

Methods of Psychological Research

Methods of Data Collection

1. Direct Observation

- Naturalistic, no interference
- Observing/recording behavior without trying to control the situation
- No direct information about thoughts and emotions of participants, so it is limited in this respect
- Psychology is the science of the mind and behavior, so lack of data on emotions and thoughts is a hindrance

2. Surveys

- A series of questions for discovering the self-reported attitudes or behaviors of people
- Various methods: phones, internet, mail-in, etc.
- This allows us to gather information on thoughts and emotions
- There are limitations, however; it is not possible for us to completely recall information at various times in the past...
 - I. Limitations of accuracy
 - II. People may not be honest in order to look good; sensitive topics like drug use, sexual behaviors, etc. can cause a person to be self-conscious and hide their true thoughts
 - III. The most damaging limitation: internal bias. You can deny it without realizing you even have one. For example, take the recent murder cases of Michael Brown and Eric Garner. This is an issue split down the middle for many people, and those who refuse to recognize the issue of race as a huge contributing factor to their deaths may have an internal bias that they don't see in themselves.

3. Indirect Observation

- You can make inferences based on indirect information
- Very diverse methods, for instance: eye tracking machines measure pupil movement
- Response time measures: you will complete a task quicker if the task is something you are already thinking about
- If you experience fear and anxiety, you are better able to identify "fear" vs. "frea" as a word in a word identification exercise
- Physiological measures: changes accompany many mental states:
 - o Sweating, pulse racing in fearful situations
 - o Brain scans show different activity in different mental states
 - o Cardiovascular or peripheral arousal; states of fear or anxiety
 - o Addiction (to drugs, sex, food, love, etc.): the same parts of the brain active during drug addiction are present during feelings of falling in love
- We need to summarize our observations in order to find meaningful patterns of results; we do this by quantifying data
- Quantifying data means to use numbers to summarize our variables
 - o **Variable:** any measurable characteristic that varies
 - o **Mean:** arithmetic average of scores in a distribution
 - o **Standard deviation:** computed measure of how much scores vary around the mean
 - o **Correlation:** degree of variability shared by two variables. Example: height and weight are directly related, as taller people tend to weigh more than shorter people
 - o **Positive correlation:** a direct relation between two variables
 - o **Negative correlation:** an inverse relation between two variables
 - o **No correlation:** no relation between two variables
- Correlations are useful for two quantitative variables, not categorical variables
 - o **Sample:** subgroup of a population examined in a study

- o **Representative sample:** sample that contains all variation present in a broader population
- o **Statistically significant:** likelihood that a correlation or group difference in a sample is not due to random occurrence.
- o **P-value:** probability that observed effects were due to chance, represents significance ($p < 0.05$ is statistically significant)
 - I. An observed effect is more likely to be significant if:
 - i. The effect is large
 - ii. The sample is large

Research Types

1. Descriptive research

- To discover basic characteristics of people or situations
- Examples: what are the primary structures of the brain?
- Most basic research, the least complex

2. Correlational research

- To predict aspects of mind or behavior
- Uses observation (direct/indirect), surveys, or indirect methods
- Examples:
 - o Does gender predict emotions in close relationships?
 - o Does wealth predict happiness?
 - o Does race predict intelligence?
- Each of these actually has a positive correlation, and these are very controversial findings.
- The key issue is causation; do the variables really match?
 - o If you're a male, are you less emotional than your girlfriend?
 - o If you're rich, are you automatically happier than the poor?
 - o If you're white, are you really biologically smarter, or are there other factors? Race may predict intelligence, but you aren't saying that race causes intelligence
- Correlation vs. causation:
 - o Variable A causes variable B
 - Gender; female hormones tend to promote emotional closeness more than male hormones
 - o Variable B causes variable A
 - Wealth; happiness leads to one becoming more wealthy
 - o Variables A and B are both associated with Variable C
 - Race and intelligence are both associated with access to educational resources
 - Whites tend to have better educational opportunities than disadvantaged minorities
 - o Two or more of these patterns can occur simultaneously
- **CORRELATION DOES NOT NECESSARILY IMPLY CAUSATION**

3. Experimental research

- An experiment is:
 - o Designed to rule out ambiguity of what causes what, using random assignment to conditions. The researcher does one of two things:
 - o The researcher manipulates an independent variable A
 - o The researcher examines the effects on a dependent variable B
- Example:
 - o Hypothesis: listening to classical music makes your IQ higher
 - o Even if there is a correlation, classical music still doesn't cause an increase in intelligence.
 - o Intelligent people may choose to listen to classical music on their own
 - o Smart children may have smart parents who make them listen to it

- Experiment: a group is divided into two halves, one listens to Mozart, and one does not. There are other variables, like their socioeconomic backgrounds, which contribute, so you must use a randomized way of categorizing people
- Not all research can be done experimentally
 - Example: the effect of childhood trauma on adult life; ethics prevents this
 - Research on animals allows us knowledge of these topics
 - Some psychologists study rats for learning studies, primate studies help us learn about human behavior as well
 - Much of human psychological studies are done on animals; they are willing to live in captivity and it is more ethical: some studies involve subjecting rats to experiences, and afterwards, the animal is killed and the brain is exhumed to study

Evolution and Psychology

1. What is evolution?

- Humans are animals too!
- Every living organism on earth is related; a basic tenet of evolutionary theory
- Humans resulted from evolution
- Evolution:
 - “Survival of the fittest”; we are led to believe the strongest survive, and the weakest ones die out
 - It doesn’t actually refer to strength as an indicator of who survives and who doesn’t
 - *Evolution is simply what happens when organisms reproduce*
 - There is variation between species; examples include different ethnicities and heights within the human race, different dog breeds, and different colors of a single type of flower
 - Some of these variations influence the likelihood that the organism is able to reproduce
 - Over time, differences in reproduction change the actual characteristics of the species.
 - It is about reproduction first, survival second; it is essentially how well an organism fits into its own environment
 - **Biological fitness:** greatest ability to reproduce; survival of desirable characteristics is what is important
- Example: “Wild Rabbits of the Yucatan” (not real)
 - Four colors: brown, white, gray, and spotted
 - They were all very similar, but their eating habits differed: white, gray, and spotted ate cocoa beans, which are toxic to most small mammals
 - White rabbits went extinct
 - Gray rabbits were metabolically predispositioned to eat the cocoa beans, but could not reproduce
 - Spotted rabbits could reproduce, but their offspring were infertile
 - Brown rabbits didn’t eat them, and reproduced, allowing them to dominate the Yucatan
 - This made up example illustrates a set of circumstances that allowed one type of rabbit to dominate due to a simple variation, rather than their actual strength.

2. Evolutionary Adaptations

- Adaptations for individual survival (traits that allowed our ancestors to survive, patterns of thought and behavior; inborn ways typical of people)
 - Examples: hunger, pain, fears, risk aversion → they are basic aspects of our mind and behavior; these sensations are actually signals to help us survive
 - Humans in general are irrationally risk averse; we are very concerned with staying safe, not just physically