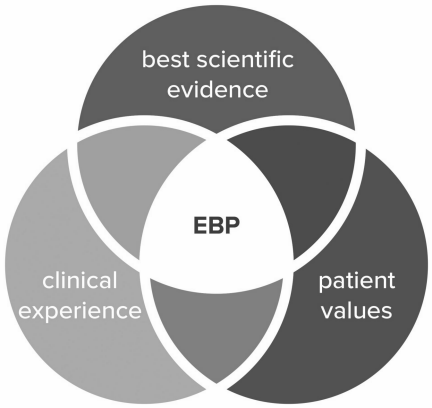
Key Features of Science	
Empirical Evidence	• Refers to data being collected through direct observation or experiment. • Empirical evidence does not rely on argument or belief. • Instead, experiments and observations are carried out carefully and reported in detail so that other investigators can repeat and attempt to verify the work.
Objectivity	• Researchers should remain totally value free when studying; they should try to remain totally unbiased in their investigations. I.e. Researchers are not influenced by personal feelings and experiences. • Objectivity means that all sources of bias are minimized and that personal or subjective ideas are eliminated. The pursuit of science implies that the facts will speak for themselves, even if they turn out to be different from what the investigator hoped
Control	All extraneous variables need to be controlled in order to be able to establish cause (IV) and effect (DV).
Hypothesis testing	E.g. a statement made at the beginning of an investigation that serves as a prediction and is derived from a theory. There are different types of hypotheses (null and alternative), which need to be stated in a form that can be tested (i.e. operationalized and unambiguous).

Key Features of Science (cont)

Replication	•This refers to whether a particular method and finding can be repeated with different/same people and/or on different occasions, to see if the results are similar. •If a dramatic discovery is reported, but it cannot be replicated by other scientists it will not be accepted. • If we get the same results over and over again under the same conditions, we can be sure of their accuracy beyond reasonable doubt. • This gives us confidence that the results are reliable and can be used to build up a body of knowledge or a theory: vital in establishing a scientific theory.
Predictability	We should be aiming to be able to predict future behaviour from the findings of our research.

Evidence Based Practice



Evidence-based practice is the integration of the best available research with clinical expertise in the context of patient characteristics, culture and preferences.

Science of Psychology

The science of psychology benefits society and enhances our lives. Psychologists examine the relationships between brain function and behavior, and the environment and behavior, applying what they learn to illuminate our understanding and improve the world around us.

The Scientist Practitioner Model

Practitioners using research and practice of validated psychological methods and theories existing at the same time

Quantitative VS Qualitative

Operationalisation

Operationalisation (cont)

Operationalisation example:
The concept of social anxiety can't be directly measured, but it can be operationalised in many different ways.
For example:

- self-rating scores on a social anxiety scale
- number of recent behavioural incidents of avoidance of crowded places
- intensity of physical anxiety symptoms in social situations

Why operationalisation matters
In quantitative research, it's important to precisely define the variables that you want to study. Without transparent and specific operational definitions, researchers may measure irrelevant concepts or inconsistently apply methods. Operationalisation reduces subjectivity and increases the reliability of your study.

Population vs. Sample

Qualitative research	Quantitative research
involves collecting and evaluating non-numerical data in order to understand concepts or subjective opinions.	involves collecting and evaluating numerical data.
• Subjective • Used to develop theories • Takes a broad, complex approach • Answers "why" and "how" questions • Explores patterns and themes	• Objective • Used to test theories • Takes a narrow, specific approach • Answers "what" questions • Explores statistical relationships

Operationalisation means turning abstract concepts into measurable observations. Although some concepts, like height or age, are easily measured, others, like spirituality or anxiety, are not. Through operationalisation, you can systematically collect data on processes and phenomena that aren't directly observable.

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A **population** is the entire group that you want to draw conclusions about.
A **sample** is the specific group that you will collect data from. The size of the sample is always less than the total size of the population.
In research, a population doesn't always refer to people. It can mean a group containing elements of anything you want to study, such as objects, events, organizations, countries, species, organisms, etc.

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Utilitarianism

utilitarianism is a philosophical theory grounded in the core idea that we should always act in the way that would impartially maximize the well-being of everyone on the planet, whether friend or stranger, near or far, human or animal.

Ethics

Ethics refers to the correct rules of conduct necessary when carrying out research. We have a moral responsibility to protect research participants from harm.

- What is ethical in research is heavily influenced by social values
- Two traditional views: Utilitarianism Vs Denotolgy

Deontology

is an ethical theory holding that decisions should be made solely or primarily by considering one's duties and the rights of others.

Tenacity

Is the state of holding on to an idea or a thing very strongly.

- Non-scientific answer

Falsification

The Falsification Principle, proposed by Karl Popper, is a way of demarcating science from non-science. It suggests that for a theory to be considered scientific it must be able to be tested and conceivably proven false.

