• Probabilistic: its findings are not expected to explain all cases all of the time
  o The conclusions of research are meant to explain a certain proportion of the possible cases
• Scientific conclusions are based on patterns that emerge only when researchers set up comparison
groups and test many people
• Availability heuristic: things that pop up easily in our mind tend to guide our thinking
  o Overestimate, biased
• Present/present bias: fail to look for absences because we notice what is present
• Cherry pick evidence to support what we think is right
• Confirmatory hypothesis testing: select questions that lead to a particular, expected answer
• Biased about being biased
  o Bias blind spot: is the belief that we are unlikely to fall prey to the cognitive biases previously
described
  ▪ Most of us think we are less bias than others
• Journal Articles: Psychology’s most important sources
  o Empirical articles or review articles
  o Empirical journal articles: report for the first time the results of an empirical research study;
    contains details about method, tests, and numerical results
    ▪ Abstract: concise summary of the article, 120 words long; describes the hypothesis,
      method, results
    ▪ Introduction: explain the topic of the study; background of research, goals, specific
      questions
    ▪ Method: how it was conducted, gives enough detail so someone could repeat the study
    ▪ Results: explains quantitative and qualitative results of the study, statistical tests the
      author used
    ▪ Discussion: how well data supported the hypothesis, summarizes study’s research
      question’s and method; promote the contributions, significance, alternative explanations
      for data
    ▪ References: full bibliographic listing
      o Review journal articles: provides a summary of all the published studies that have been done in
        one research area
      o Meta-analysis: quantitative technique, combines the result of many studies and gives a number
        that summarizes the magnitude of the effect size of a relationship
• Chapters in edited books of full-length books to write about the research they did
• PsycINFO: updated weekly by APA
• Scientists Make it Public- the Publication Process
  o Peer reviewed
• Scientists talk to the world: From Journal to Journalism
  o Is the story important?
  o Is the story accurate?
• Experience has no comparison group
  o Blood letting
  o Venting when you’re angry
• Experience is confounded
  o Source of alternative information
• Research is better than experience
• Research is probabilistic
• Intuition is biased by faulty thinking
  o Being persuaded by a good story, or by what easily comes to mind or failing to think about what
    we cannot see
• Intuition is based on motivation
Control group: is a level of an independent variable that is intended to represent “no treatment” or a neutral condition
- Treatment groups: other level or levels of the independent variable
- Placebo group: control group is exposed to an inert treatment such as a sugar pill
- Comparison group does not need to be a control group

- **Experiments Establish Temporal Precedence**
  - Ability to establish temporal precedence, by controlling which variable comes first, is a strong advantage of experimental designs
  - Cause comes before the effect
  - Makes experiments superior to correlations

- **Well-Designed Experiments Establish Internal Validity**
  - Any alternative explanations?
  - Study must ensure that the causal variable is responsible for the change in the effect variable
  - **Confounds**: alternative explanations; potential threats to internal validity
    - Confuse
  - Design Confounds
    - Experimenter’s mistake in designing the independent variable; it is a second variable that happens to vary systematically along with the intended independent variable and therefore is an alternative explanation for the results

- **The Problem of Systematic Variability**
  - **Unsystematic variability**: random or haphazard across both groups, attitude not confound
  - **Selection Effects**
    - Occurs in an experiment when the kinds of participants in one level of the independent variable are systematically different from those in the other
    - Can occur when experimenters let participants choose which group they want to be in
    - Can also result if the experimenter assigns one type of person to one condition and another type of person to another condition
    - Avoid it with random assignment
    - Avoid it with matched groups
      - Measure the participants on a particular variable that might matter to the dependent variable
      - They would next match participants up set by set
      - Each member of the matched set is randomly assigned
      - Prevents selection effects
      - Requires many more resources than random assignment

**Independent-Groups Design**

- **Independent-Groups vs. Within-Groups Designs**
  - Independent-groups design: different groups of participants are placed into different levels of the independent variable
    - Between-subjects design or between-groups design
  - Within-groups design: there is only one group of participants and each presented with all levels of the independent variable

- **Posttest-Only Design**
  - One of the simplest
  - AKA equivalent groups, posttest only design
  - Participants are randomly assigned to independent variable groups and are tested on the dependent variable once
  - Satisfy all three criteria for causation

- **Pretest/Posttest Design**
  - Equivalent groups, pretest/posttest design