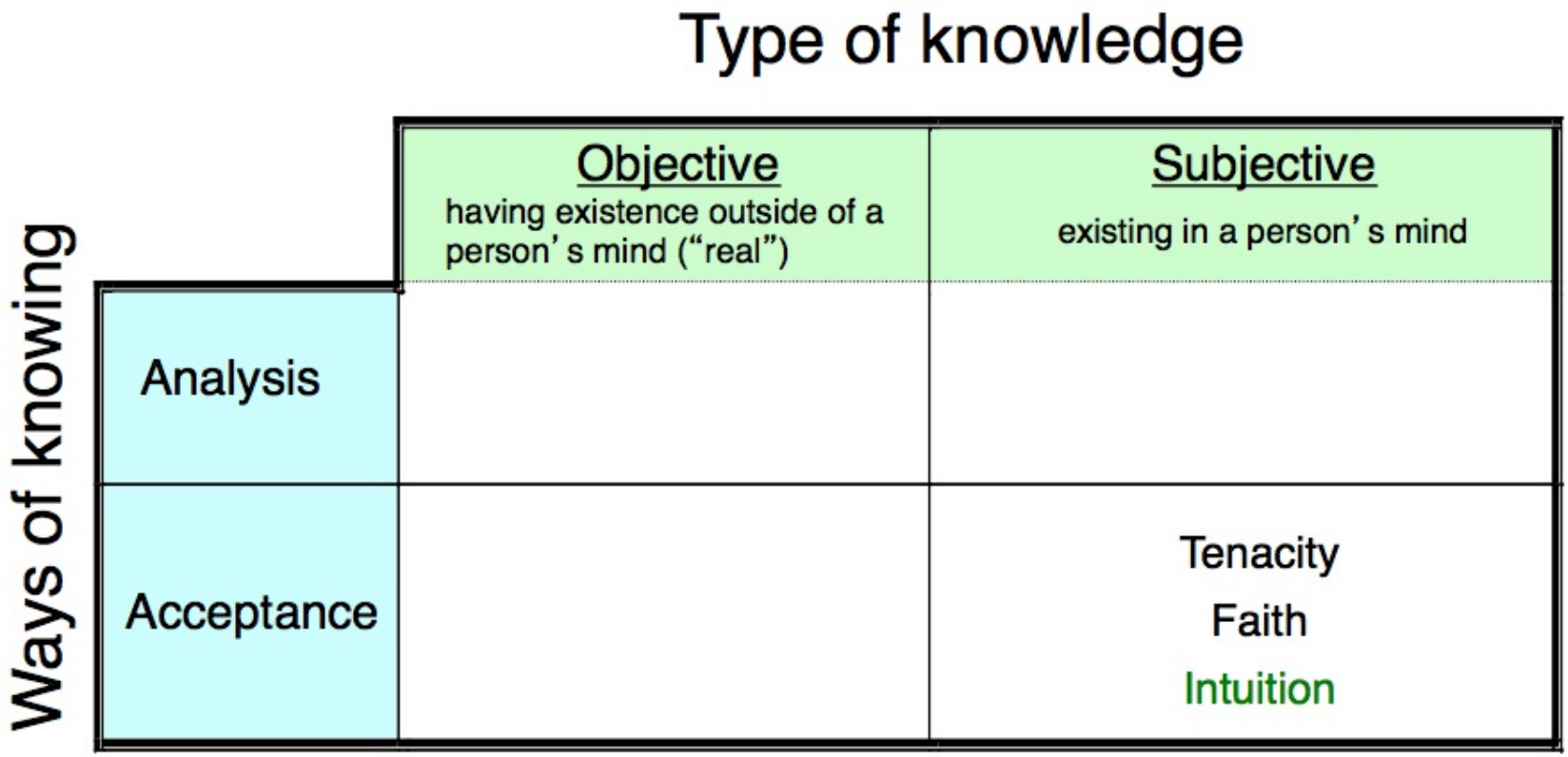

