https://www.sparknotes.com/psychology/psych101/researchmethods/context/

https://www.sportpsychologytoday.com/business-psychology/sport-psychology-research-methods-qualitative-vs-quantitative/

Unit 3 Research Methods

Introduction

Psychologists do more than just wonder about human behavior: they conduct research to understand exactly why people think, feel, and behave the way they do. Like other scientists, psychologists use the scientific method, a standardized way to conduct research. A scientific approach is used in order to avoid bias or distortion of information. After collecting data, psychologists organize and analyze their observations, make inferences about the reliability and significance of their data, and develop testable hypotheses and theories.

Psychological research has an enormous impact on all facets of our lives, from how parents choose to discipline their children to how companies package and advertise their products to how governments choose to punish or rehabilitate criminals. Understanding how psychologists do research is vital to understanding psychology itself.

Psychological Research

Psychologists study a wide range of topics, such as language development in children and the effects of sensory deprivation on behavior. They use scientifically testable models and methods to conduct their research.

Describing Research

Scientists use the following terms to describe their research:

Variables: the events, characteristics, behaviors, or conditions that researchers measure and study.

Subject or Participant: an individual person or animal a researcher studies.

Sample: a collection of subjects researchers study. Researchers use samples because they cannot study the entire population.

Population: the collection of people or animals from which researchers draw a sample. Researchers study the sample and generalize their results to the population.

The Purpose of Research

Psychologists have three main goals when doing research:

To find ways to measure and describe behavior

To understand why, when, and how events occur

To apply this knowledge to solving real-world problems

Qualitative and Quantitative

Qualitative and quantitative research methods are two commonly used psychological research approaches with very different procedures and objectives. It is important for researchers to understand the differences between these two modes of research in order to determine which approach is best suited to adequately address the research question. The greatest distinctions between these two fundamentally different research techniques are the genesis of theory and the role that theory plays in the mechanics of research. In the quantitative technique, the research effort begins with a theory: a statement that tries to explain observed phenomena. The theory is then operationalized (that is, stated in terms that can be statistically tested) through hypothesis. Data is gathered, statistical tests are completed, and the results are interpreted. The results either support the hypothesis or they do not. (Downey & Ireland, 1979)

Quantitative research is experimental and objective whereas qualitative research is explorative and is not in numerical form. Quantitative research is used to identify evidence of cause and effect relationships and is used to collect data from a larger population than qualitative research (Downey & Ireland, 1979). Aliaga and Gunderson (2000), explain that qualitative research is 'Explaining phenomena by collecting numerical data that are analyzed using mathematically based methods'. It is used to quantify attitudes, opinions, behaviors, and other defined variables – and generalize results from a larger sample population.

Quantitative data collection methods are much more structured than qualitative data collection methods. Data collection methods used in qualitative research includes focus groups, triads, dyads, interviews and observation (Creswell, 2013). Qualitative data is descriptive, which is more difficult to analyze then quantitative data which is categorized, ranked, or in units of measurement. One benefit of qualitative research is the ability to observe, collect, and reach data that other methods cannot obtain. It also provides researchers with flexibility in conveying a story without the constraints of formal academic structure (Creswell, 2013). However,

Berkwits and Inui (1998) explain that qualitative research is suspect in its usefulness to provide a generalize foundations for clinical decisions and policies.

Qualitative methods derive from a variety of psychological research disciplines and traditions (Crabtree & Miller, 2012). Different in many ways from quantitative research; yet qualitative research does have a quantitative connection. Qualitative research, also recognized as preliminary exploratory research, is used to capture communicative information not conveyed in quantitative data about beliefs, feelings, values, and motivations that trigger behaviors. They are used to learn directly from the participant what is important to them, to provide the context necessary to understand quantitative findings, and to identify variables important for future clinical studies (Crabtree & Miller, 2012). Qualitative research provides insights into the problem and helps to develop ideas or hypotheses for potential quantitative research.

Experimental

There are three quantitative research approaches: (1) experimental, (2) quasi-experimental, and (3) non-experimental. Variables are the foundation of quantitative research. Variables are something that takes on different values or categories. The experimental approach is used to study the cause and effect relationship of variables, specifically the independent and dependent variables. This approach involves the use of true random assignments of variables for analysis. The defining characteristic of the experimental approach involves the manipulation of the independent variable. The quasi-experimental approach is similar to the experimental approach however the main difference is that it does not include the use of randomly assigned variables. The final quantitative research approach, non-experimental, is a comparative approach that differs from experimental because there is no manipulation of the independent variable or random assignment of variables

The Scientific Method

Psychologists use the scientific method to conduct their research. The Scientific Method is a standardized way of making observations, gathering data, forming theories, testing predictions, and interpreting results.