For example, the hypothesis that "all swans are white," can be falsified by observing a black swan.

Authority

the capacity to influence others. Formal authority enables an individual to exert influence as a result of either high, legally recognized office (legitimate authority) or high rank in a long-established but not legally codified hierarchy (traditional authority).

Value

A value is a sub-set of a variable; variables can have different values

Intuition

Acquisition of knowledge not based on reasoning or inference

Aim

What you are setting out to achieve in the experiment

Hypothesis

Hypothesis testing is a formal procedure for investigating our ideas about the world using statistics. It is most often used by scientists to test specific predictions, called hypotheses, that arise from theories.

There are 5 main steps in hypothesis testing:

- State your research hypothesis as a null hypothesis and alternate hypothesis (Ho) and (Ha or H1).
- Collect data in a way designed to test the hypothesis.
- Perform an appropriate statistical test.
- Decide whether to reject or fail to reject your null hypothesis.

Hypothesis (cont)

- Present the findings in your results and discussion section.

The **alternate hypothesis** is usually your initial hypothesis that predicts a relationship between variables. **The null hypothesis** is a prediction of no relationship between the variables you are interested in.

Independent Variable (IV) & Dependent Variable

Independent Variable (IV)

An independent variable is the variable you manipulate or vary in an experimental study to explore its effects. It's called "independent" because it's not influenced by any other variables in the study. This variable is changed to investigate the effect upon the DV

Independent variable levels

You are studying the impact of a new medication on the blood pressure of patients with hypertension.

Your independent variable is the treatment that you directly vary between groups.

You have three independent variable levels, and each group gets a different level of treatment.

You randomly assign your patients to one of the three groups:

- A low-dose experimental group
- A high-dose experimental group
- A placebo group

Dependent Variable (DV)

A dependent variable is the variable that changes as a result of the independent variable manipulation. It's the outcome you're interested in measuring, and it "depends" on your independent variable. The dependent variable is what you record after you've manipulated the independent variable. You use this measurement data to check whether and to what extent your independent variable influences the dependent variable by conducting statistical analyses.
Based on your findings, you can estimate the degree to which your independent variable variation drives changes in your dependent variable. You can also predict how much your dependent variable will change as a result of variation in the independent variable.

Rationalism vs. Empiricism

Rationalism and empiricism are schools of thought that search for meaning in our existence. Each of these philosophies quest for the truth in our life by promoting skepticism, or a doubt that the other ideas are true. Fundamentally, these two philosophies are essentially opposites. Philosophers who value rationalism or empiricism maintain a continual discussion over the meaning of our existence by establishing claims that attempt to disprove the beliefs of the other philosophy based on their skepticism of opposing viewpoints. A key similarity between these philosophies is that many philosophers from both schools of thought believe in God; however, God's responsibility in how humans uncover the truth about their existence is fundamentally different.

Rationalism

Rationalism functions on three key principles that work to find the truth:

1. **Deduction** - Deduction is the application of concrete principles to draw a conclusion. Mathematical principles are an example of deduction. For example, finding the square footage of a room is always done the same way, by multiplying the width and length.

2. **Innate ideas** - Innate ideas is the concept that we're born with fundamental truths or experiences left over from another life that we're born with. These ideas can also come from God. Innate ideas can explain why some people possess significantly more talent in some things than others who have exactly the same exposure to them.

3. **Reason** - Reason uses logic to determine a conclusion. Logic can use multiple methods to determine the truth, and the emphasis is on finding the truth, not on the method.

Empiricism

Empiricism, on the other hand, works with key principles to use skepticism in its school of thought that rejects the principles of rationalism.

Empiricism (cont)

1. **Sense experience** - Empiricists believe that our ideas come solely from sense experience. These ideas are either simple or complex and make use of the five senses (touch, taste, smell, sound and sight). Simple ideas are those that use only one of the five senses to establish perception. For example, sugar is sweet. Complex ideas use more than one of the five senses to gain a more detailed perception. Sugar is sweet and white and granular, for example.

2. **Innate ideas** - Empiricists reject the notion of innate ideas. A popular term associated with this came from John Locke, who believed that the mind was a blank slate or tabula rasa.

3.**Induction** - Induction is the most crucial principle to empiricism. Induction is the belief that very little can be proven conclusively, especially with out experience
if a tree falls in the forest and nobody is around to hear it, Does it make a sound?

Social Cognition Biases:

Belief perseverance	Wanting to believe so much that no evidence can change your mind
Confirmation Bias	Searching out and playing attention only to the information that supports your current beliefs
Availability Heuristic	Overestimating how memorable events occur

Social Cognition Biases: (cont)

First Instinct Fallacy	instances when we change an answer from right to wrong loom larger in memory and lead to frustrated "if only" self-r-ecriminations.