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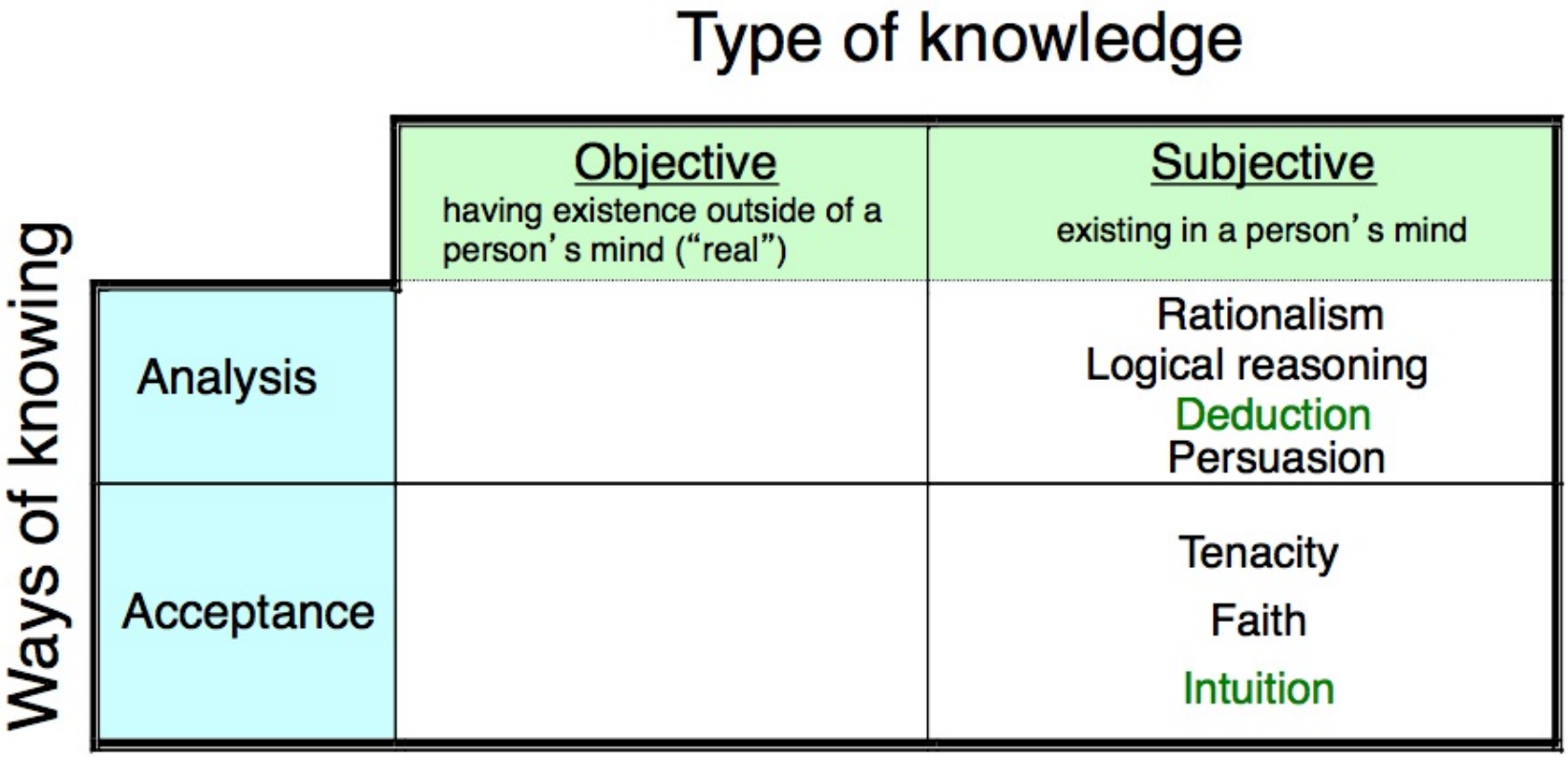