Researchers make observations in order to describe and measure behavior. After observing certain events repeatedly, researchers come up with a theory that explains these observations. A Theory is an explanation that organizes separate pieces of information in a coherent way. Researchers generally develop a theory only after they have collected a lot of evidence and made sure their research results can be reproduced by others.

Example: A psychologist observes that some college sophomores date a lot, while others do not. He observes that some sophomores have blond hair, while others have brown hair. He also observes that in most sophomore couples at least one person has brown hair. In addition, he notices that most of his brown-haired friends date regularly, but his blond friends don't date much at all. He explains these observations by theorizing that brown-haired sophomores are more likely to date than those who have blond hair. Based on this theory, he develops a hypothesis that more brown-haired sophomores than blond sophomores will make dates with people they meet at a party. He then conducts an experiment to test his hypothesis. In his experiment, he has twenty people go to a party, ten with blond hair and ten with brown hair. He makes observations and gathers data by watching what happens at the party and counting how many people of each hair color actually make dates. If, contrary to his hypothesis, the blond-haired people make more dates, he'll have to think about why this occurred and revise his theory and hypothesis. If the data he collects from further experiments still do not support the hypothesis, he'll have to reject his theory.

Making Research Scientific

Psychological research, like research in other fields, must meet certain criteria in order to be considered scientific. Research must be:

Replicable

Falsifiable

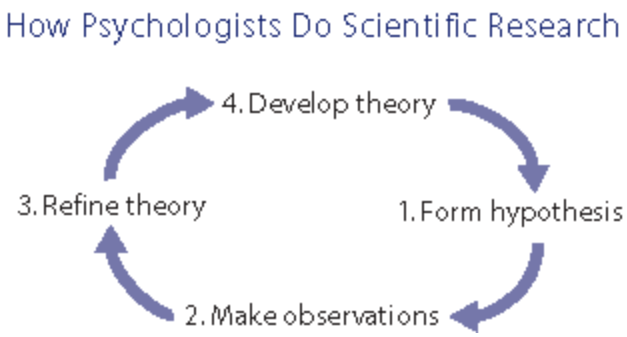
Precise

Parsimonious

Research Must Be Replicable

Research is Replicable when others can repeat it and get the same results. When psychologists report what they have found through their research, they also describe in detail how they made their discoveries. This way, other psychologists can repeat the research to see if they can replicate the findings.

After psychologists do their research and make sure it's replicable, they develop a theory and translate the theory into a precise hypothesis. A Hypothesis is a testable prediction of what will happen given a certain set of conditions. Psychologists test a hypothesis by using a specific research method, such as Naturalistic Observation, a Case Study, a Survey, or an Experiment. If the test does not confirm the hypothesis, the psychologist revises or rejects the original theory.



A Good Theory

A good theory must do two things: organize many observations in a logical way and allow researchers to come up with clear predictions to check the theory.

Research Must Be Falsifiable

A good theory or hypothesis also must be Falsifiable, which means that it must be stated in a way that makes it possible to reject it. In other words, we have to be able to prove a theory or hypothesis wrong. Theories and hypotheses need to be falsifiable because all researchers can succumb to the confirmation bias. Researchers who display Confirmation Bias look for and accept evidence that supports what they want to believe and ignore or reject evidence that refutes their beliefs.

Example: Some people theorize that the Loch Ness Monster not only exists but has become intelligent enough to elude detection by hiding in undiscovered, undetectable, underwater caves. This theory is not falsifiable. Researchers can never find these undiscovered caves or the monster that supposedly hides in them, and they have no way to prove this theory wrong.

Research Must Be Precise

By stating hypotheses precisely, psychologists ensure that they can replicate their own and others' research. To make hypotheses more precise, psychologists use operational definitions to define the variables they study. Operational Definitions state exactly how a variable will be measured.

Example: A psychologist conducts an experiment to find out whether toddlers are happier in warm weather or cool weather. She needs to have an operational definition of happiness so that she can measure precisely how happy the toddlers are. She might operationally define happiness as "the number of smiles per hour."

Research Must Be Parsimonious

The Principle Of Parsimony, also called Occam's Razor, maintains that researchers should apply the simplest explanation possible to any set of observations. For instance, psychologists try to explain results by using well-accepted theories instead of elaborate new hypotheses. Parsimony prevents psychologists from inventing and pursuing outlandish theories.