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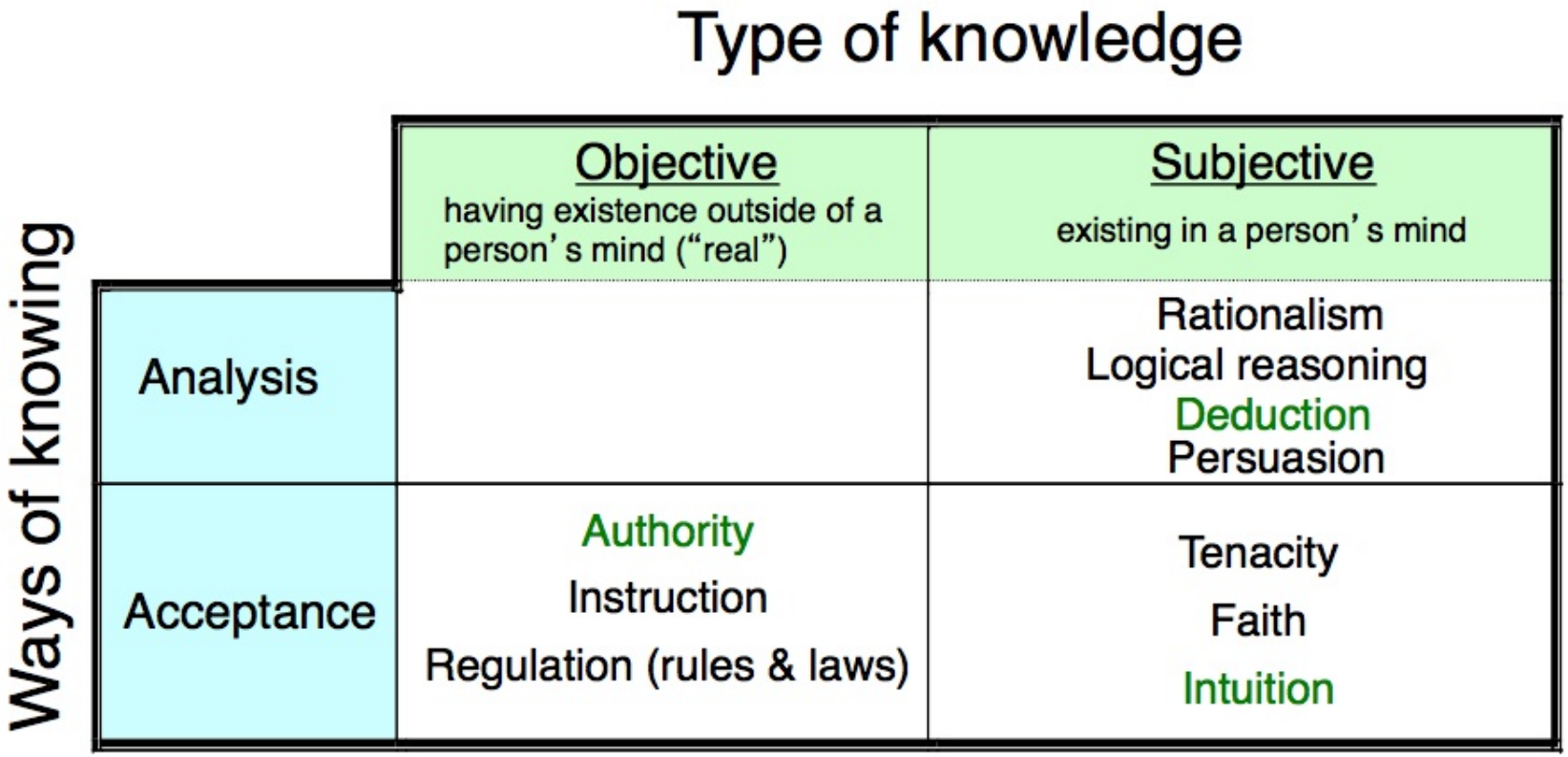