Parsimony

Parsimonious means "being thrifty or stingy." A person who values parsimony will apply the thriftiest or most logically economical explanation for a set of phenomena.

Example: Suppose a student consistently falls asleep in her statistics class. She theorizes that before each class, her statistics professor secretly sprays her seat with a nerve gas that makes her very drowsy. If she had applied the principle of parsimony, she would not have come up with this theory. She can account for her sleepiness with a much simpler and more likely explanation: she finds statistics boring.

Psychologists use many different methods for conducting research. Each method has advantages and disadvantages that make it suitable for certain situations and unsuitable for others.

Descriptive or Correlational Research Methods

Case studies, surveys, naturalistic observation, and laboratory observation are examples of Descriptive or Correlational Research Methods. Using these methods, researchers can describe different events, experiences, or behaviors and look for links between them. However, these methods do not enable researchers to determine causes of behavior.

Remember: Correlation Is not The Same As Causation. Two factors may be related without one causing the other to occur. Often, a third factor explains the correlation.

Example: A psychologist uses the survey method to study the relationship between balding and length of marriage. He finds that length of marriage correlates with baldness. However, he can't infer from this that being bald causes people to stay married longer. Instead, a third factor explains the correlation: both balding and long marriages are associated with old age.

Measuring Correlation

A Correlation Coefficient measures the strength of the relationship between two variables. A correlation coefficient is always a number between –1 and +1. The sign (+ or –) of a correlation coefficient indicates the nature of the relationship between the variables.

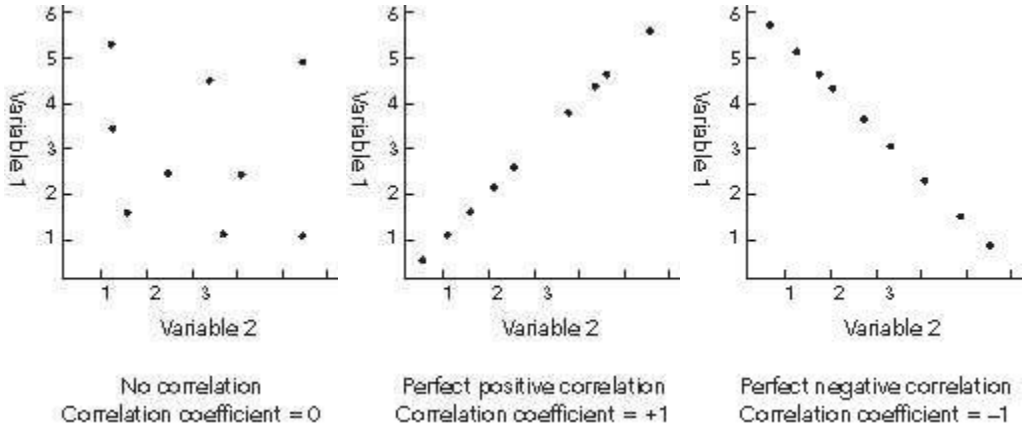
A Positive Correlation (+) means that as one variable increases, the other does too.

Example: The more years of education a person receives, the higher his or her yearly income is.

A Negative Correlation (–) means that when one variable increases, the other one decreases.

Example: The more hours a high school student works during the week, the fewer A's he or she gets in class.

The higher the correlation coefficient, the stronger the correlation. A +0.9 or a –0.9 indicates a very strong correlation; a +0.1 or a –0.1 indicates a very weak correlation. A correlation of 0 means that no relationship exists between two variables.



Common correlational research methods include case studies, surveys, naturalistic observation, and laboratory observation.

Case Studies

In a Case Study, a researcher studies a subject in depth. The researcher collects data about the subject through interviews, direct observation, psychological testing, or examination of documents and records about the subject.

Surveys

A Survey is a way of getting information about a specific type of behavior, experience, or event. When using this method, researchers give people questionnaires or interview them to obtain information.

When subjects fill out surveys about themselves, the data is called Self-Report Data. Self-report data can be misleading because subjects may do any of the following:

Lie intentionally

Give answers based on wishful thinking rather than the truth

Fail to understand the questions the survey asks

Forget parts of the experience they need to describe

Naturalistic Observation

When using naturalistic observation, researchers collect information about subjects by observing them unobtrusively, without interfering with them in any way. Researchers create a record of events and note relationships among those events. With naturalistic observation, researchers face the challenge of getting a clear view of events without becoming noticeable to the subjects.

Laboratory Observation

As the name implies, researchers perform Laboratory Observation in a laboratory rather than in a natural setting. In laboratory observation, researchers can use sophisticated equipment to measure and record subjects' behavior. They can use one-way mirrors or hidden recording devices to observe subjects more freely while remaining hidden themselves. Unlike observation in a natural setting, laboratory observation offers researchers some degree of control over the environment.

Psychological Tests

Researchers use Psychological Tests to collect information about personality traits, emotional states, aptitudes, interests, abilities, values, or behaviors. Researchers usually Standardize these tests, which means they create uniform procedures for giving and scoring them. When scoring a test, researchers often compare subjects' scores to Norms, which are established standards of performance on a test. A well-constructed standardized test can evaluate subjects better than self-report data.

Reliability

A test has good Reliability if it produces the same result when researchers administer it to the same group of people at different times. Researchers determine a test's Test-Retest Reliability by giving the test to a group of people and then giving the test again to the same group of people at a later time. A reliable test will produce approximately the same results on both occasions.

Psychologists also use Alternate-Forms Reliability to determine a test's reliability. They measure alternate-forms reliability by giving one version of a test to a group of people and then giving another version of the same test to the same group of people. A reliable test will produce roughly the same results no matter which version of the test is used.

Validity

A test is Valid if it actually measures the quality it claims to measure. There are two types of validity:

Content Validity is a test's ability to measure all the important aspects of the characteristic being measured. An intelligence test wouldn't have good content validity if it measured only verbal intelligence, since nonverbal intelligence is an important part of overall intelligence.

Criterion Validity is fulfilled when a test not only measures a trait but also predicts another criterion of that trait. For example, one criterion of scholastic aptitude is academic performance in college. A scholastic aptitude test would have good criterion validity if it could predict college grade point averages.

Overview of Research Methods

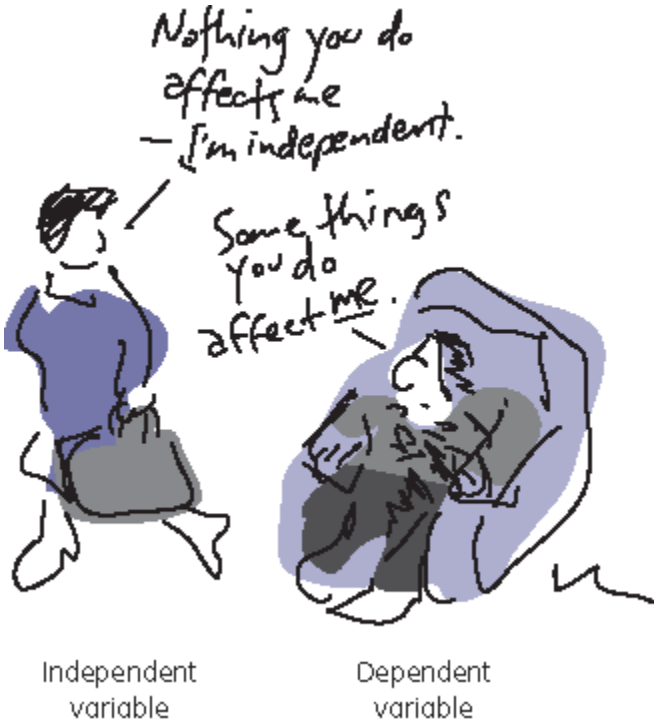
Research Method	Advantages	Disadvantages
Survey	Can provide information about many people since it's cheap and easy to do	Provides information about behavior that can't be observed directly
	Yields a lot of information	Relies on self-report data, which can be misleading
	Provides a good way to generate hypotheses	Doesn't allow conclusions about cause-and-effect relationships
		Sometimes gives incomplete information
		Sometimes relies only on self-report data, which can be misleading
Case Study	Provides a good way to generate hypotheses Yields data that other methods can't provide	Can be subjective and thus may yield biased results

		Doesn't allow conclusions about cause-and-effect relationships
		Sometimes yields biased results
		May be difficult to do unobtrusively
Naturalistic Observation	Can be useful for generating hypotheses Provides information about behavior in the natural environment	Doesn't allow conclusions about cause-and-effect relationships
		Sometimes yields biased results
		Carries the risk that observed behavior is different from natural behavior
Laboratory Observation	Enables use of sophisticated equipment for measuring and recording behavior Can be useful for generating hypotheses	Doesn't allow conclusions about cause-and-effect relationships
		Requires good reliability and validity before it can be used
Test	Gives information about characteristics such as personality traits, emotional states, aptitudes, interests, abilities, values, and behaviors	Doesn't allow conclusions about cause-and-effect relationships
Experiment	Identifies cause-and-effect relationships Distinguishes between placebo effects and real effects of a treatment or drug	Can be artificial, so results may not generalize to real-world situations

Experiments

Unlike correlational research methods or psychological tests, Experiments can provide information about cause-and-effect relationships between variables. In an experiment, a researcher manipulates or changes a particular variable under controlled conditions while observing resulting changes in another variable or variables. The researcher manipulates

the Independent Variable and observes the Dependent Variable. The dependent variable may be affected by changes in the independent variable. In other words, the dependent variable depends (or is thought to depend) on the independent variable.