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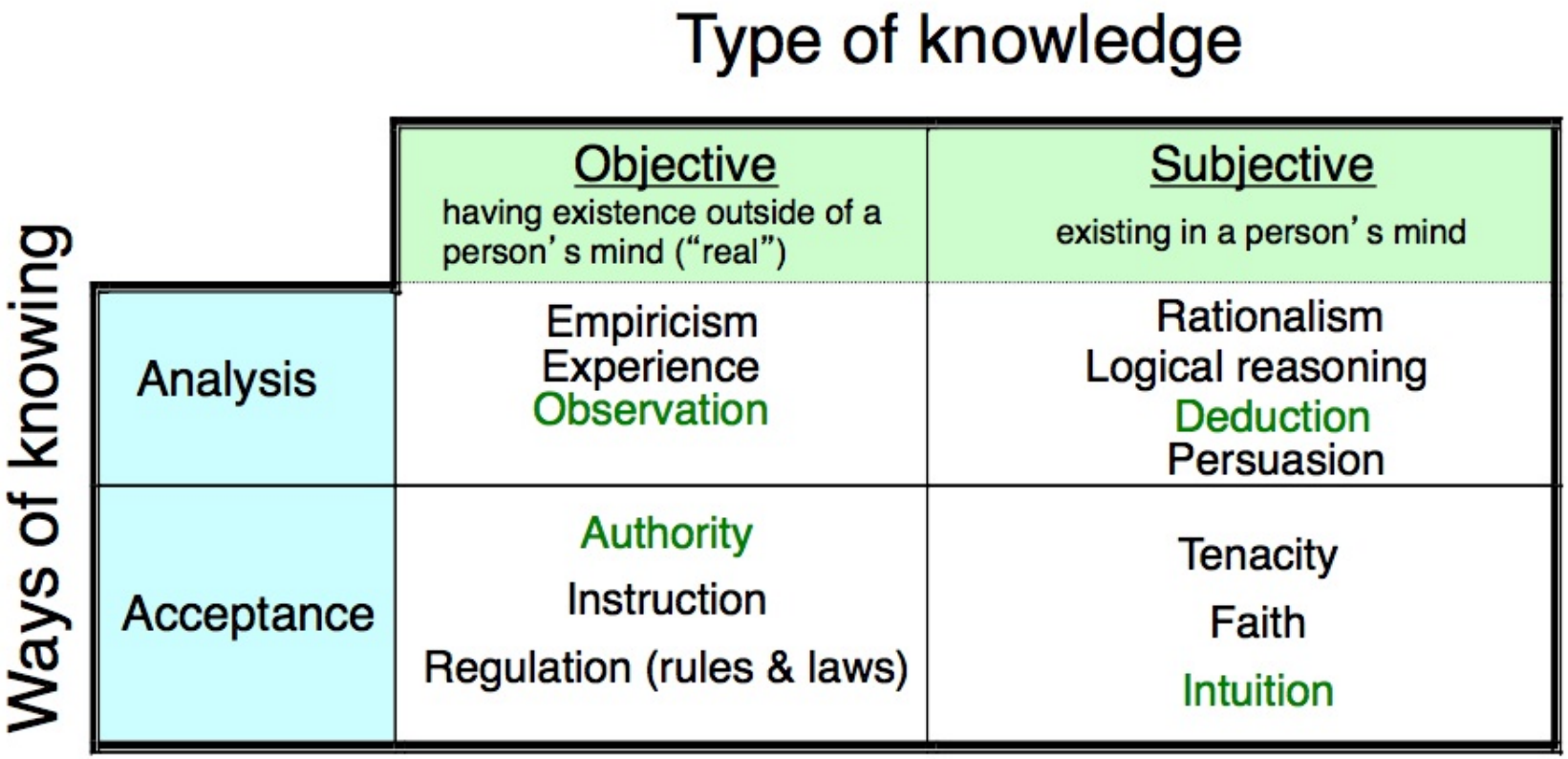