Experimental and Control Groups

Typically, a researcher conducting an experiment divides subjects into an experimental group and a control group. The subjects in both groups receive the same treatment, with one important difference: the researcher manipulates one part of the treatment in the experimental group but does not manipulate it in the control group. The variable that is manipulated is the independent variable. The researcher can then compare the experimental group to the control group to find out whether the manipulation of the independent variable affected the dependent variable.

Often, subjects in the control group receive a placebo drug or treatment, while subjects in the experimental group receive the real drug or treatment. This helps researchers to figure out what causes the observed effect: the real drug or treatment, or the subjects' expectation that they will be affected.

Example: Suppose a researcher wants to study the effect of drug A on subjects' alertness. He divides 100 subjects into two groups of 50, an experimental group and a control group. He dissolves drug A in saline solution and injects it into all the subjects in the experimental group. He then gives all the control group subjects an injection of only saline solution. The

independent variable in this case is drug A, which he administers only to the experimental group. The control group receives a placebo: the injection of saline solution. The dependent variable is alertness, as measured by performance on a timed test. Any effect on alertness that appears only in the experimental group is caused by the drug. Any effect on alertness that appears in both the experimental and control groups could be due to the subjects' expectations or to extraneous variables, such as pain from the injection.

Extraneous Variables

Ideally, subjects in the experimental and control groups would be identical in every way except for the variables being studied. In practice, however, this would be possible only if researchers could clone people. So researchers try to make groups with subjects that are similar in all respects that could potentially influence the dependent variable. Variables other than the independent variable that could affect the dependent variable are called Extraneous Variables.

One way to control extraneous variables is to use random assignment. When researchers use Random Assignment, they create experimental and control groups in a way that gives subjects an equal chance of being placed in either group. This guarantees the two groups' similarity.

Disadvantages of Experiments

The main disadvantage of experiments is that they usually don't fully reflect the real world. In an experiment, researchers try to control variables in order to show clear causal links. However, to exert control in this way, researchers must simplify an event or a situation, which often makes the situation artificial.

Another disadvantage of experiments is that they can't be used to study everything. Sometimes researchers can't control variables enough to use an experiment, or they find that doing an experiment would be unethical—that is, it would be painful or harmful in some way to the subjects being studied.

Bias in Research

Bias is the distortion of results by a variable. Common types of bias include sampling bias, subject bias, and experimenter bias.

Sampling Bias

Sampling Bias occurs when the sample studied in an experiment does not correctly represent the population the researcher wants to draw conclusions about.

Example: A psychologist wants to study the eating habits of a population of New Yorkers who have freckles and are between the ages of eighteen and forty-five. She can't possibly study all people with freckles in that age group, so she must study a sample of people with freckles. However, she can generalize her results to the whole population of people with freckles only if her sample is representative of the population. If her sample includes only white, dark-haired males who are college juniors, her results won't generalize well to the entire population she's studying. Her sample will reflect sampling bias.

Subject Bias

Research subjects' expectations can affect and change the subjects' behavior, resulting in Subject Bias. Such a bias can manifest itself in two ways:

A Placebo Effect is the effect on a subject receiving a fake drug or treatment. Placebo effects occur when subjects believe they are getting a real drug or treatment even though they are not. A Single-Blind experiment is an experiment in which the subjects don't know whether they are receiving a real or fake drug or treatment. Single-blind experiments help to reduce placebo effects.

The Social Desirability Bias is the tendency of some research subjects to describe themselves in socially approved ways. It can affect self-report data or information people give about themselves in surveys.

Experimenter Bias

Experimenter Bias occurs when researchers' preferences or expectations influence the outcome of their research. In these cases, researchers see what they want to see rather than what is actually there.

A method called the Double-Blind procedure can help experimenters prevent this bias from occurring. In a double-blind procedure, neither the experimenter nor the subject knows which subjects come from the experimental group and which come from the control group.