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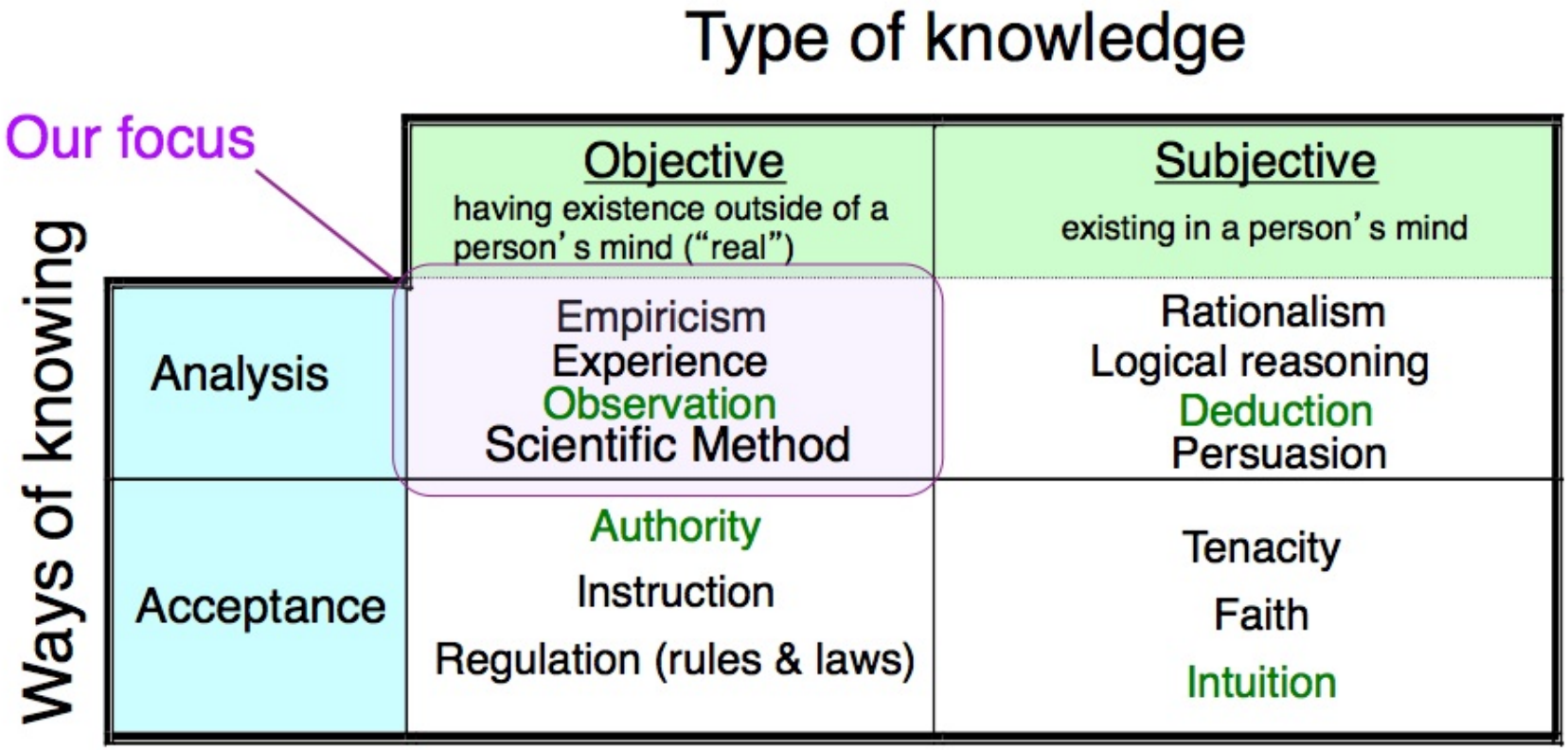

Methods of Inquiry

The Scientific Method

- A method used to test and analyze claims about behavior
- Uses systematic observation and experimentation
- Four Cannons of the Scientific Method
  - Empiricism
  - Determinism
  - Parsimony
  - Testability
- A 6 step process

Step 1: Observation

- Pay attention to the world around you, look for generalizations
  - *Write down two generalizations that you have observed about people's behavior*

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- Two classes of generalizations
  - Descriptive generalizations – just describe what was seen, no predictions made
  - Cause-effect generalizations – make predictions about the observed relationship between two (or more) things

Step 2: Develop a theory or hypothesis

- Identify the variables associated with your observations
- An explanation for the observed behavior(s)
  - How are the variables related to one another?
    - May be based on past research, common sense, intuition, logic, etc.

Step 3: Generate a testable prediction

- Testability: Need to specify how your hypotheses can be tested.
  - The relevant variables must be defined and observable.

- Falsification is at the heart of the scientific method
  - Scientists don't try to prove a theory, but rather set out to refute ("disprove") theories
  - Refutable hypotheses – must be stated in a way that allows the potential for it to be wrong

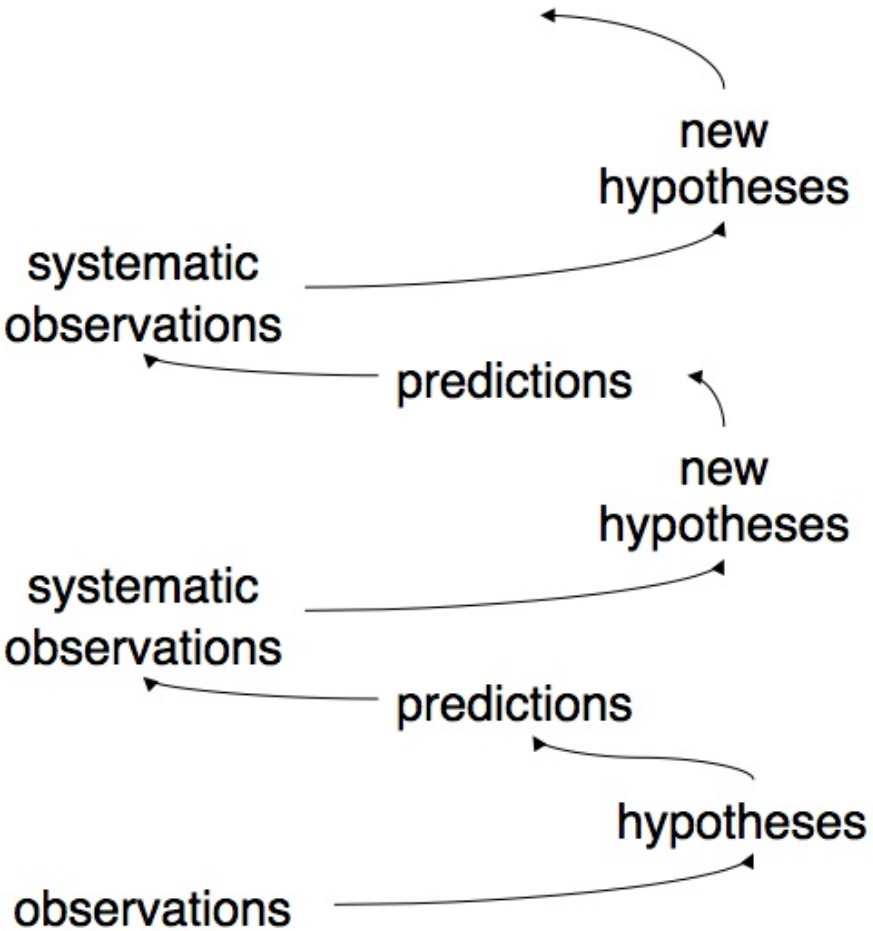
Step 4: Make systematic observations

- Observational and experimental methods
  - Which variables will we examine?
  - How do we measure these variables?
  - Which variables can we systematically manipulate?
  - What variables need to be controlled?
  - Where (from whom) will we collect the observations?

Step 5: Evaluate your evidence

- Refutes theory?
- Supports theory (not "proves the theory")?
- Leads to revision of theory?
- Consider alternative theories?
  - There are always alternative explanations
  - Parsimony: Simple explanations are preferred over more complex ones

Step 6: Rinse and repeat



Psychology as a science

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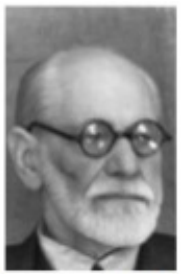

Dr. Sigmund Freud

Dr. Phil (McGraw)

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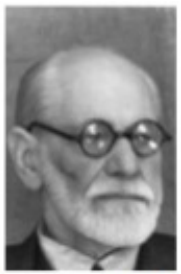

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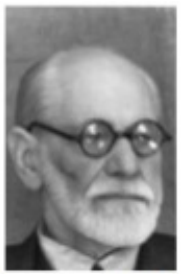

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   - Do these guys represent the standard psychologist?
     - NO!
   - Psychology is a very diverse discipline
     - APA has 56 different divisions of psychology

Psychology as a science

- What is science?
- What are the goals of science?
- Is psychology a science?
  - Yes
    - Studies the full range of human behavior using scientific methods
    - Applications derived from this knowledge are scientifically based

Psychology as a science

- Psychology's goals are *similar* to the goals of the physical sciences
  - Psychologists are concerned with the behavior of people (or animals) rather than the physical world

- How is psychology *different* from the physical sciences?
  - Human behavior is typically much more variable than most physical systems
    - Forces us to consider control (either statistical or methodological)
  - Often the thing of interest requires indirect measurement

Five goals of psychology

- Description of behavior
  - Describe events, what changes what might affect change, what might be related to what, etc.
- Prediction of behavior
  - Given X what will likely happen
- Control of behavior
  - For the purpose of interventions (e.g., how do we prevent violence in schools)
- Causes of behavior
  - Sometimes predictions aren't enough, want to know **how** the X and the outcome are related
  - Develop specific theories
- Explanation of behavior
  - A *complete* theory of the how's and why's